317000 318000 319000 320000 321000 322000 323000

5730000 5729000 5728000 5727000 5726000

N

KP 659
RK 686
RK 685
KP 658
RK 684
KP 657
RK 683
KP 656
RK 682
KP-655
RK 681
KP 654
RK 680
KP 653
5
1

North Thompson River
Peltigera conspersa
North Thompson River
Yellowhead South Highway No.5

TRANS MOUNTAIN

FIGURE 2

RARE PLANT, LICHEN AND ECOLOGICAL COMMUNITY OBSERVATIONS

TRANS MOUNTAIN EXPANSION PROJECT

SHEET 42 OF 71

- Kilometre Post (KP)
- Trans Mountain Pipeline (TMPL)
- Reference Kilometre Post (RK)
- Trans Mountain Expansion Project Proposed Pipeline Corridor
- Proposed Power Line
- Rare Bryophite or Lichen
- Rare Vascular Plant
- Rare Ecological Community
- Highway
- Paved Road
- Resource Road
- Railway
- Village / Hamlet
- City / Town
- Indian Reserve / Métis Settlement
- Facility Footprint
- National / Provincial Park
- Park / Protected Area
- Municipal / District Boundary

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MAP NUMBER: 201310_MAP_TERA_VEG_00444_REV0		PAGE: SHEET 42 OF 71
DATE: December 2013	TERA REF.: 7894	REVISION: 0
SCALE: 1:20,000	PAGE SIZE: 11x17	DISCIPLINE: VEG
DRAWN: SES	CHECKED: TGG	DESIGN: TGG

0 200 400 600 800 m

ALL LOCATIONS APPROXIMATE

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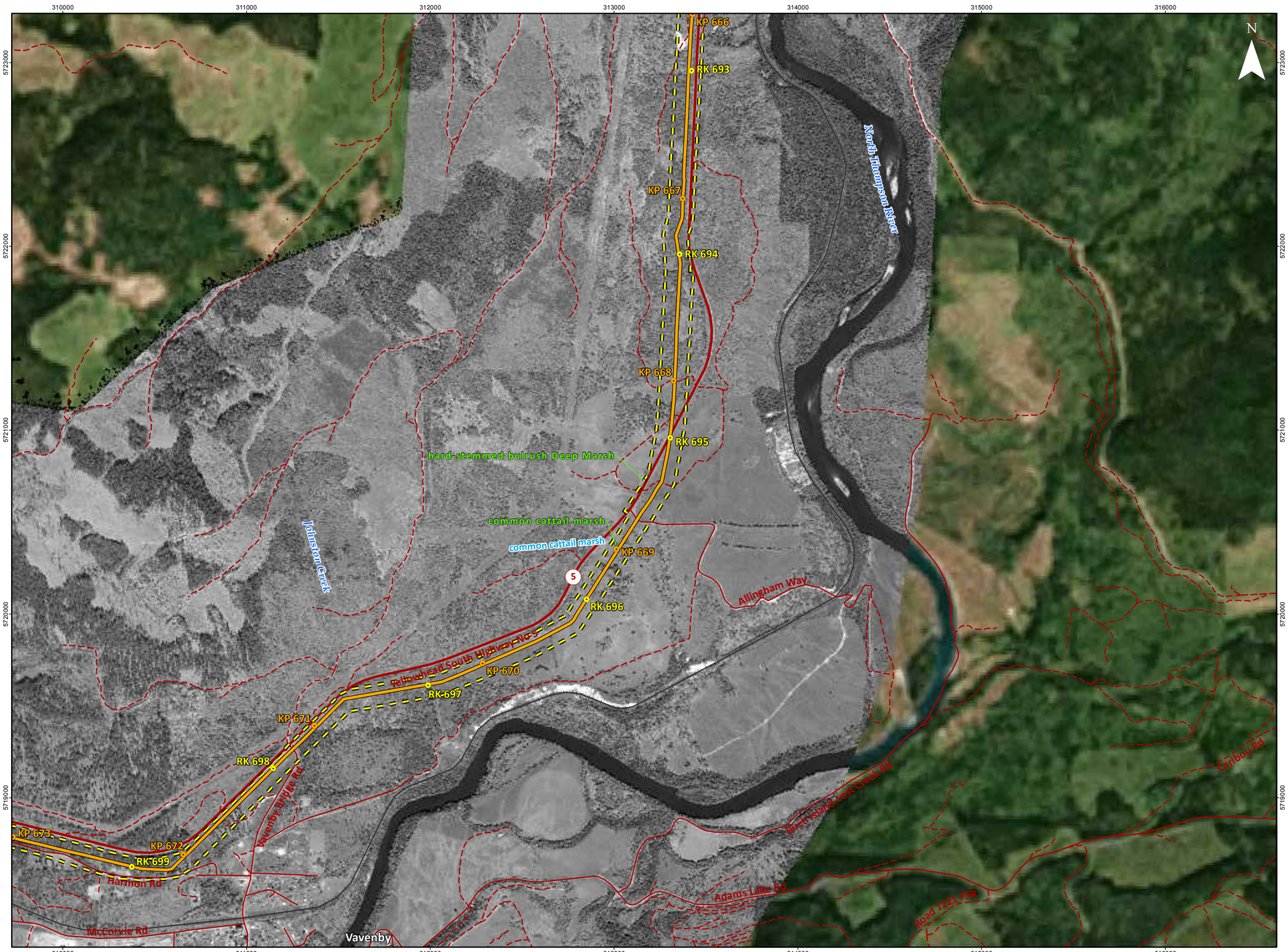

TRANS MOUNTAIN

FIGURE 2

RARE PLANT, LICHEN AND ECOLOGICAL COMMUNITY OBSERVATIONS

TRANS MOUNTAIN EXPANSION PROJECT

SHEET 43 OF 71

- Kilometre Post (KP)
- Trans Mountain Pipeline (TMPL)
- Reference Kilometre Post (RK)
- Trans Mountain Expansion Project Proposed Pipeline Corridor
- Proposed Power Line
- Rare Bryophite or Lichen
- Rare Vascular Plant
- Rare Ecological Community
- Highway
- Paved Road
- Resource Road
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DRAWN: SES	CHECKED: TGG		DESIGN: TGG

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ALL LOCATIONS APPROXIMATE

201310_MAP_TERA_VEG_00444_Rev0.mxd

298000 299000 300000 301000 302000 303000

5722000 5721000 5720000 5719000 5718000

RK 713
KP 686
RK 712
KP 685
RK 711
KP 684
RK 710
KP 683
RK 709
KP 682
RK 708
KP 681
RK 707
KP 680
RK 706
KP 679

Norris Rd
McCracken Rd
Birch Island
Birch Island Dump Rd
Birch Rd
Clay Creek
Crossing Creek
Yellowhead South Highway No 5
common cattail marsh
Birch Island-Lost Creek Rd

N

TRANS MOUNTAIN

FIGURE 2

RARE PLANT, LICHEN AND ECOLOGICAL COMMUNITY OBSERVATIONS

TRANS MOUNTAIN EXPANSION PROJECT

SHEET 44 OF 71

- Kilometre Post (KP)
- Trans Mountain Pipeline (TMPL)
- Reference Kilometre Post (RK)
- Trans Mountain Expansion Project Proposed Pipeline Corridor
- Proposed Power Line
- Rare Bryophite or Lichen
- Rare Vascular Plant
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- City / Town
- Indian Reserve / Métis Settlement
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MAP NUMBER		PAGE
201310_MAP_TERA_VEG_00444_REV0		SHEET 44 OF 71
DATE	TERA REF.	REVISION
December 2013	7894	0
SCALE	PAGE SIZE	DISCIPLINE
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DRAWN	CHECKED	DESIGN
SES	TGG	TGG

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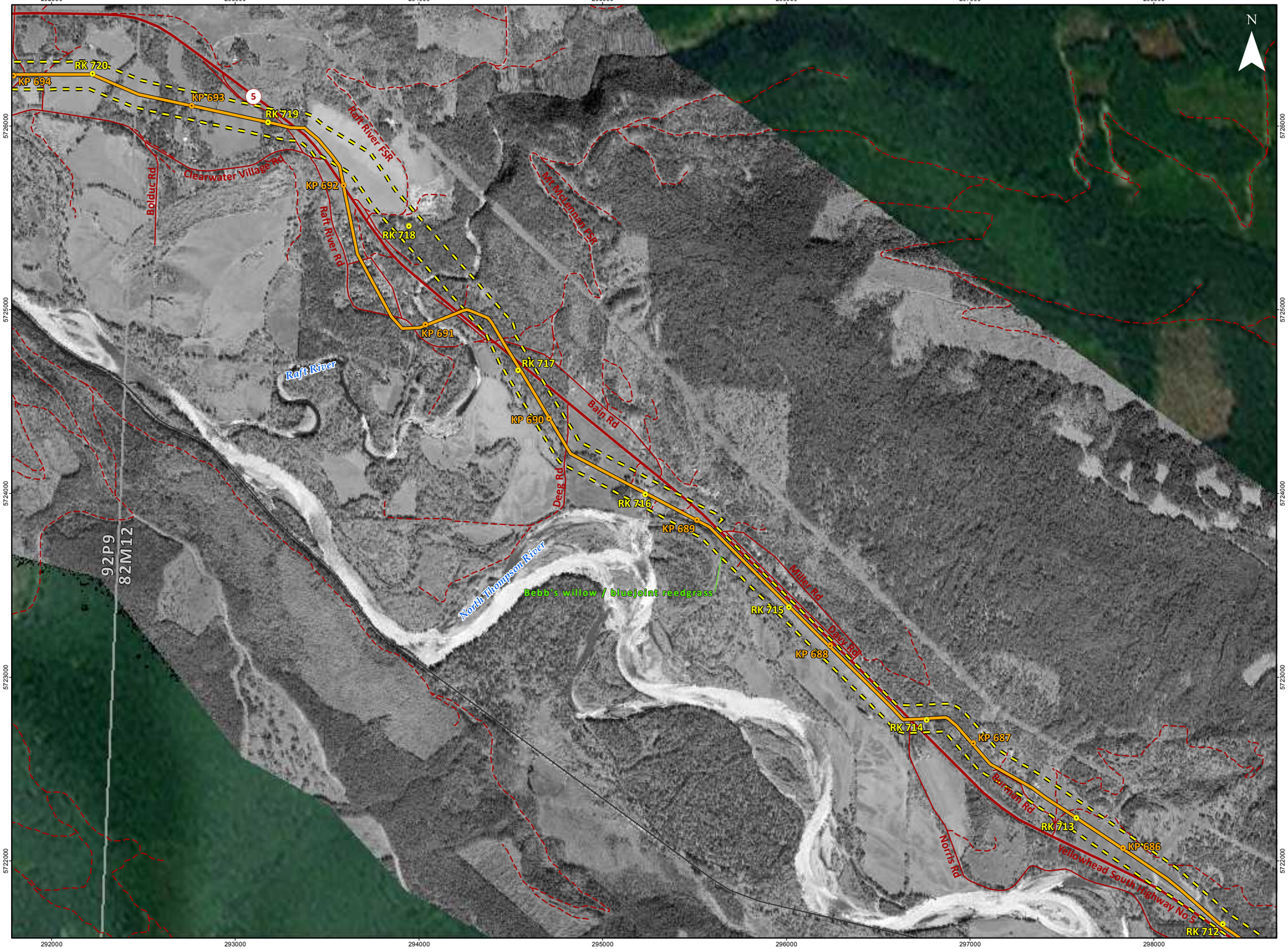
ALL LOCATIONS APPROXIMATE

201310_MAP_TERA_VEG_00444_Rev0.mxd



TRANS MOUNTAIN

FIGURE 2

RARE PLANT, LICHEN AND ECOLOGICAL COMMUNITY OBSERVATIONS

TRANS MOUNTAIN EXPANSION PROJECT

SHEET 45 OF 71

- Kilometre Post (KP)
- Trans Mountain Pipeline (TMPL)
- Reference Kilometre Post (RK)
- Trans Mountain Expansion Project Proposed Pipeline Corridor
- Proposed Power Line
- Rare Bryophite or Lichen
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ALL LOCATIONS APPROXIMATE

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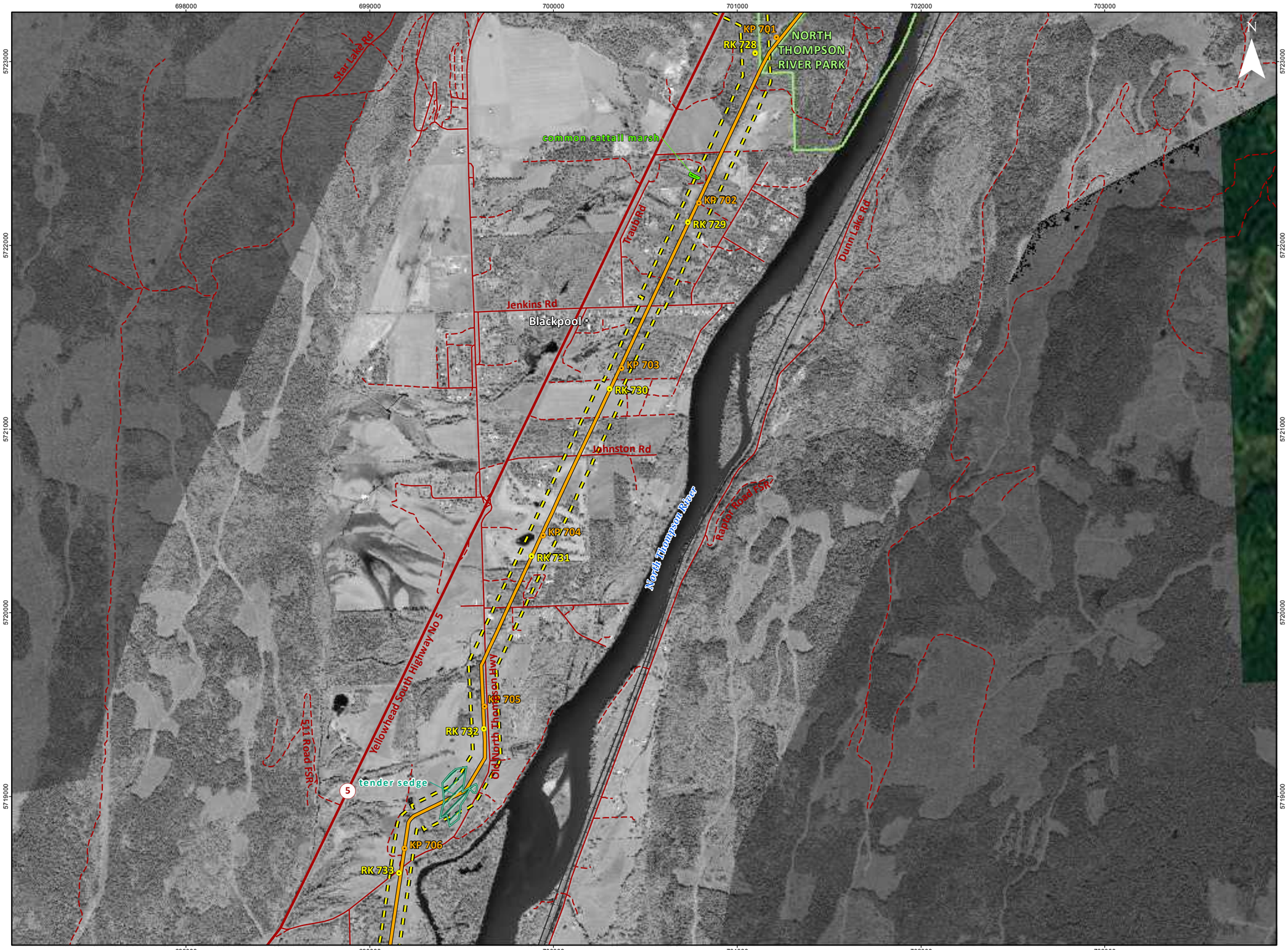

TRANS MOUNTAIN

FIGURE 2

RARE PLANT, LICHEN AND ECOLOGICAL COMMUNITY OBSERVATIONS

TRANS MOUNTAIN EXPANSION PROJECT

SHEET 46 OF 71

- Kilometre Post (KP)
- Trans Mountain Pipeline (TMPL)
- Reference Kilometre Post (RK)
- Trans Mountain Expansion Project Proposed Pipeline Corridor
- Proposed Power Line
- Rare Bryophite or Lichen
- Rare Vascular Plant
- Rare Ecological Community
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DRAWN: SES	CHECKED: TGG	DESIGN: TGG

0 200 400 600 800 m

ALL LOCATIONS APPROXIMATE

201310_MAP_TERA_VEG_00444_Rev0.mxd

693000 694000 695000 696000 697000 698000 699000

5718000 5717000 5716000 5715000 5714000

N

Blackwater Rd
Mann Creek
Mann Rd
KP 707
RK 734
Petrol Rd
Pumping Station Rd
KP 708
tender sedge
RK 735
Bebb's willow / bluejoint reedgrass
KP 709
RK 736
Blackpool
KP 710
least moonwort
KP 711
RK 737
RK 738
5
Yellowhead South Highway No 5
Dunn Lake Rd
KP 712
RK 739
Dicranum flagellare
KP 713
RK 740
Lemieux Lake
KP 714
RK 741
tender sedge
KP 715
RK 742
North Thompson River
Auldgirth Rd

693000 694000 695000 696000 697000 698000 699000

201310_MAP_TERA_VEG_00444_Rev0.mxd

TRANS MOUNTAIN

FIGURE 2

RARE PLANT, LICHEN AND ECOLOGICAL COMMUNITY OBSERVATIONS

TRANS MOUNTAIN EXPANSION PROJECT

SHEET 47 OF 71

- Kilometre Post (KP)
- Trans Mountain Pipeline (TMPL)
- Reference Kilometre Post (RK)
- Trans Mountain Expansion Project Proposed Pipeline Corridor
- Proposed Power Line
- Rare Bryophite or Lichen
- Rare Vascular Plant
- Rare Ecological Community
- Highway
- Paved Road
- Resource Road
- Railway
- Village / Hamlet
- City / Town
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SCALE: 1:20,000	PAGE SIZE: 11x17	DISCIPLINE: VEG
DRAWN: SES	CHECKED: TGG	DESIGN: TGG

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ALL LOCATIONS APPROXIMATE

690000 691000 692000 693000 694000 695000 696000

5708000 5707000 5706000 5705000 5704000

Demers Lake

Nahalliston Creek

Demers Creek

McNab Rd

KP 721

RK 748

KP 722

RK 749

white wintergreen

Peltigera conspersa

western redcedar - paper birch/oak fern

KP 723

Mexican mosquito fern

RK 750

Lemieux Creek Rd

KP 724

RK 751

KP 725

RK 752

Carterwright Rd

Eakin Creek Rd

Little Fort Hwy 24

24

EAKIN CREEK CANYON PARK

DUNN PEAK PROTECTED AREA

ROUND TOP

Yellowhead South Highway No 5

5

N

690000 691000 692000 693000 694000 695000 696000

201310_MAP_TERA_VEG_00444_Rev0.mxd

TRANS MOUNTAIN

FIGURE 2

RARE PLANT, LICHEN AND ECOLOGICAL COMMUNITY OBSERVATIONS

TRANS MOUNTAIN EXPANSION PROJECT

SHEET 48 OF 71

- Kilometre Post (KP)
- Trans Mountain Pipeline (TMPL)
- Reference Kilometre Post (RK)
- Trans Mountain Expansion Project Proposed Pipeline Corridor
- Proposed Power Line
- Rare Bryophite or Lichen
- Rare Vascular Plant
- Rare Ecological Community
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- Paved Road
- Resource Road
- Railway
- Village / Hamlet
- City / Town
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DATE December 2013	TERA REF. 7894	REVISION 0
SCALE 1:20,000	PAGE SIZE 11x17	DISCIPLINE VEG
DRAWN SES	CHECKED TGG	DESIGN TGG

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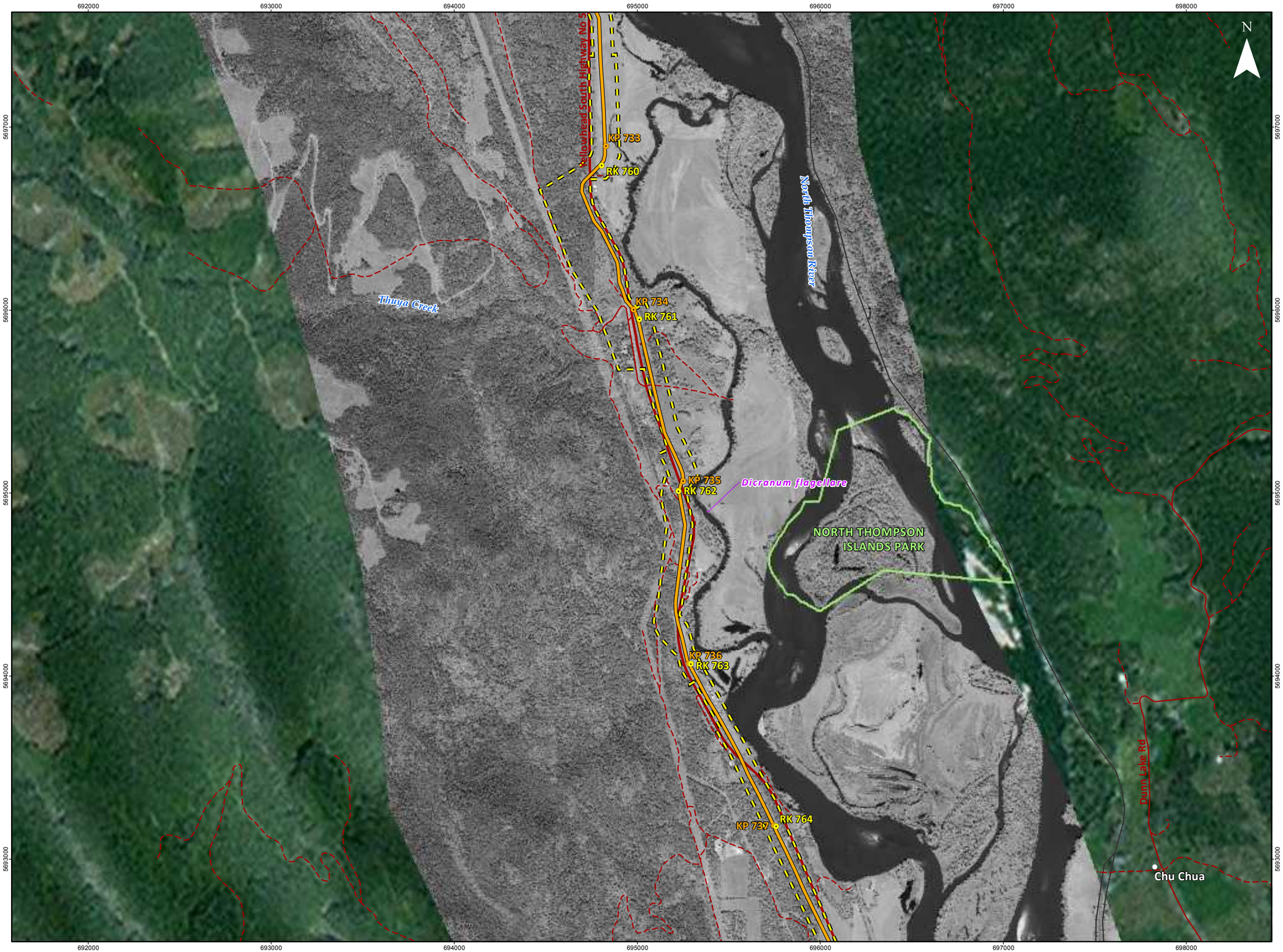
ALL LOCATIONS APPROXIMATE



TRANS MOUNTAIN

FIGURE 2

RARE PLANT, LICHEN AND ECOLOGICAL COMMUNITY OBSERVATIONS

TRANS MOUNTAIN EXPANSION PROJECT

SHEET 49 OF 71

- Kilometre Post (KP)
- Trans Mountain Pipeline (TMPL)
- Reference Kilometre Post (RK)
- Trans Mountain Expansion Project Proposed Pipeline Corridor
- Proposed Power Line
- Rare Bryophite or Lichen
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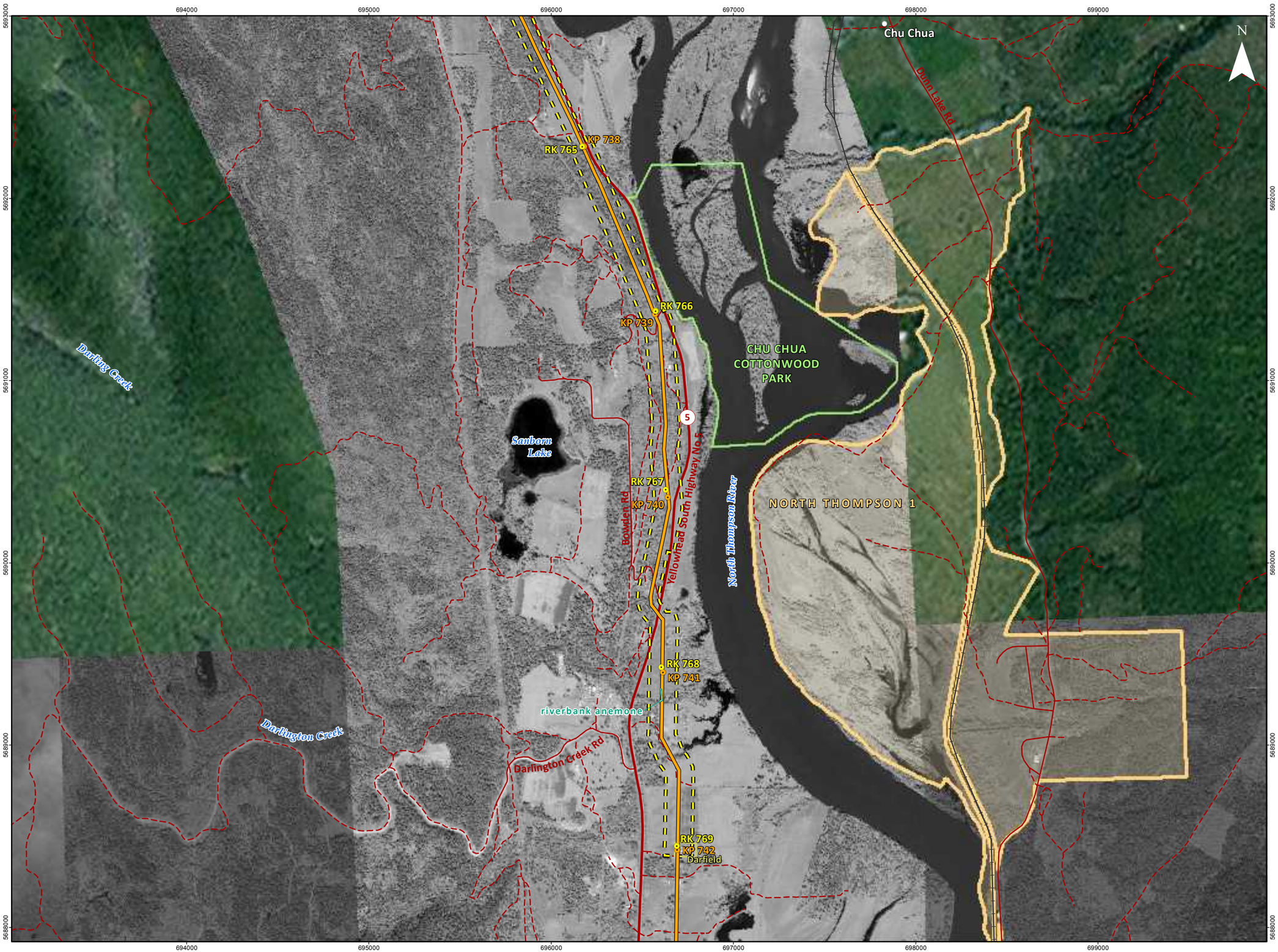

TRANS MOUNTAIN

FIGURE 2

RARE PLANT, LICHEN AND ECOLOGICAL COMMUNITY OBSERVATIONS

TRANS MOUNTAIN EXPANSION PROJECT

SHEET 50 OF 71

- Kilometre Post (KP)
- Trans Mountain Pipeline (TMPL)
- Reference Kilometre Post (RK)
- Trans Mountain Expansion Project Proposed Pipeline Corridor
- Proposed Power Line
- Rare Bryophite or Lichen
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DRAWN: SES	CHECKED: TGG	DESIGN: TGG

0 200 400 600 800 m

ALL LOCATIONS APPROXIMATE

201310_MAP_TERA_VEG_00444_Rev0.mxd

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5649000 5648000 5647000 5646000 5645000

N

KP 784

riverbank anemone

RK 812 KP 785

Douglas-fir / common snowberry - saskatoon

Kearly Rd

5

Yellowhead South Hwy No 5

RK 813 KP 786

Grassland Rd

North Thompson River

RK 814 KP 787

many-headed sedge

Black Pines

Westside Rd

RK 815 KP 788

Vinsulla Ferry Rd

201310_MAP_TERA_VEG_00444_Rev0.mxd

TRANS MOUNTAIN

FIGURE 2

RARE PLANT, LICHEN AND ECOLOGICAL COMMUNITY OBSERVATIONS

TRANS MOUNTAIN EXPANSION PROJECT

SHEET 51 OF 71

- Kilometre Post (KP)
- Trans Mountain Pipeline (TMPL)
- Reference Kilometre Post (RK)
- Trans Mountain Expansion Project Proposed Pipeline Corridor
- Proposed Power Line
- Rare Bryophite or Lichen
- Rare Vascular Plant
- Rare Ecological Community
- Highway
- Paved Road
- Resource Road
- Railway
- Village / Hamlet
- City / Town
- Indian Reserve / Métis Settlement
- Facility Footprint
- National / Provincial Park
- Park / Protected Area
- Municipal / District Boundary

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DATE December 2013	TERA REF. 7894	REVISION 0
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DRAWN SES	CHECKED TGG	DESIGN TGG

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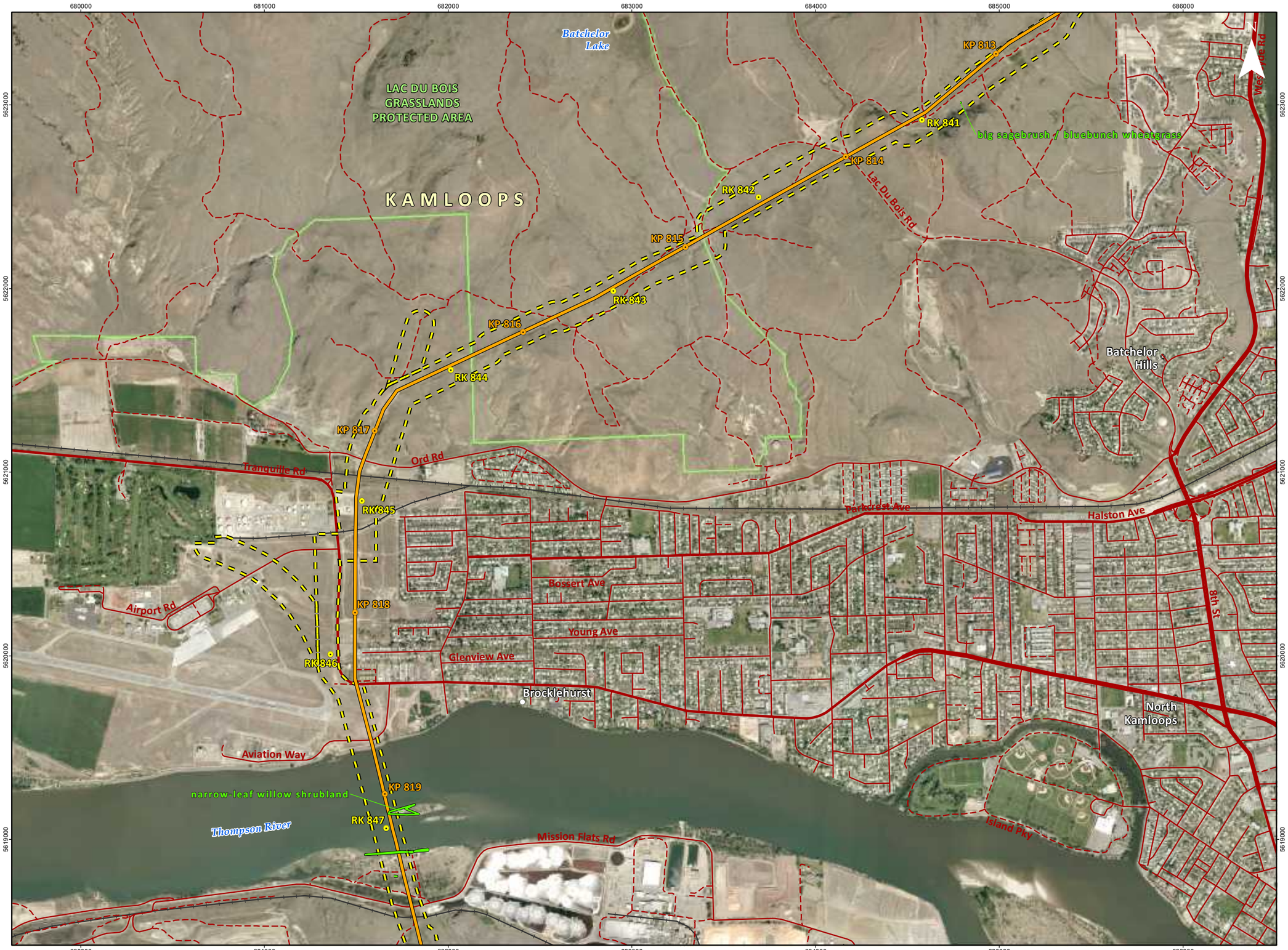

TRANS MOUNTAIN

FIGURE 2

RARE PLANT, LICHEN AND ECOLOGICAL COMMUNITY OBSERVATIONS

TRANS MOUNTAIN EXPANSION PROJECT

SHEET 52 OF 71

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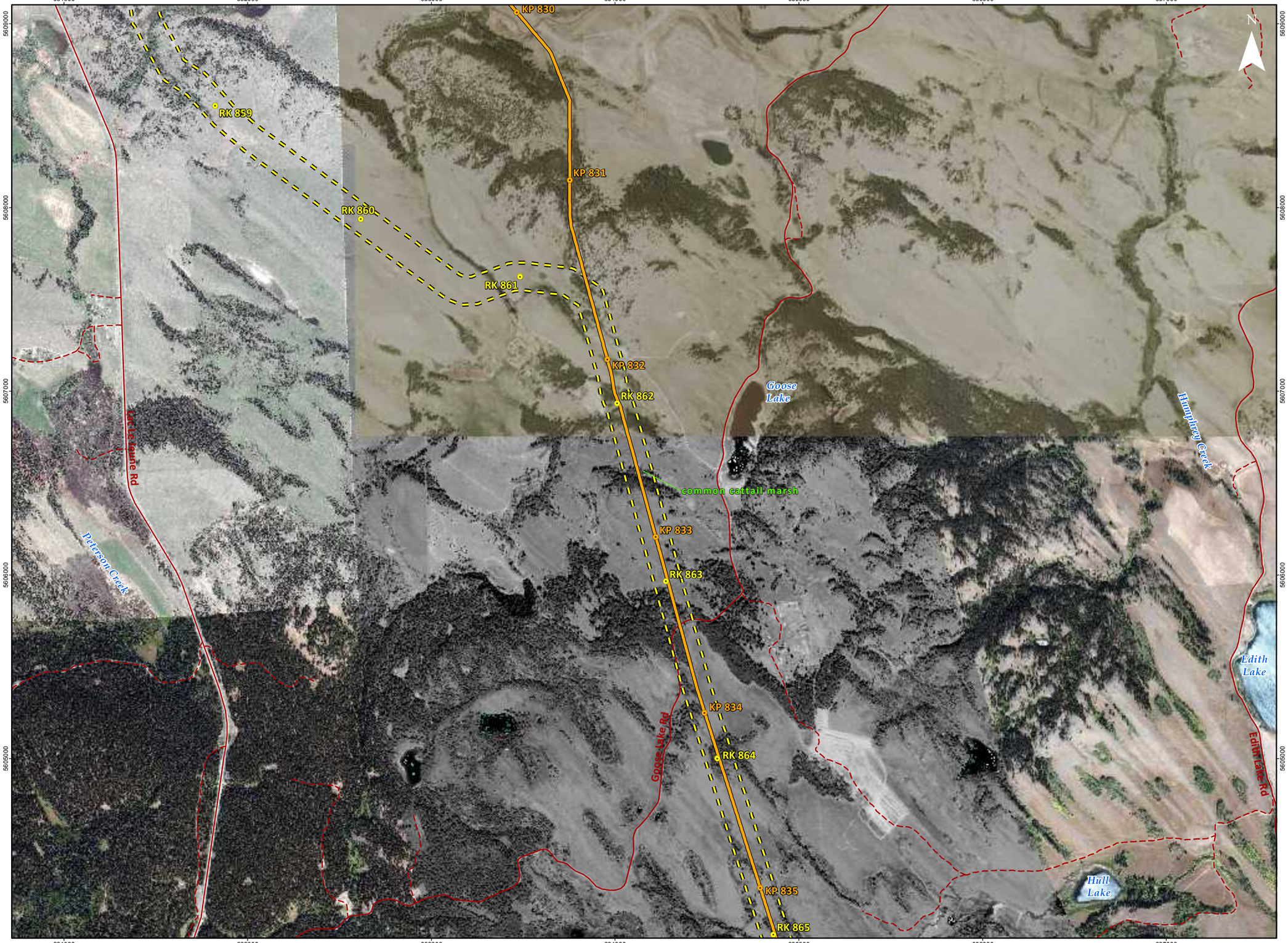

TRANS MOUNTAIN

FIGURE 2

RARE PLANT, LICHEN AND ECOLOGICAL COMMUNITY OBSERVATIONS

TRANS MOUNTAIN EXPANSION PROJECT

SHEET 53 OF 71

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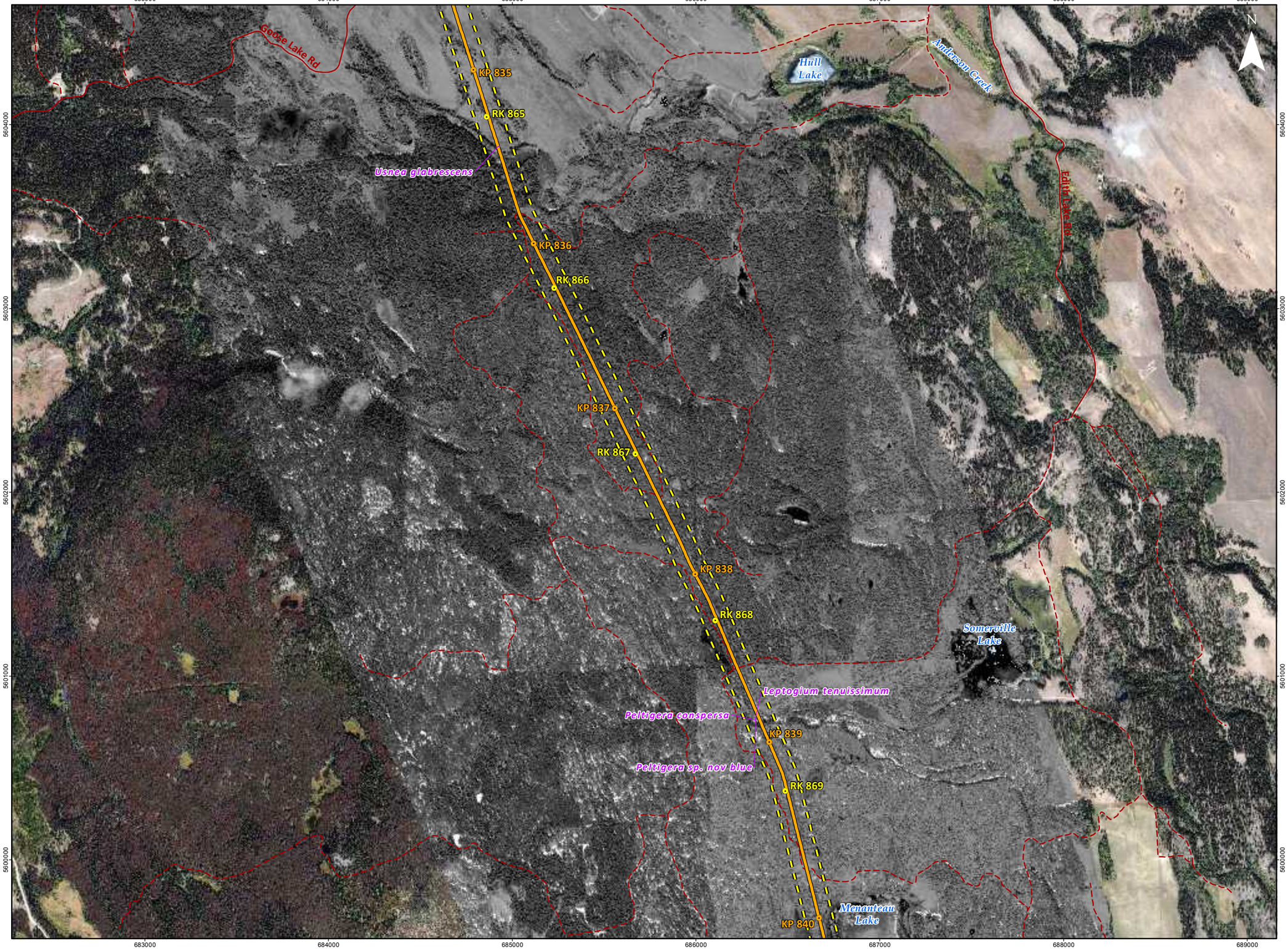

TRANS MOUNTAIN

FIGURE 2

RARE PLANT, LICHEN AND ECOLOGICAL COMMUNITY OBSERVATIONS

TRANS MOUNTAIN EXPANSION PROJECT

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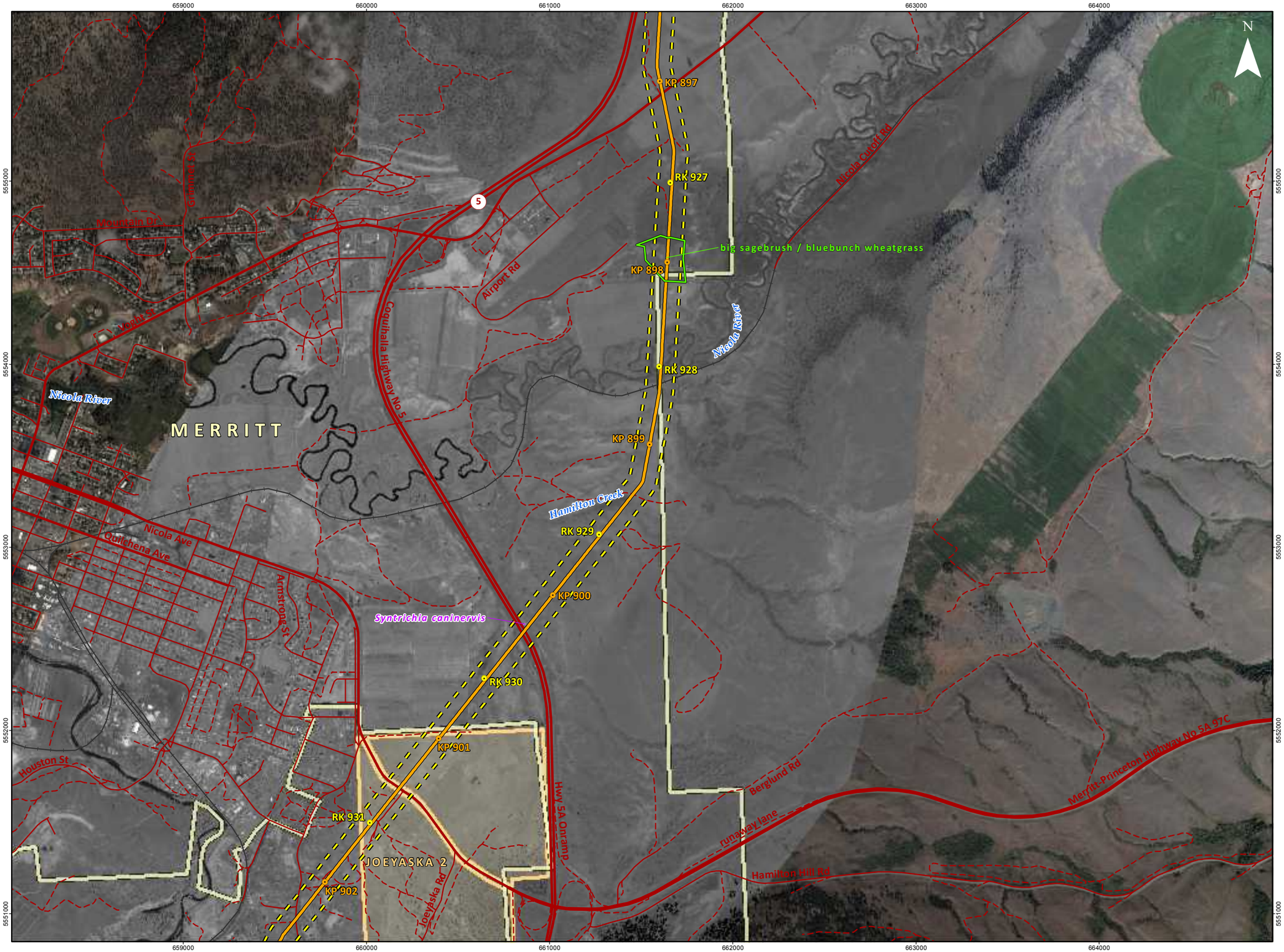

TRANS MOUNTAIN

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RARE PLANT, LICHEN AND ECOLOGICAL COMMUNITY OBSERVATIONS

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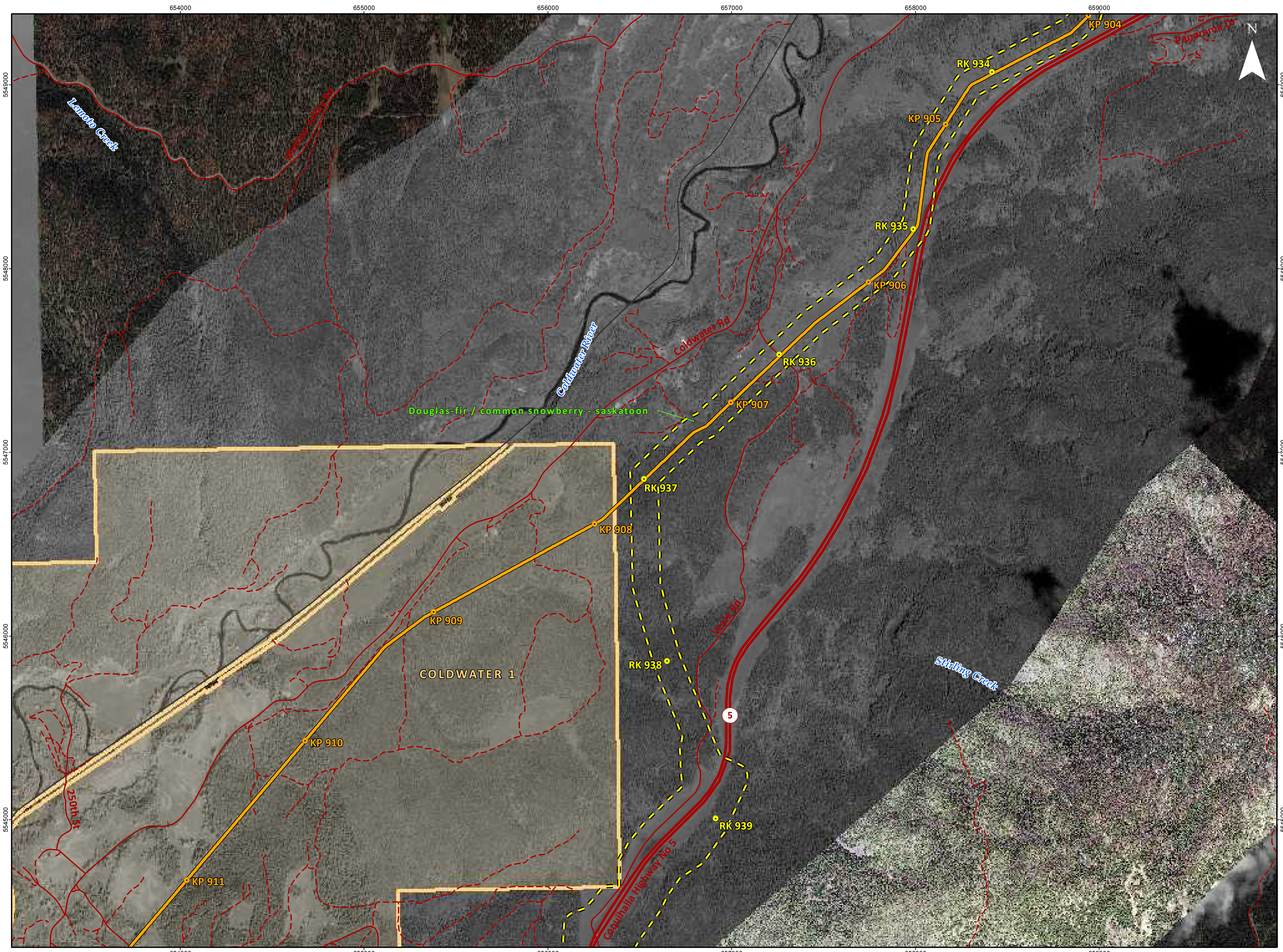

TRANS MOUNTAIN

FIGURE 2

RARE PLANT, LICHEN AND ECOLOGICAL COMMUNITY OBSERVATIONS

TRANS MOUNTAIN EXPANSION PROJECT

SHEET 56 OF 71

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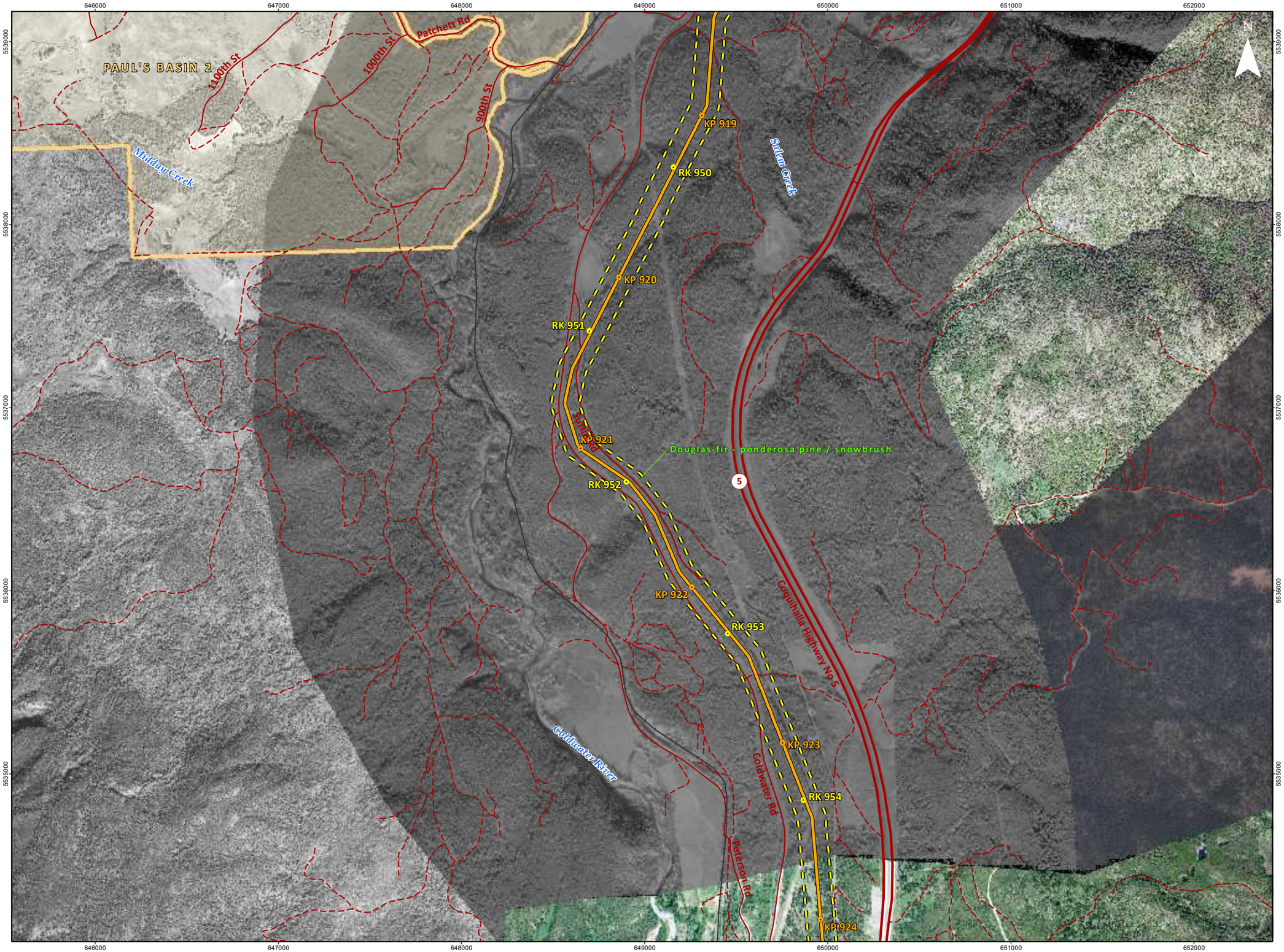

TRANS MOUNTAIN

FIGURE 2

RARE PLANT, LICHEN AND ECOLOGICAL COMMUNITY OBSERVATIONS

TRANS MOUNTAIN EXPANSION PROJECT

SHEET 57 OF 71

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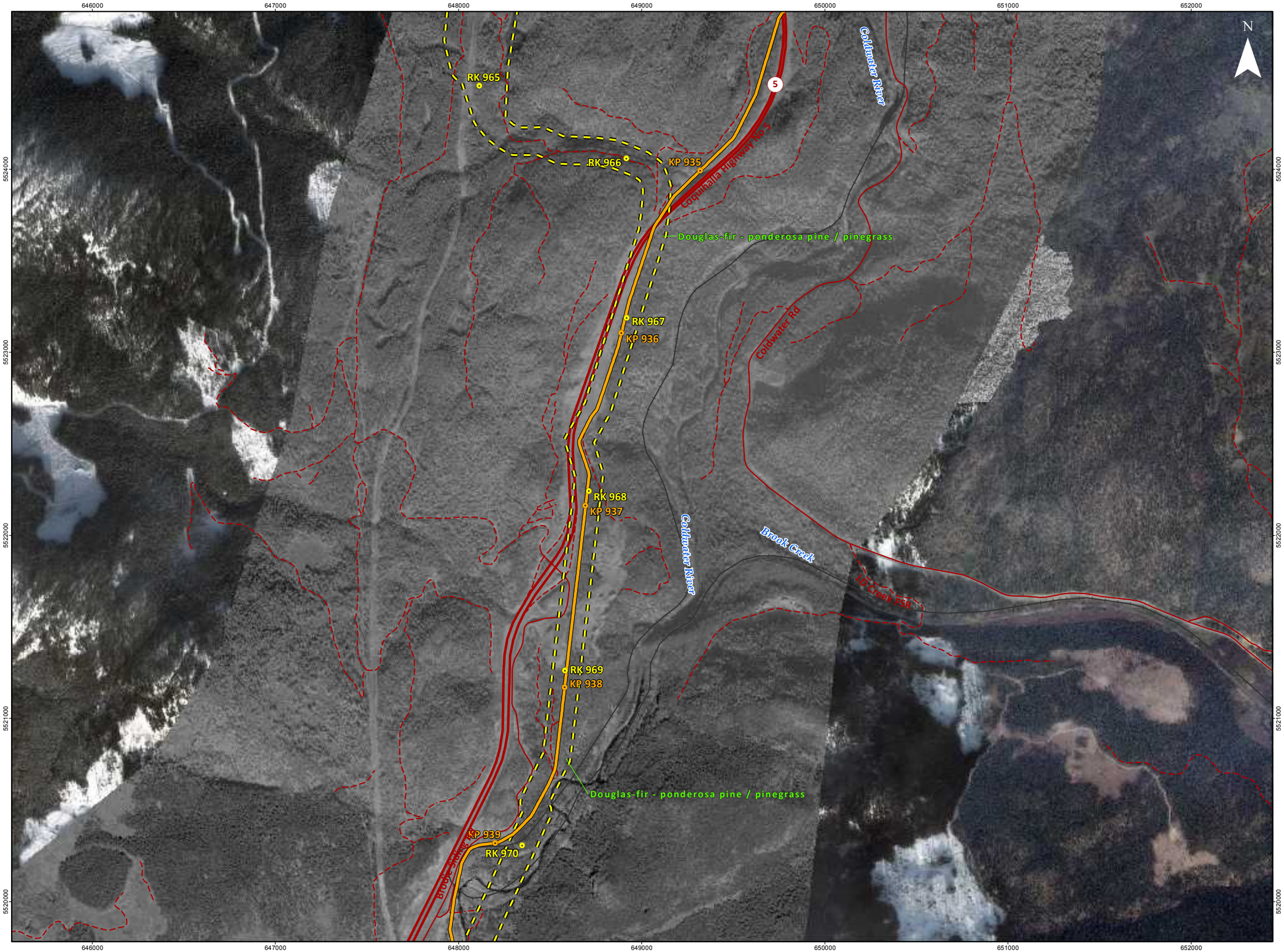

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TRANS MOUNTAIN EXPANSION PROJECT

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5516000 5515000 5514000 5513000 5512000

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KP 945 RK 976

KP 946 RK 977

KP 947 RK 978

KP 948 RK 979

KP 949 RK 980

RK 981

92H14 92H15

92H14 92H11

92H15 92H10

92H11 92H10

Make-Murray FSR

Coldwater River

Coquihalla Highway No 5

5

Bottleneck Creek

Juliet Dr

Juliet pit Rd

Juliet Rd

Juliet Creek FSR

utility access rd

COLDWATER RIVER PARK

hybrid spruce species - Douglas-fir / subalpine fir

641000 642000 643000 644000 645000 646000 647000

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TRANS MOUNTAIN

FIGURE 2

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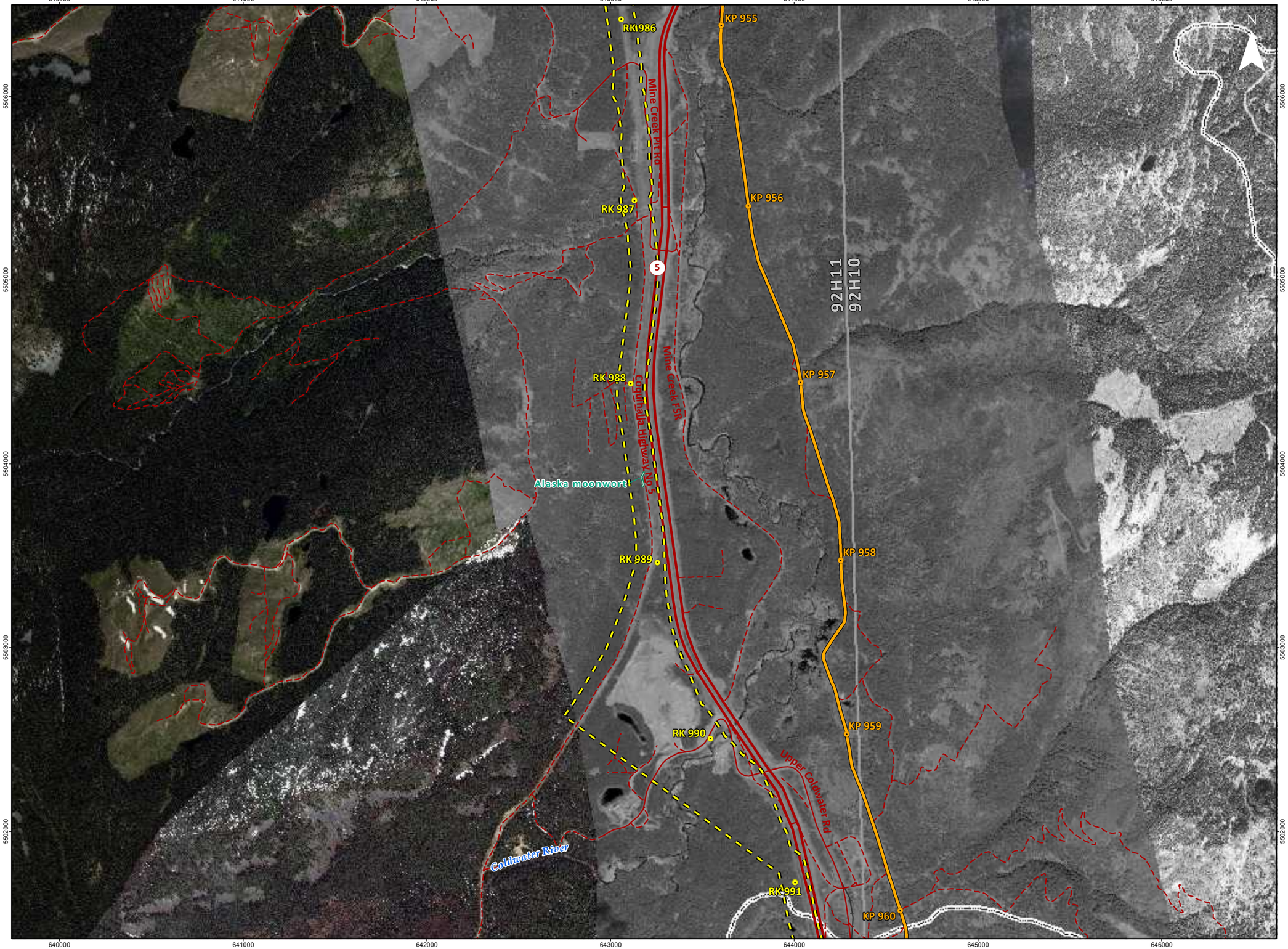

TRANS MOUNTAIN

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RARE PLANT, LICHEN AND ECOLOGICAL COMMUNITY OBSERVATIONS

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DRAWN: SES	CHECKED: TGG	DESIGN: TGG

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5495000 5494000 5493000 5492000 5491000

RK 1005
RK 1006
RK 1007
RK 1008
RK 1009
RK 1010
RK 1011

amabilis fir - western redcedar / devil's club

slender spike rush

COQUIHALLA SUMMIT RECREATION AREA

Boston Bar Creek

5

N

TRANS MOUNTAIN

FIGURE 2

RARE PLANT, LICHEN AND ECOLOGICAL COMMUNITY OBSERVATIONS

TRANS MOUNTAIN EXPANSION PROJECT

SHEET 61 OF 71

- Kilometre Post (KP)
- Trans Mountain Pipeline (TMPL)
- Reference Kilometre Post (RK)
- Trans Mountain Expansion Project Proposed Pipeline Corridor
- Proposed Power Line
- Rare Bryophite or Lichen
- Rare Vascular Plant
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627000 628000 629000 630000 631000 632000 633000

5490000 5489000 5488000 5487000 5486000

Jeanne Lake

Ladner Creek

RK 1012

RK 1013

amabilis fir - western redcedar / devil's club

Boston Bar Creek

RK 1014

Hwy 5

5

Usnea quasirigida

RK 1015

RK 1016

TRANS MOUNTAIN

FIGURE 2

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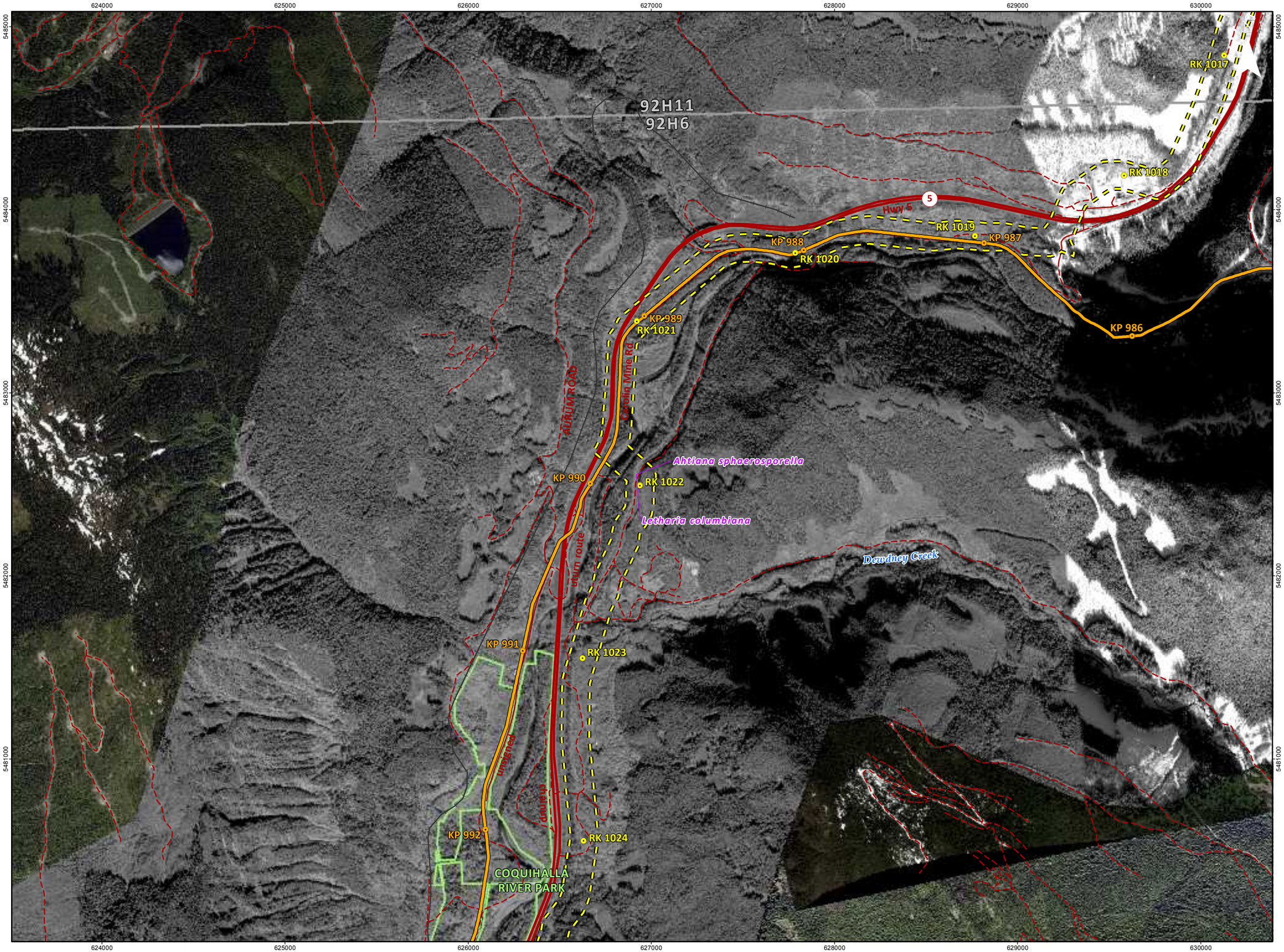

TRANS MOUNTAIN

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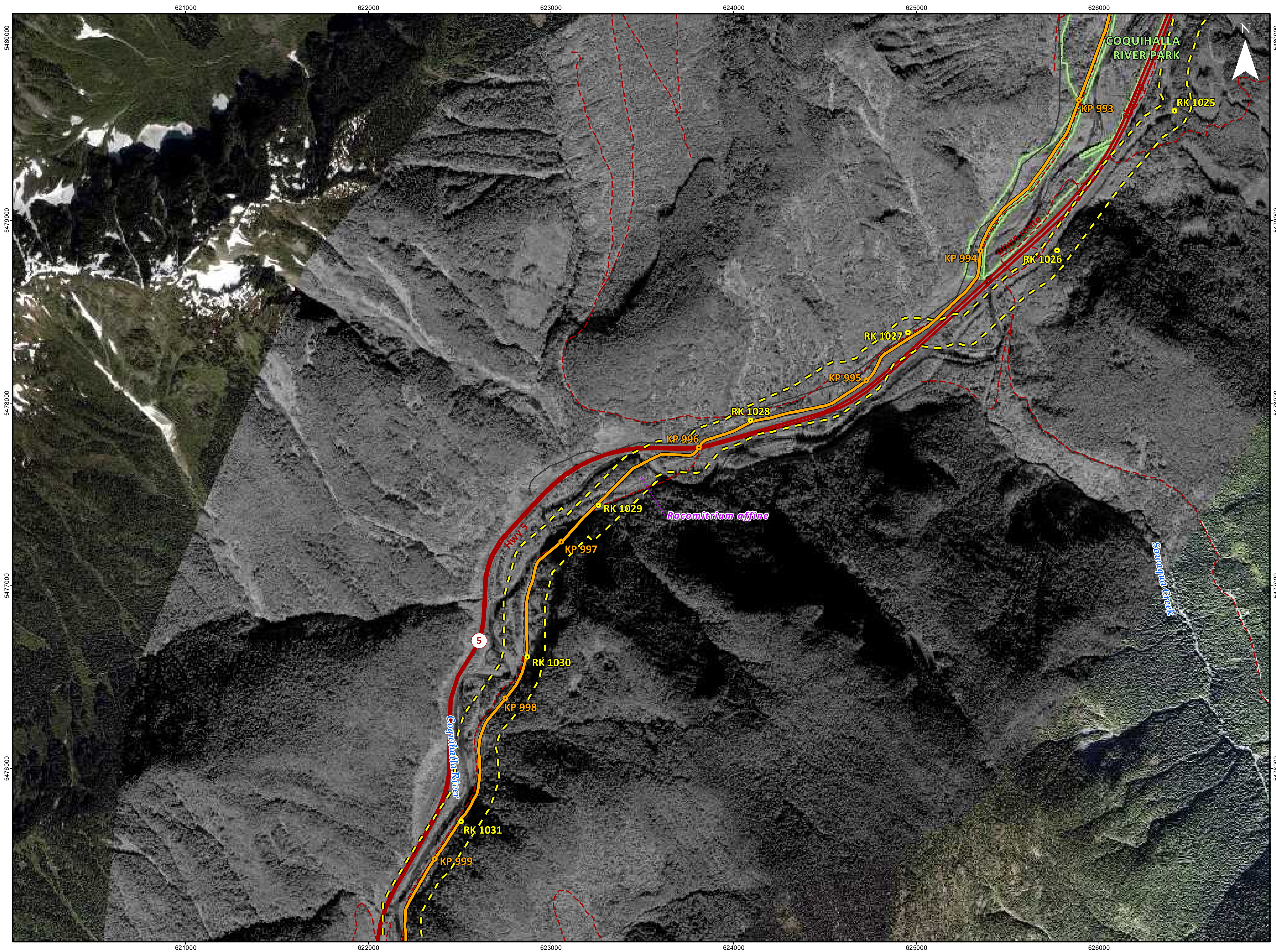

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RK 1033
KP 1001
RK 1034
KP 1002
RK 1035
KP 1003
KP 1004
RK 1036
RK 1037
KP 1005
KP 1006
RK 1038
RK 1039
KP 1007
KP 1008
Othello
campion species
Jason Rd
Fish Camp Rd
Othello Rd
Tunnels Rd
Coquihalla River
Hwy 5
Hwy 5 Offramp
COQUIHALLA CANYON PARK
NICOLUM RIVER PARK
5
3
177

N

TRANS MOUNTAIN

FIGURE 2

RARE PLANT, LICHEN AND ECOLOGICAL COMMUNITY OBSERVATIONS

TRANS MOUNTAIN EXPANSION PROJECT

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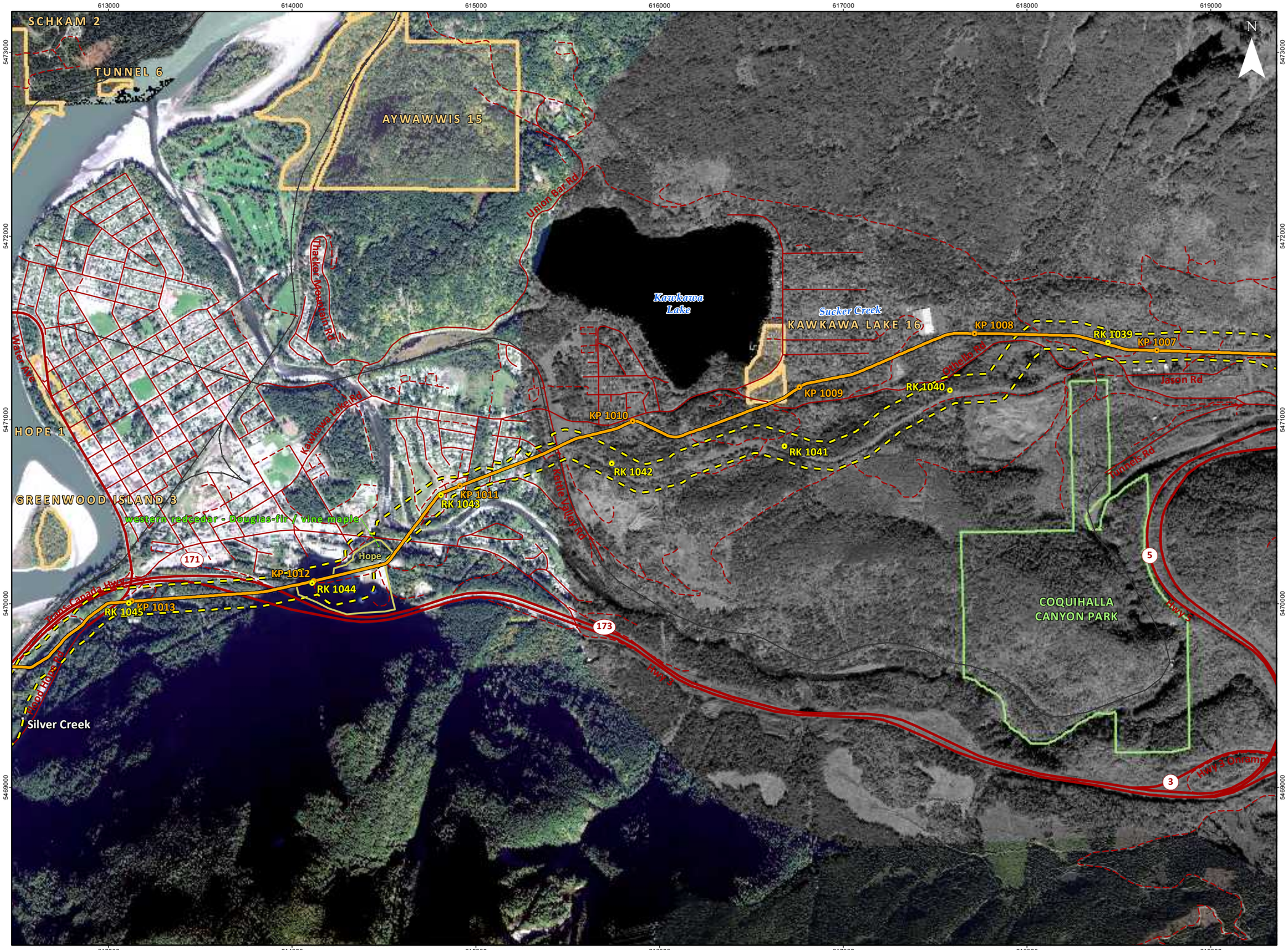

TRANS MOUNTAIN

FIGURE 2

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TRANS MOUNTAIN EXPANSION PROJECT

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5456000 5455000 5454000 5453000 5452000

SEABIRD ISLAND

92H5
92H4

Fraser River

KP 1038

Trans Mountain Pipeline

RK 1071

KP 1039

RK 1072

KP 1040

western redcedar - Douglas-fir / vine maple

RK 1073

KP 1041

RK 1074

KP 1042

Trans Canada Hwy

1

RK 1075

KP 1043

Halvorsen Rd

unsigned
POPKUM 1

RK 1076

Wahleach Lake

N

TRANS MOUNTAIN

FIGURE 2

RARE PLANT, LICHEN AND ECOLOGICAL COMMUNITY OBSERVATIONS

TRANS MOUNTAIN EXPANSION PROJECT

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TRANS MOUNTAIN

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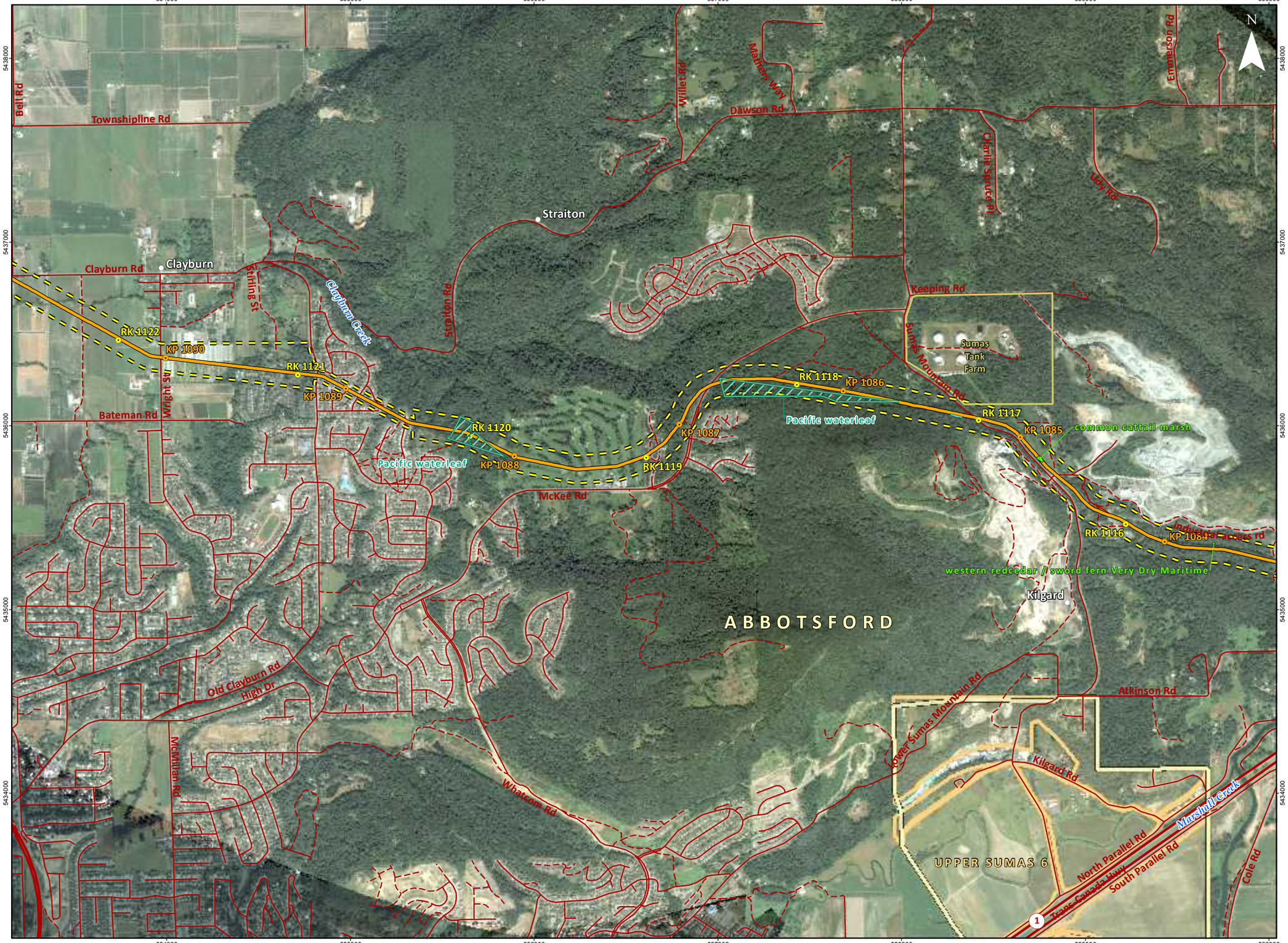

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ALL LOCATIONS APPROXIMATE

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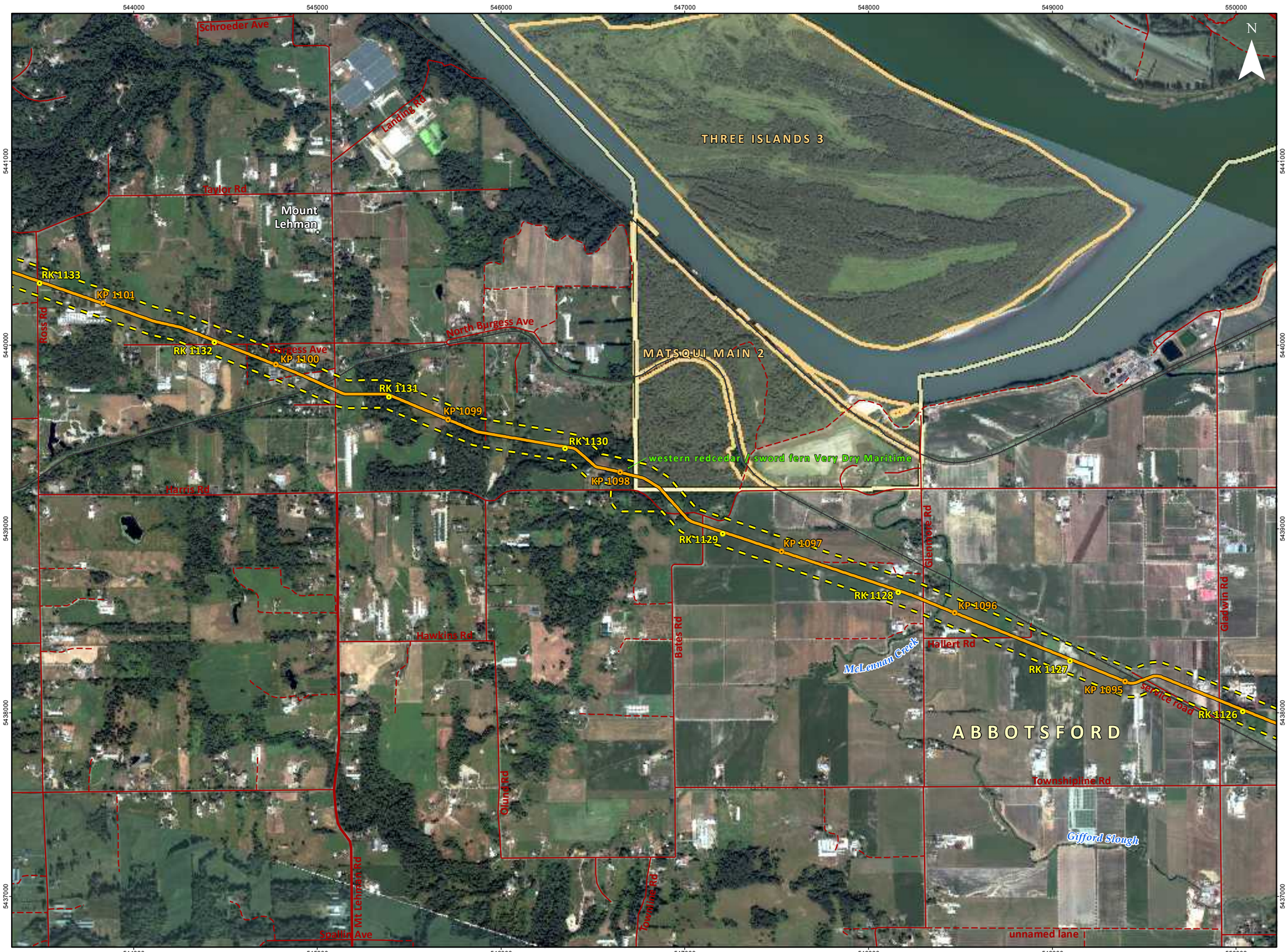

TRANS MOUNTAIN

FIGURE 2

RARE PLANT, LICHEN AND ECOLOGICAL COMMUNITY OBSERVATIONS

TRANS MOUNTAIN EXPANSION PROJECT

SHEET 70 OF 71

- Kilometre Post (KP)
- Trans Mountain Pipeline (TMPL)
- Reference Kilometre Post (RK)
- Trans Mountain Expansion Project Proposed Pipeline Corridor
- Proposed Power Line
- Rare Bryophite or Lichen
- Rare Vascular Plant
- Rare Ecological Community
- Highway
- Paved Road
- Resource Road
- Railway
- Village / Hamlet
- City / Town
- Indian Reserve / Métis Settlement
- Facility Footprint
- National / Provincial Park
- Park / Protected Area
- Municipal / District Boundary

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tera ENVIRONMENTAL CONSULTANTS

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MAP NUMBER: 201310_MAP_TERA_VEG_00444_REV0		PAGE: SHEET 70 OF 71
DATE: December 2013	TERA REF.: 7894	REVISION: 0
SCALE: 1:20,000	PAGE SIZE: 11x17	DISCIPLINE: VEG
DRAWN: SES	CHECKED: TGG	DESIGN: TGG

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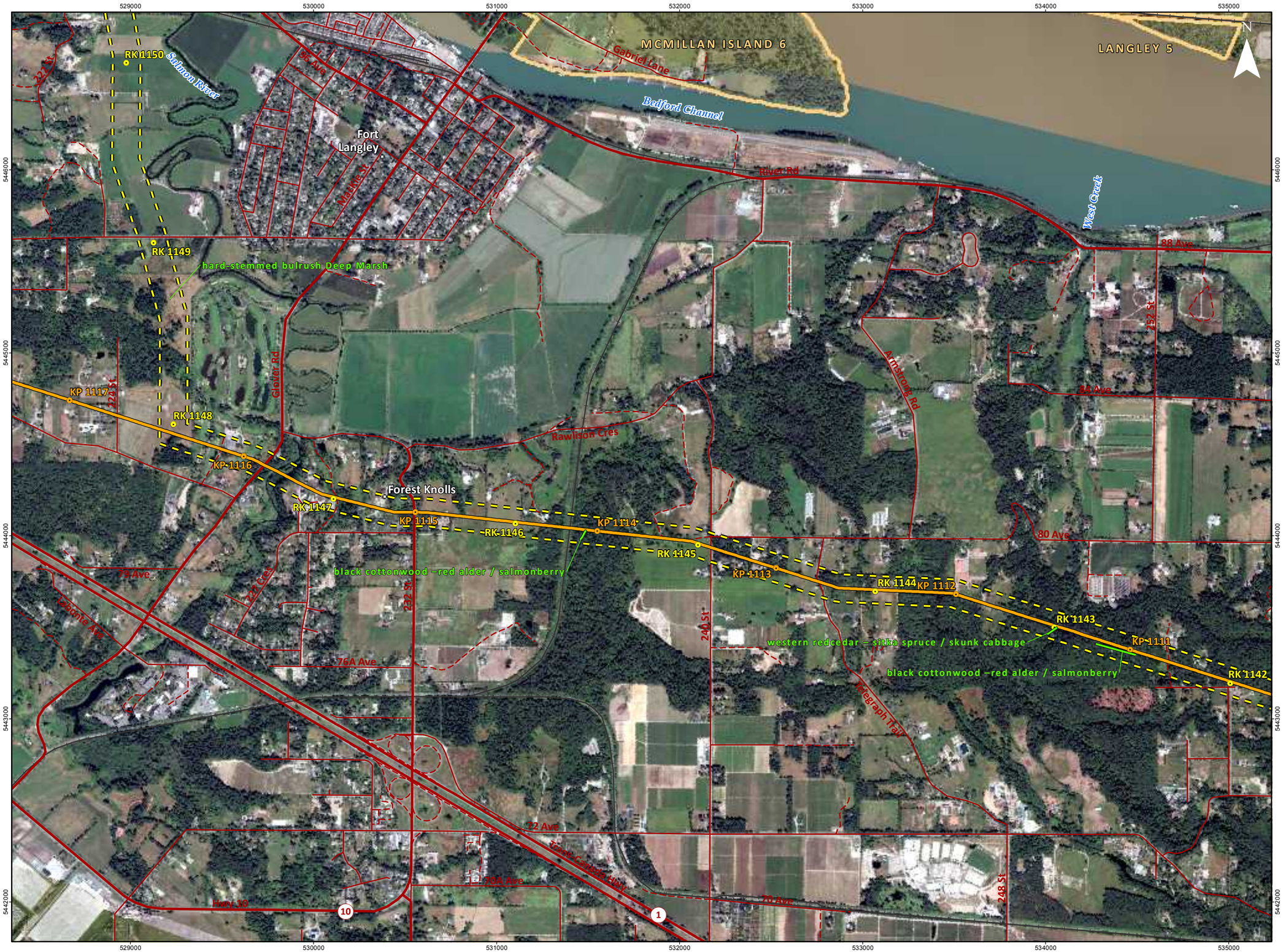
ALL LOCATIONS APPROXIMATE

201310_MAP_TERA_VEG_00444_Rev0.mxd



TRANS MOUNTAIN

FIGURE 2

RARE PLANT, LICHEN AND ECOLOGICAL COMMUNITY OBSERVATIONS

TRANS MOUNTAIN EXPANSION PROJECT

SHEET 71 OF 71

- Kilometre Post (KP)
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ALL LOCATIONS APPROXIMATE

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APPENDIX B

POTENTIALS TABLES

TABLE B1

POTENTIAL RARE PLANT AND LICHEN SPECIES IN THE BOREAL FOREST – CENTRAL MIXEDWOOD AND DRY MIXEDWOOD, FOOTHILLS – LOWER FOOTHILLS, PARKLAND – CENTRAL PARKLAND NATURAL, ROCKY MOUNTAIN – MONTANE SUBREGIONS OF THE PROPOSED PIPELINE PROJECT

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
VASCULAR PLANTS						
Adenocaulon bicolor	pathfinder	Moist woods and thickets. Flowering from June to September.	Yes	Yes	S2[1]	--
Adiantum aleuticum	western maidenhair fern	Moist forests, rocks, rocky scree and banks. Sporulating from summer to fall.	Yes	Yes	S2[1]	--
Agrostis exarata	spike redtop	Moist slopes and open areas; usually areas that hold snow late in the growing season. Flowering from late June to August.	--	Yes	S2[1]	--
Agrostis humilis	low bent grass	Moist slopes and meadows. Flowering from August to September.	Yes	Yes	S2[1]	--
Agrostis mertensii	northern bent-grass	Moist slopes. Flowering from July to August.	Yes	Yes	S2[1]	--
Allium geyeri	Geyer's onion	Wet meadows and streambanks. Flowering from June to July.	--	Yes	S2[1]	--
Almutaster pauciflorus	few-flowered aster	Saline soils, saline shores and depressions. Flowering from spring to fall.	Yes	--	S2S3[1]	--
Alopecurus alpinus	alpine foxtail	Shores and open woodland. Flowering from June to August.	--	Yes	S2?[1]	--
Anemone quinquefolia	wood anemone	Moist woods. Flowering in July.	Yes	Yes	S1[1]	--
Antennaria aromatica	scented everlasting	Limestone talus. Flowering from July to early August.	--	--	S2[1]	--
Antennaria corymbosa	corymbose everlasting	Open woods and meadows. Flowering in August.	--	Yes	S1[1]	--
Aquilegia jonesii	Jones' columbine	Talus slopes and rock crevices. Flowering in July.	Yes	Yes	S2[1]	--
Arabidopsis salsuginea	mouse-ear cress	Moist, saline shores and flats by springs and lakes. Flowering from late April to June.	Yes	Yes	S1[1]	--
Arabis lemmonii	Lemmon's rock cress	Mesic alpine/subalpine slopes. Flowering from July to August.	Yes	Yes	S2[1]	--
Arctagrostis arundinacea	polar grass	Marshy ground and moist meadows.	Yes	Yes	S2S3[1]	--
Arenaria longipedunculata	sandwort	Moist, gravelly areas. Flowering from spring to summer	Yes	Yes	S1[1]	G3G4Q[3]
Arnica amplexicaulis	stem-clasping arnica	Moist woods. Flowering from July to August.	Yes	Yes	S2[1]	--
Arnica longifolia	long-leaved arnica	Rocky slopes and cliffs. Flowering from July to August.	--	Yes	S2[1]	--
Arnica louiseana	rock arnica	Exposed tundra slopes and calcareous rock slides. Flowering from July to August.	Yes	Yes	S1S3[1]	G3[3]
Arnica parryi	nodding arnica	Open woods, grassy slopes and scree slopes. Flowering from July to August.	--	Yes	S2[1]	--
Artemisia tilesii	Herriot's sagewort	Open woods and river flats. Flowering from July to October.	Yes	Yes	S3 (W)[1]	--
Artemisia tridentata	big sagebrush	Dry hills. Flowering from August to September.	Yes	Yes	S2[1]	--
Aster campestris	meadow aster	Dry open areas. Flowering from July to August.	--	Yes	S2[1]	--
Aster eatonii	Eaton's aster	Moist montane woodland and streambanks. Flowering from August to September.	--	Yes	S2[1]	--
Aster engelmannii	elegant aster	Open, montane woods. Flowering from July to August.	Yes	Yes	S3S4 (W)[1]	--
Aster umbellatus	flat-topped white aster	Moist woods, thickets, meadows and swampy sites. Flowering from July to September.	Yes	Yes	S2[1]	--
Astragalus bodinii	Bodin's milk vetch	Gravelly banks and moist, sandy meadows. Flowering in July.	--	Yes	S1[1]	--

TABLE B1 Cont'd

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
Athyrium alpestre var. *americanum*	alpine spleenwort	Rocky alpine/subalpine slopes and meadows.	Yes	Yes	S1[1]	--
Atriplex suckleyi	endolepis	Dry, eroded slopes. Flowering from late summer to fall.	--	--	S3 (W)[1]	--
Berberis repens	creeping mahonia	Mountain woods. Flowering from April to June.	--	Yes	S3 (W)[1]	--
Blysmus rufus	red bulrush	Saline fens and poorly-drained, iron-rich ponds. Flowering in July.	--	--	S1[1]	--
Bolboschoenus fluviatilis	river bulrush	Margins of ponds and lakes. Flowering from June to July.	Yes	Yes	S1[1]	--
Botrychium ascendens	ascending grape fern	Stream floodplain habitats dominated by deciduous shrubs. Flowering in late spring to mid-summer.	--	Yes	S2[1]	G3[3]
Botrychium campestre	field grape fern	Sandy soils ditches. Flowering from early spring to late summer.	--	Yes	S1[1]	G3G4[3]
Botrychium crenulatum	scalloped grape fern	Dry, open areas. Flowering from mid-spring to late summer.	--	Yes	S1[1]	G3[3]
Botrychium hesperium	western grape fern	Mesic, grassy slopes and wooded areas. Flowering from early spring to early fall.	Yes	Yes	SU[1]	--
Botrychium lanceolatum	lance-leaved grape fern	Wet, rocky slopes, meadows and woods. Flowering from late spring to mid-summer.	Yes	Yes	S2[1]	--
Botrychium matricariifolium	chamomile grape fern	Mesic grassy slopes. Flowering from early spring to early fall.	--	Yes	S1[1]	--
Botrychium michiganense	Michigan grape fern	Open, grassy areas.	Yes	Yes	SU[1]	G1G2[3]
Botrychium multifidum var. *intermedium*	leather grape fern	Moist, sandy areas and fields.	Yes	Yes	S3 (W)[1]	--
Botrychium oneidense	blunt-lobed grape fern	Moist, shady, acidic woods and swamps.	--	--	S1[1]	--
Botrychium pallidum	pale moonwort	Open fields and occasionally shaded habitats.	--	Yes	S1[1]	G3[3]
Botrychium paradoxum	paradoxical grape fern	Moist, grassy slopes in mountains. Flowering from early to late summer.	--	Yes	S1[1]	G2[3]
Botrychium pedunculosum	stalked grape fern	Floodplain bottoms. Leaves appearing in late spring and dying in late fall.	--	--	S1[1]	G2G3[3]
Botrychium pinnatum	northwestern grape fern	Moist or wet, open places. Flowering from June to August.	Yes	Yes	S3[1]	--
Botrychium simplex	dwarf grape fern	Moist meadows and shores. Flowering from mid-spring to early fall.	Yes	Yes	S2[1]	--
Botrychium spathulatum	spatulate grape fern	Meadows and open forests.	Yes	Yes	S2[1]	G3[3]
Botrychium x watertonense	grape fern hybrid	Grassy openings in coniferous forests in mountains. Flowering in early summer.	--	Yes	S1[1]	--
Boykinia heucheriformis	telesonix	Rocky outcrops and talus slopes at alpine/subalpine elevations. Flowering June to August.	Yes	Yes	S2[1]	--
Braya humilis ssp. *maccallae*	leafy braya	Gravelly river flats. Flowering from May to June.	Yes	Yes	S1[1]	G5T2T3Q[3]
Braya purpurascens	alpine braya	Moist scree slopes. Flowering from June to August.	Yes	Yes	S1S2[1]	--
Brickellia grandiflora	large-flowered brickellia	Dry slopes, shores and roadsides. Flowering from July to September.	--	Yes	S1S2[1]	--
Bromus latiglumis	Canada brome	Moist banks. Flowering from late June to August.	Yes	Yes	S1[1]	--
Bromus vulgaris	woodland brome	Moderately moist and open coniferous woods. Flowering from late June to August.	--	Yes	S3 (W)[1]	--

TABLE B1 Cont'd

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
Bupleurum americanum	thorough-wax	Dry hillsides.	Yes	Yes	S3 (W)[1]	--
Calamagrostis lapponica	Lapland reed grass	Moist to dry gravelly slopes at high elevations. Flowering in August.	Yes	Yes	S1[1]	--
Calochortus apiculatus	mariposa lily	Dry slopes. Flowering in summer.	--	Yes	S3 (W)[1]	--
Calylophus serrulatus	shrubby evening-primrose	Sandy prairies and dunes.	--	--	S2[1]	--
Camassia quamash var. *quamash*	blue camas	Moist to wet meadows. Flowering from May to July.	--	Yes	S2[1]	G5T3T5[3]
Campanula aparinoides	marsh bellflower	Wet meadows and marshes.	--	Yes	S1[1]	--
Campanula uniflora	alpine harebell	Alpine/subalpine slopes. Flowering in July.	Yes	Yes	S2[1]	--
Cardamine parviflora	small bitter cress	Sandy soil and dry woods. Flowering in July.	Yes	Yes	S1[1]	--
Cardamine pratensis	meadow bitter cress	Bogs and swamps. Flowering from June to July.	Yes	Yes	S3 (W)[1]	--
Carex adusta	browned sedge	Dry, acidic soil, moist, sandy ground under pine, and stony ground. Flowering in July.	--	--	S1[1]	--
Carex aperta	open sedge	Low, wet ground; open wetlands. Flowering from July to August.	--	Yes	S1[1]	--
Carex arcta	narrow sedge	Moist woods. Flowering in July.	--	Yes	S1[1]	--
Carex bicolor	two-colour sedge	Wet sand and silt by streams and lakeshores. Fruiting in summer.	--	--	S1[1]	--
Carex capitata	capitate sedge	Boggy and often calcareous areas. Flowering from June to August.	Yes	Yes	S3 (W)[1]	--
Carex cordillerana	cordillera sage	Grassy slopes and rich soil. Fruiting from May to July.	--	Yes	S1[1]	G3G4[3]
Carex crawei	Crawe's sedge	Calcareous meadows. Flowering from June to July.	Yes	Yes	S2[1]	--
Carex garberi	elk sedge	Moist areas, including shorelines, meadows and graminoid fens. Fruiting in summer.	Yes	Yes	S2S3[1]	--
Carex geyeri	Geyer's sedge	Open woods and dry mountain slopes. Fruiting from late April to late August.	--	Yes	S3 (W)[1]	--
Carex glacialis	glacier sedge	Dry, calcareous mountain slopes. Flowering from June to July.	Yes	Yes	S2[1]	--
Carex heleonastes	Hudson Bay sedge	Often calcareous bogs and marshes. Fruiting from June to August.	Yes	Yes	S2[1]	--
Carex heteroneura var. *epapillosa*	blackened sedge	Moist to dry mountain meadows. Flowering from July to August.	--	Yes	S1[1]	G5TNR[3]
Carex hookerana	Hooker's sedge	Plains, dry banks and open woods. Flowering in June.	Yes	Yes	S3 (W)[1]	--
Carex hystericina	porcupine sedge	Shady marshes. Flowering from May to June.	--	--	S1[1]	--
Carex incurviformis var. *incurviformis*	seaside sedge	Gravelly, alpine/subalpine areas; salt marshes, tundra, sand dunes and river flats. Flowering in June.	Yes	Yes	S2[1]	--
Carex lacustris	lakeshore sedge	Marshes and swampy woods. Flowering from July to August.	Yes	Yes	S2[1]	--
Carex lenticularis var. *dolia*	lens-fruited sedge	Moist lakeshores and marshes, river flats and streambanks. Fruiting from August to September.	Yes	Yes	S1[1]	G5T3[3]
Carex mertensii	purple sedge	Moist, montane woods and streambanks. Flowering from May to July.	Yes	Yes	S2[1]	--
Carex oligosperma	few-fruited sedge	Wet meadows and bogs. Flowering in July.	--	Yes	S3?[1]	--
Carex parryana var. *parryana*	Parry's sedge	Moist, open meadows and low ground near water; alkaline flats. Flowering in July.	Yes	Yes	S3 (W)[1]	--
Carex paysonis	Payson's sedge	Mountain meadows. Flowering from July to September.	--	Yes	S1S2[1]	--
Carex pedunculata	stalked sedge	Forest edges. Flowering from May to June.	--	Yes	S1[1]	--
Carex petasata	pasture sedge	Dry grassland and open woods. Flowering from May to July.	--	Yes	S1S2[1]	--
Carex platylepis	broad-scaled sedge	Dry, open coniferous woods. Flowering from May to August.	--	Yes	S1S2[1]	--

TABLE B1 Cont'd

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
Carex podocarpa	alpine sedge	Alpine/subalpine meadows. Flowering from June to July.	Yes	Yes	S2[1]	--
Carex preslii	Presl sedge	Dry, open slopes. Flowering in July.	--	Yes	S2[1]	--
Carex saximontana	Rocky Mountain sedge	Moist woods or thickets. Fruiting from late May to mid-July.	--	Yes	S1[1]	--
Carex scoparia	broom sedge	Moist, open woodlands and moderate elevations. Flowering from June to July.	Yes	Yes	S1[1]	--
Carex tincta	tinged sedge	Meadows and open woodlands. Flowering from May to July.	Yes	Yes	SU[1]	--
Carex umbellata	umbellate sedge	Dry, open areas; often sandy. Fruiting from mid-March to mid-July.	Yes	Yes	S2[1]	--
Carex vesicaria	blister sedge	Swamps and marshes. Flowering in July.	Yes	Yes	S1[1]	--
Carex vulpinoidea	fox sedge	Swampy ground. Flowering from May to July.	Yes	Yes	S2[1]	--
Castilleja cusickii	yellow paintbrush	Grassland. Flowering from April to August. Produces fruit from May to July.	--	Yes	S3 (W)[1]	--
Ceanothus velutinus	snowbrush	Montane slopes.	--	Yes	S3 (W)[1]	--
Chenopodium atrovirens	dark green goosefoot	Open, disturbed areas; generally higher elevations.Flowering from June to September.	--	Yes	S1[1]	--
Chenopodium incanum	hoary goosefoot	Sandy grounds, dry plains and hillsides. Flowering from June to September.	--	--	S1[1]	--
Chrysosplenium iowense	golden saxifrage	Streambanks and marshy ground in shade. Flowering from May to June.	Yes	Yes	S3?[1]	G3?[3]
Cirsium scariosum	elk thistle	Open woods and slopes. Flowering from June to September.	--	Yes	S2?[1]	--
Conimitella williamsii	conimitella	Open montane slopes. Flowering in June.	--	Yes	S2[1]	G3?[3]
Coptis trifolia	goldthread	Damp, mossy woods, muskeg, willow scrub and tundra. Flowering in July.	Yes	Yes	S3 (W)[1]	--
Crataegus douglasii	Douglas hawthorn	Open woods and rocky slopes.	--	Yes	S3 (W)[1]	--
Crepis atribarba	hawk's-beard	Dry, grassy slopes at moderate elevations. Flowering from June to July.	--	Yes	S2[1]	--
Crepis intermedia	intermediate hawk's-beard	Dry, open areas. Flowering in August.	--	Yes	S2[1]	--
Crepis occidentalis	small-flowered hawk's-beard	Dry, eroding slopes; sheltered, grassy, coulee slopes. Flowering from May to June.	--	--	S2[1]	--
Cryptantha kelseyana	Kelsey's cat's eye	Poorly-developed sandy soils on level to gently sloping valley bottom terraces or uplands near the valley breaks.	--	--	S1[1]	--
Cryptogramma stelleri	Steller's rock brake	Shaded calcareous rock or springy places.	Yes	Yes	S2[1]	--
Cynoglossum virginianum var. *boreale*	northern wild comfrey	Dry to moist woods. Flowering from June to July.	Yes	Yes	S1[1]	--
Cyperus schweinitzii	sand nut-grass	Dry, sandy soil and active dunes. Fruiting from late spring to early summer.	--	--	S2[1]	--
Cypripedium acaule	stemless lady's-slipper	Wetlands, woods, sand dunes and sphagnum bogs. Flowering from late June to July.	Yes	Yes	S3[1]	--
Cypripedium montanum	mountain lady's-slipper	Moist woods. Flowering from June to August.	Yes	Yes	S2[1]	--
Cystopteris montana	mountain bladder fern	Springy or damp calcareous places. Sporulating from summer to fall.	Yes	Yes	S2[1]	--
Danthonia spicata	poverty oat grass	Dry to moist open areas and open woodland. Flowering in July. Produces fruit from late July to September.	Yes	Yes	S2[1]	--
Deschampsia elongata	slender hair grass	Meadows and open slopes. Flowering from June to July.	--	Yes	S1[1]	--
Diphasiastrum sitchense	ground-fir	Open woods and barrens.	Yes	Yes	S2[1]	--
Disporum hookeri var. *oreganum*	Oregon fairybells	Moist woods.	--	Yes	S3 (W)[1]	--

TABLE B1 Cont'd

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
Downingia laeta	downingia	Muddy shores, often alkaline. Flowering from July to August.	--	--	S2[1]	--
Draba densifolia	dense-leaved whitlow-grass	Talus slopes and alpine/subalpine ridges. Flowering in August.	--	--	S1S2[1]	--
Draba juvenilis	whitlow-grass	Below snowbeds in mountains. Flowering from June to July.	--	--	S1S3[1]	Data Deficient[5]
Draba porsildii	Porsild's whitlow-grass	Moist banks and turfy slopes. Flowering from June to July.	Yes	Yes	S1S2[1]	G3G4[3]
Drosera linearis	slenderleaf sundew	Marly bogs and wet, calcareous shores. Flowering in July.	Yes	Yes	S3 (W)[1]	--
Dryopteris cristata	crested shield fern	Moist woods and marshes.	Yes	Yes	S1[1]	--
Dryopteris filix-mas	male fern	Wooded slopes.	--	Yes	S1[1]	--
Dryopteris fragrans	fragrant shield fern	Siliceous rocks.	Yes	Yes	S3 (W)[1]	--
Elatine triandra	waterwort	Muddy shores and shallow water. Flowering from early summer to fall.	--	--	S1[1]	--
Eleocharis elliptica	slender spikerush	Neutral to calcareous wet places. Flowering from May to August.	--	Yes	S2?[1]	--
Eleocharis engelmannii	Engelmann's spike-rush	Wet places. Flowering from June to September.	--	Yes	S1[1]	--
Eleocharis mamillata	soft-stem spikerush	Fresh lakeshores, shallow ponds, streams, floating mats, bogs, fens and ditches. Fruiting in summer.	Yes	Yes	S1[1]	--
Ellisia nyctelea	waterpod	Moist, shady woods and streambanks. Flowering from May to June.	--	Yes	S2[1]	--
Elodea bifoliata	two-leaved waterweed	Slow moving water with sandy bottoms. Flowering from July to August.	--	--	S2[1]	--
Elodea canadensis	Canada waterweed	Still or slow-flowing running water in sloughs, ponds and lakes. Flowering from July to September.	--	--	SU[1]	--
Epilobium clavatum	club willowherb	Moist alpine/subalpine slopes. Flowering from July to August.	Yes	Yes	S2[1]	--
Epilobium glaberrimum ssp. *fastigiatum*	pale willowherb	Rocky mountain slopes and streambanks, moist forests and meadows. Flowering in August. Produces fruit from August to September.	--	Yes	S1[1]	--
Epilobium halleanum	Hall's willowherb	Moist ground. Flowers and produces fruit in July.	--	Yes	S1[1]	--
Epilobium lactiflorum	white willowherb	Moist streambanks and moist slopes to alpine elevations. Flowering from June to August.	Yes	Yes	S2[1]	--
Epilobium leptocarpum	slender-fruited willowherb	Moist, open, stony slopes. Flowering from July to August.	Yes	Yes	S1[1]	--
Erigeron divergens	spreading fleabane	Dry, gravelly or sandy areas. Flowering from May to July.	--	Yes	S1[1]	--
Erigeron flagellaris	creeping fleabane	Dry, open woods. Flowering from June to August.	--	Yes	S1S2[1]	--
Erigeron radicatus	dwarf fleabane	Dry ridges and scree slopes. Flowering from late May to July.	Yes	Yes	S2[1]	G3[3]
Eupatorium maculatum	spotted Joe-pye weed	Marshy ground and moist, open woods. Flowering from July to September.	--	Yes	S1S2[1]	--
Festuca occidentalis	western fescue	Dry, wooded slopes; associated with lodgepole pine and trembling aspen. Flowering from May to July.	--	Yes	S1S2[1]	--
Festuca subulata	bearded fescue	Moist thickets and shaded banks. Flowering in July.	--	--	S1[1]	--
Gayophytum racemosum	low willowherb	Open slopes and disturbed ground. Flowering from June to August.	--	--	S1[1]	--
Gentiana calycosa	mountain gentian	Moist subalpine and alpine meadows.	--	Yes	S1[1]	--
Gentiana fremontii	marsh gentian	Turfy slopes. Flowering in June.	Yes	Yes	S2[1]	--
Gentianopsis detonsa ssp. *raupii*	northern fringed gentian	Moist banks and meadows. Flowering from late June to early August.	--	Yes	S1[1]	G3G5T3T5[3]

TABLE B1 Cont'd

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
Geranium carolinianum	Carolina wild geranium	Dry, rocky woods and disturbed sites. Flowering from April to July.	Yes	Yes	S1[1]	--
Geranium erianthum	woolly geranium	Moist woods and grassy slopes. Flowering from June to August.	Yes	Yes	SH[1]	--
Glyceria elata	tufted tall manna grass	Stream sides and wet meadows. Flowering from May to July.	--	Yes	S2[1]	--
Gnaphalium microcephalum	tall common cudweed	Dry, open sites; often sandy or rocky areas. Flowering in August.	--	Yes	SH[1]	--
Gnaphalium viscosum	clammy cudweed	Meadows and openings in woods. Flowering from July to September.	--	Yes	SH[1]	--
Gratiola neglecta	clammy hedge-hyssop	Wet and muddy places. Flowering from June to August.	Yes	Yes	S2[1]	--
Gymnocarpium disjunctum	western oak fern	Moist forests, glades, rocky slopes and streambanks.	Yes	Yes	S1[1]	--
Gymnocarpium jessoense	northern oak fern	Rock crevices.	Yes	Yes	S1[1]	--
Hedyotis longifolia	long-leaved bluets	Open, sandy woods and montane slopes. Flowering from June to July.	Yes	Yes	S2[1]	--
Heuchera glabra	alpine alumroot	Moist scree, ledges and slopes at timberline. Flowering from July to August.	Yes	Yes	S1[1]	--
Hippuris montana	mountain mare's-tail	Mossy banks and shallow streams. Flowering from July to August.	Yes	Yes	S1[1]	--
Hypericum majus	large Canada St. John's-wort	Moist depressions in sand dunes and sandy shores. Flowering from late June to September.	--	--	S2[1]	--
Iliamna rivularis	mountain hollyhock	Mountain slopes, meadows and streambanks. Flowering in July.	--	Yes	S2[1]	--
Iris missouriensis	western blue flag	Moist meadows and streambanks. Flowering from June to July.	--	Yes	S2[1]	Special Concern[4,5]
Isoetes maritima	coastal quillwort	Shallow waters and lakeshores. Flowering in late August.	Yes	Yes	S1[1]	--
Isoetes occidentalis	western quillwort	Submerged, often in deep water. Flowering in late August.	--	--	S1[1]	--
Isoetes x truncata	quillwort hybrid	Immersed in and around lakes and ponds. Flowering in late August.	--	--	S1[1]	--
Juncus brevicaudatus	short-tail rush	Shores and marshes; pioneer on wet ground. Fruiting from mid-summer to fall.	--	Yes	S2[1]	--
Juncus nevadensis	Nevada rush	Wet areas. Flowering from July to August.	--	Yes	S1[1]	--
Juncus parryi	Parry's rush	Mountain slopes and meadows. Flowering in July.	--	Yes	S2[1]	--
Juncus stygius var. *americanus*	marsh rush	Fens and mossy areas around springs and seepages. Flowering in August.	Yes	Yes	S2[1]	--
Lactuca biennis	tall blue lettuce	Moist, open woods. Flowering from July to August.	Yes	Yes	S2[1]	--
Larix occidentalis	western larch	Moist mountain slopes at moderate to low elevations. Cones mature from May to June.	Yes	Yes	S2[1]	--
Lesquerella Arctica var. *purshii*	northern bladderpod	Dry, sandy or calcareous slopes and ridges; river flats. Flowering from June to July.	--	--	S2[1]	G4TNR[3]
Lewisia pygmaea var. *pygmaea*	dwarf bitter-root	Dry, rocky, alpine/subalpine slopes. Flowering from late May to August.	--	Yes	S2[1]	--
Lewisia rediviva	bitter-root	Dry, southwest exposure; desert flats. Flowering from July to August.	--	--	S1[1]	--
Lilaea scilloides	flowering quillwort	Slough margins and mud flats. Flowering in July.	Yes	Yes	S1S2[1]	--
Linanthus septentrionalis	linanthus	Dry hillsides and plains. Flowering from May to June.	--	Yes	S2[1]	--

TABLE B1 Cont'd

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
Liparis loeselii	Loesel's twayblade	Cool, moist ravines, bogs, or fens, wet, peaty or sandy meadows, and exposed sand along the edges of lakes. Colonises previously open and disturbed habitats during the early and middle stages of reforestation. Flowering from May to August.	--	--	S1[1]	--
Listera caurina	western twayblade	Moist, coniferous forests. Flowering from June to July.	--	Yes	S1[1]	--
Listera convallarioides	broad-lipped twayblade	Boggy woods and meadows. Flowering from July to September.	--	Yes	S2[1]	--
Lithophragma glabrum	smooth rockstar	Meadows and springs, and moist slopes. Flowering from July to August.	--	Yes	S2[1]	--
Lithophragma parviflorum	small-flowered rockstar	Moist meadows and open woods. Flowering from May to July.	--	Yes	S2[1]	--
Lomatium cous	biscuit-root	Dry, open slopes. Cypress Hills conglomerate. Flowering in May.	--	--	S1[1]	--
Lomatogonium rotatum	marsh felwort	Wet meadows and saline flats. Flowering from August to early September.	Yes	Yes	S2S3[1]	--
Lupinus minimus	least lupine	River flats and open, gravelly areas. Flowers in June.	--	Yes	S1S2[1]	G3G4[3]
Lupinus polyphyllus	large-leaved lupine	Moist woods. Flowering from mid-June to early September.	--	Yes	S1[1]	--
Luzula acuminata	sharp-pointed wood-rush	Moist woodland and clearings. Flowering from April to May.	Yes	Yes	S1[1]	--
Luzula hitchcockii	smooth wood-rush	Montane coniferous woodland. Flowering and fruiting in summer.	--	Yes	S3S4 (W)[1]	--
Luzula rufescens	reddish wood-rush	Mixedwood forest. Flowering and fruiting in summer.	--	Yes	S1[1]	--
Lycopus americanus	American water-horehound	Marshy ground. Flowering in July.	--	Yes	S3 (W)[1]	--
Lysimachia hybrida	lance-leaved loosestrife	Moist meadows and shores, and dry to moist open woods. Flowering in July.	Yes	Yes	S2[1]	--
Malaxis paludosa	bog adder's-mouth	Black spruce bogs in sphagnum moss. Flowering from June to August.	--	--	S1[1]	--
Marsilea vestita	hairy pepperwort	Ditches, ponds and lakes. Flowering from May to August.	--	Yes	S2[1]	--
Melica smithii	melic grass	Moist, subalpine woodlands. Flowering in July.	--	Yes	S1S2[1]	--
Melica spectabilis	onion grass	Moist woods. Flowering in August.	--	Yes	S2[1]	--
Mertensia lanceolata	lance-leaved lungwort	Prairie slopes and hillsides. Flowering from June to July.	--	Yes	S2[1]	--
Mertensia longiflora	large-flowered lungwort	Moist slopes and meadows. Flowering from May to June.	--	Yes	S2[1]	--
Microseris nutans	nodding scorzonella	Open, montane woods and grassy slopes.Flowering from April to July.	--	Yes	S2[1]	--
Mimulus floribundus	small yellow monkeyflower	Moist, montane banks. Flowering in July.	--	Yes	S1[1]	--
Mimulus glabratus	smooth monkeyflower	Springs and wet places. Flowering from May to August.	--	Yes	S1[1]	--
Mimulus guttatus	yellow monkeyflower	Stream margins, meadows and springs. Flowering from July to August.	--	Yes	S2S3[1]	--
Monotropa hypopithys	pinesap	Moist woods; saprophytic in coniferous woods. Flowering in July.	Yes	Yes	S2[1]	--
Montia linearis	linear-leaved montia	Moist to dry, sandy plains, hills and woodlands; disturbed areas. Flowering from May to July.	--	Yes	S1[1]	--
Muhlenbergia asperifolia	scratch grass	Moist, alkaline soil, especially where sandy.	--	--	S3 (W)[1]	--
Muhlenbergia racemosa	marsh muhly	Sandhills and dry slopes. Flowering from late July to August. Produces fruit from August to September.	Yes	--	S2[1]	--

TABLE B1 Cont'd

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
Munroa squarrosa	false buffalo grass	Dry plains, slopes and disturbed areas. Flowering from June to August.	--	Yes	S2[1]	--
Najas flexilis	slender naiad	Ponds and streams. Flowering from July to August.	Yes	Yes	S2[1]	--
Nemophila breviflora	small baby-blue-eyes	Moist meadows and woods. Flowering from June to July.	--	Yes	S1S2[1]	--
Nymphaea leibergii	pygmy water-lily	Ponds and quiet waters. Flowering from June to September.	Yes	Yes	S1S2[1]	--
Nymphaea tetragona	white water-lily	Lakes, ponds and slow-moving streams; likes deep and acidic water. Flowering throughout the summer.	--	--	S1[1]	--
Oenothera flava	low yellow evening-primrose	Dry slopes and flats on moist sandy soil. Flowering from July to August.	--	--	S2S3[1]	--
Oryzopsis canadensis	Canadian rice grass	Open woods and hillsides.	Yes	Yes	S1[1]	--
Oryzopsis exigua	little rice grass	Dry, open ground or open woods. Flowering from June to August.	--	Yes	S1[1]	--
Oryzopsis micrantha	little-seed rice grass	Dry, open areas and rocky slopes; sandy woodlands. Flowering from June to July.	--	Yes	S2[1]	--
Osmorhiza longistylis	smooth sweet cicely	Moist woods. Flowering in June.	Yes	Yes	S2[1]	--
Osmorhiza occidentalis	western sweet cicely	Montane woods.	--	Yes	S3 (W)[1]	--
Osmorhiza purpurea	purple sweet cicely	Moist, coniferous woods. Flowering in July.	--	Yes	S2[1]	--
Oxytropis campestris var. *davisii*	purple mountain locoweed	Alpine/subalpine and subalpine meadows, and dry ridges. Flowering from June to August.	Yes	Yes	S2?[1]	G5T3[3]
Packera subnuda	alpine meadow butterweed	Moist alpine/subalpine meadows and streambanks. Flowering from June to September.	--	Yes	S2[1]	--
Panicum acuminatum	hot-springs millet	Marshy places around hot springs. Flowering in June.	--	--	SU[1]	--
Panicum leibergii	Leiberg's millet	Dry prairie and clearings. Flowering from June to July.	Yes	Yes	S1[1]	--
Panicum wilcoxianum	sand millet	Dry, open areas; sandhill prairie, clearings and parklands. Flowering from June to July.	Yes	--	S1[1]	--
Papaver radicatum ssp. *kluanense*	alpine poppy	Rocky alpine/subalpine slopes; on shale. Flowering from June to August.	Yes	--	S2[1]	G5T3T4[3]
Parietaria pensylvanica	American pellitory	Gravelly places and disturbed areas; coulee woodlands and shrubbery. Flowering from May to July.	--	--	S3 (W)[1]	--
Paxistima myrsinites	mountain-lover	Coniferous woods and mountain slopes.	--	Yes	S3 (W)[1]	--
Pedicularis racemosa	leafy lousewort	Dry, open areas at high elevations. Flowering from July to August.	Yes	Yes	S1[1]	--
Pellaea gastonyi	Gaston's cliff-brake	Limestone crevices. Flowering from summer to fall.	--	--	S1[1]	G2G3[3]
Pellaea glabella	smooth cliff-brake	Dry limestone rocks. Sporulating from summer to fall.	Yes	--	S2[1]	--
Pellaea glabella ssp. *occidentalis*	western dwarf cliff-brake	Calcareous cliffs and ledges. Sporulating from summer to fall.	--	--	S1[1]	--
Pellaea glabella ssp. *simplex*	smooth cliff-brake	Calcareous cliffs and ledges. Sporulating from summer to fall.	Yes	--	S2[1]	--
Penstemon albertinus	blue beardtongue	Dry, open montane and subalpine slopes.	--	Yes	S3 (W)[1]	--
Penstemon eriantherus	crested beardtongue	Dry, open slopes.	--	Yes	S3 (W)[1]	--
Penstemon fruticosus var. *scouleri*	shrubby beardtongue	Dry, rocky slopes and open woods. Flowering from June to July.	--	Yes	S2[1]	--
Penstemon lyallii	large-flowered beardtongue	Rocky slopes. Flowering from July to August.	--	Yes	S3 (W)[1]	--

TABLE B1 Cont'd

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
Phacelia hastata	silver-leaved scorpionweed	Dry slopes and valleys.	--	Yes	S3 (W)[1]	--
Phacelia linearis	linear-leaved scorpionweed	Dry open slopes and shores. Flowering from June to July.	--	Yes	S2[1]	--
Phacelia lyallii	Lyall's scorpionweed	Scree slopes.	--	Yes	S2[1]	G3[3]
Phegopteris connectilis	northern beech fern	Moist woodlands.	Yes	Yes	S2[1]	--
Philadelphus lewisii	mock orange	Moist mountain woods. Flowering from July to August.	--	Yes	S1[1]	--
Phlox gracilis ssp. *gracilis*	slender phlox	Dry to moist, open ground. Flowering in June.	--	Yes	S1[1]	--
Physocarpus malvaceus	mallow-leaved ninebark	Rocky ravines, hillsides and coniferous forest. Flowering from July to August.	--	Yes	S1[1]	--
Physostegia ledinghamii	false dragonhead	Moist woods and streambanks. Flowering from July to September.	Yes	Yes	S3 (W)[1]	G3?[3]
Pinguicula villosa	small butterwort	Sphagnum bogs. Flowering from mid-June to July.	Yes	Yes	S2[1] Sensitive	--
Pinus albicaulis	whitebark pine	Timberline belt of the Rocky Mountains.	Yes	Yes	S2[1] Endangered[2]	Endangered[4,5]
Pinus flexilis	limber pine	Exposed rocky slopes and hilltops to subalpine elevations.	Yes	Yes	S2[1] Endangered[2]	--
Pinus monticola	western white pine	Open, rocky slopes in mountains. Cones mature from May to June.	--	Yes	S1[1]	--
Piperia unalascensis	Alaska bog orchid	Dry to moist coniferous forests, grassy slopes, meadows, thickets and streambanks. Flowering from June to August.	Yes	Yes	S2?[1]	--
Plantago canescens	western ribgrass	Non-alkaline grassy and gravelly slopes. Flowering in June.	Yes	Yes	S3 (W)[1]	--
Plantago maritima	seaside plantain	Saline marshes. Flowering in June.	--	--	S1[1]	--
Platanthera stricta	slender bog orchid	Seepage area. Flowering from late June to August.	Yes	--	S2[1]	--
Poa gracillima	Pacific bluegrass	Moist woods and meadows; middle and upper elevations. Flowering from June to July.	--	--	S2[1]	--
Poa stenantha	narrow-leaved bluegrass	Open woods; often on talus slopes. Flowering in August.	--	--	S1[1]	--
Polanisia dodecandra	clammyweed	Sandy or gravelly soils; disturbed sites. Flowering from summer to early fall.	Yes	Yes	S2[1]	--
Polygala paucifolia	fringed milkwort	Marshy, coniferous woods. Flowering from May to early July.	--	Yes	S1[1]	--
Polygonum douglasii ssp. *austiniae*	Austin's knotweed	Moist to dry grasslands, shrublands, rocky slopes and forest openings. Flowering from June to October.	--	Yes	S1[1]	--
Polygonum minimum	least knotweed	Dry ground; sandy soil and rock outcrops. Flowering from July to August.	Yes	--	S2[1]	--
Polygonum polygaloides ssp. *confertiflorum*	Watson's knotweed	Moist meadows and flats. Flowering in June.	Yes	Yes	S3 (W)[1]	G4G5T3T4[3]
Polypodium hesperium	western polypody	Moist, rocky outcrops. Sporulating from summer to fall.	--	--	S1[1]	--
Polypodium sibiricum	Siberian polypody	Shaded, sheltered slopes. Sporulating from summer to early fall.	--	Yes	S3 (W)[1]	--
Potamogeton foliosus	leafy pondweed	Shallow standing water. Flowering from July to September.	Yes	Yes	S2[1]	--
Potamogeton obtusifolius	blunt-leaved pondweed	Lakes and ponds, cold springs, and streams. Flowering from July to September.	Yes	Yes	S2[1]	--
Potamogeton robbinsii	Robbins' pondweed	Shallow water. Flowering from August to September.	Yes	Yes	S1[1]	--

TABLE B1 Cont'd

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
Potamogeton strictifolius	linear-leaved pondweed	Wet places submerged in water. Flowering from July to September.	Yes	Yes	S2[1]	--
Potentilla finitima	sandhills cinquefoil	Sandy prairie, hills and dunes.	--	Yes	S1[1]	G2G4Q[3]
Potentilla hookeriana	Hooker's cinquefoil	Dry, rocky slopes to alpine elevations. Flowering from July to August.	Yes	Yes	S2[1]	--
Potentilla macounii	Macoun's cinquefoill	Dry, grassy slopes and cliffs. Flowering from June to August.	--	Yes	S1[1]	G1?[3]
Potentilla multifida	branched cinquefoil	Gravel bars and open slopes. Flowering in July.	--	--	S1[1]	--
Potentilla multisecta	smooth-leaved cinquefoil	Dry alpine/subalpine slopes. Flowering in June.	Yes	--	S2[1]	GNR[3]
Potentilla paradoxa	bushy cinquefoil	Moist flats and shores. Flowering from June to July.	--	--	S3 (W)[1]	--
Potentilla plattensis	low cinquefoil	Prairie grassland and dry flats. Flowering from June to July.	--	Yes	S1S2[1]	--
Potentilla subjuga	Colorado cinquefoil	Prairie slopes to alpine/subalpine meadows. Flowering from spring to early summer.	--	Yes	S1[1]	--
Potentilla villosa	hairy cinquefoil	Rocky outcrops, scree slopes and alpine/subalpine meadows. Flowering from June to August.	Yes	Yes	S2[1]	--
Prenanthes sagittata	purple rattlesnakeroot	Moist banks and thickets. Flowering from July to August.	--	Yes	S2[1]	G3G4[3]
Primula egaliksensis	Greenland primrose	Wet meadows and shores. Flowering from June to July.	Yes	Yes	S2[1]	--
Puccinellia cusickii	Cusick's salt-meadow grass	Moist, generally alkaline areas.	--	--	SU[1]	G3G4Q[3]
Pyrola bracteata	large wintergreen	Wet woods.	Yes	--	S3 (W)[1]	G5T3T5[3]
Pyrola picta	white-veined wintergreen	Coniferous woods. Flowering from July to August.	--	--	S1[1]	--
Pyrrocoma uniflora	one-flowered ironplant	Dry to moist open slopes and banks. Flowering from May to September.	Yes	--	S3 (W)[1]	--
Quercus macrocarpa	burr oak	River valleys. Flowering in spring.	--	--	SU[1]	--
Ranunculus glaberrimus	early buttercup	Prairie grassland and meadows. Flowering from May to June.	--	--	S2S3[1]	--
Ranunculus uncinatus	hairy buttercup	Moist, shaded woodland. Flowering from April to July.	Yes	--	S3 (W)[1]	--
Rhynchospora capillacea	slender beak-rush	Calcareous bogs. Flowering in July.	Yes	--	S1[1]	--
Ribes laxiflorum	mountain currant	Wet woods. Flowering in June.	Yes	--	S2[1]	--
Ribes viscosissimum	sticky currant	Montane woods. Flowering from May to August.	--	--	S3 (W)[1]	--
Romanzoffia sitchensis	Sitka romanzoffia	Moist rocks and ledges to alpine elevations. Flowering from July to August.	Yes	--	S2[1]	--
Rorippa curvipes	yellow cress	Moist ground. Flowering from May to September.	--	--	SU[1]	--
Rorippa curvipes var. *truncata*	blunt-leaved yellow-cress	Dried-up slough bottoms. Flowering from May to September.	--	--	S1S2[1]	--
Rubus x paracaulis	hybrid dwarf raspberry	Boggy woods and marshes.	Yes	Yes	S1[1]	--
Ruppia cirrhosa	widgeon-grass	Saline and alkaline lakes, ponds and ditches. Flowering in July.	--	--	S1[1]	--
Sagittaria latifolia	broad-leaved arrowhead	Ponds and lakes. Flowering in August.	--	Yes	S2[1]	--
Salix alaxensis var. *alaxensis*	Alaska willow	Slopes, gravel bars, river terraces and glacial moraines in young forest. Flowering in June.	Yes	--	S2S3[1]	--

TABLE B1 Cont'd

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
Salix commutata	changeable willow	Forms subalpine thickets. Flowering in July.	Yes	Yes	S2[1]	--
Salix lanata ssp. *calcicola*	woolly willow	Floodplain of the North Saskatchewan River. Flowering in spring.	Yes	--	S1[1]	--
Salix raupii	Raup's willow	Thickets in moist, open forests and on gravel floodplains. Flowering in spring.	Yes	Yes	S1[1]	G2[3]
Salix sitchensis	Sitka willow	Alluvial soil (Athabasca River). Flowering in May.	Yes	--	S1[1]	--
Saxifraga ferruginea	Alaska saxifrage	Moist alpine/subalpine banks and ledges. Flowering in July and August.	Yes	Yes	S3 (W)[1]	--
Saxifraga mertensiana	Merten's saxifrage	Moist banks. Flowering from spring to summer.	--	Yes	S3 (W)[1]	--
Schizachyrium scoparium var. *scoparium*	little bluestem	Prairie grassland and foothills; calcareous soil. Flowering from July to August.	--	Yes	S3 (W)[1]	--
Scirpus pallidus	pale bulrush	Marshy areas. Flowering from June to July.	Yes	Yes	S1[1]	--
Selaginella wallacei	Wallace's little club-moss	Dry, rocky slopes on mountains.	--	--	S1[1]	--
Shinnersoseris rostrata	annual skeletonweed	Sandy banks and dunes. Flowering in August.	--	--	S2[1]	--
Silene involucrata	alpine bladder catchfly	Gravelly alpine/subalpine slopes. Flowering in July.	--	--	S1S2[1]	--
Sisyrinchium septentrionale	pale blue-eyed grass	Moist, grassy areas. Flowering from May to July.	Yes	Yes	S3[1]	G3G4[3]
Sparganium glomeratum	bur-reed	Ponds. Flowering in July.	Yes	Yes	S1[1]	--
Sparganium hyperboreum	northern bur-reed	Aquatic plants in shallow alpine/subalpine lakes. Flowering from July to August.	Yes	--	S1[1]	--
Spartina pectinata	prairie cord grass	Saline shores and marshes. Flowering from late June to July.	--	--	S1[1]	--
Spergularia salina	salt-marsh sand spurry	Brackish or saline muds and sands. Flowering from May to August.	Yes	--	S2S3[1]	--
Sphenopholis obtusata	prairie wedge grass	Moist meadows and open woods. Flowering from June to July.	Yes	Yes	S2[1]	--
Spiranthes lacera	northern slender ladies'-tresses	Small, disturbed areas within moist mixedwood forests. Flowering in mid-July.	Yes	Yes	S1[1]	--
Stellaria crispa	wavy-leaved chickweed	Moist woods at moderate elevations. Flowering from June to July.	--	Yes	S2[1]	--
Stellaria obtusa	meadow chickweed	Damp meadows and streambanks. Flowering from June to July.	--	Yes	S1[1]	--
Streptopus roseus	rose mandarin	Moist coniferous forests. Flowering from June to July.	--	Yes	S1[1]	--
Suksdorfia ranunculifolia	white suksdorfia	Moist, mossy rocks. Flowering from June to July.	--	Yes	S2[1]	--
Suksdorfia violacea	blue suksdorfia	Rock crevices and mossy banks. Flowering from May to July.	--	Yes	S1[1]	--
Taxus brevifolia	western yew	Moist woods in mountains; west of the continental divide. Flowering from April to June.	Yes	--	S1[1]	--
Thuja plicata	western red cedar	Cool, moist, mountain slopes. Cones appear from April to May.	Yes	Yes	S2[1]	--
Torreyochloa pallida var. *pauciflora*	few-flowered salt-meadow grass	Wet places. Flowering from June to August.	--	Yes	S1[1]	--
Townsendia exscapa	low townsendia	Dry hillsides and prairies. Flowering in May.	--	Yes	S2[1]	--
Triantha occidentalis ssp. *montana*	western false-asphodel	Wet, calcareous sites. Flowering in summer.	Yes	Yes	S1[1]	--
Trichophorum clintonii	Clinton's bulrush	Open woodland and turfy shores. Flowering from May to June.	Yes	--	S1[1]	--

TABLE B1 Cont'd

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
Trichophorum pumilum	dwarf bulrush	Calcareous bogs. Flowering in June.	Yes	Yes	S3 (W)[1]	--
Trillium ovatum	western wakerobin	Moist woods. Flowering from May to June.	Yes	Yes	S1[1]	--
Trisetum canescens	tall trisetum	Moist woods. Flowering from May to July.	--	Yes	S2[1]	GNR[3]
Trisetum cernuum	nodding trisetum	Moist woods.	--	Yes	S2[1]	GNR[3]
Trisetum montanum	mountain trisetum	Mountain slopes and ledges. Flowering fron July to August.	--	Yes	S1[1]	--
Trisetum wolfii	awnless trisetum	Moist woods. Flowering fron July to August.	--	Yes	S1[1]	--
Tsuga heterophylla	western hemlock	Moist coniferous forest with *Picea engelmannii* and *Abies lasiocarpa*. Moderate elevations. Shade tolerant.	Yes	Yes	S1[1]	--
Veronica catenata	water speedwell	Muddy shores and ditches. Flowering in July.	--	Yes	S2S3[1]	--
Viola pallens	Macloskey's violet	Boggy or wet ground and wet thickets. Flowering from May to July.	Yes	Yes	S2S3[1]	--
Viola pedatifida	crowfoot violet	Dry grassland. Flowering from May to June.	Yes	Yes	S2[1]	--
Viola praemorsa ssp. *linguifolia*	broad-leaved yellow prairie violet	Open areas and rocky hillsides. Flowering in July.	--	Yes	S2[1]	--
Wolffia borealis	northern ducksmeal	Ponds, lakes and slow-moving streams. Flowering from summer to early fall (very rarely).	Yes	Yes	S3 (W)[1]	--
Wolffia columbiana	watermeal	Floating or just beneath the surface in beaver ponds. Reproduce only by budding.	Yes	--	S2[1]	--
Woodsia glabella	smooth woodsia	Moist, calcareous rocks and shaded cliffs. Sporulating from summer to early fall.	Yes	Yes	S1[1]	--
Xerophyllum tenax	bear-grass	Dry mountain slopes and open woods. Flowering from spring to early summer.	--	Yes	S3S4 (W)[1]	--
NONVASCULAR PLANTS						
Agrestia hispida	vagabond lichen	Over calcareous soil and pebbles in dry, open prairies.	--	--	S2S3[1]	G3[3]
Allantoparmelia alpicola	rock grubs	Rock; generally alpine to subalpine.	--	--	S2[1]	G3G5[3]
Aloina brevirostris	short-beaked rigid screw moss	Bare or disturbed soil or silt, roadside banks, calcareous boulders or gravel, and at low to moderate elevations.	--	--	S2[1]	G3G5[3]
Aloina rigida	aloe-like rigid screw moss	Rocks, banks, clay and sandy or gravelly soil in deserts, plains or coniferous forests at moderate to high elevations.	--	--	S2[1]	G3G5[3]
Amblydon dealbatus	Amblydon moss	Rich fens; occurs sporadically on rotting wood and organic soil.	--	--	S2[1]	G3G5[3]
Amphidium mougeotii	Amphidium moss	On rocks from lowlands to 2,000 m above sea level	--	--	S1[1]	--
Anaptychia crinalis	fringe lichen	Limey cliffs, full sun or partial shade, especially overlooking streams or lakes. Rarely on shrubs.	--	--	S2[1]	--
Anastrophyllum helleranum	Anastrophyllum liverwort	Moist, well-rotted, decorticated pine logs or pine forests in humid ravines, wooded valleys or north-facing slopes. Damp, shaded rock crevices, stumps and bark and twigs of living deciduous trees.	--	--	S2[1]	--
Anastrophyllum michauxii	Anastrophyllum liverwort	Unknown.	--	--	S1[1]	--
Andreaea blyttii	Andreaea moss	Rock, alluvium and the edges of snow melt areas at low to high elevations.	--	--	S1[1]	--
Anomobryum filiforme	Anomobryum moss	Acidic habitats, wet crevices of sandstone cliffs or other seepy niches.	--	--	S1[1]	--
Anomodon minor	Anomodon moss	Bark, base of trees at breast height and calcareous rocks.	--	--	S1[1]	--
Aongstroemia longipes	Aongstroemia moss	Moist, exposed, sandy or silty soil depressions, streambanks in montane coniferous forests, subalpine regions, mountains and northern latitudes at low to high elevations.	--	--	S2[1]	G3G5[3]

TABLE B1 Cont'd

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
Aspicilia pergibbosa	sunken disc lichen	Calcareous and non-calcareous rock.	--	--	S1S2[1]	G3G5[3]
Aspicilia reptans	sunken disc lichen	Soil or plant detritus, less often rock, and mostly in arid or semi-arid habitats.	--	--	S1[1]	GNR[3]
Athalamia hyalina	Athalamia liverwort	Thin mineral soil over friable limestone, on open ground, the ledges of eroding crags, or tucked under boulders.	--	--	S2[1]	--
Atrichum selwynii	Atrichum moss	Soil, open or shaded habitats, bare roadside banks and overturned tree roots at low to high elevations.	--	--	S2[1]	--
Atrichum undulatum	undulated crane's bill moss	Soil and dry, weedy habitats, especially roadside ditches, at low elevations.	--	--	S1S2[1]	--
Aulocomnium androgynum	Aulocomnium moss	Tree trunks, rotten logs, stumps and sometimes on soil or soil over rock.	--	--	S2[1]	--
Bacidia bagliettoana	dot lichen	Soil with humus over moss.	--	--	S2[1]	--
Bacidia hegetschweileri	dot lichen	Bark of Ulmus, Alnus, Betula and Populus species.	--	--	S1[1]	G2G4[3]
Bacidia pallens	dot lichen	Grows on a number of woody plants, including Alnus, Salix, Betula, Picea and Abies species.	--	--	S1S3[1]	G3G5[3]
Barbilophozia attenuata	Barbilophozia liverwort	Calcifuge, on circumneutral to acid soft sandstone to granite, the tops of boulders and stone walls, ledges, vertical surfaces, and thin layers of peat or humus. Also steep, peaty, sandy or loamy banks, decaying logs/stumps and the trunks/bases of living trees.	--	--	S1[1]	--
Barbilophozia kunzeana	Barbilophozia liverwort	Well-drained circumneutral or acid microhabitats on peat, mosses, leaf litter, twigs, grassy tussocks, wet heaths, valley bogs, marshes, wet pastures, flushed rocky banks and streamsides.	--	--	S2[1]	--
Barbilophozia quadriloba	Barbilophozia liverwort	Calcicole, in areas of soft, mildy, base-rich schist and metamorphosed limestone. North-facing moist or wet rocks, ledges and small boulders in streams, on rocky slopes and in grassy or gravelly flushes.	--	--	S2[1]	--
Barbula coreensis	Barbula moss	Unknown.	--	--	S1[1]	G3G5[3]
Bartramia halleriana	Haller's apple moss	Siliceous cliffs and talus slopes in crevices and ledges of shaded coniferous forests.	--	--	S1[1]	Threatened[4,5]
Biatora globulosa	Biatora lichen	Unknown.	--	--	S1[1]	GNR[3]
Biatora vernalis	dot lichen	Mosses over rocks and tree bases, rarely directly on bark and usually in shaded forests.	--	--	SU[1]	--
Blasia pusilla	Blasia liverwort	Moist or wet, neutral or midly, base-rich gravel, sand, loam or clay. Occasionally on thin soil over rock, detritus, recently exposed or intermittently disturbed substrates in shaded or insolated habitats, at lowlands to alpine elevations.	--	--	S1[1]	--
Blindia acuta	sharp-pointed weissia	Moist or dripping acidic rock faces, most common in montane to alpine habitats at low to high elevations.	--	--	S2[1]	--
Brachythecium acuminatum	Brachythecium moss	Unknown.	--	--	S1S2[1]	--
Brachythecium acutum	Brachythecium moss	Unknown.	--	--	SU[1]	GNRQ[3]
Brachythecium calcareum	Brachythecium moss	Thin soil or humus covering calcareous rocks.	--	--	S1[1]	G3G4[3]

TABLE B1 Cont'd

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
Brachythecium frigidum	Brachythecium moss	Soil or sand in very wet places, in or near streams, sometimes submerged basal parts of plants and erect branches or stems forming deep cushions above water, at lowlands to 3,300 m ASL.	--	--	SU[1]	--
Brachythecium hylotapetum	Brachythecium moss	Soil, humus, rotten wood, forest litter and open places at lowlands to 2,000 m ASL.	--	--	S3[1]	GU[3]
Brachythecium plumosum	Brachythecium moss	Wet rock, usually near streams, at lowlands to 3,000 m ASL.	--	--	S2[1]	--
Brachythecium reflexum	Brachythecium moss	Most common in the montane on soil, logs and litter.	--	--	S2[1]	--
Brachythecium rutabulum	Brachythecium moss	Soil, soil over rock, roots, logs and moist places, usually in lowlands.	--	--	S2?[1]	--
Bryobrittonia longipes	Bryobrittonia moss	Calcareous soils, along stream and river banks in Arctic and montane habitats.	--	--	S2[1]	G3G4[3]
Bryoerythrophyllum ferruginascens	red leaf moss	Soil or rock, primarily limestone, dolomite or volcanic rock, from low to high elevations.	--	--	S1[1]	G3G4[3]
Bryohaplocladium virginianum	Bryohaplocladium moss	Soil, rotten wood, rocks, bark at the bases of trees, in dry places and often in burned areas; an acidophile.	--	--	S1[1]	--
Bryoria friabilis	horsehair lichen	The bark of hardwoods and conifers. Rarely on rocks. Widely but thinly distributed from valley bottoms to mountain forests and occasionally in old orchards and riparian hardwood forests.	--	--	S1[1]	G3G4[3]
Bryoria nadvornikiana	old man's beard	Deeply shaded or open boreal woodlands on conifers and birch. Also rock faces and cliffs, especially in humid sites near waterfalls or lakes.	--	--	S2[1]	GNR[3]
Bryum algovicum	Bryum moss	Probably restricted to calcareous habitats. Soil or rock in wet, seepy places, especially on bare, sandy or gravelly seeps, or in the wet crevices of cliffs.	--	--	S2[1]	--
Bryum amblydon	Bryum moss	Wet ground, Arctic to alpine, to 3,000 m ASL.	--	--	S1[1]	--
Bryum calobryoides	Bryum moss	Soil or rock at alpine elevations.	--	--	S1[1]	G3[3]
Bryum calophyllum	Bryum moss	Wet, alpine soil.	--	--	S1[1]	--
Bryum cyclophyllum	Bryum moss	Moist ground, rock crevices and sandy soil in wet places.	--	--	S2[1]	--
Bryum flaccidum	Bryum moss	Soft, moist bark in the fissures of tree trunks or at the base of trees.	--	--	SU[1]	--
Bryum lonchocaulon	Bryum moss	Damp soil or rocks, usually in the shade, often on rather dry mountain sides.	--	--	SU[1]	--
Bryum muehlenbeckii	Bryum moss	Wet soil and stones, often near streams.	--	--	S1S2[1]	--
Bryum pallens	Bryum moss	Wet soil, from lowlands to 2,700 m ASL.	--	--	S2[1]	--
Bryum porsildii	Porsild's bryum moss	Wet, calcareous cliffs, usually Arctic or alpine.	--	--	S1[1] Endangered[2]	G2G3[3] Threatened[4,5]
Bryum purpurascens	Bryum moss	Wet, sandy soil.	--	--	S1[1]	G3G4[3]
Bryum turbinatum	Bryum moss	Wet soil in the mountains.	--	--	S2[1]	--
Bryum uliginosum	Bryum moss	Wet, calcareous soil or humus near seepage or rock crevices.	--	--	S2[1]	G3G5[3]
Buellia dispersa	button lichen	Unknown.	--	--	S1[1]	GNR[3]
Buellia elegans	button lichen	On soil in semi-arid sites.	--	--	S2[1]	G3G5[3]
Buxbaumia aphylla	bug on a stick	Decaying wood, humus, shallow, acidic soil, soil depressions on rock outcrops and well-lit to somewhat shaded sites at low to moderate elevations.	--	--	S2[1]	--
Buxbaumia piperi	Buxbaumia moss	Rotten, decorticated logs and humus banks; mainly subalpine but occasionally near sea level. Coniferous forests.	--	--	S1[1]	--

TABLE B1 Cont'd

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
Buxbaumia viridis	green shield moss	Decorticated wood or humus banks in coniferous forests at high (subalpine) elevations.	--	--	S1[1]	--
Calicium salicinum	stubble lichen	Unknown.	--	--	S1[1]	--
Calicium trabinellum	yellow collar stubble lichen	Wood.	--	--	S2[1]	--
Callicladium haldanianum	Callicladium moss	Soil and decomposing logs.	--	--	S1[1]	--
Caloplaca approximata	firedot lichen	On rocks where birds perch.	--	--	S1[1]	G3G5[3]
Caloplaca arenaria	granite firedot lichen	Siliceous rocks (typically granite) in the open.	--	--	S1[1]	--
Caloplaca atroalba	firedot lichen	Unknown.	--	--	S1[1]	GNR[3]
Caloplaca chrysophthalma	firedot lichen	Poplar bark in the boreal region.	--	--	S1[1]	GNR[3]
Caloplaca citrina	powdery jewel lichen	Widely distributed; inland to maritime rocks of all kinds as well as wood and soil.	--	--	S1S2[1]	--
Caloplaca flavovirescens	sulphur-firedot lichen	Rocks containing calcium, such as limestone and sandstones. Concrete.	--	--	S2S3[1]	--
Caloplaca sideritis	firedot lichen	Unknown.	--	--	S1[1]	GNR[3]
Caloplaca sinapisperma	firedot lichen	Grows over moss and humus.	--	--	S2S3[1]	GNR[3]
Caloplaca trachyphylla	desert firedot lichen	Exposed rocks in dry sites.	--	--	S2S4[1]	--
Caloplaca xanthostigmoidea	firedot lichen	Unknown.	--	--	S1S3[1]	GNR[3]
Calypogeia integristipula	Calypogeia liverwort	Damp ledges, inclined/vertical surfaces of circumneutral to acidic sandstone, gritstone and other hard rock. Humus layers, sandy or peaty banks, woodlands, shaded, treeless habitats, coastal/moorland slopes and montane block screes.	--	--	S1[1]	--
Calypogeia muelleriana	Calypogeia liverwort	Less tolerant of deep shade and constantly wet conditions; more often on peat than soil. Lowland to alpine elevations (near 0-920 m ASL).	--	--	S2[1]	--
Calypogeia suecica	Calypogeia liverwort	Calcifuge and almost restricted to moist, decorticated logs, usually in deciduous or mixedwood forest in very humid valleys and ravines. Elevations from 15-300 m ASL.	--	--	S1[1]	--
Campylium radicale	Campylium moss	Wet places.	--	--	S2[1]	G3G5[3]
Candelariella efflorescens	powdery goldspeck lichen	Common on all kinds of bark and sometimes wood.	--	--	S1[1]	--
Candelariella lutella	goldspeck lichen	Unknown.	--	--	S1?[1]	GNR[3]
Catillaria subnegans	Catillaria lichen	Grows over moss and humus.	--	--	S1[1]	G1[3]
Cephalozia bicuspidata	Cephalozia liverwort	Calcifuge, almost any moist or wet, shaded or insulated habitat on acidic, circumneutral or well-leached sand, loam, peat, humus, cliff ledges, boulders, rocks and rotting wood at lowland to alpine elevations.	--	--	S1[1]	--
Cephalozia loitlesbergeri	Cephalozia liverwort	Calcifuge, Sphagnum hummocks in bogs with other mosses and on plant litter in damp hollows in wet heath. Also, moist peat, moribund Sphagnum and peaty banks under Calluna species. Lowland to subalpine elevations.	--	--	S1[1]	--
Cephaloziella hampeana	Cephaloziella liverwort	On living Sphagnum, tracks, waste ground and rocky slopes. Lowland to alpine elevations.	--	--	S1[1]	--
Cetraria arenaria	sand-loving Iceland lichen	Unknown.	--	--	S1[1]	--

TABLE B1 Cont'd

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
Chaenotheca chrysocephala	stubble lichen	The bark and wood of conifers or birch throughout the boreal region.	--	--	S2[1]	--
Chaenotheca stemonea	stubble lichen	Unknown.	--	--	S1[1]	GNR[3]
Chaenotheca trichialis	stubble lichen	Unknown.	--	--	S2[1]	GNR[3]
Chiloscyphus polyanthos	Chiloscyphus liverwort	The edges of or partially to fully submerged on rocks, tree roots or rotting wood in streams, springs, lakes and flushes. Sea cliffs, mountain crags, wet banks and humus-rich soil in wet woodlands and marshes. Lowland to alpine elevations.	--	--	S1[1]	--
Chrysothrix candelaris	gold dust lichen	Shaded bark and occasionally on rock. Widely distributed on rich, old forests, and also on roadside trees.	--	--	S1[1]	--
Chrysothrix chlorina	gold dust lichen	Usually found on shaded rocks rather than trees.	--	--	S1[1]	GNR[3]
Cirriphyllum cirrosum	Cirriphyllum moss	Soil over rock, often in calcareous regions, Arctic or alpine, from 1,400 m ASL to over 3,000 m ASL.	--	--	S2[1]	--
Cladonia acuminata	Cladonia lichen	Calcareous soil.	--	--	S1?[1]	--
Cladonia bellidiflora	Cladonia lichen	Rotting wood and stumps, moss or soil.	--	--	S2S3[1]	--
Cladonia digitata	finger pixie-cup	Well-rotted wood and peat and sometimes mossy tree bases.	--	--	S2[1]	G3G5[3]
Cladonia glauca	Cladonia lichen	On humus-rich soil and peat bogs.	--	--	S1[1]	GNR[3]
Cladonia grayi	Cladonia lichen	Soils, rocks, bases of trees, stumps, logs and on mosses in roadsides and open woods.	--	--	S2S3[1]	GU[3]
Cladonia humilis	Cladonia lichen	Soil, humus, among mosses and on rotting logs in open areas.	--	--	S1[1]	--
Cladonia macrophylla	Cladonia lichen	On soil among rocks.	--	--	S2[1]	GNR[3]
Cladonia merochlorophaea	Cladonia lichen	Humus-rich soil on tundra heaths and in bogs.	--	--	S2[1]	GU[3]
Cladonia metacorallifera	Cladonia lichen	On soil with some humus content.	--	--	S2[1]	GNR[3]
Cladonia norvegica	Cladonia lichen	Rotten wood; the bases and trunks of trees. Frequently in mature to old coniferous forests at low to middle elevations in the mountains.	--	--	S1[1]	--
Cladonia ochrochlora	smooth-footed powderhorn	Decaying wood; rarely on soil.	--	--	S1?[1]	G3G5[3]
Cladonia portentosa	reindeer lichen	Sandy soil and humus or moss over sand. Stabilised dunes, road cuts through dunes, dry areas in deflation plains, seashore cliffs and usually in exposed to partially shaded sites.	--	--	S1[1]	GNR[3]
Cladonia ramulosa	Cladonia lichen	Soil and rotting logs.	--	--	S1[1]	--
Cladonia rei	wand lichen	Soil or wood in the open.	--	--	S2[1]	G3G5[3]
Cladonia robbinsii	yellow tongue cladonia	Bare soil; sometimes rock.	--	--	S2S3[1]	G3G5[3]
Cladonia squamosa	Cladonia lichen	Soil or logs in forests, sometimes in exposed sites, and shade tolerant.	--	--	S2[1]	--
Cladonia stricta	Cladonia lichen	Unknown.	--	--	SU[1]	GNR[3]
Cladonia stygia	reindeer lichen	Northern bogs. Also found in drier sites in boreal and Arctic regions of the Northern Hemisphere.	--	--	S2[1]	--
Cladonia symphycarpia	split-peg lichen	Open areas on thin or sandy soil, especially in calcium-rich areas.	--	--	S2[1]	G3G5[3]
Cladonia umbricola	shaded cladonia	Shaded habitats, almost exclusively on rotting wood.	--	--	S1[1]	G3G5[3]
Claopodium bolanderi	Claopodium moss	Rock, soil over rock and rarely on wood at lowlands to 2,000 m ASL.	--	--	S1S2[1]	--

TABLE B1 Cont'd

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
Cliostomum griffithii	multicolored dot lichen	Bark and wood.	--	--	S1S2[1]	G3G5[3]
Collema coccophorum	tar jelly lichen	Dry, calcareous soil.	--	--	S1[1]	G3G5[3]
Collema crispum	jelly lichen	Unknown.	--	--	S2S4[1]	GNR[3]
Collema cristatum	fingered jelly lichen	Calcareous soil, limestone or among mosses.	--	--	S1[1]	G3G5[3]
Collema flaccidum	jelly lichen	Moss, rock and trees in open environments.	--	--	S1[1]	G3G5[3]
Collema nigrescens	blistered jelly lichen	Bark on hardwoods and shrubs in hardwood forests at low elevations.	--	--	S1[1]	--
Collema subflaccidum	tree jelly lichen	Bark of hardwoods and occasionally conifers, especially in old forests. Also on shaded or mossy rocks.	--	--	S2[1]	--
Collema undulatum var. *granulosum*	jelly flakes	Calcareous rocks.	--	--	S2S3[1]	G4G5TNR[3]
Conardia compacta	Conardia moss	Damp cliffs (especially limestone), logs, stumps, humus and bark at the base of trees in wooded swamps.	--	--	S2[1]	G3G5[3]
Conocephalum salebrosum	Conocephalum liverwort	Moist, shaded and calcareous habitats, along streams, near springs and the bases of moist rocks and cliffs. More desiccation tolerant than C. conicum.	--	--	S2[1]	GNR[3]
Coscinodon cribrosus	sieve-toothed moss	Acidic substrate from low to high elevations.	--	--	S1[1]	G3G4[3]
Cynodontium schisti	Cynodontium moss	Rock crevices and soil over rock at moderate elevations.	--	--	S1S2[1]	G3G5[3]
Cyphelium inquinans	cupped soot lichen	The bark and wood of conifers, especially in shaded or moist habitats.	--	--	S2[1]	G3G4[3]
Cyphelium notarisii	soot lichen	Unknown.	--	--	S2[1]	GNR[3]
Cyphelium tigillare	soot lichen	The weathered wood of Picea, Thuja and Pinus species, and old oak fence posts.	--	--	S2[1]	--
Cyrtomnium hymenophylloides	Cyrtomnium moss	Moist soil, soil over rock and often in calcareous regions; Arctic to alpine.	--	--	S1S2[1]	--
Dactylina beringica	finger lichen	Subspecies of D. Arctica which grows on mossy tundra and is associated with late snow banks.	--	--	S2S3[1]	GNR[3]
Dermatocarpon intestiniforme	leather lichen	Calcareous rocks.	--	--	S2[1]	GNR[3]
Dermatocarpon luridum	brook lichen	Siliceous rocks, including granite, in and along streams, and at lake edges.	--	--	S2[1]	--
Dermatocarpon moulinsii	stippleback	Calcareous cliffs.	--	--	GNR[1]	--
Dermatocarpon schaechtelinii	stippleback lichen	Unknown.	--	--	S1[1]	--
Desmatodon cernuus	narrow-leafed chain-teeth moss	Soil in calcareous regions at lowlands to 2,700 m ASL.	--	--	S1[1]	G3G5[3]
Desmatodon heimii	long-stalked beardless moss	Moist, alkaline soil, banks, frost boils, lakeshores, friable shale and near streams at low to high elevations (0-2,900 m ASL).	--	--	S2[1]	--
Desmatodon leucostoma	Desmatodon moss	Soil, silt, clay, calcareous substrates, runways and the burrows of small mammals in the subArctic.	--	--	S2[1]	G2G4[3]
Desmatodon randii	Desmatodon moss	Soil and limestone at low to moderate elevations.	--	--	S1[1]	G3?[3]
Dichelyma falcatum	Dichelyma moss	The bases of boulders in stream beds and places that are flooded for part of the year; often in fast-moving water and rapids.	--	--	S2[1]	--
Dichodontium olympicum	Dichodontium moss	Wet soil, soil over rock and montane areas associated with snow melt at moderate to high elevations (1,000-2,200 m ASL).	--	--	S1[1]	G3G5[3]

TABLE B1 Cont'd

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
Dicranella cerviculata	red-necked fork moss	Disturbed sand, clay or peaty soil and roadbanks at low to medium elevations.	--	--	S1[1]	--
Dicranella crispa	curl-leaved fork moss	Moist, sandy or silty soil at medium to high elevations.	--	--	S2[1]	G3G5[3]
Dicranella heteromalla	silky fork moss	The soil of shaded banks, along woodland trails and soil covering upturned roots at low to high elevations.	--	--	S1[1]	--
Dicranella subulata	awl-leaved fork moss	Damp soil on banks and rocky places at low to medium elevations.	--	--	S2[1]	--
Dicranum majus	greater fork moss	Humus, soil, soil over rock, rotten wood in coniferous forests, bogs and tundra at 0-1,500 m ASL.	--	--	SH[1]	--
Dicranum ontariense	cushion moss	Humus, soil, soil over rock, rarely rotten wood or stumps, mesic to dry coniferous woods and swamps and bogs at 60-1,200 m ASL.	--	--	S1[1]	--
Dicranum spadiceum	cushion moss	Fens, wet meadows, willow thickets, humus or soil on or around rocks at lake margins; occasionally drier habitats such as beach ridges. 10-2,300 m ASL.	--	--	S2[1]	--
Dicranum tauricum	broken-leaf moss	Rotten logs, stumps, tree bases in woodlands, humus or humus over rock at 150-2,200 m ASL.	--	--	S1S2[1]	--
Didymodon fallax	fallacious screw moss	Soil, silt, conglomerate, dolomite, sandstone, concrete, culverts, gypsum, shale and calcareous rock at moderate to high elevations (200-3,300 m ASL).	--	--	S2[1]	--
Didymodon nigrescens	Didymodon moss	Limestone, frost boils, outcrops and cliff faces, often near streams at low to moderate elevations (0-700 m ASL).	--	--	S1[1]	G3G5[3]
Didymodon rigidulus	rigid screw moss	Basalt, calcareous outcrops, ledges, gravel, soil, silt, tundra, frost boils and along roads and paths at low to high elevations (0-3,000 m ASL).	--	--	S2[1]	--
Didymodon subandreaeoides	Didymodon moss	Soil or rocks (limestone) along streams or near waterfalls from moderate to high elevations.	--	--	S2[1]	GU[3]
Didymodon tophaceus	blunt-leaved hair moss	Limestone, limey shale, dolomite, cliffs, rocks, moist areas, seeps, waterfalls and moist clay at low to moderate elevations (0-2,000 m ASL).	--	--	S1S2[1]	--
Didymodon vinealis	Didymodon moss	Soil, calcareous rocks, granite outcrops, schist and sandstone at moderate to high elevations (600-2,300 m ASL).	--	--	S1[1]	--
Diploschistes actinostomus	crater lichen	Non-calcareous rocks.	--	--	S1[1]	--
Diploschistes diacapsis	desert crater lichen	Bare, calcareous or non-calcareous soil in arid locations and rarely on calcareous rock.	--	--	S1[1]	--
Drepanocladus brevifolius	brown moss	Arctic and alpine sites.	--	--	SU[1]	GNRQ[3]
Drepanocladus capillifolius	brown moss	Bogs, streams and lakes in lowlands to 3,000 m ASL.	--	--	SU[1]	GU[3]
Drepanocladus crassicostatus	brown moss	Alkaline lake margins, marshy stream sides, spring ponds, pools in swampy habitats and aquatic in seepage sites.	--	--	S2[1]	G3G5[3]
Drepanocladus sendtneri	brown moss	Wet places, usually in calcareous regions, to about 3,000 m ASL.	--	--	S1[1]	--
Dryptodon patens	spreading fringe moss	Dry or moist boulders and rock ledges (usually granitic).	--	--	S2[1]	--
Encalypta brevicolla	candle-snuffer moss	Soil in open montane and alpine habitats.	--	--	S2[1]	--
Encalypta intermedia	candle-snuffer moss	Soil or soil over rock.	--	--	S1[1]	--

TABLE B1 Cont'd

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
Encalypta spathulata	candle-snuffer moss	Disturbed, calcareous soils in shaded sites.	--	--	S1[1]	--
Encalypta vulgaris	common extinguisher moss	Shallow, calcareous soil over rock.	--	--	S1S2[1]	--
Endocarpon pusillum	scaly stippled lichen	Mainly on exposed or shady limestone and rarely on tree bases (especially elms).	--	--	S2S4[1]	--
Endocarpon tortuosum	stippled lichen	Rocks in dry or seepage areas.	--	--	S2[1]	GNR[3]
Entodon concinnus	Entodon moss	Soil or soil-covered rocks in calcareous areas.	--	--	S2[1]	--
Entodon schleicheri	Schleicher's silk moss	Rocks along canyon walls in woods, rotting logs and shaded rock ledges.	--	--	S1[1]	G3G5[3]
Esslingeriana idahoensis	tinted rag lichen	Sometimes abundant on tree branches in open coniferous forests.	--	--	S1[1]	--
Fissidens adianthoides	maidenhair moss	Along streams and seepage areas, near waterfalls, in meadows, on soil, tree bases, decaying wood, dripping limestone and sandstone.	--	--	S2[1]	--
Fissidens grandifrons	narrow-leaved Chinese phoenix moss	Submerged in rapidly running water in calcareous sites.	--	--	S2[1]	--
Flavopunctelia soredica	powder-edged speckled greenshield moss	On many kinds of bark in open woods.	--	--	S2[1]	G3G5[3]
Fontinalis antipyretica	aquatic moss	Stones, roots, twigs, streams, ponds and swamps at lowland to 3,300 m ASL elevations.	--	--	S1[1]	--
Fontinalis dalecarlica	Fontinalis moss	Attached to rocks and submerged in swiftly running water.	--	--	S1[1]	G3G5[3]
Fontinalis missourica	Fontinalis moss	Submerged in the shallow water of springs and streams.	--	--	S1[1]	--
Fontinalis neomexicana	Fontinalis moss	Attached to various substrates and submerged in shallow, flowing water.	--	--	S1S2[1]	G3G5[3]
Fulgensia fulgens	sulphur lichen	Lime-rich soil or rock, rarely mosses, in arid regions and tundra.	--	--	S2S3[1]	G3G5[3]
Funaria americana	cord moss	Exposed, calcareous soils among loosely tufted grass in moist, bright, disturbed habitats and disturbed microhabitats along river bluffs in the early spring from low to moderate elevations.	--	--	S1[1]	G3?[3]
Funaria muhlenbergii	Muhlenberg's cord moss	Bare, calcareous soils at moderate elevations.	--	--	S1[1]	--
Grimmia alpestris	alpine grimmia moss	Exposed, acidic granite and sandstone from moderate to high elevations (360-3,300 m ASL).	--	--	S2[1]	G3G5[3]
Grimmia anomala	mountain forest grimmia moss	Acidic rock at moderate to high elevations.	--	--	S2[1]	--
Grimmia donniana	Donian Grimmia moss	Exposed, acidic granite and sandstone, and forest and tundra from moderate to high elevations (800-3,700 m ASL).	--	--	S2[1]	--
Grimmia elatior	large Grimmia moss	Exposed, dry, acidic rock and occasionally basic limestone from moderate to high elevations (500-4,500 m ASL).	--	--	S1S2[1]	G3G5[3]
Grimmia montana	sun Grimmia moss	Exposed, acidic granite and sandstone from moderate to high elevations (900-4,000 m ASL).	--	--	S2[1]	--
Grimmia teretinervis	Grimmia moss	Moist, calcareous sandstone, limestone and dolomite outcrops from moderate to high elevations (200-1,700 m ASL).	--	--	S1[1]	G3G5[3]
Grimmia torquata	twisted-leaved Grimmia moss	Damp, frequently vertical faces of acidic rock from moderate to high elevations (200-4,000 m ASL).	--	--	S2[1]	G3G5[3]

TABLE B1 Cont'd

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
Grimmia trichophylla	hair-pointed Grimmia moss	Dry, acidic rock from moderate to high elevations (200-2,000 m ASL).	--	--	S1[1]	--
Gymnocolea inflata	Gymnocolea liverwort	Wet heath, bog, peaty pool edges, heathy slopes, acidic rocks, gravel, sand and loam, rotting wood, leaf litter and intermittently submerged to dry habitats at lowland to alpine elevations.	--	--	S1[1]	--
Gypsoplaca macrophylla	changing earthscale	On soils containing gypsum in arid sites.	--	--	S1[1]	G3G4[3]
Herzogiella seligeri	Herzogiella moss	Rotten logs and stumps in deciduous forests and open areas, often on non-native trees and particularly coppiced sweet chestnut (Castanea sativa).	--	--	S1[1]	G3G4[3]
Heterocladium dimorphum	Heterocladium moss	Boulders, cliff crevices, soil or the humus of shaded streambanks, bark at the base of trees and acidic and basic substrates.	--	--	S1[1]	--
Heterodermia speciosa	powdered fringe lichen	Deciduous and coniferous trees in open boreal habitats.	--	--	S2[1]	--
Homalothecium nevadense	Homalothecium moss	Rock, calcareous habitats and rarely on trees or logs from lowlands to 3,000 m ASL.	--	--	S2[1]	--
Homalothecium pinnatifidum	Homalothecium moss	Sandy or rocky soil, rock and soil over rock from lowlands to 1,000 m ASL; rarely at higher elevations.	--	--	S2[1]	--
Hygroamblystegium noterophilum	Hygroamblystegium moss	Calcareous rocks, usually submerged in shallow, running water; often associated with Fissidens grandifrons.	--	--	SU[1]	--
Hygroamblystegium tenax	Hygroamblystegium moss	Wet rocks in and beside streams in calcareous and non-calcareous habitats.	--	--	S2[1]	--
Hygrohypnum alpestre	Hygrohypnum moss	Wet, acidic or siliceous rocks.	--	--	S1[1]	G3G5[3]
Hygrohypnum molle	Hygrohypnum moss	Wet places at high elevations.	--	--	S1S2[1]	--
Hygrohypnum ochraceum	Hygrohypnum moss	Rock, soil or rotten wood in or near streams from lowlands to 4,000 m ASL.	--	--	S2[1]	--
Hygrohypnum smithii	Hygrohypnum moss	Rocks in or near streams from 600 m ASL to over 3,000 m ASL.	--	--	S1[1]	G3G5[3]
Hypnum callichroum	Hypnum moss	Soil, rock and sometimes among grass in mountainous or Arctic regions.	--	--	S1[1]	--
Hypnum pallescens	Hypnum moss	Rocks and tree bases, usually in the mountains from 700-3,000 m ASL.	--	--	S2[1]	--
Hypnum procerrimum	Hypnum moss	Calcareous regions.	--	--	S2[1]	G3G4[3]
Hypnum recurvatum	Hypnum moss	Thin, interwoven mats on exposed calcareous rock, especially in dry, exposed places and rarely on tree bases or decaying wood.	--	--	S2[1]	G3G5[3]
Hypocenomyce anthracophila	dot lichen	Coniferous wood.	--	--	S1[1]	--
Hypocenomyce frieslii	clam lichen	The wood or bark of conifers or birch, especially charred logs and stumps.	--	--	S2[1]	G3G5[3]
Hypocenomyce leucococca	clam lichen	The wood or bark of conifers or birch, especially charred logs or stumps.	--	--	S1S3[1]	G3?[3]
Hypogymnia metaphysodes	deflated tube lichen	Exposed, coniferous bark or wood at elevations greater than 1,000 m ASL, and occasionally on alder or other trees at lower elevations.	--	--	S2[1]	G3G5[3]
Hypogymnia rugosa	wrinkled tube lichen	Conifers, mainly in intermontane forests at high elevations.	--	--	S1S2[1]	--
Jaffueliobryum raui	Jaffueliobryum moss	Dry sandstone and limestone, open, semi-arid to arid shrub and woodland communities, grasslands, and rarely on compacted sandy soil from moderate to high elevations (200-2,100 m ASL).	--	--	S1[1]	--
Jaffueliobryum wrightii	Jaffueliobryum moss	Dry sandstone, limestone, rarely metamorphic rock, open, semi-arid to arid shrub, woodland and grassland communities from moderate to high elevations (200-2,800 m ASL).	--	--	S2[1]	--

TABLE B1 Cont'd

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
Jungermannia atrovirens	Jungermannia liverwort	Moist, wet or intermittently submerged rocks and rock walls, the thin layer of soil or humus in exposed to deeply-shaded sites, intolerant of dessication and often near running water from lowlands to 1,070 m ASL.	--	--	S2[1]	--
Kiaeria blyttii	Blytt's fork moss	Soil in rock crevices or acidic rock at alpine elevations.	--	--	S2[1]	--
Kiaeria starkei	alpine broom moss	Acidic rock or sandy soil in rock crevices, and vertical rock surfaces from subalpine to alpine elevations.	--	--	S2[1]	--
Lecania dubitans	bean-spored rim-lichen	Poplar bark.	--	--	S2S4[1]	--
Lecanora beringii	sunken-stud lichen	Calcareous rock, bones and antlers in Arctic regions.	--	--	S2[1]	G3G4[3]
Lecanora boligera	rim lichen	Unknown.	--	--	S2?[1]	GNR[3]
Lecanora caesiorubella ssp. *saximontana*	frosted rim-lichen	Wood in the Rocky Mountains.	--	--	S1[1]	G4G5TNR[3]
Lecanora cateilea	rim-lichen	Bark (in the west coast and Great Lakes regions).	--	--	S2[1]	GNR[3]
Lecanora chlarotera	rim-lichen	Deciduous trees.	--	--	S2[1]	--
Lecanora crenulata	rim-lichen	Calcareous rocks.	--	--	S1[1]	G3G5[3]
Lecanora expallens	rim-lichen	Woody plants and old wood, especially conifers.	--	--	S1?[1]	G3G5[3]
Lecanora hybocarpa	bumpy rim-lichen	The bark of hardwoods (rarely conifers) in well-lit woodlands or on isolated trees.	--	--	S2[1]	--
Lecanora hypoptoides	rim-lichen	Unknown.	--	--	S2[1]	GNR[3]
Lecanora persimilis	rim lichen	Unknown.	--	--	S2[1]	GNR[3]
Lecanora saligna	rim-lichen	Old wood and the bark of deciduous trees.	--	--	S1[1]	G3G5[3]
Lecanora subintricata	rim-lichen	The bark of woody plants and old wood.	--	--	S2S4[1]	G3G5[3]
Lecanora wisconsinensis	rim-lichen	Unknown.	--	--	S1[1]	GNR[3]
Lecidea laboriosa	disk lichen	Unknown.	--	--	SU[1]	GNR[3]
Lecidea laprarioides	disk lichen	Unknown.	--	--	S2S4[1]	GNR[3]
Lecidea lithophila	disk lichen	Unknown.	--	--	S2[1]	G3G5[3]
Lecidea nylanderi	disk lichen	The bark and wood of conifers.	--	--	S2S4[1]	G3G5[3]
Lecidea plebeja	disk lichen	Unknown.	--	--	S1[1]	G3G5[3]
Lecidella elaeochroma	disk lichen	The bark and twigs of trees and shrubs.	--	--	S1[1]	--
Lecidella patavina	disk lichen	Unknown.	--	--	S1S2[1]	GNR[3]
Lepraria incana	dust lichen	Rocks and bark.	--	--	S2[1]	GNR[3]
Lepraria lobificans	fluffy dust lichen	Tree bases, shaded rocks and mosses.	--	--	S1[1]	GNR[3]
Leptodictyum humile	Leptodictyum moss	Damp places from lowlands to 3,000 m ASL.	--	--	S1[1]	--
Leptogium gelatinosum	jellyskin lichen	Mossy rocks and soil, and rarely on trees.	--	--	S2[1]	--
Leptogium hirsutum	jellyskin	Deciduous trees and occasionally on decaying logs and rocks.	--	--	SU[1]	G5Q[3]
Leptogium pseudofurfuraceum	dimpled jellyskin lichen	Bark and rarely on rock.	--	--	S2[1]	GNR[3]
Leptogium tenuissimum	lilliput jellyskin lichen	Sandy soil and less frequently on sandstone or bark.	--	--	S2[1]	GNR[3]
Leptorhaphis epidermidis	Leptorhaphis lichen	Unknown.	--	--	S1S3[1]	GNR[3]
Leskea gracilescens	Leskea moss	Tree bases in hardwood forests, floodplains and along roadsides, and less frequently on rocks or logs.	--	--	S1[1]	--

TABLE B1 Cont'd

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
Leskea obscura	Leskea moss	Hardwood tree bases, especially on floodplains, occasionally on rocks.	--	--	S1[1]	--
Leskea polycarpa	Leskea moss	Hardwood tree bases in areas subject to flooding and occasionally on rocks.	--	--	S1[1]	--
Leskeella nervosa	Leskeella moss	Bark and rock from lowlands to 2,300 m ASL.	--	--	S2[1]	--
Lichenomphalia umbellifera	Lichenomphalia lichen	Rotting wood and peat.	--	--	S2S4[1]	GNR[3]
Limprichtia cossonii	Limprichtia moss	Calcareous fens, wet places (not submerged) and the edge of pools.	--	--	SU[1]	GU[3]
Lobaria hallii	gray lungwort	Cottonwood trees and other poplars, maple trees and occasionally on conifers.	--	--	S1[1]	--
Lophozia ascendens	Lophozia ascendens	Unknown.	--	--	S1[1]	--
Lophozia badensis	Lophozia liverwort	Shaded and insolated sites with moist sand, gravel, loam, clay, silt, limestone, chalk or mosses from lowland to alpine elevations.	--	--	S1[1]	--
Lophozia capitata	Lophozia liverwort	Exposed or lightly shaded, moist or intermittently flooded clay, sand or fine, gravelly soil in disused pits and quarries, wet, peaty soil in bogs and heath, tracks and on dead Molinia at lowland elevations.	--	--	S1[1]	--
Lophozia collaris	Lophozia liverwort	Damp or well-drained habitats, such as rocks, in or beside streams, flushes and lakes, fen tussocks, and steep banks at lowland to alpine elevations.	--	--	S1[1]	--
Lophozia excisa	Lophozia liverwort	Moist gravel, sand, loam, peat, humus-rich soil, mosses, decaying wood, tree bases (especially Betula species) and shrub branches. Often insolated but also in woodlands at lowland to subalpine elevations.	--	--	S1[1]	--
Lophozia gillmanii	Lophozia liverwort	North-facing or shaded sites with very moist or constantly irrigated limestone, base-rich schist, steep, rocky slopes, in flushes and beside streams at lowland to alpine elevations.	--	--	S1[1]	--
Lophozia grandiretis	Lophozia liverwort	Arctic/alpine species, subcalciphyte and peaty soil directly over calcareous ledges. Prefers north or northwest-facing, shaded and sheltered habitats.	--	--	S2[1]	G3?[3]
Lophozia guttulata	Lophozia liverwort	Moist, decaying wood at subalpine elevations.	--	--	S2[1]	--
Lophozia heterocolpos	Lophozia liverwort	Humus-rich soils, sandy alluvium, vertical and steep rocky banks with base-rich seepage, among mosses, lowland ravines, streambanks and montane crags at lowland to alpine elevations.	--	--	S2[1]	--
Lophozia incisa	Lophozia liverwort	Peat, rotten wood, mosses, moist, acidic or circumneutral gravel, sand, loam, clay, or humus-rich soils, shaded sandstone and shale at lowland to subalpine elevations.	--	--	S2[1]	--
Lophozia laxa	Lophozia liverwort	Unknown.	--	--	S1[1]	--
Lophozia longidens	Lophozia liverwort	The bark of Betula species, logs, peat, leaf litter, thin algae-lichen layers, mosses, humid woodlands, dwarf shrub communities, ravines, block screes, crags and north-facing slopes at lowland to subalpine elevations.	--	--	S1[1]	--
Lophozia obtusa	Lophozia liverwort	Detritus, silt or rocks beside streams, other mosses, moist, steep banks, woodlands, grassy or mossy turf and cliffs at lowland to subalpine elevations.	--	--	S1[1]	--
Lophozia rutheana	Lophozia liverwort	Calcareous fens at low elevations.	--	--	S1[1]	--
Lophozia wenzelii	Lophozia liverwort	Wet, peaty soil beside mountain streams and in flushes below late-lying snow at alpine elevations.	--	--	S1[1]	--
Mannia fragrans	Mannia liverwort	Unknown.	--	--	S1[1]	--
Mannia pilosa	Mannia liverwort	Unknown.	--	--	S1[1]	--
Meesia longiseta	Meesia moss	Calcareous fens and boggy woods.	--	--	S1[1]	--
Melanelia panniformis	shingled camouflage lichen	Non-calcareous rock.	--	--	S1[1]	--

TABLE B1 Cont'd

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
Melanelia stygia	camouflage lichen	Non-calcareous rocks at high elevations or Arctic habitats.	--	--	S2S4[1]	--
Melanelixia fuliginosa	camouflage lichen	Coniferous or deciduous bark or acidic rock.	--	--	S1S2[1]	--
Melanohalea infumata	smoked camouflage lichen	Rock.	--	--	S2S3[1]	GNR[3]
Melanohalea multispora	many-spored camoflage lichen	Deciduous tree bark in humid or mountainous habitats.	--	--	S2S4[1]	--
Melanohalea olivacea	spotted camouflage lichen	Bark, especially birch, in boreal forests.	--	--	S1[1]	G3G5[3]
Melanohalea subelegantula	camouflage lichen	Bark or wood in moist, low to moderate elevation forests.	--	--	S2S3[1]	GNR[3]
Melanohalea trabeculata	camouflage lichen	Unknown.	--	--	S1?[1]	GNR[3]
Micarea assimilata	assimilative dot lichen	Moss, humus or soil, especially in late snow melt areas.	--	--	S2[1]	G3G5[3]
Micarea melaena	dot lichen	Peaty soils, decaying wood and stumps.	--	--	S1[1]	--
Micarea prasina	dot lichen	Unknown.	--	--	S2S4[1]	GNR[3]
Micarea sylvicola	dot lichen	Unknown.	--	--	S2?[1]	GNR[3]
Mnium ambiguum	Mnium moss	Soil and soil over rock in damp woods, often in calcareous regions from lowlands to 2,000 m ASL.	--	--	S2[1]	--
Moerckia hibernica	Moerckia liverwort	Moist sand, gravel, schist, sandy peat, loam, fens, dunes, soil over rock, ravines, quarries, ditch banks, waterfall edges, lake margins, flushes and slopes from lowland to subalpine elevations.	--	--	S1S2[1]	--
Mycobilimbia carneoalbida	dot lichen	Unknown.	--	--	S2S4[1]	GNR[3]
Mycobilimbia epixanthoides	dot lichen	Unknown.	--	--	S1?[1]	GNR[3]
Mycobilimbia hypnorum	dot lichen	Unknown.	--	--	S1[1]	GNR[3]
Mycoblastus affinis	kindred blood lichen	Coniferous bark.	--	--	S2[1]	G3G5[3]
Mycoblastus sanguinarius	bloody-heart lichen	The bark and wood of conifers and birch.	--	--	S2[1]	--
Mycocalicium calicioides	Mycocalicium lichen	Unknown.	--	--	S1[1]	GNR[3]
Mycocalicium subtile	Mycocalicium lichen	Twigs and branches.	--	--	S2S4[1]	--
Myriospora heppii	cobblestone lichen	Calcareous rocks.	--	--	S1[1]	--
Myurella sibirica	Myurella moss	Sheltered habitats on moist rock or thin soil over rock.	--	--	S1[1]	--
Myurella tenerrima	Myurella moss	Soil in rock crevices in Arctic and alpine habitats.	--	--	S2[1]	G3G4[3]
Myxobilimbia sabuletorum	dot lichen	Moss over rocks (especially calcareous), mossy tree bases and bark.	--	--	S2[1]	--
Nardia breidleri	Nardia liverwort	Parially buried in moist or wet, non-basic, gravelly, sandy or peaty soil on exposed slopes, solifluction terraces at or near summits and snow melt areas at alpine elevations.	--	--	S1[1]	--
Neckera pennata	Neckera moss	Tree trunks, branches and rocks from lowlands to 3,000 m ASL.	--	--	S2S3[1]	--
Nephroma bellum	naked kidney lichen	Branches and twigs (especially coniferous), and also mossy rocks in humid forests.	--	--	S2[1]	G3G5[3]

TABLE B1 Cont'd

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
Nephroma isidiosum	Nephroma lichen	Twigs and bark in mature, humid forests.	--	--	S1[1]	G3G5[3]
Ochrolechia gowardii	Ochrolechia lichen	Unknown.	--	--	S1[1]	GNR[3]
Ochrolechia inaequatula	Ochrolechia lichen	Unknown.	--	--	S1S2[1]	GNR[3]
Oreas martiana	Oreas moss	Moderate to high elevations.	--	--	S1[1]	--
Orthothecium intricatum	Orthothecium moss	Rock; usually alpine.	--	--	S1[1]	--
Orthotrichum affine	Orthotrichum moss	Trees and rarely on rock from lowlands to 2,700 m ASL.	--	--	SU[1]	G3G5[3]
Orthotrichum pallens	Orthotrichum moss	Trees and occasionally on rock.	--	--	S2[1]	--
Orthotrichum pumilum	Orthotrichum moss	Tree bark, rarely on rock, from lowlands to 1,300 m ASL.	--	--	S1S2[1]	--
Orthotrichum pylaisii	Orthotrichum moss	Dry, exposed rocks at low to high elevations.	--	--	S1S2[1]	--
Oxystegus tenuirostris	acid-soil moss	Soil, sandstone, calcareous rock, bluffs, under overhangs, seepage areas and logs at low to high elevations.	--	--	S1[1]	--
Pannaria conoplea	shingle lichen	Bark and less frequently on rocks.	--	--	SU[1]	G3G4[3]
Parmelia omphalodes	unsalted shield lichen	Rocks in exposed habitats, especially at high elevations or latitudes.	--	--	S2[1]	G2G4[3]
Pellia endivifolia	Pellia liverwort	Soil and rocks in shaded, moist or wet habitats from lowland to subalpine elevations.	--	--	S2[1]	--
Pellia epiphylla	Pellia liverwort	Moist, well-drained, neutral or acidic clay to gravel soils, humus, woodlands, roadside banks and ditches, above the water level of streams and lakes, moist track, marshes, bogs, wet heaths, block scree and montane crags from lowland to alpine elevations.	--	--	S1[1]	--
Pellia neesiana	Pellia liverwort	Shaded microhabitats among vascular plants in wet pastures, marshes, flushes, ditches, wet woodlands, damp tracks and stream and lake banks from lowland to subalpine elevations.	--	--	S2[1]	--
Peltigera cinnamomea	cinnamon dog pelt lichen	Tree trunks and branches, especially among mosses and less frequently on mossy rocks; rarely on soil.	--	--	S2[1]	GNR[3]
Peltigera collina	tree pelt lichen	Unknown.	--	--	S2[1]	--
Peltigera horizontalis	flat fruited pelt lichen	Mossy soil, logs and rocks in forests.	--	--	S2S3[1]	--
Peltigera polydactyla	alternating dog-lichen	Soil, moss or mossy rock in forests.	--	--	S2[1]	--
Phaeophyscia adiastola	shadow lichen	Mossy, base-rich rocks and deciduous trees and shrubs in intermontane environments at low elevations.	--	--	S1S3[1]	--
Phaeophyscia cernohorskyi	shadow lichen	Hardwood bark and rock.	--	--	S1[1]	--
Phaeophyscia endococcina	shadow lichen	Rock.	--	--	S2[1]	G3G4[3]
Phaeophyscia hirsuta	shadow lichen	Rock and deciduous trees in open, semi-arid intermontane habitats.	--	--	S1[1]	G3[3]
Phaeophyscia nigricans	shadow lichen	Base-rich rock in sheltered, intermontane habitats at low elevations.	--	--	S2[1]	--
Phaeophyscia sciastra	dark shadow lichen	Forms neat rosettes on exposed rocks, especially sandstone.	--	--	S2S4[1]	--
Phaeospora parasitica	Phaeospora lichen	Unknown.	--	--	S1?[1]	GNR[3]
Phascum cuspidatum	cuspidate earth moss	Soil, lawns, fields and banks at low to moderate elevations.	--	--	S2[1]	--
Philontis marchica	Philontis moss	Soil in wet places, seepy roadbanks and the edges of springs.	--	--	S1[1]	--

TABLE B1 Cont'd

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
Phlyctis argena	whitewash lichen	The bark of deciduous trees (occasionally coniferous) and rocks.	--	--	S1?[1]	--
Physcia biziana	frosted rosette lichen	Bark or calcareous rocks in open, dry habitats.	--	--	S1S2[1]	--
Physcia dimidiata	rosette lichen	Steppe, open forests and rock outcrops in exposed to sheltered microsites from low to moderate elevations.	--	--	S1S2[1]	--
Physcia tenella	fringed rosette lichen	Twigs, bark and rock.	--	--	S2[1]	--
Physcomitrium hookeri	bladder-cap moss	Wet soil in disturbed places at moderate to high elevations.	--	--	S1[1]	G2G4[3]
Physcomitrium immersum	Physcomitrium moss	Wet soil in disturbed floodplains or mud flats near streams at moderate to high elevations.	--	--	SNR[1]	--
Physcomitrium pyriforme	urn moss	Wet soil in disturbed areas at moderate to high elevation.	--	--	S1[1]	--
Physconia enteroxantha	frost lichen	Bark, wood and occasionally rock.	--	--	S1?[1]	G3G5[3]
Physconia isidiigera	frost lichen	Bark.	--	--	S2[1]	G3G4[3]
Physconia perisidiosa	crescent frost lichen	Bark and occasionally on rock or soil.	--	--	S2[1]	G3G5[3]
Placidium lachneum	earthscale lichen	Unknown.	--	--	S1S2[1]	--
Placidium squamulosum	Placidium lichen	Calcareous soil.	--	--	SU[1]	--
Placynthiella icmalea	ink lichen	Wood.	--	--	S2S4[1]	GNR[3]
Placynthium asperellum	ink lichen	Calcareous and siliceous rocks.	--	--	S1[1]	G3G5[3]
Placynthium subradiatum	Placynthium lichen	Limestone in moist, montane habitats.	--	--	SU[1]	G2G4[3]
Plagiobryum zieri	Plagiobryum moss	Soil in rock crevices and often in calcareous regions.	--	--	S2[1]	--
Plagiomnium ciliare	Plagiomnium moss	Wet soil, usually in wooded areas beside streams.	--	--	S2[1]	--
Plagiomnium rostratum	Plagiomnium moss	Soil and soil over rock in forests.	--	--	S1[1]	--
Platydictya minutissima	Platydictya moss	Moist, shaded rock.	--	--	SU[1]	G3[3]
Pogonatum dentatum	hair-like pogonatum moss	Dry, insolated habitats, silt, sandy or gravelly soil, rocks, talus slopes and disturbed areas at moderate to high elevations.	--	--	S2[1]	G3G5[3]
Pogonatum urnigerum	urn-like pogonatum moss	Disturbed sandy or gravelly soil on streambanks, roadsides, crevices of cliffs and rocks, and late snow areas from moderate to high elevations.	--	--	S2S3[1]	--
Pohlia annotina	Pohlia moss	Damp soil from lowlands to 2,000 m ASL.	--	--	S1[1]	--
Pohlia atropurpurea	Pohlia moss	Damp to wet, disturbed, sandy or clayey soil, roadbanks, ditch banks and the margins of lakes, ponds or streams.	--	--	S1[1] Sensitive	--
Pohlia bulbifera	Pohlia moss	Soil at moderate elevations.	--	--	S1[1]	--
Pohlia obtusifolia	Pohlia moss	Damp soil near streams in alpine regions.	--	--	S1[1]	G2G4[3]
Polyblastia cupularis	Polyblastia lichen	Unknown.	--	--	S1[1]	GNR[3]
Polysporina arenacea	cobblestone lichen	Unknown.	--	--	S2[1]	GNR[3]
Polytrichum longisetum	slender hairy-cap moss	Moist, acidic to basic peaty sites, hummocks, meadows and wet tundra from moderate to high elevations.	--	--	S1[1]	--
Pseudevernia consocians	Pseudevernia lichen	Conifers; mainly in forests.	--	--	S1[1]	G3G5[3]
Pseudobryum cinclidioides	Pseudobryum moss	Wet humus in depressional microhabitats.	--	--	S2[1]	--
Pseudoleskea atricha	Pseudoleskea moss	Rocks, rare on wood, and in mountains from 1,000 m ASL to higher elevations.	--	--	SU[1]	--

TABLE B1 Cont'd

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
Pseudoleskea patens	Pseudoleskea moss	Rocks, rarely on rotten wood, and at alpine elevations, but also low elevations at northern latitudes.	--	--	S2[1]	--
Pseudoleskea stenophylla	Pseudoleskea moss	The branches of live trees, occasionally on twigs on the ground and rarely on rock, from 500-1,800 m ASL, and lower elevations at northern latitudes.	--	--	S2[1]	--
Pseudoleskeella sibirica	Pseudoleskeella moss	Rock.	--	--	S2[1]	--
Psora cerebriformis	brain scale	Soil in arid regions.	--	--	S1[1]	--
Psora globifera	blackberry scale	Rock and occasionally on soil.	--	--	S1S2[1]	--
Psora nipponica	butterfly scale	Soil or rock among mosses.	--	--	S2[1]	--
Psora tuckermanii	brown-eyed scale	Soil or rock, especially sandstone.	--	--	S2[1]	--
Pterygoneurum ovatum	hairy-leaved beardless moss	Soil (volcanic, dry, saline), frost boil and low desert scrub areas at moderate elevations (900-1,600 m ASL).	--	--	S1[1]	--
Pterygoneurum subsessile	Pterygoneurum moss	Soil (sandy, volcanic) and alkali flats from moderate to high elevations (600-1,700 m ASL).	--	--	S2[1]	--
Racomitrium heterostichum	Racomitrium moss	Acidic rocks, dry and exposed hillsides and cliffs, less frequently in damp and shaded sites, and occasionally on sandy soil or thin soil over rock from low to high elevations (0-2,000 m ASL).	--	--	S2?[1]	--
Racomitrium microcarpon	Racomitrium moss	Acidic rock, cliffs, soil or gravel in late snow areas, tundra, slopes, granite rock underhangs on talus slopes and exposed, dry to moist sites at low to high elevations (0-1,700 m ASL).	--	--	S1?[1]	GNRQ[3]
Radula complanata	Radula liverwort	The branches, trunks and exposed roots of deciduous trees and shrubs in moist, lightly-shaded sites from lowland to subalpine elevations.	--	--	S1[1]	--
Ramalina calicaris	Ramalina lichen	Unknown.	--	--	S1?[1]	GNR[3]
Ramalina farinacea	dotted ramalina	Trees and shrubs, rarely on rock, in regions with a mild, humid climate.	--	--	S3[1]	G3G5[3]
Ramalina intermedia	rock ramalina	Rock faces in forests and rarely on bark.	--	--	S2[1]	--
Ramalina obtusata	hooded ramalina	Trees and rocks.	--	--	S2[1]	--
Ramalina roesleri	frayed ramalina	The twigs and branches of trees and shrubs in open, humid sites, and rarely on wood or shaded rock.	--	--	S1[1]	G3G5[3]
Ramboldia elabens	crimson dot lichen	Hardwoods.	--	--	S2[1]	GNR[3]
Rhizocarpon badioatrum	Rhizocarpon lichen	Acidic rocks.	--	--	S1[1]	--
Rhizocarpon concentricum	Rhizocarpon lichen	Unknown.	--	--	S1[1]	--
Rhizocarpon superficiale	map lichen	Exposed, acidic rock.	--	--	S2[1]	--
Rhizomnium andrewsianum	Rhizomnium moss	Wet places in Arctic or alpine habitats.	--	--	S1[1]	G3G5[3]
Rhizomnium magnifolium	Rhizomnium moss	Wet places in woods and often near streams from lowlands to 2,000 m ASL.	--	--	S2[1]	--
Rhizomnium nudum	Rhizomnium moss	Moist soil in woods and along streams from lowlands to 2,000 m ASL.	--	--	S2[1]	--
Rhizoplaca peltata	rock-posy lichen	Calcareous rocks in exposed habitats.	--	--	S1[1]	G3G4[3]
Rhodobryum ontariense	Rhodobryum moss	Unknown.	--	--	S2[1]	--
Riccardia latifrons	Riccardia liverwort	Sphagnum, Leucobryum and Molinia hummocks, leaf litter, sheltered sites in valleys, bogs, moorlands, montane slopes, decorticated logs and stumps in wet forests from lowland to subalpine elevations.	--	--	S2[1]	--

TABLE B1 Cont'd

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
Riccardia multifida	Riccardia liverwort	Sheltered, shaded microhabitats in bogs, marshes, fens, dunes, old chalk and clay pits, wet tracks, lake margins, in and beside streams, lowland woods and ravines, and montane gullies and crags from lowland to alpine elevations.	--	--	S2S3[1]	--
Riccardia palmata	Riccardia liverwort	Damp, soft, decorticated logs and stumps, sheltered woodlands, and shaded peat and plant debris on and among rocks from lowland to subalpine elevations.	--	--	S1[1]	--
Riccia beyrichiana	Riccia liverwort	Rocks, banks, heaths, tracks, roadsides, waste ground, exposed reservoir margins, cultivated lands, montane slopes, compacted soil and periodically-flooded, strongly-insulated sites from lowlands to 800 m ASL.	--	--	S1[1]	--
Riccia cavernosa	Riccia liverwort	Insolated, wet or moist, circumneutral to basic, intermittently exposed sand or mud beside lakes, ponds, reservoirs, watterlogged areas in fields, gravel pits and sand dunes.	--	--	S1[1]	--
Riccia fluitans	Riccia liverwort	Wet or moist, circumneutral to basic mud, sandy soil, humus and racks at lake and pond margins, dried pond floors, ditches, fen peat cuttings, marshes, flooded carr, dune slacks, and floating just below the surface of slow-moving or stagnant water.	--	--	S2[1]	--
Ricciocarpos natans	Ricciocarpos liverwort	Floating at the surface of stagnant or slow-moving water, exposed, wet or moist, calcareous clay, humus-rich mud and leaf litter.	--	--	S2[1]	--
Rinodina albertana	pepper-spore lichen	Unknown.	--	--	S2[1]	GNR[3]
Rinodina archaea	brown pepper-spore lichen	Moss, bark and old wood.	--	--	S2[1]	--
Rinodina bischoffii	pepper-spore lichen	Calcareous rocks.	--	--	S1[1]	--
Rinodina colobina	pepper-spore lichen	Bark and wood.	--	--	S1[1]	GNR[3]
Rinodina disjuncta	pepper-spore lichen	Unknown.	--	--	S1?[1]	GNR[3]
Rinodina exigua	spoke pepper-spore lichen	Unknown.	--	--	S1S2[1]	GNR[3]
Rinodina metaboliza	pepper-spore lichen	Unknown.	--	--	S2S4[1]	GNR[3]
Rinodina polyspora	pepper-spore lichen	Unknown.	--	--	S1[1]	GNR[3]
Rinodina terrestris	pepper-spore lichen	Unknown.	--	--	S1[1]	GNR[3]
Scapania apiculata	Scapania liverwort	Moist, rotting wood and peat.	--	--	S1[1]	--
Scapania curta	Scapania liverwort	Moist, circumneutral clay, loam, fine sand, peaty soil, sandy detritus, sandstone, woodland tracks and pathsides, steep banks in woodlands, pastures and beside streams at low elevations.	--	--	S2[1]	--
Scapania cuspiduligera	Scapania liverwort	Limestone and base-rich schist from lowland to subalpine elevations (30-1,175 m ASL).	--	--	S2[1]	--
Scapania glaucocephala	Scapania liverwort	Decaying logs, especially cedar, fir, pine and spruce.	--	--	S2[1]	--
Scapania paludicola	Scapania liverwort	Bogs, wet, Sphagnum-rich grassy heaths, pastures and gently sloping flushes from lowland to subalpine elevations.	--	--	S2[1]	--
Scapania paludosa	Scapania liverwort	Partially or fully submerged on rocks in running water, the irrigated surfaces of cliffs, wet, earthy banks with north to east aspects, and in meltwater from late-lying snow at subalpine to alpine elevations.	--	--	S2[1]	--
Schistidium agassizii	elf bloom moss	Wet or dry rocks in or beside streams and lakes from low to high elevations (0-3,600 m ASL).	--	--	S1[1]	G3G5[3]

TABLE B1 Cont'd

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
Schistidium heterophyllum	Schistidium moss	Rock at moderate elevations.	--	--	SH[1]	G3G4[3]
Schistidium tenerum	thread bloom moss	Exposed to semi-shaded rock. Forms extensive patches, especially in and along rock crevices from low to high elevations (0-4,500 m ASL).	--	--	S2[1]	--
Schistidium trichodon	Schistidium moss	Calcareous rock in open to shaded habitats from low to high elevations (0-3,500 m ASL).	--	--	S1[1]	G2G4[3]
Schistostega pennata	luminous moss	Mineral soil on the lower part of upturned tree roots, cave ceilings, crevices in soil banks, animal burrows and occasionally on rock from low to high elevations (0-1,700 m ASL).	--	--	S1S2[1]	G3G4[3]
Scoliciosporum chlorococcum	city dot lichen	Wood and bark of all kinds, but mostly conifers or birches, and preferring barkless branches in shaded forests. Also, trees close to or in towns.	--	--	SU[1]	--
Scoliciosporum umbrinum	crustose lichen	Rocks and occasionally wood, and rarely tree bases.	--	--	S2S4[1]	--
Scouleria aquatica	Scouleria moss	Aquatic habitats, the banks and beds of streams and rivers, and rocks from low to high elevations (0-1,900 m ASL).	--	--	S2[1]	--
Seligeria calcarea	chalk brittle moss	Calcareous substrates.	--	--	S1[1]	--
Seligeria campylopoda	Seligeria moss	Calcareous substrates.	--	--	S2[1]	G3G5[3]
Seligeria donniana	Donian beardless moss	Crevices and the protected areas of bare, calcareous rock.	--	--	S2[1]	--
Seligeria tristichoides	Seligeria moss	Calcareous cliffs.	--	--	SU[1]	--
Solorina spongiosa	fringed chocolate chip lichen	Soil in Arctic and alpine tundra, and rarely in shaded boreal habitats.	--	--	S2[1]	--
Solorinella asteriscus	Solorinella lichen	Unknown.	--	--	S1[1]	GNR[3]
Sphagnum balticum	peat moss	Hollows and floating mats in raised bogs, and poor fens from low to high elevations.	--	--	S1[1]	G2G4[3]
Sphagnum compactum	neat bog moss	Poorly-drained sand, siliceous rocks and peat from low to high elevations.	--	--	S2[1]	--
Sphagnum contortum	twisted bog moss	Very minetrophic, sometimes found in slightly basic mires and intolerant of shade from low to high elevations.	--	--	S2[1]	--
Sphagnum fallax	peat moss	Poor fen habitats, often as a pioneer species, and ombrotrophic mires at hummock bases from low to moderate elevations.	--	--	S2[1]	--
Sphagnum fimbriatum	fringed bog moss	Minetrophic, common on mineral soil at bog and poor fen margins, and open and forested fens from low to high elevations.	--	--	S2[1]	--
Sphagnum lindbergii	Lindberg's bog moss	Carpet forming in ombrotrophic to weakly minetrophic boreal mires from low to high elevations.	--	--	S2[1]	--
Sphagnum platyphyllum	peat moss	Minetrophic habitats such as lake, stream, pond and open fen margins, as well as flarks of string mires and seasonally-flooded habitats from low to high elevations.	--	--	S1[1]	--
Sphinctrina turbinata	Sphinctrina lichen	Grows on various species of Pertusaria.	--	--	S1[1]	G3G5[3]
Splachnum ampullaceum	flagon-fruited splachnum moss	Soil and decaying animal matter in wet places.	--	--	S2[1]	--
Splachnum luteum	yellow collar moss	Old moose dung; in muskeg and other boggy woods in northern latitudes.	--	--	S3[1]	--
Splachnum rubrum	red collar moss	Old moose dung; in boggy swamps and muskeg.	--	--	S3[1]	--
Splachnum sphaericum	globe-fruited splachnum moss	Animal excrement in moist places, sometimes in bogs.	--	--	S2[1]	G3G5[3]

TABLE B1 Cont'd

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
Splachnum vasculosum	large-fruited splachnum moss	Dung in bogs at high elevations.	--	--	S2[1]	G3G5[3]
Staurothele areolata	rock pimples	Dry rocks.	--	--	S1[1]	--
Stenocybe major	Stenocybe lichen	The trunks and branches of balsam fir.	--	--	S1[1]	--
Stenocybe pullatula	Stenocybe lichen	Unknown.	--	--	S2S4[1]	GNR[3]
Stereocaulon botryosum	foam lichen	Rocks.	--	--	S1[1]	--
Stereocaulon condensatum	foam lichen	Sandy soil and occasionally on gravelly soil.	--	--	S1S2[1]	--
Tayloria acuminata	point-leaf small-kettle moss	Moist places on humus from 700-2,500 m ASL.	--	--	SU[1]	G3G4[3]
Tayloria froelichiana	Froelichian splachnum moss	Wet soils at high elevations.	--	--	S1[1]	G3G5[3]
Tayloria hornschuchii	small-kettle moss	Humic soils and humus, mesic tundra slopes and semi-disturbed habitat.	--	--	S1[1]	G3G5[3]
Tayloria lingulata	tongue-leaf small-kettle moss	Wet soil.	--	--	S2[1]	G3G5[3]
Tayloria serrata	slender splachnum moss	Humus or excrement from lowlands to 2,000 m ASL or higher.	--	--	S2[1]	--
Tetraplodon urceolatus	alpine lemming moss	Unknown.	--	--	S2[1]	G3G5[3]
Thelidium decipiens	Thelidium lichen	Unknown.	--	--	S2[1]	GNR[3]
Thuidium philibertii	Thuidium moss	Calcareous regions.	--	--	S1S2[1]	--
Timmia norvegica	Timmia moss	Calcareous substrates amongst rock crevices from low to high elevations.	--	--	S2[1]	--
Tortella inclinata	bent screw moss	Exposed, calcareous, loosely consolidated substrates, near waterbodies, mud flats, sand dunes, gravel pits near bogs, sandy clearings in mixedwood forests or spruce-pine groves and ditches from low to high elevations.	--	--	S2[1]	--
Tortula bartramii	Tortula moss	Dry soil and rocks from moderate to high elevations.	--	--	S1[1]	G2G4[3]
Tortula subulata	Tortula moss	Soil at low to moderate elevations.	--	--	S1[1]	--
Trapeliopsis flexuosa	mottled-disk lichen	Weathered wood, especially fences and boards in full sun.	--	--	S1S3[1]	--
Trichodon cylindricus	narrow-fruited fork moss	Sand or clay soil, open, disturbed sites, roadside banks, trails and fields from low to high elevations.	--	--	S1[1]	--
Tritomaria exsecta	Tritomaria liverwort	Decorticated logs, decaying stumps, tree bases, moist sandstone, among mosses on rocks, sheltered humid sites in areas of high rainfall at low elevations.	--	--	S1[1]	--
Tritomaria polita	Tritomaria liverwort	Humus-rich soil, other bryophytes, in or beside springs and streams, crag bases, ledges, vertical rock surfaces, earthy banks, among turf, northwest or northeast-facing slopes, and shaded or insulated sites from subalpine to alpine elevations.	--	--	S2[1]	--
Tritomaria scitula	Tritomaria liverwort	Unknown.	--	--	S2S3[1]	--
Tuckermannopsis orbata	variable wrinkle lichen	The branches and twigs of conifers or birch; rarely other hardwoods.	--	--	S2?[1]	--
Ulota curvifolia	Ulota moss	Rock in montane regions.	--	--	S2S3[1]	G3G5[3]
Umbilicaria americana	American rock tripe lichen	Granitic, steep rock faces, usually in relatively protected or partially shaded habitats.	--	--	S2S3[1]	--

TABLE B1 Cont'd

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
Umbilicaria angulata	rock tripe	Very dry, exposed rock.	--	--	S1S2[1]	--
Umbilicaria cinereorufescens	rock tripe lichen	Unknown.	--	--	S1[1]	GNR[3]
Umbilicaria muehlenbergii	plated rock tripe lichen	Boulders and steep rock walls in forests and in the open.	--	--	S2S3[1]	--
Umbilicaria phaea	emery rock tripe	Exposed rocks in hot, arid habitats.	--	--	S2[1]	--
Usnea ceratina	warty beard lichen	Conifers and shrubs in humid, open forest.	--	--	S1[1]	--
Usnea fulvoreagens	beard lichen	Unknown.	--	--	S1S3[1]	GNR[3]
Usnea scabiosa	beard lichen	Conifers in forests or open habitats.	--	--	S1S2[1]	GNR[3]
Usnea stuppea	beard lichen	Unknown.	--	--	SU[1]	GNR[3]
Verrucaria muralis	speck lichen	Dry rocks.	--	--	S2[1]	--
Verrucaria viridula	speck lichen	Unknown.	--	--	S1[1]	GNR[3]
Warnstorfia pseudostraminea	brown moss	Poor fens and pools in wet tundra and near waterfalls.	--	--	S1[1]	G3G4[3]
Warnstorfia tundrae	brown moss	Subalpine to alpine and Arctic habitats.	--	--	S2[1]	GU[3]
Weissia controversa	green-cushioned weissia moss	Weedy soil, rock, disturbed areas, roadsides, fields, acidic or calcareous substrates.	--	--	S2[1]	--
Xanthomendoza fulva	bare-bottomed sunburst lichen	Bark, wood and rock in semi-open to shaded, drier habitats at low elevations.	--	--	S1[1]	--
Xanthomendoza hasseana	polar sunburst lichen	Bark (especially poplar, oak and other hardwoods), occasionally wood or rock, in semi-open to open, nutrient-rich habitats.	--	--	S1S2[1]	--
Xanthomendoza montana	sunburst lichen	The bark of hardwoods and conifers, occasionally wood, in open, dry habitats.	--	--	SU[1]	--
Xanthoparmelia conspersa	rock-shield lichen	Siliceous rock, especially granite, in sunny locations.	--	--	S1[1]	--
Xanthoparmelia lineola	rock-shield lichen	Exposed rock.	--	--	S1[1]	--
Xanthoparmelia subdecipiens	rock-shield lichen	Unknown.	--	--	S2[1]	--
Xylographa parallela	black woodscript lichen	Hard, weathered wood.	--	--	S2S4[1]	--
Xylographa vitiligo	white-spotted woodscript lichen	Hard, weathered wood.	--	--	S2[1]	--

Sources: ACIMS 2013c,d,e, AESRD 2012, Argus and Pryer 1990, COSEWIC 2013a, Douglas *et al.* 2002, FNA Editorial Committee 1993+, Government of Canada 2013 Kershaw *et al.* 2001, Moss 1983, NatureServe 2012a,b, Porsild and Cody 1980, Williston 2001

Notes:

1 Provincial (S) ranks are assigned ACIMS (2013c). Ranks range from 1 (five or fewer occurrences) to 5 (demonstrably secure under present conditions); definitions below are adapted from NatureServe (2012b) unless noted otherwise.

S1 = Critically Imperilled: because of extreme rarity or because of some factor(s) making it especially vulnerable to extirpation. Typically five or fewer occurrences or very few remaining individuals (< 1,000).

S2 = Imperilled: because of rarity or because of some factor(s) making it very vulnerable to extirpation. Typically 6-20 occurrences or few remaining individuals (1,000-3,000).

S3 = Vulnerable: because rare and uncommon, or found in a restricted range (even if abundant at some locations), or because of other factors making it vulnerable to extirpation. Typically 21-100 occurrences or between 3,000 and 10,000 individuals.

S4 = Apparently Secure: uncommon but not rare and usually widespread in the province. Possible cause of long-term concern. Usually more than 100 occurrences and more than 10,000 individuals.

S5 = Secure: common, widespread, and abundant in the province. Essentially ineradicable under present conditions. Typically with considerably more than 100 occurrences and more than 10,000 individuals.

S#S# = Range Rank: a numeric range rank (*e.g.*, S2S3) is used to indicate the range of uncertainty about the exact status of the element.

SH = Possibly Extirpated: known from only historical records but still some hope of rediscovery. There is evidence that the species may no longer be present in the jurisdiction, but not enough to state this with certainty.

SU = Unrankable: currently unrankable due to lack of information or due to substantially conflicting information about status or trends.

S#? = Inexact numeric rank: denotes inexact numeric rank.

Q = Questionable taxonomy: taxonomic status is questionable; numeric rank may change with taxonomy.

T = Designates a rank associated with a subspecies.

(W) = Watch List: elements that are not currently considered as high conservation concern, but there is some information to suggest that they may become rare should there be significant alterations to the element's habitats or population. Data for watch listed elements are collected by ACIMS (2013e).

NR = Unranked: rank not yet assessed.

-- = Information currently not available.

2 Alberta's *Wildlife Act*. A species legislated as Endangered or Threatened under the *Wildlife Act* or designated Special Concern by the Endangered Species Conservation Committee using definitions based on those used by COSEWIC (AESRD 2012) (see Note 6).

3 Global (G) ranks are based on species status world-wide and follow a system parallel to that for Provincial Ranks (Note 1), ranging from 1 (five or fewer occurrences) to 5 (demonstrably secure under present conditions). Only Global Ranks of concern (G1 to G3) or questionable ranks are displayed, range ranks (G#G#) which include a G1 to G3 ranking are also included (*e.g.*, G3G4) (as defined by NatureServe 2012b). Global ranks were obtained from ACIMS (2013c).

4 *SARA*. *SARA* establishes Schedule 1 as the list of species to be protected on all federal lands in Canada. *SARA* also applies to all lands in Canada for Schedule 1 bird species cited in the *Migratory Birds Convention Act* and Schedule 1 aquatic species as determined by Fisheries and Oceans Canada.

Endangered: a species that is facing imminent extirpation or extinction.

Threatened: a species that is likely to become an endangered species if nothing is done to reverse the factors leading to its extirpation or extinction.

Special Concern: a species that is particularly sensitive to human activities or natural events, but is not an endangered or threatened species.

5 COSEWIC (2013a). Species listed as 'Extirpated', 'Not at Risk' or 'Data Deficient' were generally not included in the table without other noteworthy factors being present.

Endangered: a species facing imminent extirpation or extinction.

Threatened: a species likely to become endangered if limiting factors are not reversed.

Special Concern: a species that is particularly sensitive to human activities or natural events, but is not an endangered or threatened species.

TABLE B2

POTENTIAL RARE ECOLOGICAL COMMUNITIES IN THE CENTRAL PARKLAND, DRY MIXEDWOOD, CENTRAL MIXEDWOOD, LOWER FOOTHILLS AND MONTANE NATURAL SUBREGIONS OF THE PROPOSED PIPELINE PROJECT

Scientific Name	Common Name	Right-of-Way Within Known Species Range	Provincial/Global Designations[1,2]
Forest/Woodland			
Acer negundo/Prunus virginiana	Manitoba maple/choke cherry	Yes	S1S2, G3
Abies bifolia – Pinus flexilis – Populus tremuloides/Thalictrum venulosum	subalpine fir – limber pine – aspen/veiny meadow rue	Yes	S2?
Betula neoalaskana – Picea glauca/Salix discolor/Equisetum arvense swamp forest community	Alaska birch – white spruce/pussy willow/common horsetail swamp forest community	Yes	S1S2
Betula neoalaskana/Ledum groenlandicum	Alaska birch/common Labrador tea	Yes	S1S2
Betula papyrifera/Lycopodium obscurum – Lycopdium annotinum woodland	white birch/ground-pine/stiff club-moss woodland	Yes	S2?
Betula papyrifera/Shepherdia canadensis	paper birch/buffaloberry	Yes	S1S2
Betula papyrifera/Betula occidentalis/Arctostaphylos uva-ursi	white birch/water birch/common bearberry	Yes	S1
Larix laricina – Picea mariana/Cornus stolonifera – Rubus idaeus	tamarack – black spruce/red-osier dogwood – wild red raspberry	Yes	S1S2
Larix laricina/Carex prairea	tamarack/prairie sedge	Yes	S1
Larix occidentalis/Rubus parviflorus	western larch/thimbleberry	--	S1
Picea glauc/Alnus incana ssp. tenuifolia – Betula neoalaskana/Equisetum pratense/Hylocomium splendens	white spruce/river alder – Alaska birch/meadow horsetail/stair-step moss	Yes	S3
Picea glauca/Equisetum scirpoides forest	white spruce/dwarf-scouring rush forest	Yes	SU
Picea glauca/Abietinella abietina	white spruce/fern moss	Yes	S2S3
Picea glauca/Betula pumila – Salix bebbiana/Carex eburnea	white spruce/dwarf birch – beaked willow/bristle-leaved sedge	Yes	S1?
Picea glauca/Cetraria islandica	white spruce/lichen	Yes	S1?
Picea glauca/Equisetum scirpoides forest	white spruce/dwarf scouring-rush forest	Yes	SU
Picea glauca/Rosa acicularis/Abietinella (Thuidium) abietina	white spruce/prickly rose/fern moss	Yes	S1
Picea glauca/Shepherdia canadensis/Abietinella (Thuidium) abietina	white spruce/Canada buffaloberry/fern moss	Yes	S2
*Picea mariana/Cornus stolonifera/*feathermoss	black spruce/red-osier dogwood/feathermoss	Yes	S1S2
Picea mariana southernmost population	black spruce southernmost population	Yes	SU (W)
Picea mariana/Cornus stolonifera/feathermoss	black spruce/red-osier dogwood/feathermoss	Yes	S1S2
Pinus contorta/Cornus stolonifera woodland	lodgepole pine/red-osier dogwood woodland	Yes	S2?, G2G3
Pinus flexili Arctostaphylos uva-ursi woodland	limber pine/common bearberry woodland	Yes	S2
Pinus flexilis – Pseudotsuga menziesii/Juniperus spp./*Arctostaphylos uva-ursi*	limber pine – Douglas-fir/juniper species/common bearberry	Yes	S2
Pinus flexilis scree woodland	limber pine scree woodland	Yes	S1S2, G3Q
Pinus flexilis/Arctostaphylos uva-ursi - Juniperus horizontalis	limber pine/common bearberry - creeping juniper	Yes	S2S3
Populus angustifoli/Cornus stolonifera	narrow-leaved cottonwood/red-osier dogwood	--	S2S3
Populus angustifolia/Symphoricarpos occidentalis	narrow-leaf cottonwood/buckbrush	--	S2S3
Populus balsamifera – P. tremuloides/Alopecurus alpinus – Calamagrostis canadensis	balsam poplar – aspen/alpine foxtail – bluejoint	Yes	S1S2
Populus balsamifera/Alnus incana ssp. tenuifolia – Cornus stolonifera/Equisetum pratense	balsam poplar/river alder - red-osier dogwood/meadow horsetail	Yes	S3
Populus balsamifera/Viburnum opulus/Matteuccia struthiopteris	balsam poplar/high-bush cranberry/ostrich fern	Yes	S1S2
Populus balsamifera ssp. trichocarpa – (Populus) tremuloides/Heracleum lanatum forest	black cottonwood – (aspen)/cow parsnip forest	Yes	S2, G2
Populus balsamifera ssp. trichocarpa – Picea engelmannii/Cornus stolonifera forest	black cottonwood – Engelmann spruce/red-osier dogwood forest	Yes	S1S2, G2G3

TABLE B2 Cont'd

Scientific Name	Common Name	Right-of-Way Within Known Species Range	Provincial/Global Designations[1,2]
Populus balsamifera ssp. trichocarpa – Picea engelmannii/Equisetum arvense forest	black cottonwood – Engelmann spruce/common horsetail forest	Yes	S1S2, G2?
Populus balsamifera ssp. trichocarpa/Calamagrostis canadensis forest	black cottonwood – conifer/bluejoint forest	Yes	S1S2, G2?
Populus balsamifera/Alnus incana ssp. tenuifolia -Cornus stolonifera/Equisetum pratense	balsam poplar/river alder - red-osier dogwood/meadow horsetail	Yes	S3
Populus balsamifera/Rhamnus alnifolia/Equisetum arvense	balsam poplar/alder-leaved buckthorn/common horsetail	--	S1
Populus balsamifera/Viburnum opulus/Matteuccia struthiopteris	balsam poplar/high-bush cranberry/ostrich fern	Yes	S1S2
Populus tremuloides – Abies bifolia – Picea engelmannii/Streptopus amplexifolius forest	aspen – subalpine fir – Engelmann spruce/clasping-leaved twisted-stalk forest	Yes	S1S2, G2G3
Populus tremuloides – P. balsamifera/Alnus viridis/Calamagrostis canadensis	aspen – balsam poplar/green alder/bluejoint	Yes	S3? (W)
Populus tremuloides/Juniperus horizontalis/Carex siccata	aspen/creeping juniper/hay sedge	Yes	S2S3
Populus tremuloides/Rosa acicularis/Apocynum androsaemifolium	aspen/prickly rose/spreading dogbane	Yes	S1S2
Populus tremuloides/Rubus parviflorus/Aralia nudicaulis	aspen/thimbleberry/wild sarsaparilla	Yes	S2S3
Populus tremuloides/Salix bebbiana – Corylus cornuta/Calamagrostis canadensis – Matteuccia struthiopteris	aspen/beaked willow – beaked hazelnut/bluejoint – ostrich fern	Yes	S1
Populus tremuloides/Vaccinium myrtilloides woodland	aspen/common blueberry woodland	Yes	S2?
Populus tremuloides/Leymus innovatus – Aster conspicuus avalanche community	aspen/hairy wild rye – showy aster avalanche community	Yes	S2
Populus tremuloides/Rosa aciculari/Apocynum androsaemifolium	aspen/prickly rose/spreading dogbane	Yes	S1S2
Populus tremuloides/Rubus parviflorus	aspen/thimbleberry	Yes	S2
Populus tremuloides/Rubus parviflorus/Aralia nudicaulis	aspen/thimbleberry/wild sarsaparilla	Yes	S2S3
Populus tremuloides/Salix bebbiana – Corylus cornuta/Calamagrostis canadensis – Matteuccia struthiopteris	aspen/beaked willow – beaked hazelnut/bluejoint - ostrich fern	Yes	S1
Populus tremuloides/Vaccinium myrtilloides woodland	aspen/common blueberry woodland	Yes	S2?
Pseudotsuga menziesii –- Pinus flexilis/Juniperus communis/Festuca campestris	Douglas-fir – limber pine/ground juniper/mountain rough fescue	Yes	S2S3
Pseudotsuga menziesii/Angelica spp. forest	Douglas-fir/angelica spp. forest	Yes	S1S2, G2?
Pseudotsuga menziesii/Leymus innovatus	Douglas-fir/hairy wild rye	Yes	S3? (W)
Shrubland			
Alnus incana ssp. tenuifolia/Matteuccia struthiopteris shrubland	river alder/ostrich fern shrubland	Yes	S2?
Amelanchier alnifolia/Arctostaphylos uva-ursi/Oryzopsis pungens	saskatoon/common bearberry/northern rice grass	Yes	S2S3
Amelanchier alnifolia/Pseudoroegneria spicata shrubland	saskatoon/bluebunch wheatgrass shrubland	Yes	S2S3, G3G4Q
Andromeda polifolia/Sarracenia purpurea/Sphagnum angustifolium	bog rosemary/pitcher-plant/peat moss	Yes	S1S2
Betula glandulosa/Festuca campestris	bog birch/mountain rough fescue	Yes	S2S3
Betula occidentalis – Amelanchier alnifolia/Artemisia campestris - Elymus lanceolatus (Agropyron dasystachyum)	water birch – saskatoon/plains wormwood – northern wheatgrass	Yes	S1
Betula occidentalis/Juniperus horizontalis	water birch/creeping juniper	Yes	S2S3
Betula occidentalis montane shrubland	water birch montane shrubland	Yes	S1S2, G3G4
Betula pumila – Ledum groenlandicum/Juncus balticus/Tomenthypnum nitens – Hylocomium splendens slope fen	dwarf birch – common Labrador tea/wire rush/golden moss – stair-step moss slope fen	Yes	S1?
Betula pumila – Salix spp./*Carex* spp.	dwarf birch – willow/sedges	Yes	S3? (W)
Chamaedaphne calyculata – Kalmia polifolia/Cladina mitis	leatherleaf – northern laurel/green reindeer lichen	Yes	S1S2
Elaeagnus commutata – Prunus virginiana/Carex siccata	silverberry – chokecherry/hay sedge	Yes	S2S3
Elaeagnus commutata/Pascopyrum smithii	silverberry/western wheatgrass	Yes	S3

TABLE B2 Cont'd

Scientific Name	Common Name	Right-of-Way Within Known Species Range	Provincial/Global Designations[1,2]
Elaeagnus commutata riparian shrubland	silverberry riparian shrubland	Yes	SU, G2Q
Populus tremuloides – Amelanchier alnifolia avalanche chute shrubland	aspen – saskatoon avalanche chute shrubland	Yes	S1S2, G3?
Rhamnus alnifolia shrubland	alder-leaved buckthorn shrubland	--	S1S2, G3
Salix bebbiana/Cornus stolonifera	beaked willow/red -osier dogwood	Yes	S3?
Salix bebbiana/Rubus idaeus/Geranium richardsonii	beaked willow/wild red raspberry/wild white geranium	Yes	S2
Salix drummondiana/Scirpus microcarpus – Calamagrostis canadensis	Drummond's willow/small-fruited bulrush – bluejoint	Yes	S1
Salix pedicellari/Potentilla palustris rich fen	bog willow/marsh cinquefoil rich fen	Yes	S2?
Symphoricarpos albus – Amelanchier alnifolia slope type	snowberry- Saskatoon shrubby slope	Yes	S2?
Dwarf Shrubland			
Arctostaphylos uva-ursi/Pseudoroegneria spicata dwarf shrubland	common bearberry/bluebunch wheatgrass dwarf shrubland	Yes	S2S3, G2G3
Juniperus horizontalis/Calamovilfa longifolia – Carex pensylvanica ssp. heliophila	creeping juniper/sand grass – sun-loving sedge	--	S2S3
Shrub Herbaceous			
Artemisia tridentata ssp. *vaseyana – Amelanchier alnifolia*	big sagebrush – saskatoon slope community	--	S1
Artemisia tridentata ssp. *vaseyana – Rhamnus alnifolia*	big sagebrush – alder-leaved buckthorn	--	S1
Herbaceous			
Atriplex subspicata – Puccinellia nuttalliana – Triglochin palustris string fen	spearscale saltbrush – Nuttall's salt-meadow grass - slender arrow grass	Yes	S1S3
Bromus marginatus – Pseudoroegneria spicata grassland	large mountain brome – bluebunch wheatgrass grassland	--	S1S2, G2?
Calamagrostis stricta – Triglochin maritima string fen	narrow reed grass – seaside arrow-grass string fen	Yes	S1S3
Calamovilfa longifolia – Sporobolus cryptandrus	sand grass – sand dropseed	Yes	S2S3
Carex limosa – Menyanthes trifoliata – Cardamine pratensis	mud sedge – buck-bean – meadow bitter cress	Yes	S1S2
Carex limosa – Scheuchzeria palustris/Sphagnum teres - S. subsecundum	mud sedge – scheuchzeria/peat moss	Yes	S1
Carex oligosperma/Sphagnum subsecundum	few-fruited sedge/twisted bog moss	--	S1S2
Carex pseudocyperus – Calla palustris	cyperus-like sedge – water arum	Yes	S2
Carex retrorsa marsh	turned sedge marsh	Yes	S1S2
Carex rostrata marsh	beaked sedge marsh	Y Yes	S2
Carex spp. – Stipa curtiseta – Danthonia intermedia grassland	upland sedge – western porcupine grass – intermediate oat grass grassland	Yes	S1?
Carex stenophylla – Pascopyrum smithii slope grassland	low sedge – western wheatgrass slope grassland	Yes	S1
Danthonia parryi – Festuca idahoensis – Festuca campestris	Parry oat grass – Idaho fescue – mountain rough fescue	--	SU
Distichlis stricta – Pascopyrum smithii	salt grass – western wheatgrass	--	S2
Elymus lanceolatus – Antennaria parviflora	northern wheatgrass – small-leaved everlasting	Yes	S1
Elymus lanceolatus – Artemisia dracunculus – Artemisia frigida	northern wheatgrass – dragonwort – pasture sagewort	Yes	S1
Elymus lanceolatus – Artemisia frigida	northern wheatgrass – pasture sagewort	Yes	S2S3
Elymus lanceolatus – Elymus trachycaulus	northern wheatgrass – slender wheatgrass	Yes	S1
Elymus lanceolatus – Pascopyrum smithii	northern wheatgrass – western wheatgrass	Yes	S2?
Elymus lanceolatus – Stipa comata	northern wheatgrass – needle-and-thread	Yes	S2
Elymus trachycaulus – Distichlis stricta	slender wheatgrass – salt grass	Yes	S1
Elymus trachycaulus – Hierochloe hirta ssp. Arctica	slender wheatgrass – sweet grass	Yes	SU
Elymus trachycaulus – Koeleria macrantha	slender wheatgrass – June grass	Yes	SU
Festuca campestris – Pseudoroegneria spicata grassland	mountain rough fescue – bluebunch wheatgrass grassland	Yes	S1S2

TABLE B2 Cont'd

Scientific Name	Common Name	Right-of-Way Within Known Species Range	Provincial/Global Designations[1,2]
Festuca hallii – Calamovilfa longifolia	plains rough fescue – sand grass	Yes	S1
Festuca hallii – Carex spp./Arctostaphylos uva-ursi	plains rough fescue – sedges/common bearberry	Yes	S1
Festuca hallii grassland	plains rough fescue grassland	Yes	S1
*Festuca hallii – Koeleria macrantha/Juniperus horizontalis/*forbs	plains rough fescue – June grass/creeping juniper/forbs	Yes	S2
Festuca hallii – Stipa curtiseta grassland	plain's rough fescue – western porcupine grass grassland	Yes	S2S3
Festuca hallii – Stipa viridula	plains rough fescue – green needle grass	Yes	S1
Festuca idahoensis – Pseudoroegneria spicata grassland	Idaho fescue – bluebunch wheatgrass grassland	--	S1S2
Koeleria macrantha – Artemisia frigida – Linum lewisii	June grass – pasture sagewort – wild blue flax	Yes	S2S3
Koeleria macrantha – Pascopyrum smithii	June grass – western wheatgrass	Yes	S1S2
Muhlenbergia asperifolia – Scirpus nevadensis – Distichlis stricta	scratch grass – Nevada bulrush – salt grass	--	S1S2
Pascopyrum smithii – Artemisia tilesii – Artemisia frigida	western wheatgrass – Herriot's sagewort – pasture sagewort	--	S1
Pascopyrum smithii – Hordeum jubatum	western wheatgrass – foxtail barley	Yes	S1
Pseudoroegneria spicata – Carex obtusata	bluebunch wheatgrass – blunt sedge	Yes	S1
Pseudoroegneria spicata – Leymus innovatus – Aster conspicuus	bluebunch wheatgrass – hairy wild rye – showy aster	Yes	S1
Pseudoroegneria spicata grassland	bluebunch wheatgrass grassland	Yes	S1
Puccinellia nuttalliana community	Nuttall's salt-meadow grass community	Yes	S3?, G3?
Stipa columbiana – Lupinus sericeus herbaceous vegetation	Columbia needle grass – silky perennial lupine herbaceous vegetation	Yes	S2S3, G2G3
Stipa curtiseta – Stipa viridula – Carex spp.	western porcupine grass – green needle grass – sedges	Yes	S2S3
Stipa richardsonii – Koeleria macrantha – Antennaria parvifolia	Richardson's needle grass – June grass – small-leaved everlasting	Yes	S2S3
Triglochin maritima – Carex praegracilis spring fen	seaside arrow-grass – graceful sedge spring fen	Yes	S1S2
Xerophyllum tenax herbaceous vegetation	bear-grass herbaceous vegetation	--	S1S2, GNR
Sparsely Vegetated			
Hudsonia tomentosa sand flats	sand heather sand flats	Yes	S2?
Juniperus horizontalis/(Koeleria macrantha)/Cladina mitis	creeping juniper/(June grass)/green reindeer lichen	Yes	S1S2
Pascopyrum smithii – Pyrrocoma uniflora	western wheatgrass – one-flowered ironplant	--	S1
*Populus angustifolia/*recent alluvial	narrow-leaf cottonwood/recent alluvial	--	S2S3
Puccinellia nuttalliana – Suaeda calceoliformis – Spergularia marina barren	Nuttall's salt-meadow grass – western sea-blite - salt-marsh sand spurry barren	--	S2
Salicornia rubra emergent marsh	samphire emergent marsh	Yes	S2, G2G3
Scirpus nevadensis – (Triglochin maritima)	Nevada bulrush – (seaside arrow-grass)	Yes	S2S3
Spartina gracilis – (Pascopyrum smithii)	alkali cord grass – (western wheatgrass)	Yes	S2S3
Sporobolus cryptandrus semi-active dune	sand dropseed semi-active dune	Yes	S2
Triglochin maritima emergent marsh	seaside arrow-grass emergent marsh	Yes	S2?
Aquatic			
Cymbella pusilla – Mastogloia smithii – Nitzschia palea	diatom ponds	--	S1S3
Isoetes echinospora aquatic community	northern quillwort aquatic community	Yes	S1
Ruppia cirrhosa aquatic community	widgeon-grass aquatic community	--	S1
Sparganium eurycarpum emergent aquatic vegetation	giant bur-reed emergent aquatic vegetation	Yes	S1S2

Sources: ACIMS 2013a,e, Allen 2013, AESRD 2012, Argus and Pryer 1990, COSEWIC 2013a, Douglas *et al.* 2002, FNA Editorial Committee 1993+, Government of Canada 2013, Kershaw *et al.* 2001, Moss 1983, NatureServe 2012a,b, Porsild and Cody 1980, Williston 2001

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S2	=	Imperilled: because of rarity or because of some factor(s) making it very vulnerable to extirpation. Typically 6-20 occurrences or few remaining individuals (1,000-3,000).
S3	=	Vulnerable: because rare and uncommon, or found in a restricted range (even if abundant at some locations), or because of other factors making it vulnerable to extirpation. Typically 21-100 occurrences or between 3,000 and 10,000 individuals.
S4	=	Apparently Secure: uncommon but not rare, and usually widespread in the province. Possible cause of long-term concern. Usually more than 100 occurrences and more than 10,000 individuals.
S5	=	Secure: common, widespread and abundant in the province. Essentially ineradicable under present conditions. Typically with considerably more than 100 occurrences and more than 10,000 individuals.
S#S#	=	Range Rank: a numeric range rank (*e.g.*, S2S3) is used to indicate the range of uncertainty about the exact status of the element.
SH	=	Possibly Extirpated: known from only historical records but still some hope of rediscovery. There is evidence that the species may no longer be present in the jurisdiction, but not enough to state this with certainty.
SU	=	Unrankable: currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
S#?	=	Inexact numeric rank: denotes inexact numeric rank.
Q	=	Questionable taxonomy: taxonomic status is questionable; numeric rank may change with taxonomy.
T	=	Designates a rank associated with a subspecies.
(W)	=	Watch List: elements that are not currently considered as high conservation concern, but there is some information to suggest that they may become rare should there be significant alterations to the element's habitats or population. Data for watch listed elements are collected by ACIMS (ACIMS 2013e).
NR	=	Unranked: rank not yet assessed.

2. Global (G) ranks are based on species status world-wide and follow a system parallel to that for Provincial Ranks (Note 1), ranging from 1 (five or fewer occurrences) to 5 (demonstrably secure under present conditions). Only Global Ranks of concern (G1 to G3) or questionable ranks are displayed (as defined by NatureServe 2012b). Global ranks were obtained from ACIMS (2013a).

TABLE B3

POTENTIAL RARE PLANT AND LICHEN SPECIES IN THE BG, CWH, ESSF, ICH, IDF, MS, MH, PP, SBS BGC ZONES AND CASCADES, CHILLIWACK, HEADWATERS, KAMLOOPS FDS OF THE PROPOSED PROJECT

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
VASCULAR PLANTS						
Acorus americanus	American sweet-flag	Shallow water. Flowering in July.	Yes	Yes	S2S3[1] Blue[2]	--
Actaea elata var. *elata*	tall bugbane	Moist woods at lower elevations. Flowering from June to mid-August.	Yes	Yes	S1[1] Red[2]	G3TNR[3] Endangered[4,5]
Agoseris lackschewitzii	pink agoseris	Moist to mesic meadows. Flowering from June to September.	Yes	--	S2S3[1] Blue[2]	--
Allium geyeri var. *tenerum*	Geyer's onion	Watercourses, mountain meadows, rocky ledges and outcrops. Flowering from May to September.	Yes	Yes	S2S3[1] Blue[2]	G4G5T3T5[3]
Alopecurus carolinianus	Carolina meadow-foxtail	Moist depressions and seasonal wetland margins. Flowering in spring.	Yes	--	S2[1] Red[2]	--
Anagallis minima	chaffweed	Moist places and pond margins. Flowering from May to August.	Yes	--	S3[1] Blue[2]	--
Anemone canadensis	Canada anemone	Moist meadows and forest openings. Flowering in July.	Yes	Yes	S2S3[1] Blue[2]	--
Anemone drummondii var. *drummondii*	alpine anemone	Dry, sun-exposed microsites characterised by gently rolling, grass-dominated meadows and shallow soils. Garry Oak stands and open understories of shrubs. Flowering from June to August.	Yes	--	S2S3[1] Blue[2]	--
Anemone virginiana var. *cylindroidea*	riverbank anemone	Moist to mesic sites. Flowering from June to August.	Yes	Yes	S3[1] Blue[2]	--
Antennaria corymbosa	flat-top pussytoes	Moist subalpine-alpine willow thickets in the Rocky and Cascade mountains. Flowering from early to mid-summer.	Yes	--	S1[1] Red[2]	--
Antennaria flagellaris	stoloniferous pussytoes	Dry, grassy slopes. Flowering from May to June.	Yes	Yes	S1[1] Red[2]	-- Endangered[4,5]
Arnica nevadensis	Nevada arnica	Coniferous forests, meadows and rocky slopes. Flowering from July to September.	--	Yes	S1S3[1] Red[2]	G3G5[3]
Asplenium adulterinum	corrupt spleenwort	Limestone rocks, ledges and sinkholes.	Yes	--	S2S3[1] Blue[2]	G3?[3]
Atriplex argentea ssp. *argentea*	silvery orache	Saline areas or disturbed sites. Flowering from summer to fall.	Yes	--	S1[1] Red[2]	--
Atriplex truncata	wedgescale orache	Alkaline flats and disturbed areas.	Yes	--	S3[1] Blue[2]	--
Azolla mexicana	Mexican mosquito fern	Quiet backwaters or oxbow lakes, slough or pond surfaces. Fruiting late August to September.	Yes	--	S2[1] Red[2]	-- Threatened[4,5]
Berula erecta	cut-leaved water-parsnip	Wet to moist shorelines, streambanks, ditches and open areas. Flowering mid-summer.	Yes	Yes	S3[1] Blue[2]	--
Bidens amplissima	Vancouver Island beggarticks	Low elevation and wet, open habitat. Flowering in late summer.	Yes	Yes	S3[1] Blue[2]	G3[3] Special Concern[4,5]

TABLE B3 Cont'd

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
Bidens vulgata	tall beggarticks	Ditches and lake margins. Flowering August to September.	Yes	Yes	S1[1] Red[2]	--
Boechera microphylla	crevice suncress	Cliffs and rocky slopes in sagebrush, mountain shrub and open conifer forests. Flowering from April to June.	Yes	Yes	S1S2[1] Red[2]	--
Boechera paupercula	tiny suncress	Rock outcrops, talus slopes and gravelly soil in alpine and subalpine habitats. Flowering June to August.	--	Yes	SH[1] Red[2]	G2G4[3]
Boechera sparsiflora	stretching suncress	Mesic grasslands, riverbanks and disturbed areas. Flowering from May to June."	Yes	--	S1[1] Red[2]	--
Botrychium alaskense	Alaska moonwort	Disturbed meadows, roadsides, riverbars and fields at low elevations. Riverine meadows, sandy fields and lightly vegetated --scree slopes at higher elevations.	--	Yes	S1S2[1] Red[2]	--
Botrychium crenulatum	dainty moonwort	Dry to moist, open areas or riverbanks. Leaves appearing in late spring to late summer.	Yes	Yes	S2S3[1] Blue[2]	G3[3]
Botrychium echo	echo moonwort	Mountain slopes, snow fields, road ditches and sand dunes. Leaves appearing in June and dying in September.	--	Yes	S1S2[1] Red[2]	G3[3]
Botrychium hesperium	western moonwort	Mesic meadow, snowfields and ditches. Leaves appearing in mid-spring and dying in early fall. Spores produced in July.	Yes	--	S2S3[1] Blue[2]	--
Botrychium michiganense sp. *nov. ined.*	Michigan moonwort	Open areas, clearings, woodlands and rocky outcrops.	Yes	Yes	S1S3[1] Red[2]	G3[3]
Botrychium montanum	mountain moonwort	Hemlock forest. Leaves appearing in late spring to late summer.	Yes	Yes	S1[1] Red[2]	G3[3]
Botrychium yaaxudakeit	Yakutat moonwort	Beach sand deposits in coastal habitats, grassy riverine meadows and mountain talus slopes and roadsides inland.	--	----	S1S3[1] Red[2]	G3G4[3]
Bouteloua gracilis	blue grama	Dry, short-grass prairie. Flowering in early summer.	Yes	Yes	S2[1] Red[2]	--
Brickellia oblongifolia ssp. *oblongifolia*	narrow-leaved brickellia	Sagebrush hillsides. Flowering from May to August.	--		S2S3[1] Blue[2]	--
Cacaliopsis nardosmia	silvercrown	Mesic to dry slopes and forest edges. Flowering from April to July.	Yes	--	S1[1] Red[2]	--
Callitriche heterophylla var. *heterophylla*	two-edged water-starwort	Shallow ponds and shorelines. Fruiting in September.	Yes	--	S2S3[1] Blue[2]	--
Caltha palustris var. *radicans*	yellow marsh-marigold	Wet sites, bogs and shallow water. Flowering in July.	Yes	Yes	S2S3[1] Blue[2]	G5TNR[3]
Carex backii	Back's sedge	Dry to moist, shady woods and riparian woodland. Flowering in June.	--	Yes	S2S3[1] Blue[2]	--
Carex bicolor	two-coloured sedge	Moist to wet meadows and shorelines. Fruiting in summer.	--	--	S2S3[1] Blue[2]	--
Carex comosa	bearded sedge	Shallow water and the edges of slow streams. Fruiting from April to July.	Yes	Yes	S2[1] Red[2]	--
Carex heleonastes	Hudson Bay sedge	Wet sites and lowland to near timberline. Fruiting from June to August.	Yes	Yes	S2S3[1] Blue[2]	--

TABLE B3 Cont'd

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
Carex hystericina	porcupine sedge	Shorelines, swamps and wet meadows.	Yes	Yes	S2S3[1] Blue[2]	--
Carex interrupta	green-fruited sedge	Gravelly lakeshores. Fruiting from July to August.	Yes	--	S2[1] Red[2]	--
Carex praeceptorum	teacher's sedge	Wet and boggy meadows, the margins of lakes, ponds, seeps and springs at 3,050-3,115 m. Fruiting from July to September.	--	--	S1S3[1] Red[2]	--
Carex rostrata	swollen beaked sedge	Floating fens at the edges of ponds and lakes. Fruiting from June to August.	Yes	--	S2S3[1] Blue[2]	--
Carex scoparia	pointed broom sedge	Mesic meadows, shorelines and open forests. Fruiting from late spring to summer.	Yes	--	S2S3[1] Blue[2]	--
Carex scopulorum var. *bracteosa*	Holm's Rocky Mountain sedge	Wet places at high elevations. Fruiting from August to September.	Yes	Yes	S2S3[1] Blue[2]	G5T3T5[3]
Carex sychnocephala	many-headed sedge	Wet meadows and lakeshores. Fruiting from summer to fall.	Yes	--	S3[1] Blue[2]	--
Carex tonsa var. *tonsa*	bald sedge	Sand dunes. Fruiting from mid-April to early July.	Yes	--	S2S3[1] Blue[2]	--
Carex vallicola var. *vallicola*	valley sedge	Moist to dry meadows, open forests and shrublands in the steppe and montane zones. Fruiting from spring to early summer.	Yes	Yes	S1[1] Red[2]	--
Carex vulpinoidea	fox sedge	Sloughs and streambanks. Fruiting from July to August.	Yes	--	S2S3[1] Blue[2]	--
Castilleja cusickii	Cusick's paintbrush	Meadows and mountain slopes.	Yes	Yes	S1[1] Red[2]	--
Castilleja rupicola	cliff paintbrush	Cliffs and rocky places. Flowering from July to September.	Yes	Yes	S3[1] Blue[2]	G3G4[3] Threatened[4,5]
Cephalanthera austiniae	phantom orchid	Mesic, low elevation forests, often south or west-facing slopes, with sparse ground cover and at the base of mature birch. Flowering from May to July.	Yes	--	S2[1] Red[2] Threatened[4,5]	--
Chamaerhodos erecta ssp. *nuttallii*	American chamaerhodos	Dry hillsides. Flowering from June to July.	Yes	Yes	S2S3[1] Blue[2]	--
Chamaesyce serpyllifolia ssp. *serpyllifolia*	thyme-leaved spurge	Dry, sandy or gravelly sites. Flowering from June to September.	Yes	Yes	S2S3[1] Blue[2]	--
Chenopodium atrovirens	dark lamb's-quarters	Saline or alkaline sites. Fruiting from mid-summer to fall.	Yes	--	S1[1] Red[2]	--
Claytonia perfoliata ssp. *intermontana*	miner's-lettuce	Vernally-moist, rocky outcrops. Flowering from April to June.	Yes	Yes	S1[1] Red[2]	G5TNR[3]
Claytonia washingtoniana	Washington springbeauty	Moist to mesic, mossy rock outcrops and forests in the lowland and montane zones. Flowering from January to June.	Yes	Yes	S2[1] Red[2]	G2G4[3]
Coleanthus subtilis	moss grass	Damp, muddy lake margins. Flowering in October.	Yes	--	S1[1] Red[2]	G3G5[3]
Collomia tenella	slender collomia	Dry, open areas, sagebrush flats and claybanks in the steppe and montane zones. Rare in extreme South Central BC; known only from the Princeton area in the Similkameen Valley. Flowering in June.	Yes	--	S1[1] Red[2]	Endangered[4,5]

TABLE B3 Cont'd

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
Crepis atribarba ssp. *atribarba*	slender hawksbeard	Dry, open, sandy or gravelly sites. Flowering from May to July.	Yes	Yes	S1[1] Red[2]	--
Crepis modocensis ssp. *modocensis*	low hawksbeard	Dry, open sites. Flowering from May to July.	Yes	Yes	S1[1] Red[2]	--
Crepis modocensis ssp. *rostrata*	western low hawksbeard	Dry, open sites. Flowering from May to July.	Yes	Yes	S1[1] Red[2]	G4G5T3T4[3]
Crepis occidentalis ssp. *conjuncta*	western hawksbeard	Sparsely vegetated rock in the alpine or tundra zones. Flowering from June to July.	Yes	--	S2[1] Red[2]	G5T3T5[3]
Crepis occidentalis ssp. *pumila*	gray hawk's-beard	Exposed scree slopes. Flowering from June to July.	Yes	--	S1[1] Red[2]	--
Cryptantha ambigua	obscure cryptantha	Dry grasslands and shrublands. Flowering from June to July.	Yes	Yes	S3[1] Blue[2]	--
Cryptogramma cascadensis	Cascade parsley fern	Dry to mesic rocks and rocky scree slopes. New growth produced in spring, spores maturing in late summer and fall, and leaves dying in fall.	Yes	--	S2S3[1] Blue[2]	--
Cuscuta campestris	field dodder	Parasitic, especially on legumes. Flowering from April to October.	Yes	--	S2S3[1] Blue[2]	--
Cyperus squarrosus	awned cyperus	Moist to wet, sandy sites. Fruiting in summer.	Yes	--	S3[1] Blue[2]	--
Delphinium bicolor ssp. *bicolor*	Montana larkspur	Dry grasslands, shrublands, rocky slopes and forests. Flowering from late spring to early summer.	Yes	Yes	S2S3[1] Blue[2]	--
Delphinium glareosum	rockslide larkspur	Unknown. Flowering in summer.	Yes	--	S1[1] Red[2]	G3G4[3]
Descurainia sophioides	northern tansy mustard	Mesic, disturbed sites and waste places. Flowering from May to July.	--	--	S1S3[1] Red[2]	--
Dicentra uniflora	steer's head	Well-drained soil from foothills to subalpine slopes. Flowering from very early spring to late summer.	Yes	Yes	S2S3[1] Blue[2]	--
Douglasia laevigata	smooth douglasia	Moist coastal or river bluffs to rocky ridges. Flowering in early summer.	Yes	--	S2S3[1] Blue[2]	G3[3]
Draba cinerea	gray-leaved draba	Dry meadows and cliffs. Flowering from June to August.	Yes	Yes	S2S3[1] Blue[2]	--
Draba ruaxes	coast mountain draba	Dry meadows, cliffs, rocky slopes and scree slopes in the subalpine and alpine zones. Flowering from June to August.	Yes	Yes	S2S3[1] Blue[2]	--
Drosera linearis	slender-leaf sundew	Bogs, often marly sites; requires alkaline conditions for growth. Also on wet, calcareous shores. Fruiting in June.	--	--	S1[1] Red[2]	--
Drymocallis arguta	tall cinquefoil	Dry to moist meadows, thickets, rocky, grassy slopes and open forests in the steppe and montane zones. Flowering from May to August.	Yes	Yes	S1S3[1] Red[2]	--
Dryopteris cristata	crested wood fern	Moist woods and marshes. Flowering in summer.	Yes	Yes	S2S3[1] Blue[2]	--
Elatine rubella	three-flowered waterwort	Ditches, mud flats, shallow ponds and shorelines. Flowering from July to August.	Yes	Yes	S2S3[1] Blue[2]	--

TABLE B3 Cont'd

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
Eleocharis elliptica	elliptic spike-rush	Lakeshores, streamsides and wet meadows in the montane to alpine zones. Fruiting from late spring to fall.	Yes	Yes	S2S3[1] Blue[2]	--
Eleocharis nitida	slender spike-rush	Fresh bog pools, streams and disturbed areas. Fruiting from late spring to summer.	--	Yes	S1[1] Red	--
Eleocharis parvula	small spike-rush	Wet saline or alkaline places. Fruiting from summer to fall.	Yes	--	S2S3[1] Blue[2]	--
Eleocharis rostellata	beaked spike-rush	Coastal salt marshes, freshwater marshes and alkaline lakes. Fruiting from summer to fall.	Yes	--	S2S3[1] Blue[2]	--
Elmera racemosa var. *racemosa*	elmera	Rock crevices and mountain ridges. Flowering from July to August.	Yes	--	S2S3[1] Blue[2]	--
Elodea nuttallii	Nuttall's waterweed	Submerged in lakes, ponds or stream. Flowering in summer.	Yes	Yes	S3[1] Blue[2]	--
Epilobium glaberrimum ssp. *fastigiatum*	smooth willowherb	Moist streambanks, rocky slopes and open forests. Flowering from July to September.	Yes	Yes	S2S3[1] Blue[2]	--
Epilobium halleanum	Hall's willowherb	Moist ground, mostly in the mountains. Flowering from May to September.	Yes	Yes	S2S3[1] Blue[2]	--
Epilobium hornemannii ssp. *behringianum*	Hornemann's willowherb	Moist slopes and streambanks. Flowering from July to August.	Yes	Yes	S2S3[1] Blue[2]	--
Epilobium mirabile	hairy-stemmed willowherb	Moist open areas in forest. Flowering from July to August.	Yes	Yes	S1S3[1] Red[2]	--
Epilobium oregonense	Oregon willowherb	Seepage areas. Flowering from June to September.	Yes	Yes	S2S3[1] Blue[2]	--
Epilobium pygmaeum	smooth spike-primrose	Vernally moist sites. Flowering June to July.	Yes	Yes	S2[1] Red[2]	--
Epilobium x treleasianum	Trelease's hybrid willowherb	Hybrid of *E. ciliatum* ssp. *glandulosum* and *E. luteum*. Moist streambanks, seepage areas, meadows or disturbed places. Flowering from July to September.	--	Yes	S3[1] Blue[2]	--
Epipactis gigantea	giant helleborine	Moist, calcareous habitat, hot springs and lakeshores. Flowering from April to early August.	Yes	--	S3[1] Blue[2]	Special Concern[4,5]
Erigeron philadelphicus var. *glaber*	salt marsh Philadelphia fleabane	Moist to mesic grasslands, shrublands and open forests. Flowering from June to August.	Yes	Yes	Red	G5T1[3]
Eutrochium maculatum var. *bruneri*	Joe-pye weed	Wet to moist swamp or pond margins and forest openings in the lowland zone. Flowering from summer to fall.	Yes	Yes	S1[1] Red[2]	--
Festuca minutiflora	little fescue	Dry, stony slopes. Flowering in August.	Yes	Yes	S2S3[1] Blue[2]	--
Galium labradoricum	northern bog bedstraw	--	--	--	S2S3[1] Blue[2]	--
Gaura coccinea	scarlet gaura	Dry, sandy sagebrush slopes. Flowering from June to August.	Yes	--	S1[1] Red[2]	--
Gayophytum humile	dwarf groundsmoke	In mountains, dry places and sandy soil. Flowering from June to August.	Yes	Yes	S2S3[1] Blue[2]	--
Glyceria leptostachya	slender-spiked mannagrass	Salt marshes, streamsides, wet meadows. Flowering from June to August.	Yes	--	S2S3[1] Blue[2]	G3[3]

TABLE B3 Cont'd

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
Glyceria pulchella	slender mannagrass	Ponds and ditches.	Yes	Yes	S2S3[1] Blue[2]	--
Hedeoma hispida	mock-pennyroyal	Dry sites.	Yes	Yes	S1[1] Red[2]	--
Helenium autumnale var. *grandiflorum*	mountain sneezeweed	Streambanks, wet ditches, moist meadows and low to mid-elevation. Flowering from July to November.	Yes	Yes	S2S3[1] Blue[2]	G5T3T5[3]
Helianthus nuttallii ssp. *rydbergii*	Nuttall's sunflower	Open areas, sandy dry soils and wet places. Flowering from late summer to fall.	--	Yes	S1[1] Red[2]	--
Hesperostipa spartea	porcupinegrass	Dry to mesic slopes and open forests. Flowering in July.	Yes	--	S2[1] Red[2]	--
Heterocodon rariflorum	heterocodon	Moist, open places in foothills and valleys. Flowering from June to September.	Yes	Yes	S3[1] Blue[2]	--
Hornungia procumbens	ovalpurse	Moist saline or alkaline sites. Flowering from February to July.	Yes	--	S3[1] Blue[2]	--
Hydrophyllum tenuipes	Pacific waterleaf	Moist, open forests at low to middle elevations. Flowering from May to July.	Yes	--	S2[1] Red[2]	--
Hypericum scouleri ssp. *nortoniae*	western St. John's-wort	Moist sites. Flowering from late July to early August.	Yes	Yes	S2S3[1] Blue[2]	G5T3T5[3]
Idahoa scapigera	scalepod	Moist seepages to dry slopes. Flowering from March to May.	--	Yes	S2[1] Red[2]	--
Isoetes howellii	Howell's quillwort	Lake margins exposed in summer. Spores mature in late spring and summer.	Yes	--	S1[1] Red[2]	--
Isoetes nuttallii	Nuttall's quillwort	Vernal pools and seepage areas. Spores mature in late spring and early summer.	Yes	--	S3[1] Blue[2]	--
Iva axillaris	poverty-weed	Waste ground and cultivated ground. Flowering from May to October.	Yes	Yes	S1[1] Red[2]	--
Juncus albescens	whitish rush	Wet, calcareous fens. Flowering from July to August.	--	--	S2S3[1] Blue[2]	--
Juncus brevicaudatus	short-tailed rush	Wet meadows, peat bogs, lakeshores and riverbanks. Fruiting from mid-summer to fall.	Yes	Yes	Red	--
Juncus confusus	Colorado rush	Moist soil in open woods, thickets and grassland. Flowering and fruiting late spring to summer.	Yes	Yes	S1[1] Red[2]	--
Juncus oxymeris	pointed rush	Wet meadows. Fruiting late spring to fall.	Yes	Yes	S2S3[1] Blue[2]	--
Juncus stygius	bog rush	Wet peat bogs. Flowering from June to August.	Yes	--	S2S3[1] Blue[2]	--
Leptosiphon septentrionalis	northern linanthus	Forest openings, dry meadows and open places. Flowering from late May to June/July.	--	Yes	S3[1] Blue[2]	--
Lewisia columbiana var. *columbiana*	Columbia lewisia	Rocky slopes and crevices. Flowering late spring to late summer.	Yes	Yes	S2S3[1] Blue[2]	--

TABLE B3 Cont'd

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
Lewisia triphylla	three-leaved lewisia	Moist, gravelly slopes, meadows, open forests and sandy snowbed sites from the montane to alpine zones. Flowering late spring to summer.	Yes	Yes	S2S3[1] Blue[2]	--
Lewisiopsis tweedyi	Tweedy's lewisia	Rock crevices, ledges and talus slopes, mostly in areas dominated by PP. Flowering in summer.	Yes	--	S1[1] Red[2]	G3[3]
Lilaea scilloides	flowering quillwort	Shallow water, coastal tidal flats and interior valleys. Flowering in summer.	Yes	--	S2S3[1] Blue[2]	--
Lindernia dubia var. *anagallidea*	false-pimpernel	Wet, sandy or muddy sites. Flowering from June to September.	Yes	--	S2S3[1] Blue[2]	--
Lindernia dubia var. *dubia*	yellowseed false pimpernel	Wet, sandy or muddy banks and shores in the lowland and steppe zones. Flowering from June to September.	Yes	--	S1[1] Red[2]	--
Lomatium brandegeei	Brandegee's lomatium	Open or wooded slopes. Flowering from May to August.	Yes	Yes	S2S3[1] Blue[2]	G3?[3]
Lomatium triternatum ssp. *platycarpum*	nine-leaved desert-parsley	Dry, open slopes and grasslands in the lowland, steppe and montane zones. Flowering from May to July.	--	Yes	S2[1] Red[2]	G5T3T5[3]
Lupinus arbustus ssp. *pseudoparviflorus*	Montana lupine	Moist montane sites. Flowering from June to August.	--	Yes	S1[1] Red[2]	G5T2T3[3]
Lupinus argenteus var. *laxiflorus*	silvery lupine	Dry montane sites. Flowering from April to July.	Yes	Yes	S1[1] Red[2]	--
Lupinus bingenensis var. *subsaccatus*	Suksdorf's lupine	Dry lowland sites. Flowering from April to June.	Yes	Yes	S2[1] Red[2]	G4G5TNR[3]
Lupinus rivularis	streambank lupine	Open lowlands and mud flats. Flowering from late May to October.	Yes	--	S1[1] Red[2]	G2G4[3] Endangered[4,5]
Marsilea vestita	hairy water-clover	Shallow lake margins.	Yes	--	S1[1] Red[2]	--
Megalodonta beckii	water marigold	Lakeshores. Flowering from July to September.	Yes	--	S3[1] Blue[2]	--
Melica bulbosa	oniongrass	Mesic to dry slopes. Flowering late spring.	Yes		S3[1] Blue[2]	--
Melica fugax	little oniongrass	Unknown. Flowering from May to July.	Yes	--	S2[1] Red[2]	--
Melica spectabilis	purple oniongrass	Moist meadows and open forests. Flowering from May to August.	Yes	Yes	S2S3[1] Blue[2]	--
Mimulus breviflorus	short-flowered monkey-flower	Open, drying streambeds, seeps and ponds. Flowering from May to July.	Yes	--	S2S3[1] Blue[2]	--
Mimulus breweri	Brewer's monkey-flower	Damp, sandy soil at moderate elevations. Flowering from June to September.	--	--	S2S3[1] Blue[2]	--
Mimulus suksdorfii	Suksdorf's monkey-flower	Moist, generally clay soils, in full sun. Flowering in mid-spring.	Yes	--	S1[1] Red[2]	--
Mitella caulescens	leafy mitrewort	Moist, shaded forest, wet meadows and swamps. Flowering from April to June.	Yes	Yes	S2S3[1] Blue[2]	--
Muhlenbergia filiformis	slender muhly	Near springs or seepage, moist meadows in mountain valleys and subalpine slopes. Flowering from July to August.	Yes	Yes	S1[1] Red[2]	--

TABLE B3 Cont'd

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
Muhlenbergia racemosa	satin grass	Moist-mesic slopes, open forests and rocky areas.	--	--	S1[1] Red[2]	--
Myriophyllum hippuroides	western water-milfoil	Ponds. Flowering from July to October.	Yes	Yes	S3[1] Blue[2]	--
Myriophyllum pinnatum	green parrot's-feather	Ponds and streams. Flowering in August.	Yes	Yes	S1[1] Red[2]	--
Myriophyllum ussuriense	Ussurian water-milfoil	Muddy lake margins or riverbanks. Flowering in August.	Yes	--	S3[1] Blue[2]	G3[3]
Navarretia intertexta	needle-leaved navarretia	Open slopes, moist meadows and vernal pools. Flowering from June to September.	Yes	--	S2[1] Red[2]	GNR[3]
Navarretia propinqua	near navarretia	In shallow wet depressions. Flowering from June to September.	--	Yes	S1[1] Red[2]	--
Nephroma occultum	cryptic paw	Bark and wood in the mid to upper canopy of conifers in old-growth forests at low elevations.	--	Yes	S2S3[1] Blue[2]	Special Concern[4,5]
Nicotiana attenuata	wild tobacco	Dry, sandy bottom lands and dry open areas. Flowering from June to September.	Yes	--	S1[1] Red[2]	--
Olsynium douglasii var. *inflatum*	satinflower	Dry, rocky bluffs and sagebrush slopes. Flowering from early spring to early summer.	Yes	--	S1[1] Red[2]	G4G5T3T4[3]
Ophioglossum pusillum	northern adder's-tongue	Wet or periodically flooded meadows and lake margins. Leaves appear mid-spring.	Yes		S2S3[1] Blue[2]	--
Opuntia x *columbiana*	grizzlybear prickly pear	Dark, basaltic cliffs and derived sands. Flowering late June to early July.	--	--	S2S4[1] Blue[2]	GNR[3]
Orobanche corymbosa ssp. *mutabilis*	flat-topped broomrape	Sagebrush slopes and plains; parasitic on *Artemisia* spp. Flowering from June to September.	Yes	--	S3[1] Blue[2]	G4T3?[3]
Orobanche ludoviciana var. *arenosa*	Suksdorf's broomrape	Grassland, shrublands and open forests; parasitic on *Artemisia* spp. Flowering from June to August.	--	Yes	Red	G5TNR[3]
Pectocarya penicillata	winged combseed	Dry sites.	--	Yes	S1[1] Red[2]	--
Pedicularis parviflora ssp. *parviflora*	small-flowered lousewort	Muskeg and wet places. Flowering in July.	--	--	S3[1] Blue[2]	--
Pinus albicaulis	whitebark pine	Upper subalpine forests. Flowering in mid-summer.	Yes	Yes	S3[1] Blue[2]	G3G4[3] Endangered[4,5]
Plagiobothrys leptocladus	finebranched popcornflower	Vernal pools.	Yes	--	S1S3[1] Red[2]	--
Pleuropogon refractus	nodding semaphoregrass	Bogs, streambanks, swampy meadows and shaded woods near sea level. Flowering from May to August.	Yes	Yes	S3[1] Blue[2]	--
Poa fendleriana ssp. *fendleriana*	mutton grass	Dry slopes, talus and ridges. Flowering in mid-spring.	Yes	----	S1[1] Red[2]	--
Polemonium elegans	elegant Jacob's-ladder	Dry cliffs and scree slopes. Flowering from June to September.	Yes	--	S2S3[1] Blue[2]	--
Polygonum polygaloides ssp. *confertiflorum*	close-flowered knotweed	Wet vernal pools, roadsides and meadows. Flowering from May to August.	Yes		S1[1] Red[2]	G4G5T3T4[3]

TABLE B3 Cont'd

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
Polygonum polygaloides ssp. *kelloggii*	Kellogg's knotweed	Wet, vernal pools to dry meadows. Flowering from June to September.	Yes	--	S2S3[1] Blue[2]	G4G5T3T5[3]
Polygonum sawatchense ssp. *oblivium*	Sawatch knotweed	Unknown. Flowering from June to August.	--	--	S1[1] Red[2]	GNRTNR[3]
Polystichum kruckebergii	Kruckeberg's holly fern	Serpentine soils among rocks, meadows and open areas in forests.	Yes	--	S2S3[1] Blue[2]	--
Polystichum scopulinum	mountain holly fern	Rock outcrops and serpentine soils.	Yes	--	S2[1] Red[2]	Threatened[4,5]
Potamogeton nodosus	long-leaved pondweed	Lakes and sloughs. Flowering in mid-summer.	Yes	--	S1[1] Red[2]	--
Potamogeton oakesianus	Oakes' pondweed	Lakes. Flowering from summer to fall.	Yes	--	S2S3[1] Blue[2]	--
Potamogeton perfoliatus	perfoliate pondweed	Lakes. Flowering from summer to fall.	Yes	--	S2S3[1] Blue[2]	--
Potamogeton strictifolius	stiff-leaved pondweed	Lakes. Flowering and fruiting from summer to fall.	Yes	--	S2S3[1] Blue[2]	--
Potentilla diversifolia var. *perdissecta*	diverse-leaved cinquefoil	Mesic meadows and rock outcrops. Flowering from May to August.	--	--	S2S3[1] Blue[2]	--
Potentilla nivea var. *pentaphylla*	five-leaved cinquefoil	Gravelly slopes. Flowering in July.	--	--	S2S3[1] Blue[2]	--
Potentilla paradoxa	bushy cinquefoil	Damp places, meadows and streambanks.	Yes	Yes	S1[1] Red[2]	--
Psilocarphus brevissimus var. *brevissimus*	dwarf woolly-heads	Unknown.	Yes	--	S1[1] Red[2]	Endangered[4,5]
Pyrola elliptica	white wintergreen	Dry to moist forests. Flowering from July to August.	Yes	Yes	S2S3[1] Blue[2]	--
Ranunculus pedatifidus ssp. *affinis*	birdfoot buttercup	Moist meadows. Flowering in July.	--	Yes	S2S3[1] Blue[2]	--
Rotala ramosior	toothcup meadow-foam	Inundated lakeshores. Flowering from July to September.	Yes	--	S1[1] Red[2]	Endangered[4,5]
Rubus lasiococcus	dwarf bramble	Thickets and moist to dry woods. Flowering from June to August.	Yes	Yes	S2S3[1] Blue[2]	--
Rubus nivalis	snow bramble	Open to shaded montane forests at high altitudes. Flowering from June to July.	Yes	Yes	S3?[1] Blue[2]	--
Rupertia physodes	California-tea	Open areas and forest margins; disturbed areas. Flowering from June to August.	Yes	Yes	S3[1] Blue[2]	--
Salix amygdaloides	peach-leaf willow	Riverbanks and lakeshores. Flowering from early April to June.	Yes	Yes	S2[1] Red[2]	--

TABLE B3 Cont'd

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
Salix boothii	Booth's willow	Streamsides and meadows. Flowering from early April to early July.	Yes	Yes	S2S3[1] Blue[2]	--
Salix petiolaris	meadow willow	Wet thickets. Flowering from mid-April to mid-June.	Yes	Yes	S2S3[1] Blue[2]	--
Salix tweedyi	Tweedy's willow	Moist streamsides and lakeshores. Flowering in July.	Yes	Yes	S3[1] Blue[2]	--
Sanguisorba menziesii	Menzies' burnet	Bogs and marshes. Flowering from July to August.	Yes	--	S2S3[1] Blue[2]	G3G4[3]
Scrophularia lanceolata	lance-leaved figwort	Moist to mesic sites. Flowering from April to August.	Yes	--	S2S3[1] Blue[2]	--
Senecio integerrimus var. *ochroleucus*	white western groundsel	Dry to moist sites. Flowering in spring.	Yes	Yes	SH[1] Red[2]	--
Sidalcea hendersonii	Henderson's checker-mallow	Meadows, wet places and tidal flats. Flowering from June to August.	Yes	Yes	S3[1] Blue[2]	G3[3]
Sidalcea oregana var. *procera*	Oregon checker-mallow	Sagebrush hillsides. Flowering from June to September.	Yes	--	S1[1] Red[2]	--
Sparganium fluctuans	water bur-reed	Shallow water and slow-moving streams. Flowering from July to August.	--	Yes	S2S3[1] Blue[2]	--
Sphaeralcea coccinea	scarlet globe-mallow	Dry hillsides. Flowering in spring.	Yes	Yes	S1[1] Red[2]	--
Sphenopholis intermedia	slender wedgegrass	Moist stream and lake margins, meadows and hot springs. Flowering from May to July.	Yes	--	S3[1] Blue[2]	--
Sphenopholis obtusata	prairie wedgegrass	Moist stream and lake margins, meadows and hot springs. Flowering from June to August.	Yes	--	S1[1] Red[2]	--
Sporobolus compositus var. *compositus*	rough dropseed	Dry sites. Flowering in summer.	--	Yes	S3[1] Blue[2]	--
Stellaria obtusa	blunt-sepaled starwort	Damp meadows along streams. Flowering from late spring to summer.	Yes	Yes	S2S3[1] Blue[2]	--
Stuckenia vaginata	sheathing pondweed	Lakes. Flowering from July to August.	Yes	--	S2S3[1] Blue[2]	--
Thelypodium laciniatum var. *laciniatum*	thick-leaved thelypody	Open, dry and rocky areas. Flowering from April to August.	--	Yes	S2S3[1] Blue[2]	--
Torreyochloa pallida	Fernald's false manna	Pond borders, bogs, marshes and wet hollows. Flowering from June to August.	--	Yes	S1[1] Red[2]	--
Toxicodendron diversilobum	poison oak	Boulders in streams, thickets and wooded slopes. Flowering from April to July.	Yes	Yes	S2S3[1] Blue[2]	--
Trichophorum pumilum	dwarf clubrush	Bogs, lakeshores and wet meadows. Fruiting from July to August.	Yes	Yes	S2S3[1] Blue[2]	--
Tripterocladium leucocladulum	Tripterocladium moss	Forms mats on shaded to exposed soil, rocks or trees at low elevations.	Yes	Yes	S3[1] Blue[2]	G3[3]
Verbena hastata var. *scabra*	blue vervain	Moist to wet sites. Flowering from June to November.	Yes	Yes	S2S3[1] Blue[2]	--

TABLE B3 Cont'd

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
Wolffia borealis	northern water-meal	Stagnant ponds, lakes and slow-moving streams. Flowering from summer to early fall.	Yes	Yes	S2[1] Red[2]	--
Zeltnera exaltata	western centaury	Moist places, near hot springs and alkaline lakes. Flowering from late July to September.	Yes	--	S1[1] Red[2]	--
NON-VASCULAR PLANTS[6]						
Aloina bifrons	Aloina moss	Calcareous soils at moderate elevations.	Yes	--	S2S3[1] Blue[2]	G3[3]
Alsia californica	Alsia moss	Trees near coastal environments.	Yes	--	S3[1] Blue[2]	--
Amblystegium varium	Amblystegium moss	In dry places on soil, humus, rocks, logs and bark.	--	--	S2S4[1] Blue[2]	--
Andreaea schofieldiana	Andreaea moss	Mat forming on dry rock outcrops at moderate elevations.	Yes	--	S2S3[1] Blue[2]	G2G3[3]
Andreaea sinuosa	Andreaea moss	Exposed acidic rock associated with late-lying snow at low to moderate elevations.	Yes	--	S1S2[1] Red[2]	G2[3]
Atrichum tenellum	Atrichum moss	Disturbed clay or sandy soil in exposed habitats at low to moderate elevations.	--	--	S2S3[1] Blue[2]	--
Barbula amplexifolia	Barbula moss	Soil or rock in moist areas, commonly near the mist zone of waterfalls at moderate to high elevations.	--	--	S1[1] Red[2]	--
Bartramia halleriana	Haller's apple moss	Siliceous cliffs and talus slopes in the crevices and ledges of shaded coniferous forests.	Yes	--	S2[1] Red[2]	Threatened[4,5]
Brachydontium olympicum	Brachydontium moss	Soil or rock at moderate elevations.	Yes	Yes	S1S2[1] Red[2]	G2G3[3]
Brachythecium holzingeri	Brachythecium moss	Wet habitats on humus at moderate elevations.	Yes	--	S2S3[1] Blue[2]	GU[3]
Brotherella roellii	Roell's brotherella	Deciduous and coniferous trees or rotten logs and stumps of second-growth forests.	Yes	Yes	S1S2[1] Red[2]	G3[3] Endangered[5]
Bryoerythrophyllum columbianum	Columbian carpet moss	Compact silt to sandy loam soils in semi-arid steppe and grassland environments.	Yes	--	S2S3[1] Blue[2]	G3G4[3] Special Concern[4,5]
Bryum capillare var. *barbatum*	Bryum moss	Unknown.	--	--	S1S3[1] Red[2]	G5TNR[3]
Bryum gemmiparum	bud-tipped Bryum moss	Moist soil.	--	Yes	S3[1] Blue[2]	G3G5[3]
Bryum schleicheri	Bryum moss	Oceanic interior ranges on wet soil or rocks in the alpine.	Yes	Yes	S2S3[1] Blue[2]	--
Bryum stenotrichum	Bryum moss	Calcareous soil, occasionally in rock crevices, at low to moderate elevations.	--	--	S2S3[1] Blue[2]	GNR[3]
Callicladium haldanianum	Callicladium moss	Soil and decomposing logs.	Yes	Yes	S3?[1] Blue[2]	--
Campylium radicale	Campylium moss	Wet places.	Yes	Yes	S2S3[1] Blue[2]	G3G5[3]

TABLE B3 Cont'd

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
Ceratophyllum echinatum	spring hornwort	Aquatic in lakes and sloughs in lowland and montane zones. Flowering from spring to summer.	Yes	--	S3[1] Blue[2]	--
Ceratophyllum echinatum	spring hornwort	Aquatic in lakes and sloughs in lowland and montane zones. Flowering from spring to summer.	Yes	--	S3[1] Blue[2]	--
Coscinodon cribrosus	seive-toothed moss	Acidic substrate from low to high elevations.	Yes	--	S1[1] Red[2]	G3G4[3]
Crossidium aberrans	Crossidium moss	Unknown.	--	--	S2S3[1] Blue[2]	G3G5[3]
Diphyscium foliosum	powder gun moss	Soil or soil over rock.	Yes	Yes	S3?[1] Blue[2]	--
Discelium nudum	naked weissia	Clay or silt soil on banks at low to moderate elevations.	Yes	--	S2S3[1] Blue[2]	G3G4[3]
Encalypta mutica	candle-snuffer moss	Disturbed, calcareous substrates with exposed soil or soil over rock.	Yes	----	S2S3[1] Blue[2]	G3[3]
Encalypta spathulata	candle-snuffer moss	Disturbed calcareous soils in shaded sites.	Yes		S2S3[1] Blue[2]	--
Entosthodon rubiginosus	rusty cord-moss	Silt or clay-rich soils in seasonally w*et al*kaline habitats.	--	--	S1[1] Red[2]	G1G3[3] Endangered[4,5]
Epipterygium tozeri	Epipterygium moss	Shaded, disturbed, non-calcareous, loamy or sandy, vertical or steeply inclined banks beside lanes, ditches and rivers.	--		S3[1] Blue[2]	--
Fabronia pusilla	silver hair moss	Rocks and trees in semi-exposed, seasonally dry habitats.	Yes	Yes	SH[1] Red[2]	Endangered[4,5]
Fissidens fontanus	water pocket moss	Rocks, sticks, logs, cypress knees, the bases of trees and shrubs in stagnant and flowing water. Can be submerged in mineralised and polluted waters.	Yes	Yes	S1[1] Red[2]	--
Fissidens pauperculus	poor pocket moss	Banks and in dried streambeds on bare, gravelly soil.	--	--	S1[1] Red[2]	G3?[3] Endangered[4,5]
Fissidens ventricosus	Fissidens moss	Rocks submerged in rapidly running streams. Occasionally on wet rocks beside streams.	Yes	Yes	S2S3[1] Blue[2]	GU[3]
Funaria muhlenbergii	Muhlenberg's cord moss	Bare, calcareous soils at moderate elevations.	Yes	--	S3?[1] Blue[2]	--
Grimmia anomala	mountain forest grimmia	Acidic rock at moderate to high elevations.	--	--	S2S3[1] Blue[2]	--
Grimmia mollis	water Grimmia	Wet rocks at moderate to high elevations.	--	Yes	S2S3[1] Blue[2]	G3G5[3]
Grimmia plagiopodia	bird Grimmia	Sandstone, limestone, sometimes concrete and glacio-lacustrine silt at low to high elevations.	Yes	--	S2?[1] Red[2]	--
Hygrohypnum alpinum	alpine hygrohypnum moss	Unknown.	Yes	--	S3[1] Blue[2]	--
Hymenostylium recurvirostre var. *insigne*	Hymenostylium moss	Wet, limey cliffs from low to moderate elevations (up to 1,000 m ASL).	Yes	--	S2S3[1] Blue[2]	G3[3]

TABLE B3 Cont'd

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
Meesia longiseta	Meesia moss	Calcareous fens or bogs in boreal, alpine and Arctic environments.	Yes	--	S3[1] Blue[2]	--
Microbryum vlassovii	nugget moss	On steep portions of semi-arid silt banks in early seral communities.	Yes	--	S1[1] Red[2]	G2?[3]
Mnium arizonicum	Mnium moss	Soils and occasionally the crevices of cliffs in alpine environments.	--	--	S2S3[1] Blue[2]	--
Orthotrichum cupulatum	Orthotrichum moss	Dry rock at moderate to high elevations in calcareous regions.	Yes	Yes	S2S3[1] Blue[2]	--
Orthotrichum pallens	pale bristle moss	Trees and occasionally rocks.	Yes	Yes	S3[1] Blue[2]	--
Orthotrichum rivulare	Orthotrichum moss	Roots or bases of trees and rocks near streams at low to high elevations.	Yes	Yes	S3[1] Blue[2]	--
Orthotrichum striatum	Orthotrichum moss	Trees from lowlands to 1,500 m ASL.	Yes	Yes	S3[1] Blue[2]	--
Philonotis yezoana	*Philonotis* moss	Rock in shaded stream gorges and on cliffs or steep slopes which are wet from seepage.	Yes	Yes	S2S3[1] Blue[2]	G2G3[3]
Physcomitrium immersum	Physcomitrium moss	Wet soil in disturbed floodplains or mud flats near streams at moderate to high elevations.	--	Yes	S1[1] Red[2]	--
Physcomitrium pyriforme	urn moss	Wet soil in disturbed areas at moderate to high elevations.	--	Yes	S3[1] Blue[2]	--
Plagiobryum demissum	Plagiobryum moss	Soil and rock in montane regions.	Yes	Yes	S1S2[1] Red[2]	G3G5[3]
Platyhypnidium riparioides	Platyhypnidium moss	Submerged or semi-submerged on rocks, tree roots and wood in streams, ditches, canals and ponds.	Yes	Yes	S3?[1] Blue[2]	--
Pohlia cardotii	Pohlia moss	Moist ground between 2,000-2,700 m.	Yes	Yes	S2[1] Red[2]	G2G3[3]
Pohlia longicollis	Pohlia moss	The shelves of cliffs and in crevices Also soil or humus on the banks of trails.	--	Yes	S2[1] Red[2]	--
Pseudephemerum nitidum	Pseudoephemerum moss	Damp soil and silt in grassy areas near streams from low to moderate elevations.	Yes	--	S1[1] Red[2]	--
Pseudocyphellaria rainierensis	oldgrowth specklebelly	Trees and shrubs, highly oceanic and markedly humid climatic conditions.	--	--	S2S3[1] Blue[2]	G3G4[3] Special Concern[4,5]
Pterygoneurum kozlovii	alkaline wing-nerved moss	Seasonally wet, litter-covered alkaline soils amongst vascular plants.	Yes	--	S2[1] Red[2]	G2G3[3]
Ptychomitrium gardneri	Ptychomitrium moss	Exposed rock along rivers from low to moderate elevations.	Yes	Yes	S3[1] Blue[2]	--
Racomitrium pacificum	Racomitrium moss	Dry to seasonally submerged, acidic to basic, diffusely-lit to exposed rocks, sandy soil and soil over rocks from low to moderate elevations.	Yes		S2S3[1] Blue[2]	G3[3]
Racomitrium pygmaeum	Racomitrium moss	Dry, open ground in alpine heaths from moderate to high elevations (1,900-2,500 m ASL).	--	--	S3?[1] Blue[2]	GU[3]

TABLE B3 Cont'd

Scientific Name	Common Name	Habitat	Right-of-Way Within Known Species Range	Preferred Habitat on Proposed Right-of-Way	Provincial Designations	Federal/Global Designations
Schistidium atrichum	Schistidium moss	Limestone rock in dry and shaded environments at high elevations.	--	--	S1S3[1] Red[2]	GNR[3]
Schistidium heterophyllum	Schistidium moss	Rock at moderate elevations.	Yes	Yes	S2S3[1] Blue[2]	G3G4[3]
Schistidium trichodon	Schistidium moss	Calcareous rock in open to shaded habitats from low to high elevations (up to 3,500 m ASL).	Yes	--	S3[1] Blue[2]	G2G4[3]
Seligeria tristichoides	Seligeria moss	Calcareous cliffs.	Yes	--	S3[1] Blue[2]	--
Sphagnum contortum	twisted bog moss	Exposed minerotrophic sites from low to moderate elevations.	Yes	--	S3[1] Blue[2]	--
Sphagnum jensenii	pendant branch peat moss	Minerotrophic and aquatic habitats or poor to medium fens at low to moderate elevations.	Yes	--	S1S2[1] Red[2]	GU[3]
Sphagnum wulfianum	peat moss	Coniferous forest from low to moderate elevations.	Yes	Yes	S2S3[1] Blue[2]	--
Tetrodontium brownianum	Brown's four-toothed moss	Growing inverted on moist rock; commonly granite or sandstone.	--	Yes	S3[1] Blue[2]	G3G4[3]
Tomentypnum falcifolium	golden moss	Scattered in mildly eutrophic habitats in wooded inland areas from low to high elevations.	Yes	--	S3[1] Blue[2]	G3G5[3]
Tortula bolanderi	Tortula moss	Rock or soil over rock from low to high elevations.	--	Yes	S2[1] Red[2]	G3G5[3]
Tortula cernua	Tortula moss	Unknown.	--	--	S2S3[1] Blue[2]	G3G5[3]
Tortula leucostoma	Tortula moss	Soil, silt, clay, calcareous substrates and the runways and burrows of small mammals in the subArctic.	--	--	S3[1] Blue[2]	G2G4[3]
Tortula obtusifolia	Tortula moss	Soil, rock, limestone, calcareous sandstone, stone walls, crevices and ledges from low to high elevations.	Yes	--	S3[1] Blue[2]	--
Ulota curvifolia	Ulota moss	Rock in montane regions.	Yes	Yes	S3[1] Blue[2]	G3G5[3]
Warnstorfia pseudostraminea	brown moss	Poor fens and pools in wet tundra and near waterfalls.	Yes	--	S3[1] Blue[2]	G3G4[3]
Warnstorfia tundrae	brown moss	Arctic, alpine or subalpine habitats.	--	Yes	S2[1] Red[2]	GU[3]
Weissia brachycarpa	Weissia moss	Soil, calcareous rocks and grassy areas at moderate elevations.	Yes	--	S1S2[1] Red[2]	GNR[3]

Sources: Argus and Pryer 1990, BC MOE 2012, BC MOE 2013, COSEWIC 2013a, Douglas *et al.* 1998-2002, Douglas *et al.* 2002, Government of Canada 2013 Hitchcock and Cronquist 1973, NatureServe 2012a,b

Notes:

1 Provincial (S) ranks are assigned by BC MOE (2013). Ranks range from 1 (five or fewer occurrences) to 5 (demonstrably secure under present conditions); all definitions below are adapted from NatureServe (2012b).

S1 = Critically Imperilled: because of extreme rarity or because of some factor(s) making it especially vulnerable to extirpation. Typically five or fewer occurrences or very few remaining individuals (< 1,000).

S2 = Imperilled: because of rarity or because of some factor(s) making it very vulnerable to extirpation. Typically 6-20 occurrences or few remaining individuals (1,000-3,000).

S3	=	Vulnerable: because rare and uncommon, or found in a restricted range (even if abundant at some locations), or because of other factors making it vulnerable to extirpation. Typically 21-100 occurrences or between 3,000 and 10,000 individuals.
S4	=	Apparently Secure: uncommon but not rare, and usually widespread in the province. Possible cause of long-term concern. Usually more than 100 occurrences and more than 10,000 individuals.
S5	=	Secure: common, widespread and abundant in the province. Essentially ineradicable under present conditions. Typically with considerably more than 100 occurrences and more than 10,000 individuals.
S#S#	=	Range Rank: a numeric range rank (*e.g.*, S2S3) is used to indicate the range of uncertainty about the exact status of the element.
SH	=	Possibly Extirpated: known from only historical records but still some hope of rediscovery. There is evidence that the element may no longer be present in the jurisdiction, but not enough to state this with certainty.
SU	=	Unrankable: currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
S#?	=	Inexact numeric rank: denotes inexact numeric rank.
Q	=	Questionable taxonomy: taxonomic status is questionable; numeric rank may change with taxonomy.
T	=	Interspecific taxon: refers to subspecies, varieties and other designations below the level of species. A "T" Rank cannot imply a subspecies or variety is more abundant than the species (NatureServe 2012b).
NR	=	Unranked: rank not yet assessed.

2 BC Provincial List (BC MOE 2013). Generally only Red and Blue list designations are displayed unless a Yellow listed species also has other status designations indicating it is a species of concern.

Red List : includes species that have been legally designated as Endangered or Threatened under the BC *Wildlife Act* , are extirpated, or are candidates for such designation.

Blue List: includes species not immediately threatened, but of concern because of characteristics that make them particularly sensitive to human activities or natural events.

3 Global (G) ranks are based on species status world-wide and follow a system parallel to that for Provincial Ranks (Note 1), ranging from 1 (five or fewer occurrences) to 5 (demonstrably secure under present conditions). Only Global Ranks of concern (G1 to G3) or questionable ranks are displayed (as defined by NatureServe 2012b). Global ranks were obtained from BC MOE (2013).

4 *SARA*. The *SARA* establishes Schedule 1 as the list of species to be protected on all federal lands in Canada. The *Act* also applies to all lands in Canada for Schedule 1 bird species cited in the *Migratory Birds Convention Act* and Schedule 1 aquatic species as determined by Fisheries and Oceans Canada.

Endangered: a species that is facing imminent extirpation or extinction.

Threatened: a species that is likely to become an endangered species if nothing is done to reverse the factors leading to its extirpation or extinction.

Special Concern: a species that is particularly sensitive to human activities or natural events, but is not an endangered or threatened species.

5 COSEWIC 2013. Species listed as 'Extirpated', 'Not at Risk' or 'Data Deficient' were generally not included in the table without other noteworthy factors being present.

Endangered: a species facing imminent extirpation or extinction.

Threatened: a species likely to become endangered if limiting factors are not reversed.

Special Concern: a species that is particularly sensitive to human activities or natural events, but is not an endangered or threatened species.

6 Only non-vascular plant species that are listed on *SARA* Schedule 1 are included.

TABLE B4

POTENTIAL RARE ECOLOGICAL COMMUNITIES IN THE BG, CWH, ESSF, ICH, IDF, MS, MH, PP, SBS BGC ZONES AND CASCADES, CHILLIWACK, HEADWATERS, KAMLOOPS FDS OF THE PROPOSED PROJECT

Scientific Name	Common Name	Right-of-Way Within Known Species Range	Provincial Designations	Global Designations[3]
alkali saltgrass - Nuttall's alkaligrass	Distichlis spicata var. stricta - Puccinellia nuttalliana	Yes	S1[1] Red[2]	--
alkali saltgrass Herbaceous Vegetation	Distichlis spicata var. stricta Herbaceous Vegetation	Yes	S2[1] Red[2]	GNR
awned sedge Fen - Marsh	Carex atherodes Fen - Marsh	Yes	S21? Red[2]	G3G5
(balsam poplar, black cottonwood) - spruces/red-osier dogwood	Populus spp. (balsamifera, trichocarpa) - Picea spp./Cornus stolonifera	Yes	S2[1]? Red[2]	GNR
Baltic rush - field sedge	Juncus balticus - Carex praegracilis	Yes	S3[1] Blue[2]	G3G4
big sagebrush/bluebunch wheatgrass	Artemisia tridentata/Pseudoroegneria spicata	Yes	S2[1] Red[2]	G2
black cottonwood/common snowberry - roses	Populus trichocarpa/Symphoricarpos albus - Rosa spp.	Yes	S2[1] Red[2]	GNR
black cottonwood - water birch	Populus trichocarpa - Betula occidentalis	Yes	S1[1] Red[2]	GNR
bluebunch wheatgrass - junegrass	Pseudoroegneria spicata - Koeleria macrantha	Yes	S3[1] Blue[2]	GNR
buckbean - slender sedge	Menyanthes trifoliata - Carex lasiocarpa	Yes	S3[1] Blue[2]	G3
common cattail Marsh	Typha latifolia Marsh	Yes	S3[1] Blue[2]	--
Douglas-fir/bluebunch wheatgrass - stiff needlegrass	Pseudotsuga menziesii/Pseudoroegneria spicata - Achnatherum occidentale	--	S3[1] Blue[2]	GNR
Douglas-fir - PP/bluebunch wheatgrass - pinegrass	Pseudotsuga menziesii - Pinus ponderosa/Pseudoroegneria spicata - Calamagrostis rubescens	Yes	S3[1] Blue[2]	GNR
Douglas-fir - PP/pinegrass	Pseudotsuga menziesii - Pinus ponderosa/Calamagrostis rubescens	Yes	S3[1] Blue[2]	GNR
Douglas-fir/red-stemmed feathermoss - step moss	Pseudotsuga menziesii/Pleurozium schreberi - Hylocomium splendens	Yes	S3[1] Blue[2]	G3
Douglas-fir/Rocky Mountain juniper/kinnikinnick	Pseudotsuga menziesii/Juniperus scopulorum/Arctostaphylos uva-ursi	Yes	S2[1] Red[2]	GNR
Douglas-fir/Rocky Mountain juniper/prairie sagewort	Pseudotsuga menziesii/Juniperus scopulorum/Artemisia frigida	Yes	S3[1] Blue[2]	GNR
Douglas-fir/Rocky Mountain juniper/shrubby penstemon	Pseudotsuga menziesii/Juniperus scopulorum/Penstemon fruticosus	Yes	S3[1] Blue[2]	GNR
hard-stemmed bulrush Deep Marsh	Schoenoplectus acutus Deep Marsh	Yes	S3[1] Blue[2]	--
hybrid white spruce/black gooseberry	Picea engelmannii x glauca/Ribes lacustre	Yes	S3[1] Blue[2]	GNR

TABLE B4 Cont'd

Scientific Name	Common Name	Right-of-Way Within Known Species Range	Provincial Designations	Global Designations[3]
hybrid white spruce/prickly rose/low northern sedge	Picea engelmannii x glauca/Rosa acicularis/Carex concinna	Yes	S3[1] Blue[2]	GNR
hybrid white spruce/prickly rose/wild sarsaparilla	Picea engelmannii x glauca/Rosa acicularis/Aralia nudicaulis	Yes	S3[1] Blue[2]	GNR
lodgepole pine/birch-leaved spirea/pinegrass	Pinus contorta/Spiraea betulifolia/Calamagrostis rubescens	Yes	S3[1] Blue[2]	GNR
MacCalla's willow/beaked sedge	Salix maccalliana/Carex utriculata	Yes	S3[1] Blue[2]	G3
mountain alder/common horsetail	Alnus incana/Equisetum arvense	Yes	S3[1] Blue[2]	G3
mountain alder/red-osier dogwood/lady fern	Alnus incana/Cornus stolonifera/Athyrium filix-femina	Yes	S3[1] Blue[2]	G3G4
narrow-leaf willow Shrubland	Salix exigua Shrubland	Yes	S2[1] Red[2]	--
Nuttall's alkaligrass - foxtail barley	Puccinellia nuttalliana - Hordeum jubatum	Yes	S2[1] Red[2]	G3?
PP/red three-awn	Pinus ponderosa/Aristida purpurea var. longiseta	Yes	S3[1] Blue[2]	GNR
rough fescue - bluebunch wheatgrass	Festuca campestris - Pseudoroegneria spicata	--	S2[1] Red[2]	--
sand dropseed - needle-and-thread grass	Sporobolus cryptandrus - Hesperostipa comata	--	S3[1] Blue[2]	G2
scrub birch - northern gooseberry	Betula nana - Ribes oxyacanthoides	Yes	S2[1] Red[2]	G2
scrub birch/water sedge	Betula nana/Carex aquatilis	Yes	S3[1] Blue[2]	--
seaside arrow-grass Marsh	Triglochin maritima Marsh	Yes	S2[1] Red[2]	GNR
shore sedge - buckbean/hook-mosses	Carex limosa - Menyanthes trifoliata/Drepanocladus spp.	Yes	S3[1] Blue[2]	G3
Sitka willow/Sitka sedge	Salix sitchensis/Carex sitchensis	Yes	S3[1] Blue[2]	G3
slender sedge/common hook-moss	Carex lasiocarpa Drepanocladus aduncus	Yes	S3[1] Blue[2]	G3
spreading needlegrass Herbaceous Vegetation	Achnatherum richardsonii Herbaceous Vegetation	--	S3[1] Blue[2]	G3
swamp horsetail - beaked sedge	Equisetum fluviatile - Carex utriculata	Yes	S3[1] Blue[2]	--
tall willows/Sartwell's sedge	Salix spp./Carex sartwelli	Yes	S3[1] Blue[2]	GNR
trembling aspen/common snowberry/Kentucky bluegrass	Populus tremuloides/Symphoricarpos albus/Poa pratensis	Yes	S2[1] Red[2]	GNR

TABLE B4 Cont'd

Scientific Name	Common Name	Right-of-Way Within Known Species Range	Provincial Designations	Global Designations[3]
tufted clubrush/golden star-moss	Trichophorum cespitosum/Campylium stellatum	Yes	S2S3[1] Blue[2]	G2G3
tufted hairgrass Community	Deschampsia cespitosa Community	Yes	S3[1] Blue[2]	--
water birch/roses	Betula occidentalis/Rosa spp.	Yes	S1[1] Red[2]	G3G4
western hemlock - western redcedar/clad lichens	Tsuga heterophylla - Thuja plicata/Cladonia spp.	Yes	S3[1] Blue[2]	GNR
western redcedar/falsebox	Thuja plicata/Paxistima myrsinites	Yes	S3[1] Blue[2]	GNR
western redcedar - hybrid white spruce/black twinberry/soft-leaved sedge	Thuja plicata - Picea engelmannii x glauca/Lonicera involucrata/Carex disperma	Yes	S2[1] Red[2]	GNR

Sources: Argus and Pryer 1990, BC MOE 2012, 2013, COSEWIC 2013a, Douglas *et al.* 1998-2002, Douglas *et al.* 2002, Government of Canada 2013, Hitchcock and Cronquist 1973, NatureServe 2012a,b

Notes:

1 Provincial (S) ranks are assigned by BC MOE (2013). Ranks range from 1 (five or fewer occurrences) to 5 (demonstrably secure under present conditions); all definitions below are adapted from NatureServe (2012b).

- S1 = Critically Imperilled: because of extreme rarity or because of some factor(s) making it especially vulnerable to extirpation. Typically five or fewer occurrences or very few remaining individuals (< 1,000).
- S2 = Imperilled: because of rarity or because of some factor(s) making it very vulnerable to extirpation. Typically 6-20 occurrences or few remaining individuals (1,000-3,000).
- S3 = Vulnerable: because rare and uncommon, or found in a restricted range (even if abundant at some locations), or because of other factors making it vulnerable to extirpation. Typically 21-100 occurrences or between 3,000 and 10,000 individuals.
- S4 = Apparently Secure: uncommon but not rare, and usually widespread in the province. Possible cause of long-term concern. Usually more than 100 occurrences and more than 10,000 individuals.
- S5 = Secure: common, widespread and abundant in the province. Essentially ineradicable under present conditions. Typically with considerably more than 100 occurrences and more than 10,000 individuals.
- S#S# = Range Rank: a numeric range rank (*e.g.*, S2S3) is used to indicate the range of uncertainty about the exact status of the element.
- SH = Possibly Extirpated: known from only historical records but still some hope of rediscovery. There is evidence that the element may no longer be present in the jurisdiction, but not enough to state this with certainty.
- SU = Unrankable: currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
- S#? = Inexact numeric rank: denotes inexact numeric rank.
- Q = Questionable taxonomy: taxonomic status is questionable; numeric rank may change with taxonomy.
- T = Interspecific taxon: refers to subspecies, varieties and other designations below the level of species. A "T" Rank cannot imply a subspecies or variety is more abundant than the species (NatureServe 2012b).
- NR = Unranked: rank not yet assessed.

2 BC Provincial List (BC MOE 2012). Generally only Red and Blue list designations are displayed unless a Yellow listed species also has other status designations indicating it is a species of concern.

Red List: includes species that have been legally designated as Endangered or Threatened under the BC *Wildlife Act* , are extirpated, or are candidates for such designation.

Blue List: includes species not immediately threatened, but of concern because of characteristics that make them particularly sensitive to human activities or natural events.

3 Global (G) ranks are based on species status world-wide and follow a system parallel to that for Provincial Ranks (Note 1), ranging from 1 (five or fewer occurrences) to 5 (demonstrably secure under present conditions). Only Global Ranks of concern (G1 to G3) or questionable ranks are displayed (as defined by NatureServe 2012b). Global ranks were obtained from BC MOE (2013).

APPENDIX C

TERRESTRIAL ECOSYSTEM MAPPING METHODS AND RESULTS REPORT FOR THE PROJECT

TABLE OF CONTENTS

LIST OF TABLES

DEFINITIONS AND ACRONYM LIST

Acronym/Definition	Full Name
ABMI	Alberta Biodiversity Monitoring Institute
AENR	Alberta Energy and Natural Resources
AESRD	Alberta Environment and Sustainable Resource Development
AGRASID	Agricultural Region of Alberta Soil Inventory Database
AVI	Alberta Vegetation Inventory
BC	British Columbia
BC CDC	British Columbia Conservation Data Centre
BC MFLNRO	British Columbia Ministry of Forests, Lands and Natural Resource Operations
BC MOE	British Columbia Ministry of Environment
BC MOFR	British Columbia Ministry of Forests and Range
BEC	Biogeoclimatic Ecosystem Classification
BECdb	Biogeoclimatic Ecosystem Classification database
BGC	Biogeoclimatic
ESA	Environmental and Socio-Economic Assessment
IPP	Integrated Pipeline Projects Inc.
LLC	Lambert Conformal Conic map projection
LSA	local study area
NDT	natural disturbance type
NEB	National Energy Board
NRC	Natural Resources Canada
REC	Rare Ecological Community
RISC	Resource Information Standards Committee
RSA	regional study area
the Project	the Trans Mountain Expansion Project
TEM	terrestrial ecosystem mapping
TEK	traditional ecological knowledge
TERA	TERA Environmental Consultants
Timberline	Timberline Forest Inventory Consultants
TMEP	Trans Mountain Expansion Project
TMPL	Trans Mountain pipeline
Trans Mountain	Trans Mountain Pipeline ULC
TRIM	Terrain Resource Information Management
VRI	Vegetation Resource Inventory

1.0 INTRODUCTION

Terrestrial ecosystem mapping (TEM) was completed within the Trans Mountain Expansion Project (referred to as "TMEP" or "the Project") Vegetation Regional Study Area (RSA) to describe the diversity, relative abundance and distribution of vegetation communities and of structural stages for lands where vegetation may be affected by the Project. TEM supports the Environmental and Socio-Economic Assessment (ESA) for the Project.

1.1 Objectives

The objectives of the TEM are to:

- describe the pre-Project diversity, relative abundance and distribution of vegetation communities;
- describe the pre-Project diversity, relative abundance and distribution of structural stages; and
- provide an ecological framework for vegetation and wildlife assessment for the Project.

This report describes the methods of TEM, the approach for and results of field work and provides an overview of the results of the finalized TEM that was used for the vegetation assessment and wildlife assessment (see the Wildlife Modeling and Species Accounts Technical Report in Volume 5C).

1.2 Regulatory Standards

1.2.1 Federal Standards

For lands where vegetation may be affected by the Project the NEB *Filing Manual* (2013) requires a description of the pre-project diversity, relative abundance and distribution of vegetation communities of ecological, economic or human importance. The filing manual also states that vegetation community descriptions must apply the most relevant and up to date ecological classification or mapping system.

In Alberta, ecological classification systems are built within Natural Subregions. In BC, ecological classification systems are built within Biogeoclimatic (BGC) subzone variants.

1.2.2 Provincial Standards in Alberta

In Alberta, the most relevant and up to date ecological classification system is outlined in the *Field Guide to Ecosites of Northern Alberta* (Beckingham and Archibald 1996), the *Field Guide to Ecosites of West-Central Alberta* (Beckingham *et al.* 1996), the *Range Plant Communities and Range Health Assessment Guidelines for the Central Parkland Subregion of Alberta* (Burkinshaw *et al.* 2009) and the *Guide to Range Plant Community Types and Carrying Capacity for the Dry and Central Mixedwood Subregions in Alberta, 6th approximation* (Willoughby *et al*. 2006). See Table 1.1 for the field guide used in each Natural Subregion for the Project.

There are no provincial guidelines for mapping ecological units in Alberta. Therefore, the provincial guidelines for mapping ecological units in BC were adapted for the portion of the Project in Alberta.

1.2.3 Provincial Standards in British Columbia

In BC, the most relevant and up to date ecological classification system and approach to describing ecosystems is outlined in the Field Manual for Describing Terrestrial Ecosystems 2nd Edition (BC Ministry of Forests and Range [BC MOFR] and BC Ministry of Environment [BC MOE] 2010) and various regional land management handbooks published by BC Ministry of Forests, Lands and Natural Resource Operations [BC MFLNRO]. See Table 1.1 for the land management handbook used in each BGC subzone variant.

Mapping methodology for the Project was developed according to the Standards for Terrestrial Ecosystem Mapping in British Columbia (Resource Information Standards Committee [RISC] 1998) and was applied to both the BC and Alberta portions of the Project.

TABLE 1.1

FIELD GUIDES AND LAND MANAGEMENT HANDBOOKS FOR EACH NATURAL SUBREGION AND BGC VARIANT

Natural Subregion or BGC Variant	Code	Field Guide or Land Management Handbook[1, 2]
ALBERTA		
Central Mixedwood	CM	• *Field Guide to Ecosites of Northern Alberta* • *Guide to Range Plant Community Types and Carrying Capacity for the Dry and Central Mixedwood Subregions in Alberta*, 6th approximation
Central Parkland	CP	• *Range Plant Communities and Range Health Assessment Guidelines for the Central Parkland Subregion of Alberta*
Dry Mixedwood	DM	• *Field Guide to Ecosites of Northern Alberta* • *Guide to Range Plant Community Types and Carrying Capacity for the Dry and Central Mixedwood Subregions in Alberta*, 6th approximation
Lower Foothills	LF	• *Field Guide to Ecosites of West-Central Alberta*
BRITISH COLUMBIA		
Thompson Very Dry Hot Bunchgrass	BGxh2	• *Land Management Handbook Number 23*
Nicola Very Dry Warm Bunchgrass	BGxw1	• *Land Management Handbook Number 23*
Undifferentiated and Parkland Coastal Mountain-heather Alpine	CMAunp	• *Classification of Non forested Ecosystems*
Dry Maritime Coastal Western Hemlock	CWHdm	• *Land Management Handbook Number 28*
Southern Dry Submaritime Coastal Western Hemlock	CWHds1	• *Land Management Handbook Number 28*
Southern Moist Submaritime Coastal Western Hemlock	CWHms1	• *Land Management Handbook Number 28*
Eastern Very Dry Maritime Coastal Western Hemlock	CWHxm1	• *Land Management Handbook Number 28*
Raush Moist Mild Engelmann Spruce - Subalpine Fir	ESSFmm1	• *Land Management Handbook Number 15 update*
Moist Warm Engelmann Spruce - Subalpine Fir	ESSFmw	• *Land Management Handbook Number 23*
Cascade Moist Warm Engelmann Spruce - Subalpine Fir	ESSFmw1	• Draft Site Classification for the 52 Biogeoclimatic Units in the Southern Interior Forest Region
Northern Monashee Wet Cold Engelmann Spruce - Subalpine Fir	ESSFwc2	• Draft Site Classification for the 52 Biogeoclimatic Units in the Southern Interior Forest Region
North Thompson Dry Warm Interior Cedar - Hemlock	ICHdw3	• Draft Site Classification for the 52 Biogeoclimatic Units in the Southern Interior Forest Region
Thompson Moist Cool Interior Cedar - Hemlock	ICHmk2	• Draft Site Classification for the 52 Biogeoclimatic Units in the Southern Interior Forest Region
Moist Mild Interior Cedar - Hemlock	ICHmm	• *Land Management Handbook Number 15 update*
Thompson Moist Warm Interior Cedar - Hemlock	ICHmw3	• Draft Site Classification for the 52 Biogeoclimatic Units in the Southern Interior Forest Region
Mica Very Wet Cool Interior Cedar Hemlock	ICHvk1	• Draft Site Classification for the 52 Biogeoclimatic Units in the Southern Interior Forest Region
Wells Gray Wet Cool Interior Cedar - Hemlock	ICHwk1	• Draft Site Classification for the 52 Biogeoclimatic Units in the Southern Interior Forest Region
Thompson Dry Cool Interior Douglas-Fir	IDFdk1	• *Land Management Handbook Number 23*
Cascade Dry Cool Interior Douglas-Fir	IDFdk2	• *Land Management Handbook Number 23*
Thompson Moist Warm Interior Douglas-Fir	IDFmw2	• Draft Site Classification for the 52 Biogeoclimatic Units in the Southern Interior Forest Region
Thompson Moist Warm – Steep South phase Interior Douglas-Fir	IDFmw2b	• Draft Site Classification for the 52 Biogeoclimatic Units in the Southern Interior Forest Region
Okanagan Very Dry Hot Interior Douglas-Fir	IDFxh1	• *Land Management Handbook Number 23*
Thompson Very Dry Hot Interior Douglas-Fir	IDFxh2	• *Land Management Handbook Number 23*
Thompson Very Dry Hot Interior Douglas-Fir, Grassland Phase	IDFxh2a	• *Land Management Handbook Number 23*
Leeward Moist Maritime Mountain Hemlock	MHmm2	• *Land Management Handbook Number 28*
Thompson Very Dry Hot Ponderosa Pine	PPxh2	• *Land Management Handbook Number 23*
McLennan Dry Hot Sub-Boreal Spruce	SBSdh1	• *Land Management Handbook Number 15 update*

Notes: 1 Refer to Section 6.0 References for complete field guide citations.

2 Wetlands were classified using Wetlands of British Columbia (MacKenzie and Moran 2004) during TEM surveys.

2.0 CONSULTATION

Consultation was conducted with representatives of several government agencies in BC as well as with representatives of Environment Canada while developing the methods for the TEM completed for the Project. Regulatory authorities in BC were primarily consulted on TEM because of their provincially localized expertise on TEM. The consultation conducted is summarized in Table 2.1.

TABLE 2.1

SUMMARY OF CONSULTATION ACTIVITIES RELATED TO TEM

Stakeholder Group/Agency Name	Name and Title of Contact	Method of Contact	Date of Consultation Activity	Reason For Engagement	Issues/Concerns	Commitments/Follow-Up Actions/Comments
PROVINCIAL CONSULTATION – BRITISH COLUMBIA						
Government of BC	Corey Erwin, Vegetation Ecologist	Email	July 27, 2012	Project introduction. TEM Survey methodologies.	No response to date.	None.
Thompson-Okanagan Region, Government of BC	Michael Ryan, Research Ecologist	Phone	August 28, 2012 and September 12, 2012	Project introduction. TEM Survey methodologies.	Michael Ryan invited TERA Environmental Consultants (TERA) to follow up via email.	TERA followed up via email.
		Email	October 26 to November 15, 2012	Project introduction. TEM Survey methodologies.	Michael Ryan advised Survey Intensity Level 4 and requested additional details about existing TEM relevant to the Project. Offered contact information for other Regional Ecologists and advised how to correlate the 2005 draft BEC Classification for the Thompson-Okanagan Region with the current Red and Blue-listed rare ecological communities.	TERA offered additional detail about rare plant and rare ecological community surveys as justification for Survey Intensity Level 5. TERA offered additional details about existing TEM. TERA requested further comment on Survey Intensity Level 5 with the additional surveys in mind. No further comment has been received.
		Email	February 22 to April 15, 2013	Land Management Handbook advice.	TERA requested advice on which Land Management Handbooks to use to classify vegetation communities in the MSmw1 and ESSFmw1. Michael Ryan provided draft Land Management Handbooks by Lloyd (2005) and a cross walk table between the site series in the ESSFmw1 and the ESSFmw.	None.
Omineca and NE Region, Government of BC	Bruce Rogers, Research Ecologist	Email	October 29 to November 23, 2012	Project introduction. TEM Survey methodologies.	Bruce Rogers advised Survey Intensity Level 4. Bruce Rogers requested PDF of the proposed pipeline corrido showing the ESSFmm1.	TERA offered additional detail about rare plant and rare ecological community surveys as justification for Survey Intensity Level 5. TERA offered additional details about existing TEM. TERA sent requested PDF. TERA requested further comment on Survey Intensity Level 5 with the additional surveys in mind. No further comment has been received.

TABLE 2.1 Cont'd

Stakeholder Group/Agency Name	Name and Title of Contact	Method of Contact	Date of Consultation Activity	Reason For Engagement	Issues/Concerns	Commitments/Follow-Up Actions/Comments
Coastal Region, Government of BC	Dr. Sari Sanders, Research Ecologist	Email	October 29 to November 15, 2012	Project introduction. TEM Survey methodologies.	No response to date.	None.
FEDERAL CONSULTATION						
Environment Canada - Canadian Wildlife Service	Harp Gill, Senior Environmental Assessment Officer; Jennifer Wilson, Special Projects Officer; Andrew Robinson, Senior Environmental Assessment Officer; Rene McKibbin, Environmental Assessment Officer (Advisor to Environment Canada with Gebauer and Associates); Paul Gregoire, Senior Environmental Assessment Officer	Meeting	April 17, 2013	Project introduction. Review of work plans including TEM Survey methodologies. Review of the results of consultation with provincial ecologists.	Environment Canada asked how much new right-of-way there would be, how all information could be collected in one year of fieldwork, and if there was any existing TEM that could be used. Environment Canada asked why all field work being conducted, especially wetlands, could not be fed back into TEM. Environment Canada asked what data sources would be used for TEM. Environment Canada accepted TERA's use of Survey Intensity Level 5 and acknowledged that some compromises had to be made given the scope of the Project, but emphasized that the approach needs to be justified and defensible.	TERA offered additional details about timelines and plans for supplementary TEM mapping and field plots in fall 2013 and 2014. TERA offered additional details about TEM data sources.
Environment Canada - Canadian Wildlife Service	Jan Kirkby, Landscape Ecologist	Email	November 7, 2013	Project introduction. TEM Survey methodologies.	No response to date.	None.

3.0 METHODS

TEM was completed for the Project within the Vegetation RSA. To ensure consistency between mappers, the RSA was pre-stratified based on anthropogenic disturbance and soils data in Alberta and based on BGC variant, slope and aspect in BC. Preliminary mapping occurred following the 2012 TEM field surveys. Quality assurance and quality control measures were employed to ensure consistency of delineation and attribution among ecosystem mappers and to ensure accuracy of the TEM. Final mapping occurred after the 2013 TEM field surveys.

Polygons were delineated using biophysical principles into units representing relatively homogenous site conditions that would support similar ecosystems and structural stages within each Natural Subregion and BGC variant. Each polygon was assigned up to three proportionally described site series, structural stage and site modifiers.

Survey Intensity Level 5 (*i.e.*, field verification of at least 5% of the polygons in the Vegetation RSA) was chosen for this Project. Due to the additional desktop and field work to identify all wetlands within the proposed pipeline corridor and specific surveys conducted for rare plants and rare ecological communities, this is considered to provide an accurate depiction of the ecosystems within the Vegetation RSA and to meet the industry standard for TEM on a large project. Within areas for which TEM has been completed to data, field surveys have been conducted for 5.5% of polygons within the Vegetation RSA. The survey intensity is expected to change slightly in the supplemental filing.

The methods used and details of the activities outlined above are described in the following sections.

3.1 Ecological Mapping

3.1.1 Study Area Boundaries

The proposed pipeline was considered in relation to a proposed pipeline corridor, a Local Study Area (LSA) and a Regional Study Area (RSA). Section 3.3 of the Vegetation Technical Report provides details on these spatial boundaries and a justification for their selection.

TEM was completed for the Vegetation RSA, which consists of a 2 km wide band generally from the centre of the proposed pipeline corridor centre and facilities (*e.g.*, 1,000 m on both sides of the centre of the proposed pipeline corridor). See Figures 5.9-1 through 5.9-4 of Volume 5A of the ESA for an overview of the Vegetation RSA spatial boundaries. The RSA also includes areas within a 1 km buffer of the boundaries of the following facilities:

- Edmonton Terminal;
- Gainford Pump Station;
- Niton Pump Station;
- Wolf Pump Station;
- Edson Pump Station;
- Hinton Pump Station;
- Rearguard Pump Station;
- Blue River Pump Station;
- Blackpool Pump Station;
- Hargreaves Pump Station;
- Darfield Pump Station;

- Black Pines Pump Station study area (the Black Pines study area differs from the proposed Black Pines site current to October 2013. Future changes may occur to this boundary, which will be assessed in the supplemental filing);
- Kamloops Pump Station;
- Kingsvale Pump Station;
- Sumas Pump Station;
- Sumas Terminal;
- BurnabyTerminal; and
- Westridge Marine Terminal.

TEM has not yet been completed for the segment of the proposed pipeline corridor from Edson to Hinton, a segment in the Coquihalla and in the additional proposed pipeline corridor refinement areas added on August 23, 2013. This will be provided in a supplemental filing. The addition of these areas in the supplemental filing is not expected to affect the achievement of Survey Level Intensity 5.

3.1.2 Ecosystem Classification

Mapping methodology was developed according to the Standards for Terrestrial Ecosystem Mapping in British Columbia (RISC 1998) and was applied to both the Alberta and BC portions of the Project. As per standard TEM projects, the ecosystem mapping was based on a hierarchical ecosystem classification framework, which includes Natural Subregion units and ecosystem units in Alberta, as well as BGC subzone variant units and ecosystem units in BC.

In Alberta, ecosites are functional ecological units that develop under similar conditions such as moisture and nutrient regime (Beckingham and Archibald 1996). Each ecosite is represented by a lowercase letter with "a" being the driest and most nutrient poor and each subsequent letter denotes a progressively wetter and/or more nutrient rich unit. Within each ecosite, there are often several ecosite phases which are defined based on the dominant canopy species (or the tallest vegetation layer where trees are not present). Ecosite phases are identified by a letter, representing the ecosite and a number representing each distinct phase. Numerous plant community types are defined within each ecosite phase. Unique plant communities within an ecosite phase are defined based on understory species composition and abundance. Plant communities are represented by the alphanumeric code which identifies the ecosite phase followed by a period and another number which represents the plant community type. For example, d1.1 Aw/Canada buffalo-berry is one of many plant communities within the Boreal Mixedwood d1 low-bush cranberry Aw ecosite phase (where Aw refers to aspen) (Beckingham and Archibald 1996). It is not possible to determine plant community types from Alberta Vegetation Inventory (AVI) data or imagery interpretation, therefore, polygons have been classified to ecosite phase.

In BC, the Biogeoclimatic Ecosystem Classification (BEC) system delineates ecological zones (*i.e.*, BGC subzone variant units) by vegetation, soils and climate and classifies ecosystems within the ecological zones based on the potential of the site at climax or mature successional stages (BC MFLNRO 2013a). Three levels of classification exist at the local level for ecosystem units: site association, site series and site type. Site series is the most commonly used site unit as it describes a climax vegetation community that can be expected to occur with specific site and soil characteristics within a BGC subzone and variant. Site associations can occur at various ecological conditions within various BGC units and are divided into site series within BGC subzones and variants. Site types are subdivisions of site series but few site types have been defined and are therefore not used to classify polygons. Polygons have been classified to site series by first noting the BGC subzone variant (and phase in select cases) followed by the numeric site series for that BGC unit. Zonal site series (those that best reflect the regional climate and are least influenced by local topography and/or soil properties) are numbered 01 and non-zonal site series are numbered from 02 to 29 sequentially in order of driest to wettest moisture regime and secondarily in order of poorest to richest nutrient regime (BC MFLNRO 2013a). Standard BEC codes and names as per the BEC database (BECdb) version 8 (BC MFLNRO 2011) were used for ecosystem unit coding within BC.

Where an ecosite phase or BEC code and name was not available for an observed ecosystem unit (usually due to anthropogenic disturbance), Project-specific codes, called 'all-ecosystem units' were used (*e.g.*, tame pasture was coded as TP).

3.1.3 Orthophoto Preparation

The air photos used to create the orthophoto coverage which was then used to complete the TEM are listed in Table 3.1.

TABLE 3.1

ORTHOPHOTOS USED TO COMPLETE TEM FOR THE PROJECT

Area of Imagery	Date of Data Capture	Scale of Data Capture	Source of Data
City of Edmonton	2011	25 cm Panchromatic	Acquired by Kinder Morgan Original source: City of Edmonton
Edmonton to Stony Plain	2010	50 cm Colour	Acquired by Kinder Morgan, Original source: I-cubed: Information integration and imaging (Lambert Conformal Conic map projection [LLC])
Stony Plain to Rearguard	2005-2006	50 cm Colour	Acquired by Kinder Morgan Original source: OrthoShop Geomatics Ltd
Hargraves to Hope	2010	50 cm Colour	Acquired by Kinder Morgan Original source: I-cubed: Information integration and imaging, LLC
RK 549 to RK 555 (South of Albreda)	2009	50 cm Panchromatic	Acquired by Integrated Pipeline Projects Inc. (IPP) for Kinder Morgan
Finn Creek Park Area	2009	50 cm Panchromatic	Acquired by TERA from Blackbridge Geomatics on behalf of Kinder Morgan
Black Pines	2011	50 cm Colour	Acquired by IPP for Kinder Morgan
City of Kamloops	2012	10 cm Colour	Acquired by IPP for Kinder Morgan
Kingsvale Power Line	2011	50 cm Colour	Acquired by TERA from Blackbridge Geomatics on behalf of Kinder Morgan
Hope to Sumas	2010	50 cm Colour	Acquired by Kinder Morgan Original source: I-cubed: Information integration and imaging, LLC
Hope	2011	50 cm Colour	Acquired by IPP for Kinder Morgan
Sumas to Burnaby	2010	50 cm Colour	Acquired by Kinder Morgan. Original source: I-cubed: Information integration and imaging, LLC
Lower Mainland	2012	50 cm Colour	Acquired by IPP for Kinder Morgan

3.1.4 Geodatabase Creation and Pre-Stratification

Methodologies for handling digital data were developed according to the Standard for Terrestrial Ecosystem Mapping – Digital Data Capture in British Columbia, Version 3.0 (RISC 2000) and the Terrestrial Ecosystem Information Digital Data Submission Standard – Draft for Field Testing (BC MOE 2010). The input data available to support TEM differs between Alberta and BC, therefore, different databases were created for each province. To assist in polygon delineation, a preliminary stratification of each Natural Subregion and BGC subzone variant was completed prior to mapping. In Alberta, pre-stratification was based on the Alberta Biodiversity Monitoring Institute (ABMI) Human Footprint Map Layer Version 1.0 (ABMI 2010a,b) and Agricultural Region of Alberta Soil Inventory Database (AGRASID) Version 3.0 (Alberta Soil Information Centre 2001). In BC, pre-stratification was based on combined slope and aspect classes derived from Terrain Resource Information Management (TRIM) II Elevation Points (Government of British Columbia 1996-2013; BC Ministry of Environment, Lands and Parks 1997). See Table 3.2 for the slope gradient classes and aspect gradient classes used for pre-stratification in BC. The projection used in Alberta was 10TM NAD 83 Forest and the projection used in BC was BC Environment Albers (NAD 83).

TABLE 3.2

SLOPE AND ASPECT GRADIENT CLASSES FOR BC PRE-STRATIFICATION

Slope Class	Description
Level	0-5 % slope
Gentle	> 5-25 % slope
Moderate	> 25-65 % slope
Steep	> 65 % slope
Aspect Class	Description
Warm	135°-270°
Cool	0-45°, 315-360°
Neutral	45-135°, 270-315°

North of the City of Kamloops, the TRIM II digital elevation point data used to create the digital elevation model for pre-stratification was incomplete, resulting in erroneous slope and aspect classes. Pre-stratified polygons were not used in this limited section of the Project, which spanned approximately 37 km from RK 812 to RK 849.

In addition to preliminary stratification, several reference data layers were available to mappers to assist with imagery interpretation while delineating and attributing polygons.

Reference data for the Alberta geodatabase used information from the data layers listed below.

- National Hydro Network Waterbodies (rivers, lakes and ponds) (Natural Resources Canada [NRC] 2007-2011).
- AVI (Alberta Environment and Sustainable Resource Development 2012).
- Phase 3 Forestry Mapping (Alberta Energy and Natural Resources [AENR] 1980a-c, AENR 1981, AENR 1983, AENR 1985a,b).
- Hillshade (TERA 2008).
- Contours (metric: 20 m intervals; imperial: 20 ft intervals) (NRC 2012a,b).
- 2012/2013 plot data (TERA 2013).

Reference data for the BC geodatabase used information from the data layers listed below:

- TRIM II Water Layer Feature (Government of BC 1996-2013):
  - lakes; and
  - rivers;
- TRIM II Wetland Layer Feature (Government of BC 1996-2013):
  - marshes; and
  - swamps;
- Digital Elevation Model (TERA 2012):
  - slope gradient layer– 4 classes (see Table 3.2); and
  - aspect gradient layer– 3 classes (see Table 3.2);
- TRIM II Contours (20 m intervals) (Government of BC 1996-2013);

- Vegetation Resource Inventory (VRI) (BC MFLNRO 2013b);
- Existing TEM, predictive ecosystem mapping and terrain mapping, where available (Timberline Forest Inventory Consultants [Timberline] 2006); and
- 2012/2013 plot data (TERA 2013).

3.1.5 Existing Terrestrial Ecosystem Mapping Data for Trans Mountain Pipeline

Timberline completed TEM along the TMPL system from Hargreaves to Darfield, BC in 2006 (Timberline 2006). Ecosystems were mapped using the official BGC codes database (BECdb) Version 6 (BC MOE 2003 in Timberline 2006). Portions of the Vegetation RSA overlap with the area where TEM was completed for this segment. This data has been incorporated into the TEM for the Project by updating the classification of ecosystems to BECdb Version 8 (BC MFLNRO 2011).

The existing TEM was then updated after the 2012 TEM field surveys by the senior ecologist for this Project. Existing TEM polygon boundaries were adjusted to correspond with the new mapping outer boundary based upon the most current map buffer. This adjustment considered the new area to be added to an existing polygon and determined if the map entities attributed in the original polygon were still appropriate and adjusted decile proportions, if necessary. If the new mapping area was large enough, a new polygon was delineated, although in many instances the mapping buffer was just a few metres beyond the original data collection boundary.

The coverage of the existing TEM data from Timberline within the Vegetation RSA for the Project occurred from approximately RK 490 to RK 614, as well as RK 721 to RK 769.

3.1.6 Preliminary Terrestrial Ecosystem Mapping

Upon creation of the geodatabase and pre-stratification as described in Section 3.1.4, polygon delineation was accomplished with a “heads up” direct to digital system in ArcView 10.1. All polygons were delineated in two dimensions using 20 m TRIM contours and hillshade as referenced and in accordance with a defined set of rules:

1. Polygon delineation was completed at scale of 1:10,000, with a target average polygon size of 10 ha and a minimum polygon size of 2 ha. Minimum polygon width was 50 m.
2. Polygons closed at Natural Subregion or BGC subzone variant boundaries, two line water features and Vegetation RSA boundaries.
3. Water feature polygons for ponds, lakes and wetlands were retained from the TRIM water features layer in BC. In Alberta, the landscape is highly modified by human use and water feature polygons were removed when the imagery supported the absence of a pond, lake or wetland.
4. Polygon boundaries respected biophysical landscape features primarily, recognizing similarities in slope, aspect, landscape position and dominant terrain features affecting soil moisture regime, such as drainage and depth, first, followed by changes in structural stage. Stand structure is generally a reflection of disturbance history, not enduring landscape features so it formed the secondary consideration in delineation.

Polygon attribution was completed directly into the geodatabase and followed three basic rules:

1. A maximum of three ecosystem units were allowed per polygon.
2. Each ecosystem unit consists of the following components: ecosite phase or site series, atypical site modifier(s) and vegetation development units (structural stage, canopy composition and stand disturbance).
3. Only accepted ecosite phase or site series, modifier and structural stage codes were used.
    a. Refer to Table 1.1 for the field guides and land management handbooks used to classify ecosite phase and site series in Alberta and BC. Standardized codes and definitions for units that occur on the landscape but are not defined ecosite phase or site series classification (*e.g.*, rock outcrops, flood associations, avalanche units, waterbodies, agricultural units and urban/suburban areas) were obtained from the TEM standards (RISC 1998) or the *Biogeoclimatic Ecosystem*

Classification of Non-forested Ecosystems in British Columbia, Technical Report 068 (MacKenzie 2012). See Attachment A1 for the map legend. Assumed modifiers, or those that define the "typical" condition of each unit, are also listed for all mapped units.

b. Site series can occur over a range of site conditions, depending on interactions between "compensating factors", therefore, atypical site modifiers are used to describe conditions outside those considered "typical" for that ecosystem. See Table 3.3 for a description of mapped atypical modifiers.

c. Stand conditions will vary considerably within an ecosite phase or site series depending on disturbance history, stand age, and species composition. Table 3.4 describes mapped structural stages and Table 3.5 describes mapped canopy composition and stand disturbances attributes.

In addition to the broad rules defined above, more context specific rules were created during the mapping process. New rules were developed through discussion between the ecosystem mappers and the senior ecologist and were recorded in a document accessible to all ecosystem mappers.

TABLE 3.3

ATYPICAL MODIFIER CODES AND CRITERIA

Modifier	Code	Criteria
Gentle	j	site occurs on gently sloping topography (less than 25% in the interior and less than 35% in the CWH, CDF and MH zones)[1]
Cool	k	site sites occurs on cool, northerly aspects (315°-45°), on moderately steep slopes (25%-65% slope in the interior and 35%-65% slope in the CWH, CDF and MH zones)[2]
Warm	w	site series occurs on warm, southerly aspects (135°-270°), on moderately steep slopes (25%-65% slope in the interior and 35%-65% slope in the CWH, CDF and MH zones)[2]
Steep cool	q	site series occurs on steep slopes (> 65%) with cool, northerly aspects (315°-45°)[2]
Steep warm	z	site series occurs on steep slopes (> 65%) with warm, southerly aspects (135°-270°)[2]
Shallow	s	site series occurs where soils are considered to be shallow to bedrock (20 cm-100 cm)[1]
Deep	d	site series occurs on soils greater than 100 cm to bedrock[1]
Coarse	c	site series occurs on soils with a coarse texture, including sand and loamy sand; and also sandy loam, loam and sandy clay loam with greater than 70% coarse fragment volume[1,3]
Fine	f	site series occurs on soils with a fine texture including silt and silt loam with less than 20% coarse fragment volume; and clay, silty clay, silty clay loam, clay loam, sandy clay and heavy clay with less than 35% coarse fragments[1,3]

Notes: 1 As defined by the TEM Standards for Terrestrial Ecosystem Mapping in British Columbia (RISC 1998).

2 Slope and aspect class criteria defined by senior ecologist.

3 Soil textures have been grouped specifically for the purposes of TEM.

TABLE 3.4

STRUCTURAL STAGE CODES AND DESCRIPTIONS

Structural Stage	Code	Description
Bryoid, void	1	Non-vegetated or dominated by bryophytes and lichens.
Herb	2	Early successional stage or herbaceous communities maintained by environmental conditions or disturbance.
Forb	2a	Herbaceous communities dominated (greater than 1/2 of the total herb cover) by non-graminoid herbs, including ferns.
Graminoid	2b	Herbaceous communities dominated (greater than 1/2 of the total herb cover) by grasses, sedges, reeds and rushes.
Aquatic vegetation	2c	Herbaceous communities dominated (greater than 1/2 of the total herb cover) by floating or submerged aquatic plants; does not include sedges growing in marshes with standing water.
Dwarf shrub	2d	Communities dominated (greater than 1/2 of the total herb cover) by dwarf woody species.
Shrub/Herb	3	Early successional stage or shrub communities maintained by environmental conditions or disturbance.
Low shrub	3a	Communities dominated by shrub layer vegetation less than 2 m tall.
Tall shrub	3b	Communities dominated by shrub layer vegetation that are 2-10 m tall in BC and 2 m-5 m tall in Alberta.

TABLE 3.4 Cont'd

Structural Stage	Code	Description
Pole sapling	4	Trees greater than 10 m tall in BC and greater than 5 m tall in Alberta, typically densely stocked, have overtopped shrub and herb layers; younger stands are vigorous (usually greater than 10-15 years old); older stagnated stands (up to 100 years old) are also included; self-thinning and vertical structure not yet evident in the canopy.
Young forest	5	Self-thinning has become evident and the forest canopy has begun differentiation into distinct layers (dominant, main canopy, and overtopped). Time since disturbance is generally 40-80 years but may begin as early as age 30, depending on tree species and ecological conditions.
Mature forest	6	Trees established after the last disturbance have matured; a second cycle of shade tolerant trees may have become established; understories become well developed as the canopy opens up; time since disturbance is generally 80-140 years for Natural Disturbance Type (NDT) 3 and 80-250 years for NDT 1, 2, 4 or 5.[1]
Old forest	7	Old, structurally complex stands composed mainly of shade-tolerant and regenerating tree species; snags and coarse woody debris in all stages of decomposition are typical, as are patchy understories; understories may include tree species uncommon in the canopy, due to inherent limitations of these species under the given conditions; time since disturbance is generally greater than 140 years for NDT 3 and greater than 250 years for NDT 1, 2, 4 or 5.[1]

Source: RISC 1998 with modifications for Alberta

Note: 1 Alberta was mapped as NDT 3. In BC, variants mapped within NDT 3 include ICHdw3, ICHmk2, MSdm2, MSmw1 and SBSdh1. All other mapped variants fall into NDT 1, 2, 4 or 5 according to BECdb version 8 (BC MFLNRO 2011).

TABLE 3.5

CANOPY COMPOSITION AND DISTURBANCE CODES AND DESCRIPTIONS

	Code	Description
Canopy Composition[1]		
Coniferous	c	Greater than 3/4 of total tree layer cover[2] is coniferous.
Deciduous	d	Greater than 3/4 of total tree layer cover[2] is broadleaf.
Mixed	m	Neither coniferous or broadleaf account for greater than 3/4 of total tree layer cover.[2]
Stand Disturbance		
Fire	F	Forest fire affected stands.
Insect	Bi	Dead standing trees in canopy from mountain pine beetle or other infestation.

Notes: 1 RISC 1998.

2 Stand composition modifiers emphasize overstory and intermediate tree layers, since these are the most visible on aerial photographs.

3.1.7 Quality Assurance and Quality Control

Each ecosystem mapper's work was regularly reviewed by the senior ecologist for quality and consistency (both within and between mappers) in delineation principals and polygon attribution. Initially, quality assurance checks were completed every two to three days, but as ecosystem mappers gained experience and proficiency, bi-weekly checks were completed. Comments provided by the senior ecologist on polygon quality were reviewed by each ecosystem mapper and appropriate edits completed after each round of review. For quality assurance, 10% of all polygons delineated and attributed were checked by the senior ecologist.

3.1.8 Deviations from Provincial Standards

Project-specific TEM followed a non-standard approach and included the following variances from standard TEM:

- terrain attributes were not mapped as these were not applicable to the objectives of this Project-specific TEM;
- FS882 forms were not completed in the field, instead modified forms were used;
- ground inspection and visual plot soil pits were no deeper than 30 cm due to Project-specific ground disturbance safety protocols;

- geomorphological process and soil drainage attributes were not mapped;
- aspect and slope ranges for typical and atypical modifiers were altered; and
- typical and atypical modifiers were not assigned in Alberta.

3.1.9 Terrestrial Ecosystem Mapping Field Survey Preparation

In preparation for field surveys in 2012, pre-stratification of the mapping area into units of Natural Subregion and BGC subzone variant was completed to assist in determining plot distribution across the diversity of ecological zones. As surveys are required to characterize common and widespread ecosystem units, as well as those that occur infrequently, the senior ecologist reviewed imagery of the proposed pipeline corridor, selecting field survey locations representative of the range of ecosystem units within each Natural Subregion and BGC subzone variant. Pre-selected survey locations were restricted to parcels of land adjacent to the existing TMPL right-of-way where land access had been granted. Targets for the number of survey plots per Natural Subregion and BGC subzone variant, based on area, were also calculated.

In preparation for field surveys in 2013, preliminary TEM polygons were added to the previous information to assist in determining plot distribution spanning the diversity within each ecological zone.

3.1.10 Final Terrestrial Ecosystem Mapping

Following the 2013 summer field surveys, TEM was finalized. The 2012 and 2013 plot data was made available to mappers so that they could compare the preliminary TEM delineation and attribution to field observations. Plot data collected in the fall 2013 field surveys will be used to finalize TEM segments for the supplemental filing. Where preliminary TEM deviated from field observations, appropriate edits were made to TEM. Where applicable, insight from field observations led to overall edits to the preliminary TEM. These overall edits were made possible by mappers following consistent classification criteria during preliminary TEM.

3.2 Field Data Collection

TEM field work was completed in 2012 and 2013 to Survey Intensity Level 5 of the TEM standards (RISC 1998). To achieve a Survey Intensity Level 5 a minimum of 5% of TEM polygons were surveyed in the field. Field surveys in 2012 were conducted in Alberta from August 17 to 21, 2012 and in BC from September 28 to 29, 2012. Two TEM crews conducted each 2012 survey. TEM field crews in 2012 consisted of two ecologists, a wildlife biologist, a Traditional Ecological Knowledge (TEK) facilitator and, at minimum, one Aboriginal participant. Field surveys in 2013 were conducted in Alberta from May 17 to 28, 2013 and in BC from April 11 to 19, 2013, May 6 to 13, 2013, June 3 to 9, 2013 and September 30 to October 11, 2013. Three TEM crews conducted the first two 2013 surveys, and two TEM crews conducted the subsequent two trips. TEM field crews in 2013 consisted of two ecologists and on occasion TEK facilitator(s) and Aboriginal participants. A wildlife biologist incorporated TEM field survey locations from 2013 into the 2013 wildlife habitat assessment survey locations later in the season.

A detailed methodology for data collection at ground inspection locations is provided by the Field Manual for Describing Terrestrial Ecosystems, 2nd Edition (BC MOFR and MOE, 2010). While surveying in Alberta, the methods outlined in the Field Manual for Describing Terrestrial Ecosystems, 2nd Edition were modified to use the soil moisture and nutrient regime keys for the Natural Subregions surveyed. The TEM crews ensured, wherever possible, that the chosen survey locations expressed homogeneous site, soil and vegetation characteristics. All ground inspections were recorded on standard Site Visit Forms (FS1333) used by the BC MOE. Ground inspections met the minimum collection requirements set out in the TEM standards, and included:

- UTM coordinates;
- Natural Subregion or BGC subzone variant;
- ecosite phase or site series;

- structural stage;
- soil moisture and nutrient regime;
- rooting zone soil texture (≤ 30 cm);
- humus form;
- slope;
- aspect;
- landscape position; and
- the dominant vegetation with special attention to indicator species and percent cover of each species.

Visual inspections were completed on standard Site Visit Forms (FS1333) and collected similar information, but with reduced soils and vegetation information.

Field data forms were reviewed nightly by each crew leader for consistency and quality and at the end of each field season by the senior ecologist. The ground inspection and visual inspection data were entered into Venus 5.1 (BC MFLNRO 1998) and information from hardcopy notes was entered into a Microsoft Excel spreadsheet for summary. Both of these databases were available to ecosystem mappers during polygon delineation and attribution as part of the geodatabase.

Throughout field surveys in 2012, quick site inspections for the purposes of mapping were recorded on hardcopy notes and/or maps and included one or more of the following: ecosite phase or site series; structural stage; soil moisture and nutrient regime; a brief vegetation description; or other special features. These field notes were intended to aid the ecosystem mapper in recognizing general patterns in the imagery during preliminary TEM and were not included as visual inspections when determining that Survey Intensity Level 5 was reached.

Due to land access limitations in 2012, a helicopter flight of the proposed pipeline corridor between Kamloops and Chilliwack, BC was completed from September 31 to October 1, 2012. During the helicopter flight, an ecologist recorded information pertinent to ecosystem unit identification on overview maps. Photographs, along with relevant notes about dominant vegetation and structural stage, were taken throughout the flight and were made available to ecosystem mappers during the delineation and attribution. These photographs were also not included as visual inspections when determining that Survey Intensity Level 5 was reached.

4.0 RESULTS OF TERRESTRIAL ECOSYSTEM MAPPING

TEM has been completed for 73.2% of the total Vegetation RSA in Alberta, amounting to 49,502 ha within 4 Natural Subregions. TEM has been completed for 81.6% of the total Vegetation RSA in BC, amounting to 110,191 ha within 27 BGC subzone variants. A summary of TEM results to date and fieldwork conducted within these areas is provided in Table 4.1. A supplemental filing will provide results for TEM (including field work, which was completed in 2012 and 2013) in an additional two Natural Subregions (the Upper Foothills and the Montane) and three BCG subzone variants (IMAunp, MSdm2 and MSmw1), as well as additional areas within some of the Natural Subregions and BGC subzone variants included here that form part of the proposed pipeline corridor refinement areas added on August 23, 2013. Some polygons in areas where TEM was completed had to be deleted from the dataset due to attribution errors. These polygons will be re-attributed and also added to the supplemental filing.

A total of 272 unique ecosite phase/site series are represented in the mapping area. Detailed descriptions of the ecosite phases and site series mapped for this Project are provided in the field guides and land management handbooks listed in Table 1.1. They are not re-iterated in this report. Tables in Section 4.2 list the TEM results for ecosite phases by Natural Subregion in Alberta. Tables in Section 4.3 list the TEM results for site series by BGC subzone variant in BC. Tables in Section 4.3 also indicate whether or not each site series has been correlated with a rare ecological community by the BC Conservation Data Centre (BC CDC) (BC MOE 2013), and include additional wetland types that have been correlated with rare ecological communities by the BC CDC (BC MOE 2013).

TABLE 4.1

NATURAL SUBREGION AND BGC SUBZONE VARIANT TEM SUMMARY

Natural Subregion/BGC subzone Variant	Code	Mapped Area (ha)	Number of Polygons	Number of Ground Inspections	Number of Visual Inspections
ALBERTA					
Central Mixedwood	CM	4,660.5	394	1	16
Central Parkland	CP	13,931.7	547	1	3
Dry Mixedwood	DM	15,332.0	887	16	43
Lower Foothills	LF	15,578.1	1464	41	150
BRITISH COLUMBIA					
Thompson Very Dry Hot Bunchgrass	BGxh2[3]	2,145.0	263	--	--
Nicola Very Dry Warm Bunchgrass	BGxw1[2,3]	4,174.1	435	12	26
Undifferentiated and Parkland Coastal Mountain-heather Alpine	CMAunp	13.2	3	--	--
Dry Maritime Coastal Western Hemlock	CWHdm	3,470.0	244	2	3
Southern Dry Submaritime Coastal Western Hemlock	CWHds1	8,374.5	636	16	20
Southern Moist Submaritime Coastal Western Hemlock	CWHms1	309.3	56	--	--
Eastern Very Dry Maritime Coastal Western Hemlock	CWHxm1	12,288.4	616	13	6
Raush Moist Mild Engelmann Spruce - Subalpine Fir	ESSFmm1	66.2	13	--	--
Moist Warm Engelmann Spruce - Subalpine Fir	ESSFmw	231.0	28	--	--
Cascade Moist Warm Engelmann Spruce - Subalpine Fir	ESSFmw1	587.9	66	1	3
Northern Monashee Wet Cold Engelmann Spruce - Subalpine Fir	ESSFwc2	9.7	2	--	--
North Thompson Dry Warm Interior Cedar - Hemlock	ICHdw3	7,500.1	664	18	58
Thompson Moist Cool Interior Cedar - Hemlock	ICHmk2	169.3	16	--	--
Moist Mild Interior Cedar - Hemlock	ICHmm	2,492.8	165	--	1
Thompson Moist Warm Interior Cedar - Hemlock	ICHmw3	6,792.2	583	9	31
Mica Very Wet Cool Interior Cedar Hemlock	ICHvk1	2,460.1	126	--	3
Wells Gray Wet Cool Interior Cedar - Hemlock	ICHwk1	8,688.6	524	2	2
Thompson Dry Cool Interior Douglas-Fir	IDFdk1[2,3]	5,441.0	558	2	6
Cascade Dry Cool Interior Douglas-Fir	IDFdk2[1]	3,630.5	505	7	21
Thompson Moist Warm Interior Douglas-Fir	IDFmw2[1]	14,342.0	821	--	15

TABLE 4.1 Cont'd

Natural Subregion/BGC subzone Variant	Code	Mapped Area (ha)	Number of Polygons	Number of Ground Inspections	Number of Visual Inspections
Thompson Moist Warm – Steep South phase Interior Douglas-Fir	IDFmw2b[1]	1,751.3	98	--	2
Okanagan Very Dry Hot Interior Douglas-Fir	IDFxh1	2,938.9	342	15	25
Thompson Very Dry Hot Interior Douglas-Fir	IDFxh2[1,2,3]	3,017.6	269	--	1
Thompson Very Dry Hot Interior Douglas-Fir, Grassland Phase	IDFxh2a[1,2,3]	4,577.3	491	3	8
Leeward Moist Maritime Mountain Hemlock	MHmm2	12.5	4	--	--
Thompson Very Dry Hot Ponderosa Pine	PPxh2[2,3]	6,156.1	705	6	17
McLennan Dry Hot Sub-Boreal Spruce	SBSdh1	8,551.6	559	10	32

Notes: 1 Due to mapping adjustments in the IDF BGC Zone (described in Section 4.1), the total area listed here for these IDF variants will not be equivalent to the respective sum of areas in the variant specific tables in Section 4.3.

2 TEM mapping in segments currently not available will be provided in the supplemental filing.

3 Ground and visual inspections that have been completed in segments where TEM mapping is currently not available will be used to finalize TEM in those locations and will be provided in the supplemental filing. These inspections are not included here.

4.1 Limitations of Terrestrial Ecosystem Mapping

TEM for the Project is provided at a scale of 1:20,000 and does not depict small inclusions of ecosystems that may occur in less than 10% of a polygon or in micro-topographic landscape features. The TEM scale used for this Project gives an overview, depicts the dominant ecosystems and stand structures and provides a delineation of areas where rare ecosystems, structure and important wildlife habitat may occur. It is essential to ground verify potentially sensitive features prior to disturbance.

The polygons delineated for TEM are based on the interpretation of a suite of biophysical attributes based on landscape shape and soil moisture as well as stand features within each Natural Subregion and BGC subzone variant. Photo interpretation of ecosystem attributes can be ambiguous due to a number of factors. The limiting factors of the interpretation included limited field surveys at the time of photo interpretation, limited local knowledge and complicated site classification systems for some Natural Subregions and BGC subzone variants. Some BGC subzone variants revised by Lloyd *et al.* (2005) describe site series that are only distinguished from one another by minor vegetation differences, such as those that occur in the shrub and herb layers. Shrub and herb layers are not visible through photo interpretation. In these cases it may be important to group site series. Occasionally the variable tone of the orthophoto between years and flight lines made it difficult to distinguish structural stage, so mappers used their professional judgment to make the best estimates based on available imagery.

Within the IDF and ICH BGC Zones, mappers found that existing variant lines were not always accurate. To account for this, some polygons were mapped in another variant that was deemed to be more appropriate based on the landscape and vegetation present. These adjustments were especially common between the IDFxh2 and IDFxh2a (Lloyd *et al.* 1990).

The limitations encountered by mappers in each Natural Subregion and BGC variant are provided in their respective sections below.

4.2 Terrestrial Ecosystem Mapping Results for Alberta

4.2.1 Central Mixedwood

TEM results for ecosite phases mapped in the Central Mixedwood Natural Subregion are listed in Table 4.2. TEM results for all-ecosystem units mapped in the Central Mixedwood Natural Subregion are listed in Table 4.3.

TABLE 4.2

ECOSITE PHASES IN THE CENTRAL MIXEDWOOD NATURAL SUBREGION

Ecosite Phase[1]	Code	Structural Stages	Mapped Area (ha)
plains wormwood	aa1	--	--
lichen Pj	a1	--	--
western porcupine grass	bb1	--	--
northern wheat grass	bb2	--	--
blueberry Pj-Aw	b1	1, 2, 2a, 2b, 3a, 3b, 4, 5	109.8
blueberry Aw(Bw)	b2	2b, 4, 5, 6	62.2
blueberry Aw-Sw	b3	1, 2, 2b, 3a, 3b, 4, 5, 6	246.3
blueberry Sw-Pj	b4	5	21.9
Labrador tea-mesic Pj-Sb	c1	2, 2b, 3a, 3b, 5	99.6
low-bush cranberry Aw	d1	1, 2b, 3a, 3b, 4, 5, 6	227.6
low-bush cranberry Aw-Sw	d2	2b, 4, 5, 6	259.1
low-bush cranberry Sw	d3	5, 6	41.3
saskatoon-snowberry	d4	--	--
California oatgrass-slender wheatgrass	dd1	--	--
dogwood Pb-Aw	e1	2, 2a, 2b, 3a, 3b, 4, 5	106.6
dogwood Pb-Sw	e2	5	205.3
dogwood Sw	e3	5	15.2
dogwood shrubland	e4	--	--
horsetail Pb-Aw	f1	2, 2b, 3a, 3b, 4, 5	15.4
horsetail Pb-Sw	f2	3a, 5	53.1
horsetail Sw	f3	--	--
horsetail/willow	f4	--	--
Horsetail/Bw	f5	--	--
Labrador tea-subhygric Sb-Pj	g1	2, 2b, 3a, 4, 5	72.8
saline	g2	--	--
Labrador tea/horsetail Sw-Sb	h1	2, 3a, 3b, 4, 5	115.7
treed bog	i1	4, 5	51.1
shrubby bog	i2	2, 2a, 3a, 3b	64.1
treed poor fen	j1	4, 5	37.3
shrubby poor fen	j2	3a, 3b, 4	62.4
grassland poor fen	j3	2, 2a, 2b	13.8
treed rich fen	k1	5	2.5
shrubby rich fen	k2	3a, 3b	35.2
graminoid rich fen	k3	2a, 2b	46.3
marsh	l1	1, 2b	8.0

Note: 1 Derived from *Field Guide to Ecosites of Northern Alberta* (Beckingham and Archibald 1996) and *Guide to Range Plant Community Types and Carrying Capacity for the Dry and Central Mixedwood Subregions in Alberta*, 6th approximation (Willoughby *et al.* 2006).

TABLE 4.3

ALL-ECOSYSTEM UNITS IN THE CENTRAL MIXEDWOOD NATURAL SUBREGION

All-Ecosystem Unit	Code	Structural Stages	Mapped Area (ha)
cultivated field	CF	1, 2, 2a, 2b	2,020.9
active channel flood class	Fa	--	--
fringe flood class	Ff	--	--
low bench flood class	Fl	--	--
mid bench flood class	Fm	--	--
lake	LA	--	--

TABLE 4.3 Cont'd

All-Ecosystem Unit	Code	Structural Stages	Mapped Area (ha)
rock cliff	Rc	--	0.5
pond	PD	--	17.8
river	RI	--	--
rock outcrop	Ro	--	--
rural	Ru	1, 2a, 2b, 3a, 4, 5	71.4
rock talus	Rt	--	--
road	RZ	2, 2b	6.0
tame pasture	TP	2, 2a, 2b, 3a, 4	554.8
avalanche herb meadow	Vh	--	--
avalanche shrub thicket	Vs	--	--
avalanche treed	Vt	--	--
bog wetland	Wb	--	--
fen wetland	Wf	--	--
marsh wetland	Wm	--	--
swamp wetland	Ws	3a, 3b	16.6
shallow water aquatic	Ww	--	--
herb disclimax	Xh	--	--
shrub disclimax	Xs	--	--
urban	UR	--	--
grazing zooclimax	Zg	--	--
alkaline meadow	Ga	--	--
mine	Mi	--	--

Limitations of Terrestrial Ecosystem Mapping in the Central Mixedwood

Slope and aspect data was limited in the Central Mixedwood Natural Subregion. Imagery was of high quality but shade in some tree stands resulted in difficulty interpreting canopy composition. AVI/VRI data was very limited in the area and did not always provide stand age, composition or history (logged, burned etc.).

4.2.2 Central Parkland

TEM results for ecosite phases mapped in the Central Parkland Natural Subregion are listed in Table 4.4. TEM results for all-ecosystem units mapped in the Central Parkland Natural Subregion are listed in Table 4.5.

TABLE 4.4

ECOSITE PHASES IN THE CENTRAL PARKLAND NATURAL SUBREGION

Ecosite Phase[1]	Code	Structural Stages	Mapped Area (ha)
sand dropseed grassland	a1	--	--
sandgrass/juniper shrubland	b1	--	--
sandgrass/juniper conifer-Pj	b2	--	--
sandgrass/juniper grassland	b3	--	--
needle and thread grassland	c1	--	--
needle and thread aspen	c2	--	--
needle and thread shrubland	c3	--	--
western porcupine grass grassland	d1	--	--
western porcupine grass shrubland	d2	--	--
western porcupine grass aspen	d3	--	--

TABLE 4.4 Cont'd

Ecosite Phase[1]	Code	Structural Stages	Mapped Area (ha)
saline blowout grassland	e1	--	--
saline blowout saltgrass seepage	e2	--	--
western wheat grass grassland	f1	--	--
western wheat grass shrubland	f2	--	--
rough fescue/snowberry grassland	g1	--	--
rough fescue/snowberry tame	g2	--	--
rough fescue/snowberry shrubland	g3	--	--
rough fescue/snowberry aspen	g4	2b, 3b, 4, 5	274.0
rough fescue/snowberry conifer	g5	6	4.6
silver sagebrush	h1	--	--
red osier dogwood spruce	i1	3a, 4, 5	43.9
red-osier dogwood aspen	i2	2b, 3a, 3b, 4, 5	286.5
red-osier dogwood shrubland	i3	3b	0.9
foxtail barley grassland	j1	2b	1.4
horsetail deciduous	k1	--	--
horsetail conifer	k2	5	7.2
saline lowlands grassland	l1	--	--
graminoid fen	m1	2b	80.7
shrubby fen	m2	3a, 3b	98.8
marsh cattails	n1	2a, 2b	45.3
Marsh	n2	--	--

Notes: 1 Derived from *Range Plant Communities and Range Health Assessment Guidelines for the Central Parkland Subregion of Alberta* (Burkinshaw *et al.* 2009).

TABLE 4.5

ALL-ECOSYSTEM UNITS IN THE CENTRAL PARKLAND NATURAL SUBREGION

All-Ecosystem Unit	Code	Structural Stages	Mapped Area (ha)
cultivated field	CF	1, 2, 2b, 3a, 3b	4,867.2
active channel flood class	Fa	--	--
fringe flood class	Ff	--	--
low bench flood class	Fl	--	--
mid-bench flood class	Fm	--	--
lake	LA	--	43.7
rock cliff	Rc	--	--
pond	PD	--	161.8
river	RI	--	70.7
rock outcrop	Ro	--	--
rural	Ru	1, 2b, 3a, 3b, 4, 5	1,390.0
rock talus	Rt	--	--
road	RZ	1, 2b	687.8
tame pasture	TP	1, 2b, 3a, 3b, 5	1,787.1
avalanche herb meadow	Vh	--	--
avalanche shrub thicket	Vs	--	--
avalanche treed	Vt	--	--
bog wetland	Wb	--	4.1
fen wetland	Wf	2b, 3b	3.6
marsh wetland	Wm	--	--
swamp wetland	Ws	4, 5	36.3
shallow water aquatic	Ww	--	--
herb disclimax	Xh	--	--

TABLE 4.5 Cont'd

All-Ecosystem Unit	Code	Structural Stages	Mapped Area (ha)
shrub disclimax	Xs	--	--
urban	UR	1, 2b, 3a, 3b, 4, 5, 6	4,035.9
grazing zooclimax	Zg	--	--
alkaline meadow	Ga	--	--
mine	Mi	--	--

Limitations of Terrestrial Ecosystem Mapping in the Central Parkland

Imagery for the Central Parkland Natural Subregion was of high quality. Most of the area mapped is agricultural, rural or urban, however, very few field plots were completed in the remaining natural areas, which limited ecosite mapping verification. Many ecosites within the Central Parkland overlap in moisture and/or nutrient regime, therefore, AGRASID attributes and visual imagery were used to assist ecosite determination. VRI and contour layers were not available for this Natural Subregion.

4.2.3 Dry Mixedwood

TEM results for ecosite phases mapped in the Dry Mixedwood Natural Subregion are listed in Table 4.6. TEM results for all-ecosystem units mapped in the Central Mixedwood Natural Subregion are listed in Table 4.7.

TABLE 4.6

ECOSITE PHASES IN THE DRY MIXEDWOOD NATURAL SUBREGION

Ecosite Phase[1]	Code	Structural Stages	Mapped Area (ha)
plains woodworm	aa1	--	--
lichen Pj	a1	--	--
western porcupine grass	bb1	--	--
northern wheat grass	bb2	--	--
blueberry Pj-Aw	b1	2, 2a, 2b, 3a, 3b, 5	87.5
blueberry Aw(Bw)	b2	2a, 2b, 4, 5	51.2
blueberry Aw-Sw	b3	2a, 2b, 5	108.7
blueberry Sw-Pj	b4	--	--
Labrador tea-mesic Pj-Sb	c1	2, 2a, 2b, 3a, 3b, 4, 5	320.8
low-bush cranberry Aw	d1	1, 2, 2a, 2b, 3a, 3b, 4, 5, 6	1041.8
low-bush cranberry Aw-Sw	d2	1, 2b, 3b, 4, 5, 6	1136.6
low-bush cranberry Sw	d3	--	--
saskatoon-snowberry	d4	--	--
California oatgrass-slender wheat grass	dd1	--	--
dogwood Pb-Aw	e1	1, 2, 2b, 3a, 3b, 4, 5, 6	861.2
dogwood Pb-Sw	e2	2b, 3a, 5, 6	541.8
dogwood Sw	e3	5	1.9
dogwood shrubland	e4	3a	6.5
horsetail Pb-Aw	f1	2b, 3a, 3b, 5, 6	437.0
horsetail Pb-Sw	f2	3b, 5	54.6
horsetail Sw	f3	--	--
horsetail/willow	f4	3a, 3b, 5	37.6
horsetail/Bw	f5	3b, 5	11.6
Labrador tea-subhygric Sb-Pj	g1	2a, 2b, 3a, 4, 5, 6	434.2
saline	g2	--	--
Labrador tea/horsetail Sw-Sb	h1	2b, 3a, 3b, 4, 5, 6	163.6
treed bog	i1	2b, 3b, 4, 5	176.2

TABLE 4.6 Cont'd

Ecosite Phase[1]	Code	Structural Stages	Mapped Area (ha)
shrubby bog	i2	3a, 3b	61.9
treed poor fen	j1	2b, 3a, 3b, 4, 5	389.0
shrubby poor fen	j2	3a, 3b	205.8
grassland poor fen	j3	2, 2a, 2b	72.3
treed rich fen	k1	3b, 5	64.7
shrubby rich fen	k2	2b, 3a, 3b, 4, 5	82.8
graminoid rich fen	k3	2a, 2b, 5	64.3
marsh	l1	2a, 2b, 3b	39.0

Note: 1 *Derived from Field Guide to Ecosites of Northern Alberta* (Beckingham and Archibald 1996) and *Guide to Range Plant Community Types and Carrying Capacity for the Dry and Central Mixedwood Subregions in Alberta*, 6th approximation (Willoughby *et al.* 2006).

TABLE 4.7

ALL-ECOSYSTEM UNITS IN THE DRY MIXEDWOOD NATURAL SUBREGION

All-Ecosystem Unit	Code	Structural Stages	Mapped Area (ha)
cultivated field	CF	1, 2, 2a, 2b, 3b	3,446.5
active channel flood class	Fa	1, 2, 2a, 2b, 3a	5.4
fringe flood class	Ff	--	--
low bench flood class	Fl	--	--
mid-bench flood class	Fm	--	--
lake	LA	--	170.3
rock cliff	Rc	--	--
pond	PD	--	168.5
river	RI	--	22.9
rock outcrop	Ro	--	--
rural	Ru	1, 2, 2a, 2b, 3a, 3b, 4, 5	962.6
rock talus	Rt	--	--
road	RZ	1, 2, 2b	737.6
tame pasture	TP	2, 2a, 2b, 3a, 3b, 5	2,721.0
avalanche herb meadow	Vh	--	--
avalanche shrub thicket	Vs	--	--
avalanche treed	Vt	--	--
bog wetland	Wb	--	--
fen wetland	Wf	--	--
marsh wetland	Wm	2, 2a, 2b	128.7
swamp wetland	Ws	3a, 3b	262.3
shallow water aquatic	Ww	--	--
herb disclimax	Xh	--	--
shrub disclimax	Xs	--	--
urban	UR	1, 2b, 5	55.3
grazing zooclimax	Zg	--	--
alkaline meadow	Ga	--	--
mine	Mi	1, 2, 2b, 3a, 3b, 5	198.3

Limitations of Terrestrial Ecosystem Mapping in the Dry Mixedwood

Imagery in this area was of coarse resolution, resulting in pixilation of shadows and tree tops. AVI/VRI data was also incomplete in this area and did not always provide stand age or composition information. This limited interpretation of some of the conifer dominated attributes. Best estimates were made for treed areas based on the available imagery.

Fine scale soils information was not available to inform the classification of wetlands in this area. Based on professional judgment and experience, it was assumed that the eastern portion of the Dry Mixedwood Natural Subregion exhibited characteristics of the adjacent Central Parkland Natural Subregion. As such, many of the wetlands at the east end were classified as mineral (*e.g.*, Wm or Ws) rather than organic (*e.g.*, k2 or k3) wetlands. AGRASID soils information was used to confirm the presence of mineral soils within a polygon to support this classification.

This area has experienced substantive changes in hydrology due to anthropogenic influences such as roads and highways. As a result, the interpretation of moisture regime at a site was at times not supported by the vegetation cover present. These areas were interpreted based on the mapper's experience.

4.2.4 Lower Foothills

TEM results for ecosite phases mapped in the Lower Foothills Natural Subregion are listed in Table 4.8. TEM results for all-ecosystem units mapped in the Lower Foothills Natural Subregion are listed in Table 4.9.

TABLE 4.8

ECOSITE PHASES IN THE LOWER FOOTHILLS NATURAL SUBREGION

Ecosite Phase[1]	Code	Structural Stages	Mapped Area (ha)
shrubby grassland	a1	--	--
bearberry/lichen Pl	b1	--	--
hairy wild rye Pl	c1	2, 2b, 4, 5, 6	133.1
hair wild rye Aw	c2	2, 2b, 3a, 3b, 4, 5, 6	159.7
hairy wild rye Aw-Sw-Pl	c3	1, 2, 2b, 3a, 3b, 4, 5, 6	439.4
hairy wild rye Sw	c4	5, 6	18.3
Labrador tea-mesic Pl-Sb	d1	2, 3a, 4, 5, 6	74.6
low-bush cranberry Pl	e1	3b, 4, 5, 6	19.5
low-bush cranberry Aw	e2	2, 2b, 3a, 3b, 4, 5, 6	1,047.9
low-bush cranberry Aw-Sw-Pl	e3	2, 2b, 3a, 3b, 4, 5, 6	1,181.6
low-bush cranberry Sw	e4	2, 3a, 4, 5, 6	123.8
bracted honeysuckle Pl	f1	2, 4, 5, 6	44.5
bracted honeysuckle Aw-Pb	f2	2, 2b, 3a, 3b, 4, 5, 6	278.8
bracted honeysuckle Aw-Sw-Pl	f3	1, 2, 2b, 3a, 3b, 4, 5, 6	610.0
bracted honeysuckle Sw	f4	1, 2, 2b, 3a, 4, 5, 6	83.8
shrubby meadow	g1	3a, 3b	28.3
forb meadow	g2	2a, 2b	17.1
Labrador tea-subhydric Sb-Pl	h1	2, 3a, 4, 5, 6	108.8
horsetail Pb-Aw	i1	2, 3a, 3b, 4, 5, 6	71.6
horsetail Pb-Sw	i2	2, 2b, 3a, 3b, 4, 5, 6	522.5
horsetail Sw	i3	3a, 3b, 4, 5, 6	63.4
Labrador tea/horsetail Sb-Sw	j1	2, 2b, 3a, 3b, 4, 5, 6	532.8
treed bog	k1	3b, 4, 5	114.1
shrubby bog	k2	3a, 3b	13.1
treed poor fen	l1	2, 2b, 3a, 3b, 4, 5	735.5
shrubby poor fen	l2	2, 3a, 3b	17.3
treed rich fen	m1	2, 2b, 3a, 3b, 4, 5, 6	1,065.4
shrubby rich fen	m2	3a, 3b	178.3
graminoid rich fen	m3	2, 2b	148.1
marsh	n1	2, 2b, 3a	23.5

Note: 1 Derived from *Field Guide to Ecosites of West-Central Alberta* (Beckingham *et al*. 1996).

TABLE 4.9

ALL-ECOSYSTEM UNITS IN THE LOWER FOOTHILLS NATURAL SUBREGION

All-Ecosystem Unit	Code	Structural Stages	Mapped Area (ha)
cultivated field	CF	1, 2, 2b, 3a, 3b	2,313.5
active channel flood class	Fa	1	5.7
fringe flood class	Ff	--	--
low bench flood class	Fl	--	--
mid-bench flood class	Fm	--	--
lake	LA	--	14.1
rock cliff	Rc	--	--
pond	PD	--	42.0
river	RI	--	39.8
rock outcrop	Ro	--	--
rural	Ru	1, 2, 2b, 3a, 3b, 4, 5, 6	672.0
rock talus	Rt	--	--
road	RZ	1, 2, 2b, 3a, 3b, 4	595.6
tame pasture	TP	1, 2, 2b, 3a, 3b, 4, 5, 6	3,265.3
avalanche herb meadow	Vh	--	--
avalanche shrub thicket	Vs	--	--
avalanche treed	Vt	--	--
bog wetland	Wb	2	25.5
fen wetland	Wf	2	0.9
marsh wetland	Wm	2b, 3a, 3b	13.2
swamp wetland	Ws	2, 2b, 3a, 3b, 4, 5, 6	226.7
shallow water aquatic	Ww	1, 2c	23.5
herb disclimax	Xh	--	--
shrub disclimax	Xs	--	--
urban	UR	1, 2b, 3a, 5, 6	460.3
grazing zooclimax	Zg	--	--
alkaline meadow	Ga	--	--
mine	Mi	1	24.9

Limitations of Terrestrial Ecosystem Mapping in the Lower Foothills

Hillshade and contour data layers available for the Lower Foothills Natural Region had low resolution, which limited the determination of slope position and associated moisture regime. This created difficulties in differentiating between ecosite phases that had similar canopy composition (*e.g.*, e2 vs. c2; e3 vs. c3 etc.).

4.3 Terrestrial Ecosystem Mapping Results for British Columbia

Site series and all-ecosystem units with the potential to support a Rare Ecological Community (REC) have been correlated with a rare ecological community by the BC CDC (BC MOE 2013).

4.3.1 Thompson Very Dry Hot Bunchgrass (BGxh2)

TEM results for site series mapped in the BGxh2 BGC Zone are listed in Table 4.10. TEM results for all-ecosystem units mapped in the BGxh2 BGC Zone are listed in Table 4.11.

TABLE 4.10

SITE SERIES AND POTENTIAL RARE WETLANDS IN THE BGxh2

Site Series[1]	Code	Assumed Modifiers	Atypical Modifiers	Structural Stages	Potential to Support REC	Mapped Area (ha)
Big sage – Bluebunch wheatgrass	01	d, j, k	c, w	1, 2b, 3a	Yes	651.8
Bluebunch wheatgrass – Selaginella	02	s, w	k, q, z	1, 2b, 3a	--	138.4
Py – Red three-awn	03	d	q, w	1, 3b, 5, 6	Yes	20.7
Py – Bluebunch wheatgrass	04	d	k, w	1, 3a, 3b, 4, 5, 6	Yes	80.0
Big sage – Needle-and-thread grass	05	d	k, w	1, 2b, 3a	--	251.0
Rough fescue – Bluebunch wheatgrass	06	d	k	1, 2, 2b, 3a	Yes	106.0
Act – Snowberry - Dogwood	07	d	c, k	2, 3, 3a, 3b, 5	Yes	43.6
Woolly sedge – Arctic rush	08	d	w	2, 2b	Yes	1.4
Swamp horsetail – Beaked sedge	Wm02	--	--	--	Yes	--
Cattail	Wm05	--	--	--	Yes	--
Great bulrush	Wm06	--	--	--	Yes	--
Sharp bulrush	Wm08	--	--	--	yes	--
Seacoast bulrush	Wm11	--	--	--	yes	--

Note: 1 Derived from *A Guide to Site Identification and Interpretation for the Kamloops Forest Region Land Management Handbook No. 23* (Lloyd *et al*. 1990) and *Wetlands of British Columbia: A Guide to Identification Land Management Handbook No. 52* (MacKenzie and Moran 2004).

TABLE 4.11

ALL-ECOSYSTEM UNITS IN THE BGxh2

All-Ecosystem Unit	Code	Assumed Modifiers	Atypical Modifiers	Structural Stages	Potential to Support REC	Mapped Area (ha)
cultivated field	CF	--	c	2	--	15.8
active channel flood class	Fa	--	--	1, 2	--	0.1
fringe flood class	Ff	--	c	2, 3, 3a, 3b	--	3.5
low bench flood class	Fl	--	--	--	--	--
mid-bench flood class	Fm	--	--	--	yes	--
lake	LA	--	--	--	--	--
rock cliff	Rc	s	q, w, z	1	--	3.8
pond	PD	--	--	--	--	0.9
river	RI	--	--	--	--	147.0
rock outcrop	Ro	s	k, q, w, z	1	--	29.7
rural	Ru	--	c	1, 2, 2b, 3, 5	--	138.6
rock talus	Rt	s	k, w, z	1, 2b, 3, 3a, 3b	--	7.7
road	RZ	--	--	1	--	29.2
tame pasture	TP	--	c	2	--	6.8
avalanche herb meadow	Vh	--	--	--	--	--
avalanche shrub thicket	Vs	--	--	--	--	--
avalanche treed	Vt	--	--	--	--	--
bog wetland	Wb	--	--	--	--	--
fen wetland	Wf	--	--	--	--	--
marsh wetland	Wm	--	--	2b	yes	0.2
swamp wetland	Ws	--	--	--	--	--
shallow water aquatic	Ww	--	--	--	--	--
herb disclimax	Xh	--	--	--	--	--
shrub disclimax	Xs	--	--	--	--	--
urban	UR	--	c	1, 2, 2b, 5	--	434.6
grazing zooclimax	Zg	--	--	--	--	--
alkaline meadow	Ga	--	--	--	yes	--
mine	Mi	--	w	1, 2	--	34.2

Limitations of Terrestrial Ecosystem Mapping in the BGxh2

There were limitations in differentiating between site series 05 and 01 in the BGxh2, as they have overlapping soil moisture and nutrient regimes, as well as similar vegetation and landscape positions. To enforce consistency, site series 05 was mapped primarily on mid to upper warm slopes, while site series 01 was mapped primarily on cool and neutral slopes.

4.3.2 Nicola Very Dry Warm Bunchgrass (BGxw1)

TEM results for site series mapped in the BGxw1 BGC Zone are listed in Table 4.12. TEM results for all-ecosystem units mapped in the BGxw1 BGC Zone are listed in Table 4.13.

TABLE 4.12

SITE SERIES AND POTENTIAL RARE WETLANDS IN THE BGxw1

Site Series[1]	Code	Assumed Modifiers	Atypical Modifiers	Structural Stages	Potential to Support REC	Mapped Area (ha)
Bluebunch wheatgrass – junegrass	01	d, j, k	f, w	1, 2, 2b, 3a, 3b	yes	1,425.7
Bluebunch wheatgrass – Selaginella	02	s, w	k	2, 2b, 3a	--	135.8
Py – Bluebunch wheatgrass	03	d	s, k, w	2b, 3a, 3b, 4, 5, 6	yes	259.2
Big sage – Bluebunch wheatgrass	04	d	k, w	1, 2, 2b, 3a	yes	304.8
Py – Rough fescue – Bluebunch wheatgrass	05	d	k, w	2b, 3, 3b, 4, 5, 6	yes	429.4
Rough fescue – Bluebunch wheatgrass	06	d	k, w	2, 2b, 3, 3a, 6	yes	178.9
Giant wildrye	07	d	f	2, 2b	yes	48.0
At – Snowberry - Kentucky bluegrass	08	d	c, f	2, 2b, 3, 3a, 3b, 4, 5	yes	163.6
Salt grass – Sedge	09	d	--	2, 2b	--	4.6
Awned sedge	Wm03	--	--	--	yes	--
Cattail	Wm05	--	--	5	yes	2.5
Great bulrush	Wm06	--	--	--	yes	--
Baltic rush	Wm07	--	--	--	yes	--
Bebb's willow – Bluejoint	Ws03	--	--	--	yes	--

Note: 1 Derived from *A Guide to Site Identification and Interpretation for the Kamloops Forest Region Land Management Handbook No. 23* (Lloyd *et al.* 1990) and *Wetlands of British Columbia: A Guide to Identification Land Management Handbook No. 52* (MacKenzie and Moran 2004).

TABLE 4.13

ALL-ECOSYSTEM UNITS IN THE BGxw1

All-Ecosystem Unit	Code	Assumed Modifiers	Atypical Modifiers	Structural Stages	Potential to Support REC	Mapped Area (ha)
cultivated field	CF	--	f	2, 2b	--	494.5
active channel flood class	Fa	--	c	1	--	3.1
fringe flood class	Ff	--	c	2, 3	--	0.1
low bench flood class	Fl	--	--	2, 3	yes	16.0
mid-bench flood class	Fm	--	c	2, 3, 3b, 5, 6	yes	78.5
lake	LA	--	--	--	--	8.3
rock cliff	Rc	s	d, w	1	--	0.8
pond	PD	--	--	--	--	1.0
river	RI	--	--	--	--	24.3
rock outcrop	Ro	s	w	1	--	23.6
rural	Ru	--	--	1, 2, 2b, 3a, 5, 6	--	55.8
rock talus	Rt	s	--	1, 3	--	2.7

TABLE 4.13 Cont'd

All-Ecosystem Unit	Code	Assumed Modifiers	Atypical Modifiers	Structural Stages	Potential to Support REC	Mapped Area (ha)
road	RZ	--	--	1	--	86.2
tame pasture	TP	--	f	1, 2, 2b, 3	--	144.4
avalanche herb meadow	Vh	--	--	--	--	--
avalanche shrub thicket	Vs	--	--	--	--	--
avalanche treed	Vt	--	--	--	--	--
bog wetland	Wb	--	--	--	--	--
fen wetland	Wf	--	--	--	--	--
marsh wetland	Wm	--	--	2, 2b	yes	8.3
swamp wetland	Ws	--	--	3, 3b	yes	4.9
shallow water aquatic	Ww	--	--	2	--	1.7
herb disclimax	Xh	--	--	--	--	--
shrub disclimax	Xs	--	--	--	--	--
urban	UR	--	c, f	1, 2, 2b, 3b, 5	--	187.8
grazing zooclimax	Zg	--	--	2, 3a	--	77.8
alkaline meadow	Ga	--	--	--	yes	--
mine	Mi	--	--	1	--	1.9

Limitations of Terrestrial Ecosystem Mapping in the BGxw1

There were limitations in differentiating between site series 04 and 01 in the BGxw1, in areas where imagery was of coarse resolution (from RK 897 to RK 934). These site series have overlapping soil moisture and nutrient regimes and are found in similar landscape positions but can be differentiated by vegetation cover. Field plots completed in this area during the 2013 field season substantially increased accuracy in differentiating between these site series.

4.3.3 Undifferentiated and Parkland Coastal Mountain-Heather Alpine (CMAunp)

TEM results for site series mapped in the CMAunp BGC Zone are listed in Table 4.14. No all-ecosystem units were identified in the CMAunp BGC Zone.

TABLE 4.14

SITE SERIES IN THE CMAunp

Site Series[1]	Code	Assumed Modifiers	Atypical Modifiers	Structural Stages	Potential to Support REC	Mapped Area (ha)
Alpine fellfield	Af	--	--	3	--	0.9
Alpine grassland	Ag	--	--	--	--	--
Alpine heath	Ah	--	--	2	--	12.3
Alpine meadow	Am	--	--	--	--	--
Alpine nivation	As	--	--	--	--	--
Alpine tundra	At	--	--	--	--	--
Zoogenic alpine	Az	--	--	--	--	--
Alpine wetland	Wa	--	--	--	--	--

Note: 1 Derived from Biogeoclimatic Ecosystem Classification of Non-forested Ecosystems in British Columbia Technical Report 068 (MacKenzie 2012).

Limitations of Terrestrial Ecosystem Mapping in the CMAunp

Within the Vegetation RSA, the CMAunp comprises a limited area of only 13.2 ha. There were no limitations for this area.

4.3.4 Dry Maritime Coastal Western Hemlock (CWHdm)

TEM results for site series mapped in the CWHdm BGC Zone are listed in Table 4.15. TEM results for all-ecosystem units mapped in the CWHdm BGC Zone are listed in Table 4.16.

TABLE 4.15

SITE SERIES AND POTENTIAL RARE WETLANDS IN THE CWHdm

Site Series[1]	Code	Assumed Modifiers	Atypical Modifiers	Structural Stages	Potential to Support REC	Mapped Area (ha)
Hw – Flat moss	01	d, j, k	k, q, s, w	3a, 3b, 4, 5, 6, 7	yes	270.5
FdPl – Cladina	02	s, w	--	--	yes	--
FdHw – Salal	03	d	--	5, 7	yes	18.8
Fd – Sword fern	04	d	--	--	yes	--
Cw – Sword fern	05	d	c, k, q, w	2, 3, 3a, 3b, 4, 5, 6	yes	750.4
HwCw – Deer fern	06	d	q, w	4, 5	yes	21.6
Cw – Foamflower	07	d	k, q	2b, 3, 3a, 3b, 5, 6	yes	342.5
Ss – Salmonberry	08	d	--	3, 5, 6	yes	29.0
Act – Red-osier dogwood	09	d	--	5, 6	yes	30.0
Act – Willow	10	d	--	2c, 3, 5, 6	yes	16.4
Pl – Sphagnum	11	d	--	--	--	--
CwSs – Skunk cabbage	12	d	--	--	yes	--
Cw – Salmonberry	13	d	--	--	yes	--
Cw – Black twinberry	14	d	--	--	yes	--
Cw – Slough sedge	15	d	--	--	yes	--
Cattail	Wm05	--	--	2c, 3a	yes	17.7

Notes: 1 Derived from *A Field Guide to Site Identification and Interpretation for the Vancouver Forest Region Land Management Handbook No. 28* (Green and Klinka 1994) and *Wetlands of British Columbia: A Guide to Identification Land Management Handbook No. 52* (MacKenzie and Moran 2004).

TABLE 4.16

ALL-ECOSYSTEM UNITS IN THE CWHdm

All-Ecosystem Unit	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC[1]	Mapped Area (ha)
cultivated field	CF	--	--	2, 2b	--	1,150.3
active channel flood class	Fa	--	--	--	--	--
fringe flood class	Ff	--	--	--	--	--
low bench flood class	Fl	--	--	--	--	--
mid-bench flood class	Fm	--	--	--	--	--
lake	LA	--	--	--	--	--
rock cliff	Rc	s	--	--	--	--
pond	PD	--	--	--	--	2.2
river	RI	--	--	--	--	--
rock outcrop	Ro	s	--	--	--	--
rural	Ru	--	w	1, 2, 2b, 3, 5, 6	--	457.9
rock talus	Rt	s	--	1, 5	--	3.9
road	RZ	--	--	1	--	104.1
tame pasture	TP	--	--	--	--	--
avalanche herb meadow	Vh	--	--	--	--	--
avalanche shrub thicket	Vs	--	q	3, 3b	--	6.2
avalanche treed	Vt	--	q	4	--	8.8
bog wetland	Wb	--	--	--	yes	--

TABLE 4.16 Cont'd

All-Ecosystem Unit	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC[1]	Mapped Area (ha)
fen wetland	Wf	--	--	--	--	--
marsh wetland	Wm	--	--	3a	yes	10.0
swamp wetland	Ws	--	--	--	--	--
shallow water aquatic	Ww	--	--	2, 2c	--	27.9
herb disclimax	Xh	--	--	2	--	0.9
shrub disclimax	Xs	--	--	--	--	--
urban	UR	--	--	1, 2, 2b, 5	--	129.5
grazing zooclimax	Zg	--	--	--	--	--
alkaline meadow	Ga	--	--	--	--	--
mine	Mi	--	--	1	--	71.6

Limitations of Terrestrial Ecosystem Mapping in the CWHdm

Imagery was generally of high quality in this area, however, some limitations were encountered in the classification of urban forested ecosystems. VRI was not available for western portions of this BGC subzone variant where urban areas dominate and field surveys within the CWHdm did not assess the degree of disturbance within urban forested ecosystems.

4.3.5 Southern Dry Submaritime Coastal Western Hemlock (CWHds1)

TEM results for site series mapped in the CWHds1 BGC Zone are listed in Table 4.17. TEM results for all-ecosystem units mapped in the CWHds1 BGC Zone are listed in Table 4.18.

TABLE 4.17

SITE SERIES IN THE CWHds1

Site Series[1]	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
HwFd – Cat's-tail moss	01	d, j, k	c, k, q, s, w, z	2, 3, 3a, 3b, 4, 5, 6, 7	yes	1,157.8
FdPl – Kinnikinnick	02	s, w	k, q, z	4, 5, 6	yes	90.7
FdHw – Falsebox	03	d	k, q, c, s, w, z	2, 2b, 3, 3a, 3b, 4, 5, 6, 7	yes	921.2
Fd – Fairybells	04	d	c, k, q, s, w, z	2b, 3, 3a, 4, 5, 6, 7	yes	445.5
Cw – Solomon's-seal	05	d	c, k, q, s, w, z	2b, 3, 3a, 3b, 4, 5, 6, 7	yes	1,442.0
Hw – Queen's cup	06	d	q, s, z	3a, 3b, 5, 6, 7	yes	59.2
Cw – Devil's club	07	d	k	2b, 3, 3a, 3b, 4, 5, 6	yes	318.9
Ss – Salmonberry	08	d	c	4, 5, 6	yes	51.1
Act – Red-osier dogwood	09	d	c	2b, 3, 3b, 4, 5, 6	yes	827.9
Act – Willow	10	d	--	1, 2b, 3, 3a, 3b, 4, 5, 6	yes	132.0
Pl – Sphagnum	11	d	--	--	--	--
CwSs – Skunk cabbage	12	d	--	--	yes	--

Note: 1 Derived from *A Field Guide to Site Identification and Interpretation for the Vancouver Forest Region Land Management Handbook No. 28* (Green and Klinka 1994).

TABLE 4.18

ALL-ECOSYSTEM UNITS IN THE CWHds1

All-Ecosystem Unit	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
cultivated field	CF	--	--	2a, 2b	--	537.9
active channel flood class	Fa	--	--	1	--	6.8
fringe flood class	Ff	--	--	3a	--	23.2
low bench flood class	Fl	--	--	--	--	--
mid-bench flood class	Fm	--	--	--	--	--
lake	LA	--	--	--	--	50.7
rock cliff	Rc	s	q, z	1	--	22.7
pond	PD	--	--	--	--	9.9
river	RI	--	--	--	--	1,137.1
rock outcrop	Ro	s	c, q, w, z	1	--	24.9
rural	Ru	--	c, w	1, 2, 2a, 2b, 3, 3a, 4, 5	--	313.3
rock talus	Rt	s	k, q, w, z	1	--	62.3
road	RZ	--	--	1	--	346.7
tame pasture	TP	--	--	--	--	--
avalanche herb meadow	Vh	--	q	1, 2b	--	5.0
avalanche shrub thicket	Vs	--	k, q	2, 3, 3a, 3b	--	17.7
avalanche treed	Vt	--	--	3b, 4	--	2.6
bog wetland	Wb	--	--	--	--	--
fen wetland	Wf	--	--	2b	--	23.2
marsh wetland	Wm	--	--	2b, 2c	--	17.9
swamp wetland	Ws	--	--	3, 3b	--	12.4
shallow water aquatic	Ww	--	--	--	--	--
herb disclimax	Xh	--	--	2b	--	6.1
shrub disclimax	Xs	--	--	1	--	--
urban	UR	--	--	1, 2b, 5	--	246.7
grazing zooclimax	Zg	--	--	--	--	--
alkaline meadow	Ga	--	--	--	--	--
mine	Mi	--	--	1	--	61.3

Limitations of Terrestrial Ecosystem Mapping in the CWHds1

In the CWHds1 there were abrupt transition areas between steep slopes and valley bottoms. Imagery was darkly shaded on certain steep slopes from RK 1042 to RK 1055. Best estimates were made based on the quality of the images available. Upper slopes and steep slopes were primarily mapped as site series 03 and toe slopes mapped as site series 05. The transition zones east of Hope dominated by Douglas-fir were primarily mapped as site series 03.

4.3.6 Southern Moist Submaritime Coastal Western Hemlock (CWHms1)

TEM results for site series mapped in the CWHms1 BGC Zone are listed in Table 4.19. TEM results for all-ecosystem units mapped in the CWHms1 BGC Zone are listed in Table 4.20.

TABLE 4.19

SITE SERIES IN THE CWHms1

Site Series[1]	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
HwBa – Step moss	01	d, j, k	q, z	3, 5, 6, 7	yes	104.8
FdPl – Kinnikinnick	02	s, w	k, q, z	3, 5, 6	yes	20.6
FdHw – Falsebox	03	d	q, s, w, z	3, 4, 5, 6, 7	yes	148.7
BaCw – Oak fern	04	d	q	6, 7	yes	1.0
HwBa – Queen's cup	05	d	--	5, 6, 7	--	5.5
BaCw – Devil's club	06	d	--	--	yes	--
Ss – Salmonberry	07	d	--	--	yes	--
Act – Red-osier dogwood	08	d	--	--	yes	--
Act – Willow	09	d	--	--	yes	--
Pl – Sphagnum	10	d	--	--	--	--
CwSs – Skunk cabbage	11	d	--	--	yes	--

Note: 1 Derived from *A Field Guide to Site Identification and Interpretation for the Vancouver Forest Region Land Management Handbook No. 28* (Green and Klinka 1994).

TABLE 4.20

ALL-ECOSYSTEM UNITS IN THE CWHms1

All-Ecosystem Unit	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
cultivated field	CF	--	--	--	--	--
active channel flood class	Fa	--	--	--	--	--
fringe flood class	Ff	--	--	--	--	--
low bench flood class	Fl	--	--	--	--	--
mid-bench flood class	Fm	--	--	--	--	--
lake	LA	--	--	--	--	--
rock cliff	Rc	s	q	1	--	5.7
pond	PD	--	--	--	--	--
river	RI	--	--	--	--	--
rock outcrop	Ro	s	--	--	--	--
rural	Ru	--	--	--	--	--
rock talus	Rt	s	q, s	1, 3	--	6.9
road	RZ	--	--	--	--	--
tame pasture	TP	--	--	--	--	--
avalanche herb meadow	Vh	--	z	1, 3	--	4.3
avalanche shrub thicket	Vs	--	q, z	3	--	8.3
avalanche treed	Vt	--	--	4	--	3.4
bog wetland	Wb	--	--	--	--	--
fen wetland	Wf	--	--	--	--	--
marsh wetland	Wm	--	--	--	--	--
swamp wetland	Ws	--	--	--	--	--
shallow water aquatic	Ww	--	--	--	--	--
herb disclimax	Xh	--	--	--	--	--
shrub disclimax	Xs	--	--	--	--	--
urban	UR	--	--	--	--	--
grazing zooclimax	Zg	--	--	--	--	--
alkaline meadow	Ga	--	--	--	--	--
mine	Mi	--	--	--	--	--

Limitations of Terrestrial Ecosystem Mapping in the CHWms1

No limitations were encountered for TEM within the CWHms1.

4.3.7 Eastern Very Dry Maritime Coastal Western Hemlock (CWHxm1)

TEM results for site series mapped in the CWHxm1 BGC Zone are listed in Table 4.21. TEM results for all-ecosystem units mapped in the CWHxm1 BGC Zone are listed in Table 4.22.

TABLE 4.21

SITE SERIES AND POTENTIAL RARE WETLANDS IN THE CWHxm1

Site Series[1]	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
HwFd – Kindbergia	01	d, j, k	--	1, 2, 2b, 3, 3a, 3b, 4, 5, 6	yes	789.3
FdPl – Cladina	02	s, w	z	5	yes	1.3
FdHw – Salal	03	d	--	--	yes	--
Fd – Sword fern	04	d	w, z	3, 3b, 5	--	20.1
Cw – Sword fern	05	d	k, q, w, z	2, 3, 4, 5, 6	yes	693.7
HwCw – Deer fern	06	d	--	--	yes	--
Cw – Foamflower	07	d	k, w	3, 3a, 3b, 4, 5, 6	yes	663.7
Ss – Salmonberry	08	d	--	3, 3b, 5, 6	yes	75.7
Act – Red-osier dogwood	09	d	--	3, 3b, 5	yes	54.4
Act – Willow	10	d	--	3, 3a, 3b, 4, 5	yes	65.9
Pl – Sphagnum	11	d	--	3b	yes	3.5
CwSs – Skunk cabbage	12	d	--	3, 3a, 3b, 5	yes	67.1
Cw – Salmonberry	13	d	--	3, 6	yes	34.3
Cw – Black twinberry	14	d	--	--	yes	--
Cw – Slough sedge	15	d	--	5	--	3.7
Labrador tea – Bog-laurel – Peat-moss	Wb50	--	--	--	yes	--
Hudson Bay clubrush – Red hook-moss	Wf10	--	--	--	yes	--
Sweet gale – Sitka sedge	Wf52	--	--	3	yes	2.9
Slender sedge – White beak-rush	Wf53	--	--	3	yes	0.9
Cattail	Wm05	--	--	2, 3, 3a	yes	2.6
Great bulrush	Wm06	--	--	--	yes	--
Inflated sedge	Wm09	--	--	--	yes	--
Sitka sedge – Hemlock-parsley	Wm50	--	--	1, 2, 3	yes	19.7

Note: 1 Derived from *A Field Guide to Site Identification and Interpretation for the Vancouver Forest Region Land Management Handbook No. 28* (Green and Klinka 1994) and *Wetlands of British Columbia: A Guide to Identification Land Management Handbook No. 52* (MacKenzie and Moran 2004).

TABLE 4.22

ALL-ECOSYSTEM UNITS IN THE CWHxm1

All-Ecosystem Unit	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
cultivated field	CF	--	--	1, 2, 3, 3a, 3b, 4, 5	--	5,168.3
active channel flood class	Fa	--	--	1	--	1.0
fringe flood class	Ff	--	--	--	--	--
low bench flood class	Fl	--	--	--	--	--

TABLE 4.22 Cont'd

All-Ecosystem Unit	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
mid-bench flood class	Fm	--	--	--	--	--
lake	LA	--	--	--	--	1.9
rock cliff	Rc	s	--	--	--	--
pond	PD	--	--	--	--	36.5
river	RI	--	--	--	--	142.1
rock outcrop	Ro	s	--	1	--	1.7
rural	Ru	--	--	1, 2, 2a, 2b, 3, 3a, 3b, 4, 5	--	1,542.8
rock talus	Rt	s	--	--	--	--
road	RZ	--	--	1	--	97.1
tame pasture	TP	--	--	1, 2, 2b, 3, 3a, 3b, 5	--	1,009.9
avalanche herb meadow	Vh	--	--	--	--	--
avalanche shrub thicket	Vs	--	--	--	--	--
avalanche treed	Vt	--	--	--	--	--
bog wetland	Wb	--	--	--	yes	--
fen wetland	Wf	--	--	3	yes	5.5
marsh wetland	Wm	--	--	2, 3, 3a	yes	74.1
swamp wetland	Ws	--	--	--	yes	--
shallow water aquatic	Ww	--	--	--	--	--
herb disclimax	Xh	--	--	--	--	--
shrub disclimax	Xs	--	--	--	--	--
urban	UR	--	--	1, 2, 2b, 3, 3a, 3b, 5	--	1,689.5
grazing zooclimax	Zg	--	--	--	--	--
alkaline meadow	Ga	--	--	--	--	--
mine	Mi	--	--	1, 2	--	19.1

Limitations of Terrestrial Ecosystem Mapping in the CWHxm1

Within the CWHxm1 there were limitations in differentiating between site series 05 and 01, as they have overlapping soil moisture regimes and also overlap somewhat in slope position. The presence of red alder in the canopy distinguishes site series 05 from the 01; however, VRI was limited for most of the study area and distinguishing red alder from bigleaf maple based strictly on photo interpretation was challenging. For consistency, site series 05 was mapped primarily on moderate slopes with a mixed or deciduous canopy; site series 01 was mapped primarily on gentle slopes with a coniferous canopy or where VRI indicated red alder was not present in the canopy. Site series 07 was mapped in gullies and toe slopes. The use of site series 06 was largely avoided in areas where it was suspected to be present when there was no field data to confirm the presence or absence of rich understory vegetation. The quality of imagery from RK 1088 to RK 1100 made it challenging to interpret structural stage for the extensive cultivated fields in this area. In general, where texture was limited darker fields were mapped as structural stage 3 and lighter fields were classified as structural stage 2. Extensive irrigation channels in agricultural fields were assumed to be slow-flowing and wetland-like instead of fast-flowing and stream-like. These channels were primarily mapped as marsh wetlands (Wm).

4.3.8 Raush Moist Mild Engelmann Spruce - Subalpine Fir (ESSFmm1)

TEM results for site series mapped in the ESSFmm1 BGC Zone are listed in Table 4.23. TEM results for all-ecosystem units mapped in the ESSFmm1 BGC Zone are listed in Table 4.24.

TABLE 4.23

SITE SERIES IN THE ESSFmm1

Site Series[1]	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
Bl – Azalea – Gooseberry	01	d, j, k	--	3, 5, 6	--	40.4
Bl – Huckleberry – Feathermoss	02	s, w	--	3, 6	--	0.6
BlPl – Cladina	03	d	--	--	yes	--
Bl – Azalea – Rhododendron	04	d	k, q	3b, 4, 5, 6	--	21.7
Bl – Oak fern – Bramble	05	d	--	--	--	--
Bl – Devil's club – Lady fern	06	d	--	--	--	--
Bl – Labrador tea – Horsetail	07	d	--	--	--	--

Note: 1 Derived from Draft Land Management Handbook No. 15 Update for the ESSFmm1 (BC MOFLNRO 2007a).

TABLE 4.24

ALL-ECOSYSTEM UNITS IN THE ESSFmm1

All-Ecosystem Unit	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
cultivated field	CF	--	--	--	--	--
active channel flood class	Fa	--	--	--	--	--
fringe flood class	Ff	--	--	--	--	--
low bench flood class	Fl	--	--	--	--	--
mid-bench flood class	Fm	--	--	--	--	--
lake	LA	--	--	--	--	--
rock cliff	Rc	s	--	--	--	--
pond	PD	--	--	--	--	--
river	RI	--	--	--	--	--
rock outcrop	Ro	s	--	1	--	0.4
rural	Ru	--	--	--	--	--
rock talus	Rt	s	w	--	--	0.1
road	RZ	--	--	--	--	--
tame pasture	TP	--	--	--	--	--
avalanche herb meadow	Vh	--	--	--	--	--
avalanche shrub thicket	Vs	--	--	3b	--	3.0
avalanche treed	Vt	--	--	--	--	--
bog wetland	Wb	--	--	--	--	--
fen wetland	Wf	--	--	--	--	--
marsh wetland	Wm	--	--	--	--	--
swamp wetland	Ws	--	--	--	--	--
shallow water aquatic	Ww	--	--	--	--	--
herb disclimax	Xh	--	--	--	--	--
shrub disclimax	Xs	--	--	--	--	--
urban	UR	--	--	--	--	--
grazing zooclimax	Zg	--	--	--	--	--
alkaline meadow	Ga	--	--	--	--	--
mine	Mi	--	--	--	--	--

Limitations of Terrestrial Ecosystem Mapping in the ESSFmm1

Within the Vegetation RSA, the ESSFmm1 comprises a narrow, limited zone above the ICHmm of approximately 67 ha. Mapper experience suggested the mapping area is likely a low elevation expression of the ESSF variant, but most sites were on steep and cool slopes and fit the site series 04 concept well.

4.3.9 Moist Warm Engelmann Spruce - Subalpine Fir (ESSFmw)

TEM results for site series mapped in the ESSFmw BGC Zone are listed in Table 4.25. TEM results for all-ecosystem units mapped in the ESSFmw BGC Zone are listed in Table 4.26.

TABLE 4.25

SITE SERIES AND POTENTIAL RARE WETLANDS IN THE ESSFmw

Site Series[1]	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
BlBa – Rhododendron	01	d, j, k	w	3b, 4, 5, 6, 7	--	140.3
BlPl – Juniper – Rhacomitrium	02	s, w	z	3b	--	2.0
Fd – Falsebox – Pinegrass	03	d	--	3b	--	1.6
Bl – Huckleberry – Falsebox	04	d	w	3b, 4, 5, 6	--	40.4
BlBa – Azalea – Pipecleaner moss	05	d	--	7	--	1.2
Bl – Gooseberry – Valerian	06	d	--	--	--	--
BlBa – Oak fern – Lady fern	07	d	--	--	--	--
Bl – Gooseberry – Horsetail	08	d	--	--	--	--
Water sedge – Beaked sedge	Wf01	--	--	--	yes	--
Water sedge – Peat-moss	Wf03	--	--	--	yes	--
Barclay's willow – Water sedge – Glow moss	Wf04	--	--	--	yes	--
Narrow-leaved cotton-grass – Marsh-marigold	Wf12	--	--	--	yes	--
Narrow-leaved cotton-grass – Shore sedge	Wf13	--	--	--	yes	--
Beaked sedge – Water sedge	Wm01	--	--	--	yes	--
Swamp horsetail – Beaked sedge	Wm02	--	--	--	yes	--

Note: 1 Derived from *A Guide to Site Identification and Interpretation for the Kamloops Forest Region Land Management Handbook No. 23* (Lloyd *et al*. 1990) and *Wetlands of British Columbia: A Guide to Identification Land Management Handbook No. 52* (MacKenzie and Moran 2004).

TABLE 4.26

ALL-ECOSYSTEM UNITS IN THE ESSFmw

All-Ecosystem Unit	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
cultivated field	CF	--	--	--	--	--
active channel flood class	Fa	--	--	--	--	--
fringe flood class	Ff	--	--	--	--	--
low bench flood class	Fl	--	--	--	--	--
mid- bench flood class	Fm	--	--	--	--	--
Lake	LA	--	--	--	--	--
rock cliff	Rc	s	w	1	--	0.4
Pond	PD	--	--	--	--	--
River	RI	--	--	--	--	--
rock outcrop	Ro	s	w	1, 5	--	6.7
Rural	Ru	--	--	--	--	--
rock talus	Rt	s	q, w	1	--	3.0
Road	RZ	--	--	1	--	15.7
tame pasture	TP	--	--	--	--	--
avalanche herb meadow	Vh	--	--	2a	--	6.0
avalanche shrub thicket	Vs	--	k	3a, 3b	--	11.6
avalanche treed	Vt	--	--	5, 6	--	2.1
bog wetland	Wb	--	--	--	--	--
fen wetland	Wf	--	--	--	yes	--
marsh wetland	Wm	--	--	--	yes	--

TABLE 4.26 Cont'd

All-Ecosystem Unit	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
swamp wetland	Ws	--	--	--	--	--
shallow water aquatic	Ww	--	--	--	--	--
herb disclimax	Xh	--	--	--	--	--
shrub disclimax	Xs	--	--	--	--	--
Urban	UR	--	--	--	--	--
grazing zooclimax	Zg	--	--	--	--	--
alkaline meadow	Ga	--	--	--	--	--
mine	Mi	--	--	--	--	--

Limitations of Terrestrial Ecosystem Mapping in the ESSFmw

Imagery in the ESSFmw contained snow cover, limiting the delineation and attribution of site series in this area.

4.3.10 Cascade Moist Warm Engelmann Spruce - Subalpine Fir (ESSFmw1)

TEM results for site series mapped in the ESSFmw1 BGC Zone are listed in Table 4.27. TEM results for all-ecosystem units mapped in the ESSFmw1 BGC Zone are listed in Table 4.28.

TABLE 4.27

SITE SERIES AND POTENTIAL RARE WETLANDS IN THE ESSFmw1

Site Series[1]	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
BlBa – Rhododendron – Five-leaved bramble	01.1	d	w	3a, 3b, 5, 6	--	67.2
BlBa – Huckleberry – Five-leaved bramble	01.2	j, d	k	3a, 3b, 5, 6	--	413.2
Pl – Juniper – Kinnikinnick	02	s, j, c	z	3a, 5, 6	--	8.6
PlFd – Falsebox – Pinegrass	03	z, c,d	--	--	--	--
Bl – Huckleberry – Grouseberry	04	c,d	--	5, 6	--	9.5
Bl – Gooseberry – Valerian	05	j, d	--	3a, 6	--	16.4
Se – Horsetail	06	d	--	--	--	--
Alder – Lady fern	Av01	q, c	--	--	--	--
Alder – Thimbleberry	Av03	c	--	--	--	--
Cow parsnip – Hellebore	Av08	j	--	--	--	--
Fireweed – Bluejoint reedgrass	Av09	j	--	--	--	--
Rock-moss – Clad lichens	Rt03	s	--	--	--	--
Juniper– Kinnikinnick – Subalpine fir	Ro05	s, j, c	--	--	--	--
Grouseberry – Clad lichens	Ro10	s, j, c	--	--	--	--
Water sedge – Beaked sedge	Wf01	--	--	--	--	--
Water sedge – Peat moss	Wf03	--	--	--	--	--
Barclay's willow – Water sedge – Glow moss	Wf04	--	--	--	--	--
Narrow-leaved cotton-grass – Marsh-marigold	Wf12	--	--	--	--	--
Narrow-leaved cotton-grass – Shore sedge	Wf13	--	--	--	--	--
Beaked sedge – Water sedge	Wm01	--	--	--	--	--
Bluejoint reedgrass	Wm15	--	--	--	--	--
Pond-lily	Ww01	--	--	--	--	--

Note: 1 Derived from Draft Site Classification for the 52 Biogeoclimatic Units in the Southern Interior Forest Region (Lloyd *et al.* 2005) and *Wetlands of British Columbia: A Guide to Identification Land Management Handbook No. 52* (MacKenzie and Moran 2004).

TABLE 4.28

ALL-ECOSYSTEM UNITS IN THE ESSFmw1

All-Ecosystem Unit	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
cultivated field	CF	--	--	--	--	--
active channel flood class	Fa	--	--	--	--	--
fringe flood class	Ff	--	--	--	--	--
low bench flood class	Fl	--	--	--	--	--
mid-bench flood class	Fm	--	--	--	--	--
lake	LA	--	--	--	--	--
rock cliff	Rc	s	--	--	--	--
pond	PD	--	--	--	--	--
river	RI	--	--	--	--	--
rock outcrop	Ro	s	w	1	--	1.4
rural	Ru	--	--	--	--	--
rock talus	Rt	s	z	1	--	6.6
road	RZ	--	k, w	1	--	12.0
tame pasture	TP	--	--	--	--	--
avalanche herb meadow	Vh	--	--	--	--	--
avalanche shrub thicket	Vs	--	--	--	--	--
avalanche treed	Vt	--	--	5	--	1.8
bog wetland	Wb	--	--	3b, 5	--	2.0
fen wetland	Wf	--	--	--	--	--
marsh wetland	Wm	--	--	--	--	--
swamp wetland	Ws	--	--	--	--	--
shallow water aquatic	Ww	--	--	--	--	--
herb disclimax	Xh	--	--	--	--	--
shrub disclimax	Xs	--	k, w, z	3, 3a, 3b	--	49.0
urban	UR	--	--	--	--	--
grazing zooclimax	Zg	--	--	3b	--	0.2
alkaline meadow	Ga	--	--	--	--	--
mine	Mi	--	--	--	--	--

Limitations of Terrestrial Ecosystem Mapping in the ESSFmw1

Imagery in the ESSFmw1 contained snow cover, limiting the delineation and attribution of site series in this area.

Site series 02 and 03 in this variant overlap in soil moisture regime and landscape position, which limited their differentiation. For consistency, on steep slopes site series 02 was mapped primarily on cool and neutral aspects and site series 03 was mapped primarily on warm aspects, provided that VRI data indicated pure lodgepole pine stands. Steep slopes with warm aspects and mixed coniferous forests were mapped primarily as site series 03.

Site series 01.1 and 01.2 in the ESSFmw1 share identical soil moisture and nutrient regimes and occupy similar landscape positions. These site series are distinguished by the species composition of their shrub-layer but this information generally cannot be interpreted via aerial imagery. For consistency, site series 01.1 was mapped on moderate slopes with warm aspects and site series 01.2 was mapped on gentle and moderate slopes with neutral or cool aspects.

4.3.11 Northern Monashee Wet Cold Engelmann Spruce - Subalpine Fir (ESSFwc2)

TEM results for site series mapped in the ESSFwc2 BGC Zone are listed in Table 4.29. No all-ecosystem units were identified in the ESSFwc2 BGC Zone.

TABLE 4.29

SITE SERIES IN THE ESSFwc2

Site Series[1]	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
Bl – Azalea – Oak fern	01	d, j, k	--	3a, 6	--	9.7
Bl – Huckleberry – Heron's- bill moss	02	s, w	--	--	--	--
Bl – Rhododendron – Heron's-bill moss	03	d	--	--	--	--
Bl – Valerian – Oak fern	04	d	--	--	--	--
Grouseberry – Clad lichens	05	d	--	--	--	--
Bl – Lady fern – Oak fern	06	d	--	--	--	--
Bl – Valerian – Arrow-leaved groundsel	07	d	--	--	--	--
Pl – Dwarf blueberry – Peat-moss	08	d	--	--	--	--
Bl – Horsetail	09	d	--	--	yes	--
Bl – Bluejoint	10	d	--	--	--	--
Rocktripe lichens – Rock-moss	72	s	--	--	--	--
Huckleberry – Rock-moss	73	s	--	--	--	--
Alder – Showy sedge	74	--	--	--	--	--
Alder – Lady fern	75	--	--	--	--	--
Willow – Mitrewort	76	--	--	--	--	--
Valerian – Showy sedge	77	--	--	--	--	--
Bluejoint – Fireweed	78	--	--	--	--	--
Lady fern – Hellebore	79	--	--	--	--	--
Valerian – Subalpine daisy	92	--	--	--	--	--

Note: 1 Derived from Draft Site Classification for the 52 Biogeoclimatic Units in the Southern Interior Forest Region (Lloyd *et al.* 2005).

Limitations of Terrestrial Ecosystem Mapping in the ESSFwc2

Within the Vegetation RSA, the ESSFwc2 comprises a limited area of 9.7 ha. There were no limitations for this area.

4.3.12 North Thompson Dry Warm Interior Cedar - Hemlock (ICHdw3)

TEM results for site series mapped in the ICHdw3 BGC Zone are listed in Table 4.30. TEM results for all-ecosystem units mapped in the ICHdw3 BGC Zone are listed in Table 4.31.

TABLE 4.30

SITE SERIES IN THE ICHdw3

Site Series[1]	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
FdCwHw – Falsebox – Feathermoss	01	d, j, k	c, q, s, w, z	2, 3, 3a, 3b, 4, 5, 6, 7	--	2,856.3
FdPl – Falsebox – Pinegrass	02	s, w	c, z	2, 3, 5, 7	--	49.6
FdPl – Falsebox – Feathermoss	03	d	c, q, s, w, z	1, 2, 3, 3a, 3b, 4, 5, 6, 7	--	1,961.6
CwHw – Oak fern	04	d	c, k, q, s, w	1, 2, 2b, 3, 3a, 3b, 4, 5, 6, 7	--	772.6
Act – Dogwood – Lady fern	05	d	s	2, 3, 3b, 4, 5, 6, 7	--	288.3
CwSx – Devil's club – Lady fern	06	d	--	3, 3b, 5, 6, 7	--	70.6
CwSxw – Skunk cabbage	07	d	--	3, 3b, 5, 6	--	40.0
Aspen – Awned haircap moss	72	s	--	--	--	--
Heron's-bill moss – Clad lichens	73	s	w	2	--	3.8
$EpAt – Falsebox – Thimbleberry	01ys	d	q, w	6, 7	--	105.8
$At – Soopollallie – Pinegrass	03ys	d	s, w, z	5, 6	--	157.1

Notes: 1 Derived from Draft Site Classification for the 52 Biogeoclimatic Units in the Southern Interior Forest Region (Lloyd *et al.* 2005).

TABLE 4.31

ALL-ECOSYSTEM UNITS IN THE ICHdw3

All-Ecosystem Unit	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
cultivated field	CF	--	--	2b	--	28.0
active channel flood class	Fa	--	--	--	--	--
fringe flood class	Ff	--	--	--	--	--
low bench flood class	Fl	--	--	3, 3b	--	18.0
mid-bench flood class	Fm	--	--	6	--	0.5
lake	LA	--	--	--	--	9.6
rock cliff	Rc	s	--	--	--	--
pond	PD	--	--	--	--	8.0
river	RI	--	--	--	--	518.3
rock outcrop	Ro	s	w	2	--	4.1
rural	Ru	--	--	1, 2	--	18.7
rock talus	Rt	s	--	--	--	--
road	RZ	--	--	1, 2	--	222.0
tame pasture	TP	--	--	2, 2b	--	59.5
avalanche herb meadow	Vh	--	--	--	--	--
avalanche shrub thicket	Vs	--	--	--	--	--
avalanche treed	Vt	--	--	--	--	--
bog wetland	Wb	--	--	3b	--	3.7
fen wetland	Wf	--	--	2, 3, 3a	--	70.9
marsh wetland	Wm	--	--	2	--	74.8
swamp wetland	Ws	--	--	2, 3, 3a, 3b, 6	--	152.0
shallow water aquatic	Ww	--	--	--	--	--
herb disclimax	Xh	--	--	--	--	--
shrub disclimax	Xs	--	--	--	--	--
urban	UR	--	--	--	--	--
grazing zooclimax	Zg	--	--	--	--	--
alkaline meadow	Ga	--	--	--	--	--
mine	Mi	--	--	1, 2, 3	--	6.3

Limitations of Terrestrial Ecosystem Mapping in the ICHdw3

Polygon delineation within the ICHdw3 was limited by the lack of obvious natural features to use as boundaries. Mappers used profession judgement and contour lines to delineate polygons. It was challenging to assess “wetting up the ecosystems” in toe slopes, creek draws and around wetlands. On moderate or steep warm slopes where creeks were present, there was a need to field verify soil moisture regime in order to differentiate site series 04, 01 and 03. Field work successfully clarified the differentiation of these site series.

4.3.13 Thompson Moist Cool Interior Cedar - Hemlock (ICHmk2)

TEM results for site series mapped in the ICHmk2 BGC Zone are listed in Table 4.32. No all-ecosystem units were identified in the ICHmk2 BGC Zone.

TABLE 4.32

SITE SERIES IN THE ICHmk2

Site Series[1]	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
CwSxw – Falsebox – Knight's plume	01	d, j, k	w	3a, 3b, 4, 5, 6	yes	120.0
FdPl – Pinegrass – Kinnikinnick	02	s, w	--	--	--	--
FdPl – Falsebox – Pinegrass	03	d	--	--	--	--
FdPl – Falsebox – Feathermoss	04	d	w	3a, 3b, 5, 6	yes	49.3
CwSxw – Oak fern – Bunchberry	05	d	--	--	yes	--
CwSxw – Devil's club – Oak fern	06	d	--	--	--	--
Sxw – Horsetail	07	d	--	--	--	--
Heron's-bill moss – Clad lichens	72	s	--	--	--	--
Juniper – Kinnikinnick	73	s	--	--	--	--
$AtEp – Twinflower	01YS	d	--	--	--	--

Note: 1 Derived from Draft Site Classification for the 52 Biogeoclimatic Units in the Southern Interior Forest Region (Lloyd *et al.* 2005).

Limitations of Terrestrial Ecosystem Mapping in the ICHmk2

Within the ICHmk2, site series 04 and 01 overlap in soil moisture and nutrient regime, and also landscape position to a certain extent, which posed some limitations to mapping. For consistency, site series 04 was mapped primarily on warm slopes and upper slopes with neutral or cool aspects.

4.3.14 Moist Mild Interior Cedar - Hemlock (ICHmm)

TEM results for site series mapped in the ICHmm BGC Zone are listed in Table 4.33. TEM results for all-ecosystem units mapped in the ICHmm BGC Zone are listed in Table 4.34.

TABLE 4.33

SITE SERIES IN THE ICHmm

Site Series[1]	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
HwCw – Spruce – Step moss	01	d, j, k	q, w	1, 3, 3a, 3b, 4, 5, 6, 7	--	1,799.8
CwSxw – Soopolallie	02	s, w	--	4, 5, 6	yes	22.4
HwCw – Step moss	03	d	k, q	3, 3a, 4, 5	--	132.4
CwHw – Oak fern	04	d	j, k, q, w	3a, 4, 5, 6, 7	--	433.3
CwHw – Devil's club – Oak fern	05	d	k	3b, 4, 5, 6, 7	--	46.2
CwSxw – Devil's club – Horsetail	06	d	j	3a, 6, 7	--	40.4
SbPl – Bog-laurel – Sphagnum	07	d	--	3a	yes	1.4
CwSxw – Skunk cabbage – Sphagnum	08	d	--	5	yes	0.2

Notes: 1 Derived from Draft Land Management Handbook No. 15 Update for the ICHmm (BC MFLNRO 2007b).

TABLE 4.34

ALL-ECOSYSTEM UNITS IN THE ICHmm

All-Ecosystem Unit	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
cultivated field	CF	--	--	1	--	0.4
active channel flood class	Fa	--	--	--	--	--
fringe flood class	Ff	--	--	--	--	--
low bench flood class	Fl	--	--	--	--	--

TABLE 4.34 Cont'd

All-Ecosystem Unit	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
mid-bench flood class	Fm	--	--	--	--	--
lake	LA	--	--	--	--	--
rock cliff	Rc	s	--	--	--	--
pond	PD	--	w	--	--	1.4
river	RI	--	--	--	--	--
rock outcrop	Ro	s	--	--	--	--
rural	Ru	--	--	--	--	--
rock talus	Rt	s	--	--	--	--
road	RZ	--	--	1	--	9.7
tame pasture	TP	--	--	--	--	--
avalanche herb meadow	Vh	--	--	--	--	--
avalanche shrub thicket	Vs	--	--	--	--	--
avalanche treed	Vt	--	--	--	--	--
bog wetland	Wb	--	--	--	--	--
fen wetland	Wf	--	--	--	--	--
marsh wetland	Wm	--	--	3	--	1.9
swamp wetland	Ws	--	--	2	--	3.4
shallow water aquatic	Ww	--	--	--	--	--
herb disclimax	Xh	--	--	--	--	--
shrub disclimax	Xs	--	--	--	--	--
urban	UR	--	--	--	--	--
grazing zooclimax	Zg	--	--	--	--	--
alkaline meadow	Ga	--	--	--	--	--
mine	Mi	--	--	--	--	--

Limitations of Terrestrial Ecosystem Mapping in the ICHmm

No limitations were encountered for TEM within the ICHmm.

4.3.15 Thompson Moist Warm Interior Cedar - Hemlock (ICHmw3)

TEM results for site series mapped in the ICHmw3 BGC Zone are listed in Table 4.35. TEM results for all-ecosystem units mapped in the ICHmw3 BGC Zone are listed in Table 4.36.

TABLE 4.35

SITE SERIES IN THE ICHmw3

Site Series[1]	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
HwCw – Falsebox – Feathermoss	01	d, j, k	c, q, s, w, z	1, 2, 3, 3a, 3b, 4, 5, 6, 7	--	3,283.2
Fd – Juniper – Kinnikinnick	02	s, w	--	--	--	--
Pl – Velvet-leaved blueberry – Feathermoss	03	d	--	--	--	--
FdPl – Falsebox – Pinegrass	04	d	--	--	--	--
FdPl – Falsebox – Feathermoss	05	d	s, w, z	1, 2, 3, 3b, 4, 5, 6, 7	--	616.9
CwHw – Oak fern	06	d	k, q, w, z	2, 3, 3a, 3b, 4, 5, 6, 7	--	866.2
CwAct – Thimbleberry – Sarsaparilla	07	d	--	5, 6, 7	--	32.2
CwHw – Devil's club – Lady fern	08	d	--	2, 3, 3b, 4, 5, 6, 7	--	228.0
Act – Dogwood – Horsetail	09	d	--	7	--	77.0
CwHw – Horsetail	10	d	--	--	--	--
CwHw – Skunk cabbage	11	d	--	6	--	6.2

TABLE 4.35 Cont'd

Site Series[1]	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
Sb – Labrador tea – Peat-moss	12	d	--	2, 3b, 5	--	25.5
HwSxw – Labrador tea – Peat-moss	13	d	--	1, 2, 3a, 3b, 4, 6	--	75.4
Awned haircap moss – Clad lichens	72	s	--	3b	--	0.2
Rock moss – Clad lichens	73	s	--	1	--	3.6
Oatgrass – kinnikinnick	82	w	--	--	--	--
$CwHwfd – Falsebox	01ms	d, j, k	q, w	4, 6, 7	--	568.7

Note: 1 Derived from Draft Site Classification for the 52 Biogeoclimatic Units in the Southern Interior Forest Region (Lloyd *et al.* 2005).

TABLE 4.36

ALL-ECOSYSTEM UNITS IN THE ICHmw3

All-Ecosystem Unit	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
cultivated field	CF	--	--	5	--	12.4
active channel flood class	Fa	--	--	--	--	--
fringe flood class	Ff	--	--	--	--	--
low bench flood class	Fl	--	--	3	--	4.1
mid-bench flood class	Fm	--	--	4, 6, 7	--	47.3
lake	LA	--	--	--	--	20.3
rock cliff	Rc	s	--	--	--	--
pond	PD	--	--	2	--	5.3
river	RI	--	--	--	--	256.2
rock outcrop	Ro	s	--	--	--	--
rural	Ru	--	--	1, 2	--	47.7
rock talus	Rt	s	--	--	--	--
road	RZ	--	--	1, 3, 6	--	231.6
tame pasture	TP	--	--	--	--	--
avalanche herb meadow	Vh	--	--	--	--	--
avalanche shrub thicket	Vs	--	--	--	--	--
avalanche treed	Vt	--	--	--	--	--
bog wetland	Wb	--	--	3, 5, 6, 7	yes	40.4
fen wetland	Wf	--	--	2, 3, 3a	yes	98.3
marsh wetland	Wm	--	--	2, 3, 3a	yes	75.8
swamp wetland	Ws	--	--	3, 3b, 6, 7	--	90.9
shallow water aquatic	Ww	--	--	--	--	2.3
herb disclimax	Xh	--	--	--	--	--
shrub disclimax	Xs	--	--	--	--	--
urban	UR	--	--	1	--	65.2
grazing zooclimax	Zg	--	--	--	--	--
alkaline meadow	Ga	--	--	--	--	--
mine	Mi	--	--	1, 2	--	11.2

Limitations of Terrestrial Ecosystem Mapping in the ICHmw3

Within the ICHmw3, assessing the soil moisture regime around Blue River was challenging. Best estimates and field verification were employed. In this area there is an abrupt transition area between a steep slope and valley bottom, resulting in a lack of zonal site series and the presence of many of the infrequent wetter site series. For consistency, upper slopes and steep slopes were mapped primarily as site series 03 and toe slopes were mapped primarily as site series 05. Distinguishing site series 01 from 05 on lower, moderate slopes with a warm aspect was difficult and field verification was necessary to successfully classify these areas. Field work also confirmed the presence of site series 06 in polygons with TRIM streams and those on gentle slopes with neutral aspect and toe slopes with cool aspect.

4.3.16 Mica Very Wet Cool Interior Cedar Hemlock (ICHvk1)

TEM results for site series mapped in the ICHvk1 BGC Zone are listed in Table 4.37. TEM results for all-ecosystem units mapped in the ICHvk1 BGC Zone are listed in Table 4.38.

TABLE 4.37

SITE SERIES IN THE ICHvk1

Site Series[1]	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
CwHw – Devil's club – Lady fern	01	d, j, k	q, w	3, 3a, 3b, 4, 5, 6, 7	--	1,900.6
HwCw – Feathermoss	02	s, w	--	--	--	--
HwCw – Azalea – Feathermoss	03	d	z	3, 5	--	17.2
HwCw – Oak fern	04	d	w	3, 4, 5, 6, 7	--	56.4
CwHw – Spiny wood fern – Oak fern	05	d	k, w	3, 3a, 3b, 4, 5, 6, 7	--	414.1
Sxw – Thimbleberry - Oak fern	06	d	--	--	--	--
Sxw – Devil's club	07	d	--	--	--	--
Sxw – Dogwood – Horsetail	08	d	a	3b, 4, 5, 6, 7	--	67.5
CwHw – Skunk cabbage	09	d	--	--	--	--
Sxw – Bulrush	10	d	--	6	--	1.1
Rocktripe lichens – Rock-moss	72	s	--	--	--	--
Rock-moss – Clad lichens	73	s	--	--	--	--
Dogwood – Thimbleberry	74	--	--	--	--	--
Willow – Lady fern	75	--	--	--	--	--
Alder – Lady fern	76	--	--	--	--	--
Devil's club – Oak fern	77	--	--	--	--	--
Indian hellebore – Bluejoint	78	--	--	--	--	--

Note: 1 Derived from Draft Site Classification for the 52 Biogeoclimatic Units in the Southern Interior Forest Region (Lloyd *et al.* 2005).

TABLE 4.38

ALL-ECOSYSTEM UNITS IN THE ICHvk1

All-Ecosystem Unit	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
cultivated field	CF	--	--	--	--	--
active channel flood class	Fa	--	--	--	--	--
fringe flood class	Ff	--	--	--	--	--
low bench flood class	Fl	--	--	--	yes	--
mid-bench flood class	Fm	--	--	--	--	--
lake	LA	--	--	--	--	--
rock cliff	Rc	s	--	--	--	--
pond	PD	--	--	--	--	--
river	Rl	--	--	--	--	--
rock outcrop	Ro	s	--	--	--	--
rural	Ru	--	--	--	--	--
rock talus	Rt	s	--	--	--	--
road	RZ	--	--	--	--	--
tame pasture	TP	--	--	--	--	--
avalanche herb meadow	Vh	--	--	--	--	--
avalanche shrub thicket	Vs	--	--	3b	--	2.1
avalanche treed	Vt	--	--	--	--	--
bog wetland	Wb	--	--	--	--	--
fen wetland	Wf	--	--	--	yes	--
marsh wetland	Wm	--	--	--	--	--
swamp wetland	Ws	--	--	--	--	--
shallow water aquatic	Ww	--	--	--	--	1.0

TABLE 4.38 Cont'd

All-Ecosystem Unit	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
herb disclimax	Xh	--	--	--	--	--
shrub disclimax	Xs	--	--	--	--	--
urban	UR	--	--	--	--	--
grazing zooclimax	Zg	--	--	--	--	--
alkalie meadow	Ga	--	--	--	--	--
mine	Mi	--	--	--	--	--

Limitations of Terrestrial Ecosystem Mapping in the ICHvk1

Within the ICHvk1, there is considerable overlap in soil moisture regime among circum-mesic site series. Site series 04 and 05 could often be differentiated by slope position and aspect, but where there was ambiguity, site series 05 was mapped primarily on more sloped and concave terrain. Site series 01 was mapped primarily on upper to lower slopes with cool aspects, gentle, straight mid to lower slopes and convex terrain above the toe slope. Where there was ambiguity between site series 01 and 07, site series 07 was mapped primarily in the true toe position on straight to concave terrain and along lower slope drainages.

4.3.17 Wells Gray Wet Cool Interior Cedar – Hemlock (ICHwk1)

TEM results for site series mapped in the ICHwk1 BGC Zone are listed in Table 4.39. TEM results for all-ecosystem units mapped in the ICHwk1 BGC Zone are listed in Table 4.40.

TABLE 4.39

SITE SERIES IN THE ICHwk1

Site Series[1]	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
CwHw – Oak fern	01	d, j, k	p, q, w, z	2, 3, 3a, 3b, 4, 5, 6, 7	--	5,187.6
HwCw – Azalea – Feathermoss	02	s, w	--	3a, 4, 7	--	14.4
HwCw – Falsebox – Feathermoss	03	d	w, z	3, 3a, 4, 5, 6, 7	--	440.9
CwHw – Lady fern – Oak fern	04	d	k, q, w	3, 3a, 4, 5, 6, 7	--	305.6
CwHw – Devil's club – Lady fern	05	d	j, k, n, w	3, 3a, 3b, 4, 5, 6, 7	--	1,071.6
Bl Sxw – Thimbleberry – Oak fern	06	d	--	3a, 4, 6, 7	--	54.0
Sxw – Devil's club – Lady fern	07	d	k	3a, 4, 5, 6, 7	--	187.3
Act – Dogwood – Thimbleberry	08	d	a, p	3a, 3b, 5, 6	--	124.9
CwHw – Horsetail	09	d	p	3a, 3b, 5, 6, 7	--	129.9
CwHw – Skunk cabbage	10	d	a, p, w	2, 3a, 3b, 5, 6, 7	--	432.9
Rocktripe lichens – Rock-moss	72	s	--	--	--	--
Cedar – Feathermoss	73	s	--	--	--	--
Rock-moss – Clad lichens	74	--	--	--	--	--
Alder – Hooker's fairybells	75	--	--	--	--	--
Alder – Lady fern	76	--	--	--	--	--

Note: 1 Derived from Draft Site Classification for the 52 Biogeoclimatic Units in the Southern Interior Forest Region (Lloyd *et al.* 2005).

TABLE 4.40

ALL-ECOSYSTEM UNITS IN THE ICHwk1

All-Ecosystem Unit	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
cultivated field	CF	--	--	--	--	--
active channel flood class	Fa	--	--	1	--	0.3
fringe flood class	Ff	--	--	--	--	--
low bench flood class	Fl	--	a	1, 3a, 3b	yes	9.3
mid-bench flood class	Fm	--	--	--	--	--
lake	LA	--	--	--	--	0.4
rock cliff	Rc	s	--	--	--	--
pond	PD	--	--	--	--	5.4
river	RI	--	--	--	--	358.1
rock outcrop	Ro	s	--	--	--	--
rural	Ru	--	--	--	--	--
rock talus	Rt	s	--	--	--	--
road	RZ	--	--	1	--	143.5
tame pasture	TP	--	--	--	--	--
avalanche herb meadow	Vh	--	--	--	--	--
avalanche shrub thicket	Vs	--	--	3a	--	6.5
avalanche treed	Vt	--	--	--	--	--
bog wetland	Wb	--	--	3a, 3b, 7	--	2.2
fen wetland	Wf	--	--	2	yes	8.9
marsh wetland	Wm	--	d, p	1, 2, 2a, 3a, 3b	yes	138.7
swamp wetland	Ws	--	--	2, 3a, 3b	yes	57.1
shallow water aquatic	Ww	--	--	2, 3, 3a	--	9.4
herb disclimax	Xh	--	--	--	--	--
shrub disclimax	Xs	--	--	--	--	--
urban	UR	--	--	--	--	--
grazing zooclimax	Zg	--	--	--	--	--
alkalie meadow	Ga	--	--	--	--	--
mine	Mi	--	--	--	--	--

Limitations of Terrestrial Ecosystem Mapping in the ICHwk1

Within the ICHwk1, there was some overlap between site series 03 and 01 on gentle mid-slope positions. For consistency, areas where Douglas-fir was present in the VRI data were mapped primarily as site series 03 and upper to lower slopes, above the toe, were mapped primarily as site series 01.

4.3.18 Thompson Dry Cool Interior Douglas-Fir (IDFdk1)

TEM results for site series mapped in the IDFdk1 BGC Zone are listed in Table 4.41. TEM results for all-ecosystem units mapped in the IDFdk1 BGC Zone are listed in Table 4.42.

TABLE 4.41

SITE SERIES AND POTENTIAL RARE WETLANDS IN THE IDFdk1

Site Series[1]	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
FdPl – Pinegrass – Feathermoss	01	d, j, k	c, w	1, 2, 2a, 2b, 3, 3a, 3b, 4, 5, 6, 7	--	2,806.9
Fd – Snowberry – Bluebunch wheatgrass	02	s, w	--	2b, 3a, 5, 6, 7	--	24.1
Fd – Juniper – Pinegrass	03	d	c, k, s, w	2b, 3, 5, 6, 7	--	70.0
Fd – Pinegrass – Yarrow	04	d	c, k, w	2, 2b, 3, 3a, 3b, 5, 6, 7	--	926.6

TABLE 4.41 Cont'd

Site Series[1]	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
SxwFd – Gooseberry – Feathermoss	05	d	c, k, w	2, 2a, 2b, 3, 3a, 3b, 5, 6, 7	--	1,057.4
Sxw – Horsetail	06	d	c	3, 3a, 3b, 4, 5, 6	--	205.6
Willow – Sedge	07	d	--	2b, 3a, 3b	--	18.0
Scrub birch – Water sedge	Wf02	--	--	--	yes	--
Slender sedge – Common hook-moss	Wf05	--	--	--	yes	--
Beaked sedge – Water sedge	Wm01	--	--	--	yes	--
Great bulrush	Wm06	--	--	--	yes	--
MacCalla's willow – Beaked sedge	Ws05	--	--	--	yes	--

Note: 1 Derived from *A Guide to Site Identification and Interpretation for the Kamloops Forest Region Land Management Handbook No. 23* (Lloyd *et al*. 1990) and *Wetlands of British Columbia: A Guide to Identification Land Management Handbook No. 52* (MacKenzie and Moran 2004).

TABLE 4.42

ALL-ECOSYSTEM UNITS IN THE IDFdk1

All-Ecosystem Unit	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
cultivated field	CF	--	f	2	--	11.0
active channel flood class	Fa	--	--	--	--	--
fringe flood class	Ff	--	--	--	--	--
low bench flood class	Fl	--	--	--	--	--
mid-bench flood class	Fm	--	--	--	--	--
lake	LA	--	--	--	--	18.3
rock cliff	Rc	s	k	1	--	0.8
pond	PD	--	--	--	--	16.3
river	RI	--	--	--	--	<0.1
rock outcrop	Ro	s	w	1	--	3.9
rural	Ru	--	--	1, 2, 2b, 5	--	8.7
rock talus	Rt	s	w	1	--	1.3
road	RZ	--	--	1	--	15.9
tame pasture	TP	--	--	2, 2b, 5, 6	--	82.1
avalanche herb meadow	Vh	--	--	--	--	--
avalanche shrub thicket	Vs	--	--	--	--	--
avalanche treed	Vt	--	--	--	--	--
bog wetland	Wb	--	--	3, 3a, 3b	--	10.4
fen wetland	Wf	--	--	2, 2b, 3, 3a	yes	34.0
marsh wetland	Wm	--	c	2, 2b, 3a	yes	35.6
swamp wetland	Ws	--	--	3, 3a, 3b, 4, 5, 6	--	36.9
shallow water aquatic	Ww	--	f	2, 2b	--	9.1
herb disclimax	Xh	--	--	--	--	--
shrub disclimax	Xs	--	--	--	--	--
urban	UR	--	--	--	--	--
grazing zooclimax	Zg	--	--	--	--	--
alkalie meadow	Ga	--	w	1, 2, 2b	yes	44.9
mine	Mi	--	--	1	--	3.4

Limitations of Terrestrial Ecosystem Mapping in the IDFdk1

Within the IDFdk1, site series 04 and 01 overlap in soil moisture and nutrient regime and also landscape position to some extent, posing some limitations in mapping. For consistency, site series 04 was mapped primarily in stands dominated by Douglas-fir on either warm slopes or upper slopes with neutral or cool aspects.

4.3.19 Cascade Dry Cool Interior Douglas-Fir (IDFdk2)

TEM results for site series mapped in the IDFdk2 BGC Zone are listed in Table 4.43. TEM results for all-ecosystem units mapped in the IDFdk2 BGC Zone are listed in Table 4.44.

TABLE 4.43

SITE SERIES AND POTENTIAL RARE WETLANDS IN THE IDFdk2

Site Series[1]	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
FdPl – Pinegrass – Feathermoss	01	d, j, k	c, q, w	1, 3, 3a, 3b, 4, 5, 6, 7	--	1,688.5
FdPy – Bluebunch wheatgrass – Pinegrass	02	s, w	c, k, q, z	2, 2b, 3, 3a, 4, 5, 6, 7	yes	196.9
FdPy – Pinegrass	03	d	c, j, k, q, s, w, z	2b, 3, 3a, 3b, 4, 5, 6, 7	yes	596.3
Fd – Feathermoss	04	d	c, q	3a, 4, 5, 6	--	43.4
SxwFd – Dogwood – Gooseberry	05	d	c, k, w	2, 3, 3a, 3b, 4, 5, 6, 7	--	462.9
Sxw – Horsetail	06	d	c, k	1, 3, 3a, 3b, 4, 5, 6	--	227.0
CwSxw – Twinberry – Soft-leaved sedge	07	d	c	3b, 5, 6	yes	6.8
Willow – Sedge	08	d	--	3, 3a, 3b	yes	8.5
Slender sedge – Buckbean	Wf06	--	--	--	yes	--
Beaked sedge – Water sedge	Wm01	--	--	--	yes	--

Note: 1 Derived from *A Guide to Site Identification and Interpretation for the Kamloops Forest Region Land Management Handbook No. 23* (Lloyd *et al*. 1990) and *Wetlands of British Columbia: A Guide to Identification Land Management Handbook No. 52* (MacKenzie and Moran 2004).

TABLE 4.44

ALL-ECOSYSTEM UNITS IN THE IDFdk2

All-Ecosystem Unit	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
cultivated field	CF	--	c	2	--	10.4
active channel flood class	Fa	--	--	1	--	23.8
fringe flood class	Ff	--	--	--	--	--
low bench flood class	Fl	--	--	--	--	--
mid-bench flood class	Fm	--	c	3, 3a, 3b, 4, 5, 6	--	58.2
lake	LA	--	--	--	--	11.2
rock cliff	Rc	s	c, d, k, w	1	--	11.3
pond	PD	--	--	--	--	2.0
river	Rl	--	--	--	--	62.6
rock outcrop	Ro	s	--	1, 2, 2b	--	16.8
rural	Ru	--	c	1, 2	--	7.5
rock talus	Rt	s	z	1, 3, 5	--	32.2
road	RZ	--	c, w	1, 2	--	103.6
tame pasture	TP	--	--	--	--	--
avalanche herb meadow	Vh	--	--	--	--	--
avalanche shrub thicket	Vs	--	--	--	--	--
avalanche treed	Vt	--	--	--	--	--
bog wetland	Wb	--	--	--	--	--
fen wetland	Wf	--	--	2b, 3a	yes	9.7

TABLE 4.44 Cont'd

All-Ecosystem Unit	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
marsh wetland	Wm	--	--	2b	yes	4.7
swamp wetland	Ws	--	--	3	--	0.6
shallow water aquatic	Ww	--	--	2	--	1.3
herb disclimax	Xh	--	--	--	--	--
shrub disclimax	Xs	--	--	--	--	--
urban	UR	--	--	1	--	0.7
grazing zooclimax	Zg	--	--	--	--	--
alkalie meadow	Ga	--	--	--	yes	--
mine	Mi	--	--	1, 3a	--	44.4

Limitations of Terrestrial Ecosystem Mapping in the IDFdk2

In the IDFdk2, site series 04 and 01 overlap in soil moisture and nutrient regime and also landscape position to some extent. For consistency, site series 04 was mapped primarily in pure or dominant Douglas-fir stands on cool slopes. The black and white imagery available for this variant did not clearly display areas of shallow soils and, therefore, also posed limitations in identifying the 02 site series. Field plots were completed to verify mapping.

4.3.20 Thompson Moist Warm Interior Douglas-Fir (IDFmw2)

TEM results for site series mapped in the IDFmw2 BGC Zone are listed in Table 4.45. TEM results for all-ecosystem units mapped in the IDFmw2 BGC Zone are listed in Table 4.46.

TABLE 4.45

SITE SERIES IN THE IDFmw2

Site Series[1]	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
CwFd – Falsebox – Prince's pine	01	d, j, k	c, q, w	2, 2a, 3, 3a, 3b, 4, 5, 6, 7	--	6,224.2
Fd – Bluebunch wheatgrass	02	s, w	j	2, 3a, 4, 5, 6	--	148.1
Fd – Falsebox – Pinegrass	03	d	c, j, w	2, 3, 3a, 3b, 4, 5, 6	--	927.9
Fd – Feathermoss	04	d	k	5, 6	yes	38.5
CwFd – Thimbleberry – Sarsaparilla	05	d	j, k, w	2, 3, 3a, 3b, 4, 5, 6	--	1,181.3
CwSxw – Devil's club – Oak fern	06	d	a, j	2, 3a, 3b, 4, 5, 6	--	393.5
Cw – Horsetail	07	d	j	3a, 5, 6	--	47.1
SwxCw – Soft-leaved sedge	08	d	--	5	--	10.3
Sxw – Alder – Water sedge	09	d	--	2, 5, 6	--	58.7
Pelt lichen – Clad lichen	72	s	--	--	--	--
Selaginella – Bluebunch wheatgrass	73	s	--	--	--	--
Snowberry – Bluebunch wheatgrass	82	w	--	2, 5	--	18.6
$EpAt – Thimbleberry – Snowberry	01ys	d	w	5, 6	--	270.4
$Kentucky bluegrass – Rough fescue	83-ms	w	--	--	--	--

Note: 1 Derived from Draft Site Classification for the 52 Biogeoclimatic Units in the Southern Interior Forest Region (Lloyd *et al.* 2005).

TABLE 4.46

ALL-ECOSYSTEM UNITS IN THE IDFmw2

All-Ecosystem Unit	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
cultivated field	CF	--	--	1, 2, 2b	--	2273.8
active channel flood class	Fa	--	--	1, 3, 3a, 3b	--	40.4
fringe flood class	Ff	--	--	3b, 5, 6	--	8.9
low bench flood class	Fl	--	a	2, 3a, 3b, 4, 5, 6	--	205.6
mid-bench flood class	Fm	--	--	2, 3a, 3b, 5, 6	--	199.5
lake	LA	--	--	--	--	69.5
rock cliff	Rc	s	d	1	--	0.7
pond	PD	--	--	2	--	9.7
river	RI	--	--	--	--	960.0
rock outcrop	Ro	S	d, z	1	--	12.0
rural	Ru	--	w	2, 3b, 5, 6	--	393.2
rock talus	Rt	S	--	--	--	--
road	RZ	--	w	1, 2	--	154.6
tame pasture	TP	--	--	2, 3b, 5, 6	--	276.4
avalanche herb meadow	Vh	--	--	--	--	--
avalanche shrub thicket	Vs	--	--	--	--	--
avalanche treed	Vt	--	--	--	--	--
bog wetland	Wb	--	--	--	--	--
fen wetland	Wf	--	--	2, 3, 3a	--	2.7
marsh wetland	Wm	--	--	2, 2b, 3a, 3b	yes	20.9
swamp wetland	Ws	--	--	2, 2a, 3a, 3b	--	17.5
shallow water aquatic	Ww	--	--	2, 3a	--	3.9
herb disclimax	Xh	--	--	--	--	--
shrub disclimax	Xs	--	--	--	--	--
urban	UR	--	--	1, 2	--	338.5
grazing zooclimax	Zg	--	--	--	--	--
alkalie meadow	Ga	--	--	--	--	--
mine	Mi	--	--	1	--	4.1

Limitations of Terrestrial Ecosystem Mapping in the IDFmw2

Within the IDFmw2, differentiation between site series 01 and 05 was achieved by differences in canopy characteristics and slope position. For consistency, site series 05 was mapped primarily where western redcedar was a codominant in mature stands or the site was at a lower slope with gentle concave terrain. Site series 01 was mapped primarily on upper to lower slopes with cool aspects and straight or concave profiles, and in gentle terrain on straight or slightly convex sites. Site series 06 was mapped primarily on fluvial glacial terraces in toe slopes or along drainages. On occasion, areas in the IDFmw2 were mapped to the IDFmw2b because that variant was more appropriate based on the landscape and vegetation.

4.3.21 Thompson Moist Warm – Steep South Phase Interior Douglas-Fir (IDFmw2b)

TEM results for site series mapped in the IDFmw2b BGC Zone are listed in Table 4.47. TEM results for all-ecosystem units mapped in the IDFmw2b BGC Zone are listed in Table 4.48.

TABLE 4.47

SITE SERIES IN THE IDFmw2b

Site Series[1]	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
CwFd – Falsebox – Prince's pine	01	d, j, k	w	2, 3a, 3b, 5, 6	--	246.5
Fd – Bluebunch wheatgrass	02	s, w	--	2, 5, 6	--	88.1
Fd – Falsebox – Pinegrass	03	d	j, w	2, 3a, 5, 6	--	955.1
Fd – Feathermoss	04	d	--	--	yes	--
CwFd – Thimbleberry – Sarsaparilla	05	d	--	5	--	12.3
CwSxw – Devil's club – Oak fern	06	d	--	--	--	--
Cw - Horsetail	07	d	--	--	--	--
SwxCw – Soft-leaved aedge	08	d	--	--	--	--
Sxw – Alder – Water sedge	09	d	--	--	--	--
Pelt lichen – Clad lichen	72	s	--	--	--	--
Selaginella – Bluebunch wheatgrass	73	s	--	--	--	--
Snowberry – Bluebunch wheatgrass	82	w	--	2	--	85.8
$EpAt – Thimbleberry – Snowberry	01ys	d	w	3a, 5	--	68.5
$Kentucky bluegrass – Rough fescue	83-ms	w	--	--	--	--

Note: 1 Derived from Draft Site Classification for the 52 Biogeoclimatic Units in the Southern Interior Forest Region (Lloyd *et al.* 2005).

TABLE 4.48

ALL-ECOSYSTEM UNITS IN THE IDFmw2b

All-Ecosystem Unit	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
cultivated field	CF	--	--	2	--	75.0
active channel flood class	Fa	--	--	--	--	--
fringe flood class	Ff	--	--	--	--	--
low bench flood class	Fl	--	--	--	--	--
mid-bench flood class	Fm	--	--	--	--	--
lake	LA	--	--	--	--	--
rock cliff	Rc	s	--	--	--	--
pond	PD	--	--	--	--	--
river	RI	--	--	--	--	--
rock outcrop	Ro	s	--	--	--	--
rural	Ru	--	--	2, 3, 3b, 5	--	72.3
rock talus	Rt	s	--	--	--	--
road	RZ	--	--	1, 2	--	20.7
tame pasture	TP	--	--	2	--	8.4
avalanche herb meadow	Vh	--	--	--	--	--
avalanche shrub thicket	Vs	--	--	--	--	--
avalanche treed	Vt	--	--	--	--	--
bog wetland	Wb	--	--	--	--	--
fen wetland	Wf	--	--	--	--	--
marsh wetland	Wm	--	--	--	--	--
swamp wetland	Ws	--	--	--	--	--
shallow water aquatic	Ww	--	--	--	--	--
herb disclimax	Xh	--	--	--	--	--
shrub disclimax	Xs	--	--	--	--	--
urban	UR	--	--	--	--	--
grazing zooclimax	Zg	--	--	--	--	--
alkalie meadow	Ga	--	--	--	--	--
mine	Mi	--	--	--	--	--

Limitations of Terrestrial Ecosystem Mapping in the IDFmw2b

The same mapping principals were used in the IDFmw2b as for the IDFmw2. On occasion, areas in the IDFmw2b were mapped to the IDFmw2 because it was more appropriate based on the landscape and vegetation.

4.3.22 Okanagan Very Dry Hot Interior Douglas-Fir (IDFxh1)

TEM results for site series mapped in the IDFxh1 BGC Zone are listed in Table 4.49. TEM results for all-ecosystem units mapped in the IDFxh1 BGC Zone are listed in Table 4.50.

TABLE 4.49

SITE SERIES AND POTENTIAL RARE WETLANDS IN THE IDFxh1

Site Series[1]	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
FdPy – Pinegrass	01	d, j, k	c, q, w	2, 2b, 3, 3a, 3b, 4, 5, 6, 7	yes	1,079.1
FdPy – Bluebunch wheatgrass – Balsamroot	02	s, w	k, q	2, 3a, 5, 6, 7	yes	49.0
FdPy – Bluebunch wheatgrass – Pinegrass	03	d	c, k, w	2, 5, 6	yes	31.7
FdPy – Snowbrush – Pinegrass	04	d	c, k, w	2b, 3, 3a, 4, 5, 6, 7	yes	288.1
FdPy – Pinegrass – Idaho fescue	05	d	c, k, w	2, 2b, 3, 3a, 3b, 4, 5, 6, 7	yes	303.3
FdPy – Spirea – Feathermoss	06	d	c, w	3, 3a, 5, 6	yes	51.1
FdPy – Snowberry – Spirea	07	d	c, k, w	2, 2b, 3, 3a, 3b, 4, 5, 6, 7	--	201.8
SxwFd – Douglas maple – Dogwood	08	d	c, k, w	2, 3, 5, 6	yes	90.3
Willow – Sedge	09	d	--	3a	--	0.7
Great bulrush	Wm06	--	--	--	yes	--

Note: 1 Derived from *A Guide to Site Identification and Interpretation for the Kamloops Forest Region Land Management Handbook No. 23* (Lloyd *et al*. 1990) and *Wetlands of British Columbia: A Guide to Identification Land Management Handbook No. 52* (MacKenzie and Moran 2004).

TABLE 4.50

ALL-ECOSYSTEM UNITS IN THE IDFxh1

All-Ecosystem Unit	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
cultivated field	CF	--	c	2	--	250.1
active channel flood class	Fa	--	c	1	--	31.6
fringe flood class	Ff	--	--	--	--	--
low bench flood class	Fl	--	--	--	yes	--
mid-bench flood class	Fm	--	c	2, 3, 3a, 3b, 5, 6	yes	177.0
lake	LA	--	--	--	--	--
rock cliff	Rc	s	--	1	--	3.0
pond	PD	--	--	--	--	1.6
river	RI	--	--	--	--	25.4
rock outcrop	Ro	s	--	1	--	2.1
rural	Ru	--	c	1, 2, 3b, 5	--	57.8
rock talus	Rt	s	--	1	--	1.8
road	RZ	--	f	1, 2	--	115.3
tame pasture	TP	--	c	2, 2b	--	42.2
avalanche herb meadow	Vh	--	--	--	--	--
avalanche shrub thicket	Vs	--	--	--	--	--
avalanche treed	Vt	--	--	--	--	--
bog wetland	Wb	--	--	--	--	--
fen wetland	Wf	--	--	--	--	--

TABLE 4.50 Cont'd

All-Ecosystem Unit	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
marsh wetland	Wm	--	--	2b	yes	0.6
swamp wetland	Ws	--	--	--	--	--
shallow water aquatic	Ww	--	--	--	--	--
herb disclimax	Xh	--	--	--	--	--
shrub disclimax	Xs	--	--	--	--	--
urban	UR	--	--	1, 2	--	9.8
grazing zooclimax	Zg	--	w	2, 2b, 3, 3a, 6	--	101.8
alkaline meadow	Ga	--	--	--	yes	--
mine	Mi	--	w	1, 2, 2b, 3	--	23.5

Limitations of Terrestrial Ecosystem Mapping in the IDFxh1

Within the IDFxh1, site series 05 and 01 overlap in soil moisture and nutrient regime as well as landscape position, posing some limitations to mapping. For consistency, site series 05 was mapped primarily in ponderosa pine dominated stands and on warm aspects or areas of more convex terrain. Site series 04 also overlaps with site series 01 but is characterized as existing primarily on warm slopes. However, field data indicated that site series 04 is not restricted to these areas, so professional judgment was used in differentiating between site series 04 and 01. Site series 06 and 07 also overlap with regard to environmental conditions, differing primarily in the composition of their respective shrub layers, which cannot be interpreted by aerial imagery. For consistency, site series 07 was mapped primarily on more concave terrain and on finer materials, where these were detectable. Imagery was not effective at displaying areas of shallow soils and therefore posed a further limitation in identifying site series 02.

4.3.23 Thompson Very Dry Hot Interior Douglas-Fir (IDFxh2)

TEM results for site series mapped in the IDFxh2 BGC Zone are listed in Table 4.51. TEM results for all-ecosystem units mapped in the IDFxh2 BGC Zone are listed in Table 4.52.

TABLE 4.51

SITE SERIES AND POTENTIAL RARE WETLANDS IN THE IDFxh2

Site Series[1]	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
FdPy – Pinegrass – Feathermoss	01	d, j, k	c, w	1, 2, 2a, 2b, 3, 3a, 3b, 4, 5, 6, 7	yes	2,823.2
FdPy – Bluebunch wheatgrass – Rough fescue	02	s, w	k	2, 2a, 2b, 3, 3a, 3b, 5, 6	yes	182.5
FdPy – Bluebunch wheatgrass – Balsamroot	03	d	c, w, z	2, 3a, 3b, 5, 6	yes	311.8
FdPy – Bluebunch wheatgrass – Pinegrass	04	d	c, k, s, w, z	2, 2b, 3a, 5, 6	yes	622.7
FdPy – Pinegrass	05	d	c, w	2, 2b, 3a, 5, 6	yes	381.4
Fd – Feathermoss	06	d	c, k, q, w	2, 3, 3a, 5, 6	--	234.4
CwFd – Dogwood	07	d	c	2, 3, 3a, 3b, 5, 6	yes	294.6
Sxw – Horsetail	08	d	c	2, 3, 3a, 5, 6	--	88.5
Great bulrush	Wm06	--	--	--	yes	3.9

Note: 1 Derived from *A Guide to Site Identification and Interpretation for the Kamloops Forest Region Land Management Handbook No. 23* (Lloyd *et al*. 1990) and *Wetlands of British Columbia: A Guide to Identification Land Management Handbook No. 52* (MacKenzie and Moran 2004).

TABLE 4.52

ALL-ECOSYSTEM UNITS IN THE IDFxh2

All-Ecosystem Unit	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
cultivated field	CF	--	--	2, 2b	--	171.5
active channel flood class	Fa	--	--	2	--	0.2
fringe flood class	Ff	--	--	2, 3b	--	6.2
low bench flood class	Fl	--	--	2, 3a, 3b, 5	--	88.8
mid-bench flood class	Fm	--	--	5	--	6.6
lake	LA	--	--	--	--	34.4
rock cliff	Rc	s	--	--	--	--
pond	PD	--	--	--	--	15.2
river	Rl	--	--	--	--	178.4
rock outcrop	Ro	s	--	--	--	--
rural	Ru	--	--	2, 3a, 5	--	16.5
rock talus	Rt	s	--	1	--	0.5
road	RZ	--	--	1, 2	--	25.7
tame pasture	TP	--	--	2	--	28.0
avalanche herb meadow	Vh	--	--	--	--	--
avalanche shrub thicket	Vs	--	--	--	--	--
avalanche treed	Vt	--	--	--	--	--
bog wetland	Wb	--	--	--	--	--
fen wetland	Wf	--	--	2, 3a, 5	--	61.0
marsh wetland	Wm	--	--	2, 2b, 3a	yes	6.1
swamp wetland	Ws	--	--	2, 2a	--	6.2
shallow water aquatic	Ww	--	--	2, 3a	--	12.3
herb disclimax	Xh	--	--	--	--	--
shrub disclimax	Xs	--	--	--	--	--
urban	UR	--	--	--	--	--
grazing zooclimax	Zg	--	--	2	--	12.3
alkaline meadow	Ga	--	--	--	yes	--
mine	Mi	--	--	--	--	--

Limitations of Terrestrial Ecosystem Mapping in the IDFxh2

Within the IDFxh2, site series 01 and 05 overlap in soil moisture and nutrient regime. For consistency, site series 05 was mapped primarily in stands dominated by ponderosa pine, found on warm aspects and areas of more convex terrain. Site series 04 also overlaps with site series 01 but was distinguished by its occurrence primarily on warm slopes. Site series 03 was differentiated from site series 04 by the presence of a more open canopy. On occasion, areas in the IDFxh2 were mapped to the IDFxh2a because it was more appropriate based on the landscape and vegetation.

4.3.24 Thompson Very Dry Hot Interior Douglas-Fir, Grassland Phase (IDFxh2a)

TEM results for site series mapped in the IDFxh2a BGC Zone are listed in Table 4.53. TEM results for all-ecosystem units mapped in the IDFxh2a BGC Zone are listed in Table 4.54.

TABLE 4.53

SITE SERIES IN THE IDFxh2a

Site Series[1]	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
Fescue – Bluebunch wheatgrass	91	--	f, k, w	2, 2b, 3a, 5, 6	yes	1,356.1
Bluebunch wheatgrass – Needle-and-thread grass	92	--	s, w	1, 2, 2b	yes	83.7
Big sage – Kentucky bluegrass	93	--	--	3a	--	15.9
Balsamroot – Kentucky bluegrass	94	--	--	2, 2a, 3	--	58.5
At – Snowberry – Kentucky bluegrass	95	--	f	2, 2a, 3, 3b, 4, 5	yes	149.8

Note: 1 Derived from *A Guide to Site Identification and Interpretation for the Kamloops Forest Region Land Management Handbook No. 23* (Lloyd *et al*. 1990).

TABLE 4.54

ALL-ECOSYSTEM UNITS IN THE IDFxh2a

All-Ecosystem Unit	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
cultivated field	CF	--	f	2, 2b	--	205.4
active channel flood class	Fa	--	--	--	--	--
fringe flood class	Ff	--	--	--	--	--
low bench flood class	Fl	--	--	--	--	--
mid-bench flood class	Fm	--	--	--	--	--
lake	LA	--	--	--	--	9.3
rock cliff	Rc	s	--	--	--	--
pond	PD	--	--	--	--	3.8
river	RI	--	--	--	--	--
rock outcrop	Ro	s	w	1	--	13.1
rural	Ru	--	c	1,2, 2b, 3a, 5, 6	--	34.1
rock talus	Rt	s	w	1	--	2.9
road	RZ	--	--	1	--	28.5
tame pasture	TP	--	c	2, 2b	--	21.5
avalanche herb meadow	Vh	--	--	--	--	--
avalanche shrub thicket	Vs	--	--	--	--	--
avalanche treed	Vt	--	--	--	--	--
bog wetland	Wb	--	--	--	--	--
fen wetland	Wf	--	f	2, 2b, 3, 3a	--	8.8
marsh wetland	Wm	--	--	2, 2b	--	2.2
swamp wetland	Ws	--	c	3, 3b	--	2.0
shallow water aquatic	Ww	--	--	--	--	--
herb disclimax	Xh	--	--	--	--	--
shrub disclimax	Xs	--	--	--	--	--
urban	UR	--	--	1	--	2.0
grazing zooclimax	Zg	--	--	--	--	--
alkaline meadow	Ga	--	--	2, 2b	yes	17.1
mine	Mi	--	--	1	--	25.5

Limitations of Terrestrial Ecosystem Mapping in the IDFxh2a

On occasion, areas in the IDFxh2a were mapped to the IDFxh2 because it was more appropriate based on the landscape and vegetation.

4.3.25 Leeward Moist Maritime Mountain Hemlock (MHmm2)

TEM results for site series mapped in the MHmm2 BGC Zone are listed in Table 4.55. TEM results for all-ecosystem units mapped in the MHmm2 BGC Zone are listed in Table 4.56.

TABLE 4.55

SITE SERIES AND POTENTIAL RARE WETLANDS IN THE MHmm2

Site Series[1]	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
HmBa – Blueberry	01	d, j, k	q	7	--	4.8
HmBa – Mountain-heather	02	s, w	q	3a, 5, 6	--	4.5
BaHm – Oak fern	03	d	--	--	--	--
HmBa – Bramble	04	d	--	--	--	--
BaHm – Twistedstalk	05	d	--	--	--	--
HmYc – Deer-cabbage	06	d	--	--	--	--
YcHm – Hellebore	07	d	--	--	--	--
HmYc – Sphagnum	08	d	--	--	--	--
YcHm – Skunk cabbage	09	d	--	--	--	--
Water sedge – Beaked sedge	Wf01	--	--	--	--	--

Note: 1 Derived from *A Field Guide to Site Identification and Interpretation for the Vancouver Forest Region Land Management Handbook No. 28* (Green and Klinka 1994) and *Wetlands of British Columbia: A Guide to Identification Land Management Handbook No. 52* (MacKenzie and Moran 2004).

TABLE 4.56

ALL-ECOSYSTEM UNITS IN THE MHmm2

All-Ecosystem Unit	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
cultivated field	CF	--	--	--	--	--
active channel flood class	Fa	--	--	--	--	--
fringe flood class	Ff	--	--	--	--	--
low bench flood class	Fl	--	--	--	--	--
mid-bench flood class	Fm	--	--	--	--	--
lake	LA	--	--	--	--	--
rock cliff	Rc	s	--	--	--	--
pond	PD	--	--	--	--	--
river	Rl	--	--	--	--	--
rock outcrop	Ro	s	--	1	--	3.2
rural	Ru	--	--	--	--	--
rock talus	Rt	s	--	--	--	--
road	RZ	--	--	--	--	--
tame pasture	TP	--	--	--	--	--
avalanche herb meadow	Vh	--	--	--	--	--
avalanche shrub thicket	Vs	--	--	--	--	--
avalanche treed	Vt	--	--	--	--	--
bog wetland	Wb	--	--	--	--	--
fen wetland	Wf	--	--	--	yes	--
marsh wetland	Wm	--	--	--	--	--
swamp wetland	Ws	--	--	--	--	--
shallow water aquatic	Ww	--	--	--	--	--
herb disclimax	Xh	--	--	--	--	--
shrub disclimax	Xs	--	--	--	--	--
urban	UR	--	--	--	--	--
grazing zooclimax	Zg	--	--	--	--	--
alkaline meadow	Ga	--	--	--	--	--
mine	Mi	--	--	--	--	--

Limitations of Terrestrial Ecosystem Mapping in the MHmm2

Imagery in the MHmm2 contained snow cover, limiting the delineation and attribution of site series in this area.

4.3.26 Thompson Very Dry Hot Ponderosa Pine (PPxh2)

TEM results for site series mapped in the PPxh2 BGC Zone are listed in Table 4.57. TEM results for all-ecosystem units mapped in the PPxh2 BGC Zone are listed in Table 4.58.

TABLE 4.57

SITE SERIES AND POTENTIAL RARE WETLANDS IN THE PPxh2

Site Series[1]	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
Py – Bluebunch wheatgrass – Fescue	01	d, j, k	c, q, w	2, 2b, 3, 3a, 3b, 4, 5, 6	yes	2,099.6
FdPy – Bluebunch wheatgrass – Selaginella	02	s, w	k, z	2, 2b, 3, 3b, 5, 6, 7	--	259.0
Py – Bluebunch wheatgrass	03	d	c, w	1, 2, 2b, 3, 3a, 3b, 4, 5, 6	yes	565.5
Py – Big sage – Bluebunch wheatgrass	04	d	c, k, w	1, 2, 2b, 3, 3a, 3b, 4, 5, 6	--	679.5
Big sage – Bluebunch wheatgrass – Fescue	05	d	c, k, s, w	1, 2b, 3a, 6	yes	238.0
FdPy – Snowberry – Saskatoon	06	d	c, f, k, w	2, 2b, 3, 3a, 3b, 4, 5, 6	yes	371.4
Act – Water birch	07	d	c, f, w	2, 2b, 3, 3a, 3b, 4, 5, 6	yes	363.3
Alkali saltgrass	Gs01	--	--	2b	yes	0.6
Great bulrush	Wm06	--	--	--	yes	--
Sharp bulrush	Wm08	--	--	--	yes	--
Seacoast bulrush	Wm11	--	--	--	yes	--
Woolly sedge	Wm12	--	--	--	yes	--

Note: 1 Derived from *A Guide to Site Identification and Interpretation for the Kamloops Forest Region Land Management Handbook No. 23* (Lloyd *et al*. 1990) and *Wetlands of British Columbia: A Guide to Identification Land Management Handbook No. 52* (MacKenzie and Moran 2004).

TABLE 4.58

ALL-ECOSYSTEM UNITS IN THE PPxh2

Site Series[1]	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
cultivated field	CF	--	c	2, 2b	--	527.4
active channel flood class	Fa	--	c	1	--	12.6
fringe flood class	Ff	--	c	1, 2, 3	--	5.0
low bench flood class	Fl	--	--	--	yes	--
mid-bench flood class	Fm	--	--	--	--	--
lake	LA	--	--	--	--	0.5
rock cliff	Rc	s	d	1	--	1.5
pond	PD	--	--	--	--	1.6
river	RI	--	--	--	--	327.9
rock outcrop	Ro	s	k, w, z	1, 2, 2b	--	81.8
rural	Ru	--	c	1, 2, 2b, 3, 3a, 4, 5, 6	--	158.8
rock talus	Rt	s	w, z	1, 5, 6	--	45.9
road	RZ	--	c	1	--	80.8
tame pasture	TP	--	c	2, 2b, 3, 3a, 3b, 5	--	183.2
avalanche herb meadow	Vh	--	--	--	--	--

TABLE 4.58 Cont'd

Site Series[1]	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
avalanche shrub thicket	Vs	--	--	--	--	--
avalanche treed	Vt	--	--	--	--	--
bog wetland	Wb	--	--	--	--	--
fen wetland	Wf	--	--	--	--	--
marsh wetland	Wm	--	c, f	2, 2b	yes	8.6
swamp wetland	Ws	--	--	3, 3b, 5	--	1.2
shallow water aquatic	Ww	--	--	--	--	--
herb disclimax	Xh	--	--	--	--	--
shrub disclimax	Xs	--	--	--	--	--
urban	UR	--	c	1, 2, 2b, 3b, 5, 6	--	118.4
grazing zooclimax	Zg	--	--	2, 5	--	7.1
alkaline meadow	Ga	--	--	--	yes	--
mine	Mi	--	--	1	--	17.0

Limitations of Terrestrial Ecosystem Mapping in the PPxh2

Within the PPxh2, the quality of imagery was reduced by partial to full cloud cover from RK 812 to RK 821, posing limitations on the delineation and attribution of polygons.

Field plots indicated that site series 01 and 03 overlap in soil moisture and nutrient regime and can be found in some similar slope positions. For consistency, site series 01 was mapped primarily in areas of mixed ponderosa pine and Douglas-fir canopy along mid to lower slopes and site series 03 was mapped primarily in stands dominated by ponderosa pine on mid to upper slopes and in areas with warm aspects. This variant has experienced a considerable amount of anthropogenic disturbance, which sometimes created a challenge in distinguishing between open stands that were naturally occurring (*i.e.*, site series 04) and those that resulted from logging. Field verification was helpful in this differentiation.

Field verification was also necessary to determine the presence or absence of big sagebrush, which could not be determined from imagery alone and was important in differentiating between site series 04 and site series 01 and 03. Site series 01 and 03 overlap in soil moisture and nutrient regime and also in landscape position. Following information provided by field surveys, site series 01 was mapped primarily in stands with a ponderosa pine and Douglas-fir canopy along mid to lower slopes and site series 03 was mapped primarily in stands dominated by ponderosa pine on mid to upper slopes and on warm aspects.

4.3.27 McLennan Dry Hot Sub-Boreal Spruce (SBSdh1)

TEM results for site series mapped in the SBSdh1 BGC Zone are listed in Table 4.59. TEM results for all-ecosystem units mapped in the SBSdh1 BGC Zone are listed in Table 4.60.

TABLE 4.59

SITE SERIES AND POTENTIAL RARE WETLANDS IN THE SBSdh1

Site Series[1]	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
SxwFd – Ricegrass	01	d, j, k	c, f, q, w	2, 3, 3a, 3b, 4, 5, 6, 7	--	5,679.1
Pl – Velvet-leaved blueberry – Cladonia	02	s, w	--	5	yes	7.9
FdPl – Pinegrass – Feathermoss	03	d	c, s, w	3a, 3b, 4, 5, 6, 7	--	205.5
Pl – Pinegrass – Feathermoss	04	d	k, w	2, 3a, 3b, 4, 5, 6	--	471.4
Pl – Labrador tea – Velvet-leaved blueberry	05	d	k	2, 3, 3a, 4, 5	yes	410.5
SxwFd – Thimbleberry	06	d	k, w	3, 3a, 3b, 4, 5, 6, 7	yes	521.5
Sxw – Horsetail	07	d	f	3a, 4, 5, 6, 7	--	408.9

TABLE 4.59 Cont'd

Site Series[1]	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
Sb – Scrub birch – Sedge	08	d	p	3a, 3b, 4, 5, 6	--	100.7
MacCalla's willow – Beaked sedge	Ws05	--	--	--	yes	--

Note: 1 Derived from Draft Land Management Handbook No. 15 Update for the SBSdh1 (BC MFLNRO 2007c).

TABLE 4.60

ALL-ECOSYSTEM UNITS IN THE SBSdh1

All-Ecosystem Unit	Code	Assumed Modifiers	Atypical Modifiers	Structural Stage	Potential to Support REC	Mapped Area (ha)
cultivated field	CF	--	f	2, 2a	--	305.4
active channel flood class	Fa	--	--	1	--	0.4
fringe flood class	Ff	--	--	--	--	--
low bench flood class	Fl	--	--	1, 2, 6, 7	--	2.2
mid-bench flood class	Fm	--	--	--	--	--
lake	LA	--	--	--	--	--
rock cliff	Rc	s	--	--	--	--
pond	PD	--	k	--	--	11.5
river	RI	--	--	--	--	138.5
rock outcrop	Ro	s	--	1	--	1.8
rural	Ru	--	--	1, 2	--	39.3
rock talus	Rt	s	--	--	--	--
road	RZ	--	--	1	--	162.8
tame pasture	TP	--	j	2	--	--
avalanche herb meadow	Vh	--	--	--	--	--
avalanche shrub thicket	Vs	--	--	--	--	--
avalanche treed	Vt	--	--	--	--	--
bog wetland	Wb	--	--	--	yes	--
fen wetland	Wf	--	--	2	--	17.2
marsh wetland	Wm	--	--	2, 3a, 3b	--	23.6
swamp wetland	Ws	--	--	2	yes	12.8
shallow water aquatic	Ww	--	--	2	--	3.5
herb disclimax	Xh	--	--	--	--	--
shrub disclimax	Xs	--	--	--	--	--
urban	UR	--	--	1	--	25.3
grazing zooclimax	Zg	--	--	--	--	--
alkaline meadow	Ga	--	--	1	--	1.8
mine	Mi	--	--	--	--	--

Limitations of Terrestrial Ecosystem Mapping in the SBSdh1

Within the SBSdh1, site series 01 and 04 overlapped in submesic sites. This was resolved by mapping site series 04 primarily on gentle to moderately steep, warm, mid-slopes that lacked Douglas-fir and mapping site series 01 primarily on cool aspects.

5.0 SUMMARY

TEM was completed within the Vegetation RSA to describe the diversity, relative abundance and distribution of vegetation communities and structural stages for lands where vegetation may be affected by the Trans Mountain Expansion Project.

- TEM was completed for 73.2% of the Vegetation RSA in Alberta and 81.6% of the Vegetation RSA in BC. TEM for a segment from Edson to Hinton, a segment in the Coquihalla and in the additional proposed pipeline corridor refinement areas added on August 23, 2013 will be completed in 2014 and form part of a supplemental filing.

- TEM in Alberta classifies the landscape to ecosite phase. TEM in BC classified the landscape to site series.

- TEM methods followed the Standards for Terrestrial Ecosystem Mapping in British Columbia (RISC 1998) with a few minor deviations.

- TEM field surveys were completed in 2012 and 2013 to Survey Intensity Level 5 (*i.e.*, 5.5% of polygons were surveyed in the field). Due to additional desktop and field work to identify all wetlands within the proposed pipeline corridor and specific surveys conducted for rare plants and rare ecological communities, this is considered to meet the industry standards for TEM on a large project.

- 272 unique ecosite phase/site series are represented in the mapping area.

6.0 LITERATURE CITED

Alberta Biodiversity Monitoring Institute. 2010a. ABMI Human Footprint Map - North Saskatchewan (2010 Version 1.1) (digital file). Edmonton, AB. Available: http://www.abmi.ca. Acquired: December 2012. Last Update Check: December 2012.

Alberta Biodiversity Monitoring Institute. 2010b. ABMI Human Footprint Map - Upper Athabasca (2010 Version 1.1) (digital file). Edmonton, AB. Available: http://www.abmi.ca. Acquired: December 2012. Last Update Check: December 2012.

Alberta Energy and Natural Resources. 1980a. Phase 3 Forest Inventory. Twp 53 Rge 11 W5 Mer. 1:15,000 map.

Alberta Energy and Natural Resources. 1980b. Phase 3 Forest Inventory. Twp 53 Rge 13 W5 Mer. 1:15,000 map.

Alberta Energy and Natural Resources. 1980c. Phase 3 Forest Inventory. Twp 53 Rge 14 W5 Mer. 1:15,000 map.

Alberta Energy and Natural Resources. 1981. Phase 3 Forest Inventory. Twp 53 Rge 12 W5 Mer. 1:15,000 map.

Alberta Energy and Natural Resources. 1983. Phase 3 Forest Inventory. Twp 52 Rge 28 W5 Mer. 1:15,000 map.

Alberta Energy and Natural Resources. 1985a. Phase 3 Forest Inventory. Twp 53 Rge 9 W5 Mer. 1:15,000 map.

Alberta Energy and Natural Resources. 1985b. Phase 3 Forest Inventory. Twp 53 Rge 10 W5 Mer. 1:15,000 map.

Alberta Environment and Sustainable Resource Development. 2012. Alberta Vegetation Inventory Crown Polygons (digital file). Calgary, AB. Received from FTP. Acquired: November 2012. Last Update Check: November 2012.

Alberta Soil Information Centre. 2001. AGRASID 3.0: Agricultural Region of Alberta Soil Inventory Database (Version 3.0) (digital file). Edmonton, AB. Available: http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/sag3249?opendocument. Acquired: September 2008. Last Update Check: May 2013.

Beckingham, J.D. and J.H. Archibald. 1996. Field Guide to Ecosites of Northern Alberta. Canadian Forest Service Northwest Region Northern Forestry Centre, Special Report 5. Vancouver, BC. 336 pp.

Beckingham, J.D., I.G.W. Corns and J.H. Archibald. 1996. Field Guide to Ecosites of West-Central Alberta. Canadian Forest Service Northwest Region Northern Forestry Centre, Special Report 9. Vancouver, BC. 540 pp.

British Columbia Ministry of Environment. 2010. Terrestrial Ecosystem Information Digital Data Submission Standard – Draft for Field Testing. Ecosystems Branch for the Terrestrial Ecosystems Resources Information Standards Committee. Website: http://www.env.gov.bc.ca/fia/documents/TEI_Digital_Submission_Standards_Draft1.pdf. Accessed: May 2013.

British Columbia Ministry of Environment. 2013. BC Species and Ecosystems Explorer. Website: http://a100.gov.bc.ca/pub/eswp/. Accessed via: http://www.env.gov.bc.ca/atrisk/toolintro.html. Accessed: September 2013.

British Columbia Ministry of Environment, Lands and Parks. 1997. Policies and Specifications for TRIM II (1:20 000) and (1:10 000) Revision Data Capture. Version 2.0.

British Columbia Ministry of Forests, Lands and Natural Resource Operations. 1998. VENUS Data Capture Application (Version 5.1). Website: http://www.env.gov.bc.ca/ecology/dteif/venus.html. Accessed: September 2012.

British Columbia Ministry of Forests, Lands and Natural Resource Operations. 2007a. Draft Land Management Handbook No. 15 Update for the ESSFmm1. Website: http://www.for.gov.bc.ca/hre/becweb/Downloads/Downloads_SubzoneReports/ESSFmm1.pdf. Accessed: May 2013.

British Columbia Ministry of Forests, Lands and Natural Resource Operations. 2007b. Draft Land Management Handbook No. 15 Update for the ICHmm. Website: http://www.for.gov.bc.ca/hre/becweb/Downloads/Downloads_SubzoneReports/ICHmm.pdf. Accessed: May 2013.

British Columbia Ministry of Forests, Lands and Natural Resource Operations. 2007c. Draft Land Management Handbook No. 15 Update for the SBSdh1. Website: http://www.for.gov.bc.ca/hre/becweb/Downloads/Downloads_SubzoneReports/SBSdh1.pdf. Accessed: May 2013.

British Columbia Ministry of Forests, Lands and Natural Resource Operations. 2011. BECdb: Biogeoclimatic Ecosystem Classification Codes and Names, Version 8, 2011. MSAccess 2003 format. Forest Analysis and Inventory Branch, Victoria, BC. Website: http://www.for.gov.bc.ca/hre/becweb/resources/codes-standards/standards-becdb.html. Accessed: May 2013.

British Columbia Ministry of Forests, Lands and Natural Resource Operations. 2013a. How BEC Works. Website: http://www.for.gov.bc.ca/hre/becweb/system/how/index.html. Accessed: May 2013.

British Columbia Ministry of Forests, Lands and Natural Resource Operations. 2013b. VRI - Forest Vegetation Composite Polygons and Rank 1 Layer (digital file). Victoria, BC. Available: https://apps.gov.bc.ca/pub/dwds/home.so. Acquired: July 2013. Last Update Check: July 4, 2013.

British Columbia Ministry of Forests and Range and British Columbia Ministry of Environment. 2010. Field Manual for Describing Terrestrial Ecosystems 2nd Edition. Website: http://www.for.gov.bc.ca/hfd/pubs/Docs/Lmh/ Lmh25/Lmh25_ed2_(2010).pdf. Accessed: March 2013.

Burkinshaw, A.M., M.G. Wiloughby, K. France, H. Loonen and R.L. McNeil. 2009. Range Plant Communities and Range Health Assessment Guidelines for the Central Parkland Subregion of Alberta. Alberta Sustainable Resource Development, Land Division. Red Deer, AB. 136 pp.

Government of British Columbia. 1996-2013. Terrain Resource Information Management (TRIM II) Atlas (digital file). Victoria, BC. Available: http://www.ilmb.gov.bc.ca/. Acquired: August 2013. Last Update Check: N/A.

Green, R.N. and K. Klinka. 1994. A Field Guide to Site Identification and Interpretation for the Vancouver Forest Region. Land Management Handbook No. 28. British Columbia Ministry of Forests, Research Branch. Victoria, BC. 285 pp.

Lloyd, D., K. Angove, G. Hope and C. Thompson. 1990. A Guide to Site Identification and Interpretation for the Kamloops Forest Region. Land Management Handbook No. 23. British Columbia Ministry of Forests. Victoria, BC. 399 pp.

Llody, D., M. Ryan, N. Brand, M. Doney, V. Larson and J. MacDonald. 2005. Draft Site Classification for the 52 Biogeoclimatic Units in the Southern Interior Forest Region. British Columbia Ministry of Forests. Kamloops, BC.

MacKenzie, W.H. and J.R. Moran. 2004. Wetlands of British Columbia: A Guide to Identification. Land Management Handbook No. 52. British Columbia Ministry of Forests. Victoria, BC. 287 pp.

MacKenzie, W.H. 2012. Biogeoclimatic Ecosystem Classification of Non-Forested Ecosystems in British Columbia. Technical Report 068. Victoria, BC.

National Energy Board. 2013. Filing Manual. Inclusive of Release 2013-03 (August 2013). Calgary, AB.

Natural Resources Canada. 2007-2011. National Hydro Network (digital files). Sherbrooke, QC. Available: http://www.geobase.ca/geobase/en/data/nhn/index.html. Acquired: April 2012. Last Update Check: May 2012.

Natural Resources Canada. 2012a. CanVec - Relief and Landforms - 2570009 Contour Imperial (digital file). Sherbrooke, QC. Available: http://geogratis.cgdi.gc.ca/geogratis/en/download/topographic.html. Acquired: June 2012. Last Update Check: November 2012.

Natural Resources Canada. 2012b. CanVec - Relief and Landforms - 1030009 Contour (digital file). Sherbrooke, QC. Available: http://geogratis.cgdi.gc.ca/geogratis/en/download/topographic.html. Acquired: June 2012. Last Update Check: November 2012.

Resources Information Standards Committee. 1998. Standards for Terrestrial Ecosystem Mapping in British Columbia. Website: http://archive.ilmb.gov.bc.ca/risc/pubs/teecolo/tem/indextem.htm. Accessed: November 2013.

Resources Information Standards Committee. 2000. Standards for Terrestrial Ecosystem Mapping – Digital Data Capture in British Columbia, Version 3.0. Website: http://ilmb.gov.bc.ca/risc/pubs/teecolo/temcapture/index.htm. Accessed: November 2013.

TERA Environmental Consultants. 2008. Hillshade. Derived from Natural Resources Canada, Earth Sciences Sector, Centre for Topographic Information. 2000-2008. Canadian Digital Elevation Data 50k (digital files). Sherbrooke, QC. Available: http://www.geobase.ca/geobase/en/data/cded/index.html. Acquired: 2008. Last Update Check: December 2010.

TERA Environmental Consultants. 2012. Digital Elevation Model. Derived from Natural Resources Canada, Earth Sciences Sector, Centre for Topographic Information. 2000-2008. Canadian Digital Elevation Data 50k (digital files). Sherbrooke, QC. Available: http://www.geobase.ca/geobase/en/data/cded/index.html. Acquired: 2008. Last Update Check: December 2010.

TERA Environmental Consultants. 2013. TEM Field Points from 2012/2013 Field Season (digital file). Calgary, AB. Acquired: May 2012 to June 2013.

Timberline Forest Inventory Consultants. 2006. Terrestrial Ecosystem Inventory Compilation and Mapping TMX2 Terasen Pipelines (Trans Mountain) Inc. TMX2 Hargreaves Loop. Victoria, BC.

Willoughby, M.G., C. Stone, C. Hincz, D. Moisey, G. Ehlert and D. Lawrence. 2006. Guide to Range Plant Community Types and Carrying Capacity for the Dry and Central Mixedwood Subregions in Alberta, 6th approximation. Alberta Sustainable Resource Development, Public Lands and Forest Division. Edmonton, AB.

APPENDIX D

OBSERVED PLANT SPECIES LISTS BY PROJECT SEGMENT

TABLE D1

EDMONTON TO HINTON OBSERVED PLANT SPECIES – BY TYPE AND COMMON NAME

Common Name	Scientific Name
TREES	
Alaska birch	*Betula neoalaskana*
aspen	*Populus tremuloides*
balsam fir	*Abies balsamea*
balsam poplar	*Populus balsamifera*
black spruce	*Picea mariana*
Jack pine	*Pinus banksiana*
lodgepole pine	*Pinus contorta*
Manitoba maple	*Acer negundo*
tamarack	*Larix laricina*
white birch	*Betula papyrifera*
white spruce	*Picea glauca*
SHRUBS	
Athabasca willow	*Salix athabascensis*
autumn willow	*Salix serissima*
balsam willow	*Salix pyrifolia*
basket willow	*Salix petiolaris*
beaked hazelnut	*Corylus cornuta*
beaked willow	*Salix bebbiana*
bog birch	*Betula glandulosa*
bog willow	*Salix pedicellaris*
bracted honeysuckle	*Lonicera involucrata*
bristly black currant	*Ribes lacustre*
buckbrush	*Symphoricarpos occidentalis*
Canada buffaloberry	*Shepherdia canadensis*
choke cherry	*Prunus virginiana*
common Labrador tea	*Ledum groenlandicum*
common wild rose	*Rosa woodsii*
cranberry species	*Viburnum* sp.
creeping juniper	*Juniperus horizontalis*
dwarf birch	*Betula pumila*
false mountain willow	*Salix pseudomonticola*
flat-leaved willow	*Salix planifolia*
green alder	*Alnus viridis*
ground juniper	*Juniperus communis*
high-bush cranberry	*Viburnum opulus*
hoary willow	*Salix candida*
low-bush cranberry	*Viburnum edule*
Mackenzie's willow	*Salix prolixa*
myrtle-leaved willow	*Salix myrtillifolia*
northern black currant	*Ribes hudsonianum*
northern gooseberry	*Ribes oxyacanthoides*
pin cherry	*Prunus pensylvanica*
prickly rose	*Rosa acicularis*
pussy willow	*Salix discolor*
red-osier dogwood	*Cornus stolonifera*
river alder	*Alnus incana*
river alder	*Alnus incana ssp. tenuifolia*
sandbar willow	*Salix exigua*
saskatoon	*Amelanchier alnifolia*
Scouler's willow	*Salix scouleriana*
shining willow	*Salix lucida*
short-capsuled willow	*Salix brachycarpa*
shrubby cinquefoil	*Potentilla fruticosa*

TABLE D1 Cont'd

Common Name	Scientific Name
shrubby willow	*Salix arbusculoides*
silverberry	*Elaeagnus commutata*
Sitka alder	*Alnus viridis* ssp. *sinuata*
skunk currant	*Ribes glandulosum*
smooth willow	*Salix glauca*
snowberry	*Symphoricarpos albus*
snowberry species	*Symphoricarpos* sp.
velvet-fruited willow	*Salix maccalliana*
water birch	*Betula occidentalis*
western mountain-ash	*Sorbus scopulina*
white meadowsweet	*Spiraea betulifolia*
wild black currant	*Ribes americanum*
wild red currant	*Ribes triste*
wild red raspberry	*Rubus idaeus*
willow species	*Salix* sp.
FORBS, DWARF SHRUBS	
Agoseris species	*Agoseris* sp.
agrimony	*Agrimonia striata*
alpine aster	*Aster alpinus*
alpine bearberry	*Arctostaphylos rubra*
alpine bistort	*Polygonum viviparum*
alpine everlasting	*Antennaria alpina*
alpine hedysarum	*Hedysarum alpinum*
alpine mouse-ear chickweed	*Cerastium beeringianum*
alpine pondweed	*Potamogeton alpinus*
alpine willowherb	*Epilobium anagallidifolium*
American brooklime	*Veronica americana*
American milk vetch	*Astragalus americanus*
avens species	*Geum* sp.
Bicknell's geranium	*Geranium bicknellii*
biennial sagewort	*Artemisia biennis*
bishop's-cap	*Mitella nuda*
bitter cress	*Cardamine pensylvanica*
blue columbine	*Aquilegia brevistyla*
bluets species	*Hedyotis* sp.
blunt-leaved bog orchid	*Platanthera obtusata*
blunt-leaved sandwort	*Moehringia lateriflora*
bog cranberry	*Vaccinium vitis-idaea*
bog rosemary	*Andromeda polifolia*
boreal buttercup	*Ranunculus hyperboreus*
Brachyactis species	*Brachyactis* sp.
bracted bog orchid	*Coeloglossum viride*
bristly buttercup	*Ranunculus pensylvanicus*
broad spinulose shield fern	*Dryopteris assimilis*
broad-leaved everlasting	*Antennaria neglecta*
buck-bean	*Menyanthes trifoliata*
bulb-bearing water-hemlock	*Cicuta bulbifera*
bunchberry	*Cornus canadensis*
Bur-reed species	*Sparganium sp.*
bushy cinquefoil	*Potentilla paradoxa*
Canada anemone	*Anemone canadensis*
Canada goldenrod	*Solidago canadensis*
celery-leaved buttercup	*Ranunculus sceleratus*
chickweed species	*Cerastium sp.*
cinquefoil species	*Potentilla sp.*

TABLE D1 Cont'd

Common Name	Scientific Name
clasping-leaf pondweed	*Potamogeton richardsonii*
clasping-leaved twisted-stalk	*Streptopus amplexifolius*
Clematis species	*Clematis* sp.
cloudberry	*Rubus chamaemorus*
columbine species	*Aquilegia* sp.
common bearberry	*Arctostaphylos uva-ursi*
common bladderwort	*Utricularia vulgaris*
common blue lettuce	*Lactuca pulchella*
common blueberry	*Vaccinium myrtilloides*
common blue-eyed grass	*Sisyrinchium montanum*
common butterwort	*Pinguicula vulgaris*
common duckweed	*Lemna minor*
common fireweed	*Epilobium angustifolium*
common horsetail	*Equisetum arvense*
common mare's-tail	*Hippuris vulgaris*
common nettle	*Urtica dioica*
common pepper-grass	*Lepidium densiflorum*
common pink wintergreen	*Pyrola asarifolia*
common red paintbrush	*Castilleja miniata*
common scouring-rush	*Equisetum hyemale*
common yarrow	*Achillea millefolium*
coralroot species	*Corallorhiza* sp.
cow parsnip	*Heracleum lanatum*
cow-wheat	*Melampyrum lineare*
cream-colored vetchling	*Lathyrus ochroleucus*
creeping snowberry	*Gaultheria hispidula*
cress species	*Arabidopsis* sp.
crowberry	*Empetrum nigrum*
cushion umbrella-plant	*Eriogonum androsaceum*
cut-leaved anemone	*Anemone multifida*
dainty moonwort	*Botrychium crenulatum*
dewberry	*Rubus pubescens*
Drummond's thistle	*Cirsium drummondii*
dwarf bilberry	*Vaccinium caespitosum*
dwarf false asphodel	*Tofieldia pusilla*
dwarf raspberry	*Rubus Arcticus*
dwarf scouring-rush	*Equisetum scirpoides*
early blue violet	*Viola adunca*
early yellow locoweed	*Oxytropis sericea*
elephant's-head	*Pedicularis groenlandica*
eyebright	*Euphrasia Arctica*
fairybells	*Disporum trachycarpum*
false Solomon's-seal	*Smilacina racemosa*
felwort	*Gentianella amarella*
Fendler's cryptanthe	*Cryptantha fendleri*
few-flowered ragwort	*Senecio pauciflorus*
field mouse-ear chickweed	*Cerastium arvense*
flat-leaved bladderwort	*Utricularia intermedia*
flat-topped goldenrod	*Solidago graminifolia*
floating marsh-marigold	*Caltha natans*
floating-leaf pondweed	*Potamogeton natans*
fragile bladder fern	*Cystopteris fragilis*
Fries' pondweed	*Potamogeton friesii*
fringed gentian	*Gentianella crinita*
fringed loosestrife	*Lysimachia ciliata*

TABLE D1 Cont'd

Common Name	Scientific Name
giant bur-reed	*Sparganium eurycarpum*
giant hyssop	*Agastache foeniculum*
glaucus willowherb	*Epilobium glaberrimum*
golden corydalis	*Corydalis aurea*
golden dock	*Rumex maritimus*
golden saxifrage	*Chrysosplenium iowense*
goldthread	*Coptis trifolia*
graceful cinquefoil	*Potentilla gracilis*
grape fern species	*Botrychium* sp.
green saxifrage	*Chrysosplenium tetrandrum*
greenish-flowered wintergreen	*Pyrola chlorantha*
ground-cedar	*Diphasiastrum complanatum*
groundsel species	*Senecio* sp.
hairy rock cress	*Arabis hirsuta*
hairy speedwell	*Veronica peregrina*
harebell	*Campanula rotundifolia*
hawkweed species	*Hieracium* sp.
heal-all	*Prunella vulgaris*
heart-leaved Alexanders	*Zizia aptera*
heart-leaved arnica	*Arnica cordifolia*
heart-leaved twayblade	*Listera cordata*
Hedysarum species	*Hedysarum* sp.
hooded ladies'-tresses	*Spiranthes romanzoffiana*
hornwort	*Ceratophyllum demersum*
horsetail species	*Equisetum* sp.
Indian-pipe	*Monotropa uniflora*
ivy-leaved duckweed	*Lemna trisulca*
kidney-leaved violet	*Viola renifolia*
Labrador bedstraw	*Galium Labradoricum*
Labrador lousewort	*Pedicularis Labradorica*
lady fern	*Athyrium filix-femina*
Lapland buttercup	*Ranunculus lapponicus*
large bog cranberry	*Oxycoccus quadripetalus*
large northern aster	*Aster modestus*
large yellow lady's-slipper	*Cypripedium parviflorum* var. *pubescens*
large-leaved white water-crowfoot	*Ranunculus aquatilis*
large-leaved yellow avens	*Geum macrophyllum*
large-sheath pondweed	*Potamogeton vaginatus*
larkspur species	*Delphinium* sp.
late goldenrod	*Solidago gigantea*
leafy arnica	*Arnica chamissonis*
leather-leaved saxifrage	*Leptarrhena pyrolifolia*
lesser rattlesnake plantain	*Goodyera repens*
lesser yellow lady's slipper	*Cypripedium parviflorum*
Lindley's aster	*Aster ciliolatus*
linear-leaved pondweed	*Potamogeton strictifolius*
locoweed species	*Oxytropis* sp.
long-fruited anemone	*Anemone cylindrica*
long-leaved chickweed	*Stellaria longifolia*
long-leaved sagewort	*Artemisia longifolia*
long-stalked mouse-ear chickweed	*Cerastium nutans*
low everlasting	*Antennaria aprica*
low goldenrod	*Solidago missouriensis*
low larkspur	*Delphinium bicolor*
low milkweed	*Asclepias ovalifolia*

TABLE D1 Cont'd

Common Name	Scientific Name
Macoun's buttercup	*Ranunculus macounii*
mallow species	*Sphaeralcea* sp.
many-flowered yarrow	*Achillea sibirica*
marsh aster	*Aster borealis*
marsh cinquefoil	*Potentilla palustris*
marsh hedge-nettle	*Stachys palustris*
marsh horsetail	*Equisetum palustre*
marsh ragwort	*Senecio congestus*
marsh skullcap	*Scutellaria galericulata*
marsh violet	*Viola palustris*
marsh willowherb	*Epilobium palustre*
marsh yellow cress	*Rorippa palustris*
marsh-marigold	*Caltha palustris*
Mary species	*Collinsia* sp.
meadow bitter cress	*Cardamine pratensis*
meadow horsetail	*Equisetum pratense*
mealy primrose	*Primula incana*
Missouri milk vetch	*Astragalus missouriensis*
moschatel	*Adoxa moschatellina*
mountain-lover	*Paxistima myrsinites*
mudwort	*Limosella aquatica*
narrow spinulose shield fern	*Dryopteris carthusiana*
narrow-leaved bur-reed	*Sparganium angustifolium*
narrow-leaved collomia	*Collomia linearis*
narrow-leaved dock	*Rumex triangulivalvis*
narrow-leaved hawkweed	*Hieracium umbellatum*
narrow-leaved milk vetch	*Astragalus pectinatus*
narrow-leaved willowherb	*Epilobium leptophyllum*
nodding beggarticks	*Bidens cernua*
northern bastard toadflax	*Geocaulon lividum*
northern bedstraw	*Galium boreale*
northern daisy fleabane	*Erigeron acris*
northern grass-of-parnassus	*Parnassia palustris*
northern green bog orchid	*Platanthera hyperborea*
northern green orchid	*Platanthera aquilonis*
northern hedysarum	*Hedysarum boreale*
northern stitchwort	*Stellaria calycantha*
northern twayblade	*Listera borealis*
northern valerian	*Valeriana dioica*
northern water-horehound	*Lycopus uniflorus*
northern water-starwort	*Callitriche hermaphroditica*
northern willowherb	*Epilobium ciliatum*
oak fern	*Gymnocarpium dryopteris*
oak-leaved goosefoot	*Chenopodium salinum*
one-flowered wintergreen	*Moneses uniflora*
one-sided wintergreen	*Orthilia secunda*
Pacific oakfern	*Gymnocarpium disjunctum*
pale coralroot	*Corallorhiza trifida*
panicled aster	*Symphyotrichum lanceolatum*
pearly everlasting	*Anaphalis margaritacea*
Philadelphia fleabane	*Erigeron philadelphicus*
plains cinquefoil	*Potentilla bipinnatifida*
plains wormwood	*Artemisia campestris*
pondweed species	*Potamogeton* sp.
prairie sagewort	*Artemisia ludoviciana*

TABLE D1 Cont'd

Common Name	Scientific Name
prairie-clover species	*Petalostemon* sp.
purple avens	*Geum rivale*
purple clematis	*Clematis occidentalis*
purple peavine	*Lathyrus venosus*
purple-stemmed aster	*Aster puniceus*
rayless ragwort	*Senecio indecorus*
red and white baneberry	*Actaea rubra*
red goosefoot	*Chenopodium rubrum*
reflexed locoweed	*Oxytropis deflexa*
rosy everlasting	*Antennaria rosea*
round-leaved bog orchid	*Platanthera orbiculata*
round-leaved orchid	*Amerorchis rotundifolia*
round-leaved sundew	*Drosera rotundifolia*
running club-moss	*Lycopodium clavatum*
sago pondweed	*Potamogeton pectinatus*
saline shooting star	*Dodecatheon pulchellum*
samphire species	*Salicornia* sp.
scapose hawk's-beard	*Crepis runcinata*
scheuchzeria	*Scheuchzeria palustris*
seaside arrow-grass	*Triglochin maritima*
short-ray fleabane	*Erigeron lonchophyllus*
showy aster	*Eurybia conspicua*
showy everlasting	*Antennaria pulcherrima*
showy goldenrod	*Solidago nemoralis*
showy locoweed	*Oxytropis splendens*
silverweed	*Potentilla anserina*
slender arrow-grass	*Triglochin palustris*
slender bur-reed	*Sparganium minimum*
slender hawkweed	*Hieracium triste*
slender naiad	*Najas flexilis*
small bedstraw	*Galium trifidum*
small bladderwort	*Utricularia minor*
small bog cranberry	*Oxycoccus microcarpus*
small enchanter's nightshade	*Circaea alpina*
small northern grass-of-parnassus	*Parnassia parviflora*
small wood anemone	*Anemone parviflora*
small-flowered buttercup	*Ranunculus abortivus*
small-leaved everlasting	*Antennaria parvifolia*
smartweed species	*Polygonum* sp.
smooth aster	*Aster laevis*
smooth fleabane	*Erigeron glabellus*
smooth scouring-rush	*Equisetum laevigatum*
snakeroot	*Sanicula marilandica*
sorrel species	*Rumex* sp.
sparrow's-egg lady's-slipper	*Cypripedium passerinum*
spear-leaved arnica	*Arnica lonchophylla*
spiked water-milfoil	*Myriophyllum exalbescens*
spiny-edged little club-moss	*Selaginella selaginoides*
spotted coralroot	*Corallorhiza maculata*
spotted touch-me-not	*Impatiens capensis*
spreading dogbane	*Apocynum androsaemifolium*
spreading sweet cicely	*Osmorhiza depauperata*
spurred gentian	*Halenia deflexa*
star-flowered Solomon's-seal	*Smilacina stellata*
sticky false asphodel	*Tofieldia glutinosa*

TABLE D1 Cont'd

Common Name	Scientific Name
sticky goldenrod	*Solidago simplex*
stiff club-moss	*Lycopodium annotinum*
striped coralroot	*Corallorhiza striata*
swamp horsetail	*Equisetum fluviatile*
swamp lousewort	*Pedicularis parviflora*
sweet coltsfoot	*Petasites frigidus*
sweet-scented bedstraw	*Galium triflorum*
tall anemone	*Anemone riparia*
tall blue lettuce	*Lactuca biennis*
tall larkspur	*Delphinium glaucum*
tall lungwort	*Mertensia paniculata*
tall meadow rue	*Thalictrum dasycarpum*
thistle species	*Cirsium* sp.
thread-leaved pondweed	*Potamogeton filiformis*
three-leaved Solomon's-seal	*Smilacina trifolia*
timber milk vetch	*Astragalus miser*
toadflax species	*Comandra* sp.
tower mustard	*Arabis glabra*
tufted fleabane	*Erigeron caespitosus*
tufted loosestrife	*Lysimachia thyrsiflora*
twayblade species	*Listera* sp.
twinflower	*Linnaea borealis*
twining honeysuckle	*Lonicera dioica*
umbrella-plant species	*Eriogonum* sp.
variegated horsetail	*Equisetum variegatum*
various-leaved pondweed	*Potamogeton gramineus*
veiny meadow rue	*Thalictrum venulosum*
vernal water-starwort	*Callitriche verna*
vine-leaved coltsfoot	*Petasites frigidus* var. x *vitifolius*
Virginia grape fern	*Botrychium virginianum*
water arum	*Calla palustris*
water parsnip	*Sium suave*
water smartweed	*Polygonum amphibium*
water-hemlock	*Cicuta maculata*
water-milfoil	*Myriophyllum verticillatum*
watershield species	*Brasenia* sp.
western Canada violet	*Viola canadensis*
western dock	*Rumex occidentalis*
western willow aster	*Symphyotrichum lanceolatum* var. *hesperium*
western wood lily	*Lilium philadelphicum*
white camas	*Zigadenus elegans*
white hawkweed	*Hieracium albiflorum*
white prairie-clover	*Petalostemon candidum*
white wintergreen	*Pyrola elliptica*
white-stem pondweed	*Potamogeton praelongus*
whitlow-grass species	*Draba* sp.
wild blue flax	*Linum lewisii*
wild chives	*Allium schoenoprasum*
wild licorice	*Glycyrrhiza lepidota*
wild lily-of-the-valley	*Maianthemum canadense*
wild mint	*Mentha arvensis*
wild sarsaparilla	*Aralia nudicaulis*
wild strawberry	*Fragaria virginiana*
wild vetch	*Vicia americana*

TABLE D1 Cont'd

Common Name	Scientific Name
wild white geranium	*Geranium richardsonii*
woodland horsetail	*Equisetum sylvaticum*
woodland strawberry	*Fragaria vesca*
wormseed mustard	*Erysimum cheiranthoides*
yellow anemone	*Anemone richardsonii*
yellow avens	*Geum aleppicum*
yellow evening-primrose	*Oenothera biennis*
yellow false dandelion	*Agoseris glauca*
yellow pond-lily	*Nuphar lutea* ssp. *variegata*
yellow rattle	*Rhinanthus minor*
yellow water crowfoot	*Ranunculus gmelinii*
GRASSES, SEDGES, RUSHES	
alpine rush	*Juncus alpinoarticulatus*
awl-fruited sedge	*Carex stipata*
awned sedge	*Carex atherodes*
Bebb's sedge	*Carex bebbii*
big-head rush	*Juncus vaseyi*
bluegrass species	*Poa* sp.
bluejoint	*Calamagrostis canadensis*
bog muhly	*Muhlenbergia glomerata*
bristle-leaved sedge	*Carex eburnea*
broad-fruited sedge	*Carex tenera*
brook grass	*Catabrosa aquatica*
brownish sedge	*Carex brunnescens*
Canada wild rye	*Elymus canadensis*
Canby bluegrass	*Poa canbyi*
capitate sedge	*Carex capitata*
common cattail	*Typha latifolia*
common great bulrush	*Schoenoplectus tabernaemontani*
common tall manna grass	*Glyceria grandis*
Crawford's sedge	*Carex crawfordii*
creeping spike-rush	*Eleocharis palustris*
cyperus-like sedge	*Carex pseudocyperus*
Dewey's sedge	*Carex deweyana*
drooping wood-reed	*Cinna latifolia*
equitant-leaved rush	*Juncus ensifolius*
few-flowered sedge	*Carex pauciflora*
field wood-rush	*Luzula multiflora*
fowl bluegrass	*Poa palustris*
fowl manna grass	*Glyceria striata*
foxtail barley	*Hordeum jubatum*
fringed brome	*Bromus ciliatus*
golden sedge	*Carex aurea*
graceful sedge	*Carex praegracilis*
green sedge	*Carex viridula*
hair-like sedge	*Carex capillaris*
hairy wild rye	*Leymus innovatus*
hairy-fruited sedge	*Carex lasiocarpa*
hay sedge	*Carex siccata*
Hudson Bay bulrush	*Scirpus hudsonianus*
inland bluegrass	*Poa interior*
inland sedge	*Carex interior*
intermediate oat grass	*Danthonia intermedia*
June grass	*Koeleria macrantha*
keeled brome	*Bromus carinatus*

TABLE D1 Cont'd

Common Name	Scientific Name
Kentucky bluegrass	*Poa pratensis*
knotted rush	*Juncus nodosus*
livid sedge	*Carex livida*
long-styled rush	*Juncus longistylis*
manna grass species	*Glyceria* sp.
meadow sedge	*Carex praticola*
mountain hair grass	*Vahlodea atropurpurea*
mud sedge	*Carex limosa*
narrow reed grass	*Calamagrostis stricta*
narrowleaf cotton-grass	*Eriophorum angustifolium*
northern bog sedge	*Carex gynocrates*
northern manna grass	*Glyceria borealis*
northern reed grass	*Calamagrostis inexpansa*
northern rice grass	*Oryzopsis pungens*
Norway sedge	*Carex norvegica*
Nuttall's salt-meadow grass	*Puccinellia nuttalliana*
prairie bulrush	*Scirpus paludosus*
prairie wedge grass	*Sphenopholis obtusata*
prostrate sedge	*Carex chordorrhiza*
purple oat grass	*Schizachne purpurascens*
purple reed grass	*Calamagrostis purpurascens*
Raymond's sedge	*Carex raymondii*
red fescue	*Festuca rubra*
reed canary grass	*Phalaris arundinacea*
Richardson needle grass	*Stipa richardsonii*
Rocky Mountain fescue	*Festuca saximontana*
Ross' sedge	*Carex rossii*
rough fescue species	*Festuca* sp.
rough hair grass	*Agrostis scabra*
rush-like sedge	*Carex scirpoidea*
Sartwell's sedge	*Carex sartwellii*
sedge	*Carex pachystachya*
sedge species	*Carex* sp.
sheathed cotton grass	*Eriophorum vaginatum*
sheathed sedge	*Carex vaginata*
short-awned foxtail	*Alopecurus aequalis*
short-awned sedge	*Carex microglochin*
silver sedge	*Carex canescens*
silvery-flowered sedge	*Carex aenea*
simple bog-sedge	*Kobresia simpliciuscula*
slender cotton grass	*Eriophorum gracile*
slender rush	*Juncus tenuis*
slender wheatgrass	*Elymus trachycaulus*
slender wheatgrass	*Elymus trachycaulus* ssp. *subsecundus*
slough grass	*Beckmannia syzigachne*
small bottle sedge	*Carex utriculata*
small-flowered wood-rush	*Luzula parviflora*
small-fruited bulrush	*Scirpus microcarpus*
spike trisetum	*Trisetum spicatum*
sun-loving sedge	*Carex pensylvanica*
sweet grass	*Hierochloe hirta ssp. Arctica*
thick-spike sedge	*Carex macloviana*
thin-leaved cotton grass	*Eriophorum viridi-carinatum*
three-seeded sedge	*Carex trisperma*
toad rush	*Juncus bufonius*

TABLE D1 Cont'd

Common Name	Scientific Name
tufted bulrush	*Scirpus cespitosus*
tufted hair grass	*Deschampsia cespitosa*
tufted tall manna grass	*Glyceria elata*
two-seeded sedge	*Carex disperma*
two-stamened sedge	*Carex diandra*
water sedge	*Carex aquatilis*
white-grained mountain rice grass	*Oryzopsis asperifolia*
wire rush	*Juncus balticus*
woolly sedge	*Carex pellita*
yellow sedge	*Carex flava*
MOSSES, LICHENS, LIVERWORTS	
acute-leaved peat moss	*Sphagnum capillifolium*
Amblystegium moss	*Amblystegium serpens*
Anastrophyllum liverwort	*Anastrophyllum helleranum*
Aneura liverwort	*Aneura pinguis*
Anthelia liverwort species	*Anthelia* sp.
Atrichum moss	*Atrichum selwynii*
Atrichum moss species	*Atrichum* sp.
Aulocomnium moss species	*Aulacomnium* sp.
Austria Timmia moss	*Timmia austriaca*
Barbilophozia liverwort	Barbilophozia hatcheri
Barbula moss	*Barbula convoluta*
Bavarian Timmia moss	*Timmia megapolitana*
beard lichen	*Usnea substerilis*
bearded jellyskin	*Leptogium saturninum*
bighorn cladonia	*Cladonia cornuta*
black saddle lichen	*Peltigera neckeri*
black-bellied pelt lichen	*Peltigera rufescens*
Blepharostoma liverwort	*Blepharostoma trichophyllum*
blunt-leafed peat moss	*Sphagnum obtusum*
bog broom moss	*Dicranum undulatum*
bottlebrush frost lichen	*Physconia detersa*
Brachythecium moss	*Brachythecium salebrosum*
bristly beard lichen	*Usnea hirta*
brown moss	*Drepanocladus aduncus*
brown moss	*Hamatocaulis vernicosus*
brown moss	*Limprichtia revolvens*
brown moss	*Sanionia uncinata*
Bryohaplocladium moss	*Bryohaplocladium microphyllum*
Calliergon moss	*Calliergon stramineum*
Caloplaca lichen	*Caloplaca holocarpa*
Campylium moss	*Campylium hispidulum*
candy lichen	*Icmadophila ericetorum*
carpet pixie-cup	*Cladonia pocillum*
Cephalozia liverwort species	*Cephalozia* sp.
chalky ramalina	*Ramalina pollinaria*
Cladonia lichen	*Cladonia botrytes*
Cladonia lichen	*Cladonia cenotea*
Cladonia lichen	*Cladonia chlorophaea*
Cladonia lichen	*Cladonia coniocraea*
Cladonia lichen	*Cladonia deformis*
Cladonia lichen	*Cladonia humilis*
Cladonia lichen	*Cladonia macilenta*
Cladonia lichen species	*Cladonia* sp.
Cladonia lichen	*Cladonia squamosa*

TABLE D1 Cont'd

Common Name	Scientific Name
Climacium moss	*Climacium dendroides*
Collema lichen	*Collema furfuraceum*
common green *Bryum* moss	*Bryum pseudotriquetrum*
common hair-cap	*Polytrichum commune*
concentric pelt lichen	*Peltigera elisabethae*
copper wire moss	*Pohlia nutans*
Cratoneuron moss	*Cratoneuron filicinum*
diamond pelt lichen	*Peltigera membranacea*
Dicranella moss species	*Dicranella* sp.
Dicranum moss	*Dicranum fuscescens*
Dicranum moss	*Dicranum scoparium*
Dicranum moss species	*Dicranum* sp.
disk lichen	*Lecidella euphorea*
Distichium moss	*Distichium capillaceum*
Ditrichum moss	*Ditrichum flexicaule*
dog lichen	*Peltigera canina*
dot lichen	*Mycobilimbia pilularis*
elegant camouflage lichen	*Melanohalea elegantula*
elegant sunburst lichen	*Xanthoria elegans*
elliptic *Plagiomnium* moss	*Plagiomnium ellipticum*
Eurhynchium moss	*Eurhynchium pulchellum*
Evernia lichen	*Evernia mesomorpha*
fan *Ramalina*	*Ramalina sinensis*
fishbone beard lichen	*Usnea filipendula*
fringed wrinkle lichen	*Tuckermannopsis americana*
golden moss	*Tomentypnum nitens*
goldenleaf *Campylium* moss	*Campylium chrysophyllum*
green starburst lichen	*Parmeliopsis ambigua*
grey starburst lichen	*Parmeliopsis hyperopta*
Grimmia moss species	*Grimmia* sp.
grinning rosette lichen	*Physcia dubia*
hair-cap species	*Polytrichum* sp.
hammered shield lichen	*Parmelia sulcata*
hidden goldspeck lichen	*Candelariella aurella*
hoary rosette lichen	*Physcia aipolia*
hooded rosette lichen	*Physcia adscendens*
hooded sunburst lichen	*Xanthomendoza fallax*
hooded tube lichen	*Hypogymnia physodes*
Hylocomiastrum moss	*Hylocomiastrum* sp.
Hypnum moss species	*Hypnum* sp.
Hypocenomyce lichen	*Hypocenomyce scalaris*
Hypogymnia lichen	*Hypogymnia austerodes*
immaculate rosette lichen	*Physcia stellaris*
Jamesoniella liverwort	*Jamesoniella autumnalis*
jelly lichen	*Collema* sp.
juniper hair-cap	*Polytrichum juniperinum*
knight's plume moss	*Ptilium crista-castrensis*
lanceolate leaf rock moss	*Orthotrichum speciosum*
leather lichen species	*Peltigera* sp.
Lepidozia liverwort	*Lepidozia reptans*
Leptodictyum moss	*Leptodictyum riparium*
Lindberg's *Hypnum* moss	*Hypnum lindbergii*
Lobaria lichen	*Lobaria* sp.
Lophocolea liverwort	*Lophocolea heterophylla*
Lophocolea liverwort	*Lophocolea minor*

TABLE D1 Cont'd

Common Name	Scientific Name
Lophozia liverwort	*Lophozia guttulata*
Lophozia liverwort	*Lophozia ventricosa*
man's beard species	*Usnea* sp.
map lichen	*Rhizocarpon grande*
Marchantia liverwort	*Marchantia polymorpha*
Marchantia liverwort	*Marchantia* sp.
mealy shadow lichen	*Phaeophyscia orbicularis*
medium *Plagiomnium* moss	*Plagiomnium medium*
midway peat moss	*Sphagnum magellanicum*
mountain curved-back moss	*Oncophorus wahlenbergii*
Myurella moss	*Myurella julacea*
nit beard lichen	*Usnea subfloridana*
northern camouflage lichen	*Melanohalea septentrionalis*
obtuseleaf aspen moss	*Orthotrichum obtusifolium*
old man's beard	*Bryoria fuscescens*
organ-pipe lichen	*Cladonia crispata*
pebbled pixie-cup	*Cladonia pyxidata*
Pellia liverwort	*Pellia neesiana*
Pellia liverwort species	*Pellia* sp.
Placynthiella lichen	*Placynthium nigrum*
Plagiochila liverwort	*Plagiochila asplenioides*
Platydictya moss	*Platydictya jungermannioides*
powdered beard lichen	*Usnea lapponica*
powder-headed tube lichen	*Hypogymnia tubulosa*
powder-rimmed camouflage lichen	*Melanelixia albertana*
Preissia liverwort	*Preissia quadrata*
Ptilidium liverwort	*Ptilidium pulcherrimum*
purple horn-toothed moss	*Ceratodon purpureus*
Pylaisiella moss	*Pylaisiella polyantha*
red leaf moss	*Bryoerythrophyllum recurvirostre*
reindeer lichen	*Cladonia mitis*
reindeer lichen	*Cladonia rangiferina*
revolute *Hypnum* moss	*Hypnum revolutum*
Riccardia liverwort	*Riccardia latifrons*
rim-lichen	*Lecanora impudens*
ruffled pelt lichen	*Peltigera leucophlebia*
rusty peat moss	*Sphagnum fuscum*
salted shield lichen	*Parmelia saxatilis*
salted starburst lichen	*Imshaugia aleurites*
Sarmenthypnum moss	*Sarmenthypnum sarmentosum*
scaly pelt lichen	*Peltigera praetextata*
Schreber's moss	*Pleurozium schreberi*
Schistidium moss	*Schistidium confertum*
Scorpidium moss	*Scorpidium scorpioides*
sheepish pelt lichen	*Peltigera extenuata*
shrubby sunburst lichen	*Xanthoria candelaria*
sieve lichen	*Cladonia multiformis*
slender hair-cap	*Polytrichum strictum*
smooth cladonia	*Cladonia gracilis*
smooth cladonia	*Cladonia gracilis* ssp. *turbinata*
snakeskin liverwort	*Conocephalum salebrosum*
speckled greenshield lichen	*Flavopunctelia flaventior*
speckled shield lichen	*Punctelia subrudecta*
Sphagnum moss	*Sphagnum angustifolium*
Sphagnum moss	*Sphagnum warnstorfii*

TABLE D1 Cont'd

Common Name	Scientific Name
Sphagnum moss	*Sphagnum wulfianum*
Sphagnum moss species	*Sphagnum* sp.
squarrose peat moss	*Sphagnum squarrosum*
stair-step moss	*Hylocomium splendens*
straw beard lichen	*Usnea scabrata*
studded leather lichen	*Peltigera aphthosa*
Tetraphis moss	*Tetraphis pellucida*
Thuidium moss	*Thuidium recognitum*
toothed *Plagiomnium* moss	*Plagiomnium cuspidatum*
toothless grimmia	*Grimmia anodon*
trumpet lichen	*Cladonia fimbriata*
tufted moss	*Aulacomnium palustre*
waterside feather moss	*Brachythecium rivulare*
waxyleaf moss	*Dicranum polysetum*
whip fork moss	*Dicranum flagellare*
whiskered camouflage lichen	*Melanelixia subargentifera*
whiskered shadow lichen	*Phaeophyscia hispidula*
wiry fern moss	*Abietinella abietina*
wrinkle lichen	*Vulpicida pinastri*
yellow starry fen moss	*Campylium stellatum*
WEEDS, AGRONOMICS[1, 2]	
Canada thistle (creeping thistle)	***Cirsium arvense***
common tansy	***Tanacetum vulgare***
leafy spurge	***Euphorbia esula***
meadow hawkweed	***Hieracium caespitosum***
orange hawkweed	***Hieracium aurantiacum***
ox-eye daisy	***Chrysanthemum leucanthemum***
perennial sow-thistle	***Sonchus arvensis***
rough-fruited cinquefoil	***Potentilla recta***
scentless chamomile	***Matricaria perforata***
tall buttercup	***Ranunculus acris***
white cockle (bladder campion)	***Silene pratensis***
yellow toadflax (common toadflax)	***Linaria vulgaris***
absinthe wormwood	*Artemisia absinthium*
alfalfa	*Medicago sativa*
alsike clover	*Trifolium hybridum*
annual bluegrass	*Poa annua*
annual hawk's-beard	*Crepis tectorum*
awnless brome	*Bromus inermis*
bird's-eye	*Veronica persica*
bird's-foot trefoil	*Lotus corniculatus*
black medick	*Medicago lupulina*
bull thistle	*Cirsium vulgare*
Canada bluegrass	*Poa compressa*
caraway	*Carum carvi*
cicer milk vetch	*Astragalus cicer*
cleavers	*Galium aparine*
common chickweed	*Stellaria media*
common dandelion	*Taraxacum officinale*
common goat's-beard	*Tragopogon dubius*
common knotweed	*Polygonum arenastrum*
common mouse-ear chickweed	*Cerastium vulgatum*
common plantain	*Plantago major*
corn spurry	*Spergula arvensis*
cow cockle	*Vaccaria pyramidata*

TABLE D1 Cont'd

Common Name	Scientific Name
creeping buttercup	*Ranunculus repens*
creeping wild rye	*Elytrigia repens*
crested wheatgrass	*Agropyron cristatum*
dog mustard	*Erucastrum gallicum*
flattened spike-rush	*Eleocharis compressa* var. *borealis*
Galinsoga species	*Galinsoga* sp.
hare's-ear mustard	*Conringia orientalis*
hemp-nettle	*Galeopsis tetrahit*
lady's-thumb	*Polygonum persicaria*
lamb's-quarters	*Chenopodium album*
low cudweed	*Gnaphalium uliginosum*
matrimony vine	*Lycium halimifolium*
mayweed species	*Anthemis* sp.
northern yellow lady's-slipper	*Cypripedium parviflorum* var. *makasin*
orchard grass	*Dactylis glomerata*
parsnip	*Pastinaca sativa*
pineappleweed	*Matricaria matricarioides*
prickly annual sow-thistle	*Sonchus asper*
prickly lettuce	*Lactuca serriola*
rape species	*Brassica* sp.
red clover	*Trifolium pratense*
redtop	*Agrostis stolonifera*
rough cinquefoil	*Potentilla norvegica*
Russian-thistle	*Salsola kali*
sainfoin	*Onobrychis viciifolia*
sheep fescue	*Festuca ovina*
shepherd's-purse	*Capsella bursa-pastoris*
Siberian wheatgrass	*Agropyron fragile*
Sierra hare sedge	*Carex leporinella*
silvery cinquefoil	*Potentilla argentea*
smooth perennial sow-thistle	*Sonchus uliginosus*
stinkweed	*Thlaspi arvense*
summer-cypress	*Kochia scoparia*
timothy	*Phleum pratense*
tufted vetch	*Vicia cracca*
tumbling mustard	*Sisymbrium altissimum*
wheatgrass hybrid species	*Agroelymus* sp.
white clover	*Trifolium repens*
white sweet-clover	*Melilotus alba*
wild buckwheat	*Polygonum convolvulus*
wild oat	*Avena fatua*
yellow clover	*Trifolium aureum*
yellow sweet-clover	*Melilotus officinalis*

Notes:

1 Species nomenclature and the status of species as native or not is determined according to the BC Species and Ecosystem Explorer (BC MOE 2013), with more current taxonomic information drawn from NatureServe (2012a), when necessary. Where the BC *Weed Control Act* nomenclature differs from these sources, the *Weed Control Act* name for the species has been provided in brackets following the ACIMS or CDC name. Where no species nomenclature is available from the BC Species and Ecosystem Explorer (BC MOE 2013), only the BC *Weed Control Act* name is provided.

2 **Bold** font denotes Provincially Noxious weeds.

TABLE D2

HARGREAVES TO DARFIELD OBSERVED PLANT SPECIES – BY TYPE AND COMMON NAME

Common Name	Scientific Name
TREES	
balsam poplar	*Populus balsamifera*
black cottonwood	*Populus trichocarpa*
black spruce	*Picea mariana*
coast Douglas-fir	*Pseudotsuga menziesii* var. *menziesii*
Douglas maple	*Acer glabrum* var. *douglasii*
Engelmann spruce	*Picea engelmannii*
hybrid white spruce	*Picea engelmannii X glauca*
paper birch	*Betula papyrifera* var. *papyrifera*
Rocky Mountain Douglas-fir	*Pseudotsuga menziesii* var. *glauca*
shore pine	*Pinus contorta* var. *contorta*
subalpine fir	*Abies lasiocarpa* var. *lasiocarpa*
trembling aspen	*Populus tremuloides*
western hemlock	*Tsuga heterophylla*
western larch	*Larix occidentalis*
western redcedar	*Thuja plicata*
western white pine	*Pinus monticola*
western yew	*Taxus brevifolia*
white spruce	*Picea glauca*
SHRUBS	
Alaska willow	*Salix alaxensis* var. *alaxensis*
baldhip rose	*Rosa gymnocarpa*
balsam willow	*Salix pyrifolia*
Bebb's willow	*Salix bebbiana*
birch-leaved spirea	*Spiraea betulifolia* ssp. *lucida*
black gooseberry	*Ribes lacustre*
black hawthorn	*Crataegus douglasii* var. *douglasii*
black twinberry	*Lonicera involucrata*
bog willow	*Salix pedicellaris*
choke cherry	*Prunus virginiana* ssp. *demissa*
coastal red elderberry	*Sambucus racemosa* var. *arborescens*
common snowberry	*Symphoricarpos albus* var. *albus*
Cusick's saskatoon	*Amelanchier cusickii*
Drummond's willow	*Salix drummondiana*
dwarf birch	*Betula glandulosa*
Farr's willow	*Salix farriae*
glaucous-leaved honeysuckle	*Lonicera dioica* var. *glaucescens*
green alder	*Alnus viridis* ssp. *crispa*
grey-leaved willow	*Salix glauca* var. *acutifolia*
hardhack	*Spiraea douglasii* ssp. *douglasii*
hawthorn species	*Crataegus* sp.
highbush-cranberry	*Viburnum edule*
Labrador tea	*Rhododendron groenlandicum*
low birch	*Betula pumila* var. *glandulifera*
MacCalla's willow	*Salix maccalliana*
Mackenzie willow	*Salix prolixa*
mountain alder	*Alnus incana* ssp. *tenuifolia*
mountain snowberry	*Symphoricarpos oreophilus* var. *utahensis*
Nootka rose	*Rosa nutkana* var. *hispida*
Nootka rose	*Rosa nutkana* var. *nutkana*
northern blackcurrant	*Ribes hudsonianum* var. *hudsonianum*
northern bush willow	*Salix arbusculoides*
northern gooseberry	*Ribes oxyacanthoides ssp. oxyacanthoides*

TABLE D2 Cont'd

Common Name	Scientific Name
pin cherry	*Prunus pensylvanica*
plane-leaved willow	*Salix planifolia*
prairie rose	*Rosa woodsii* ssp. *ultramontana*
prairie saskatoon	*Amelanchier alnifolia* var. *alnifolia*
prickly rose	*Rosa acicularis* ssp. *sayi*
pussy willow	*Salix discolor*
pyramid spirea	*Spiraea pyramidata*
Queen Charlotte Islands juniper	*Juniperus communis* var. *charlottensis*
red raspberry	*Rubus idaeus* ssp. *strigosus*
red swamp currant	*Ribes triste*
red-flowering currant	*Ribes sanguineum* var. *sanguineum*
red-osier dogwood	*Cornus stolonifera*
redstem ceanothus	*Ceanothus sanguineus*
Rocky Mountain juniper	*Juniperus scopulorum*
Rocky Mountain willow	*Salix petrophila*
rose species	*Rosa* sp.
sage willow	*Salix candida*
Scouler's willow	*Salix scouleriana*
Sitka alder	*Alnus viridis* ssp. *sinuata*
Sitka mountain-ash	*Sorbus sitchensis* var. *sitchensis*
Sitka willow	*Salix sitchensis*
skunk currant	*Ribes glandulosum*
snowbrush	*Ceanothus velutinus* var. *velutinus*
soopolallie	*Shepherdia canadensis*
stink currant	*Ribes bracteosum*
sweet gale	*Myrica gale*
thimbleberry	*Rubus parviflorus* var. *parviflorus*
trailing black currant	*Ribes laxiflorum*
trumpet species	*Lonicera* sp.
under-green willow	*Salix commutata*
water birch	*Betula occidentalis*
western mountain-ash	*Sorbus scopulina* var. *cascadensis*
western mountain-ash	*Sorbus scopulina* var. *scopulina*
white-flowered rhododendron	*Rhododendron albiflorum*
willow species	*Salix* sp.
FORBS, DWARF SHRUBS	
Alaska club-moss	*Diphasiastrum sitchense*
Alaska rein orchid	*Piperia unalascensis*
Alaskan bunchberry	*Cornus unalaschkensis*
alpine aster	*Aster alpinus* ssp. *vierhapperi*
alpine speedwell	*Veronica wormskjoldii* var. *wormskjoldii*
alpine-wintergreen	*Gaultheria humifusa*
American speedwell	*Veronica beccabunga* var. *americana*
American vetch	*Vicia americana*
American water-plantain	*Alisma triviale*
annual agoseris	*Agoseris heterophylla* ssp. *heterophylla*
Arctic lupine	*Lupinus Arcticus* ssp. *Arcticus*
Arctic pearlwort	*Sagina saginoides*
arrow-leaved coltsfoot	*Petasites frigidus* var. *sagittatus*
arrow-leaved groundsel	*Senecio triangularis*
baneberry	*Actaea rubra*
beaked hazelnut	*Corylus cornuta* var. *cornuta*
Bicknell's geranium	*Geranium bicknellii*
black huckleberry	*Vaccinium membranaceum*

TABLE D2 Cont'd

Common Name	Scientific Name
black sanicle	*Sanicula marilandica*
black sanicle	*Sanicula marilandica*
blue lettuce species	*Lactuca* sp.
blue violet species	*Viola* sp.
blunt-fruited sweet-cicely	*Osmorhiza depauperata*
blunt-leaved sandwort	*Moehringia lateriflora*
bog clubmoss	*Lycopodiella inundata*
bog cranberry	*Oxycoccus oxycoccos*
boreal starwort	*Stellaria borealis* ssp. *borealis*
bracken fern	*Pteridium aquilinum* ssp. *lanuginosum*
Brewer's mitrewort	*Mitella breweri*
broad-fruited bur-reed	*Sparganium eurycarpum*
broadleaf lupine	*Lupinus latifolius* var. *latifolius*
broad-leaved starflower	*Trientalis borealis* ssp. *latifolia*
broad-leaved willowherb	*Epilobium latifolium*
buckbean	*Menyanthes trifoliata*
bulbous water-hemlock	*Cicuta bulbifera*
bunchberry	*Cornus canadensis*
butterweed species	*Senecio* sp.
Canada anemone	*Anemone canadensis*
Canada goldenrod	*Solidago lepida* var. *lepida*
Canada violet	*Viola canadensis* var. *rugulosa*
centaury species	*Centaurium* sp.
clasping twistedstalk	*Streptopus amplexifolius* var. *amplexifolius*
clover species	*Trifolium* sp.
Columbia bower	*Clematis occidentalis* ssp. *grosseserrata*
columbine species	*Aquilegia* sp.
common agrimony	*Agrimonia gryposepala*
common cattail	*Typha latifolia*
common duckweed	*Lemna minor*
common harebell	*Campanula rotundifolia*
common horsetail	*Equisetum arvense*
common mare's-tail	*Hippuris vulgaris*
common mitrewort	*Mitella nuda*
common moonwort	*Botrychium lunaria*
common silverweed	*Potentilla anserina*
common touch-me-not	*Impatiens noli-tangere*
corrugate-seeded spurge	*Chamaesyce glyptosperma*
cow-parsnip	*Heracleum maximum*
cow-wheat	*Melampyrum lineare* var. *lineare*
creamy peavine	*Lathyrus ochroleucus*
creeping-snowberry	*Gaultheria hispidula*
crested wood fern	*Dryopteris cristata*
crisp starwort	*Stellaria crispa*
crowberry	*Empetrum nigrum*
cudweed species	*Gnaphalium* sp.
cut-leaved anemone	*Anemone multifida* var. *multifida*
cut-leaved foamflower	*Tiarella trifoliata*
cut-leaved water horehound	*Lycopus americanus*
dainty moonwort	*Botrychium crenulatum*
dangling suncress	*Boechera retrofracta*
devil's club	*Oplopanax horridus*
dock species	*Rumex* sp.
dotted saxifrage	*Micranthes nelsoniana var. pacifica*
Douglas' water-hemlock	*Cicuta douglasii*

TABLE D2 Cont'd

Common Name	Scientific Name
dull Oregon-grape	*Mahonia nervosa*
dwarf blueberry	*Vaccinium caespitosum*
dwarf rattlesnake orchid	*Goodyera repens*
dwarf red raspberry	*Rubus pubescens* var. *pubescens*
dwarf scouring-rush	*Equisetum scirpoides*
earless suncress	*Boechera pendulocarpa*
early blue violet	*Viola adunca* var. *adunca*
edible thistle	*Cirsium edule* var. *macounii*
enchanter's-nightshade	*Circaea alpina* ssp. *alpina*
fairy-slipper	*Calypso bulbosa*
false azalea	*Menziesia ferruginea*
false Solomon's-seal	*Maianthemum racemosum* ssp. *amplexicaule*
false toad-flax	*Geocaulon lividum*
falsebox	*Paxistima myrsinites*
field chickweed	*Cerastium arvense*
field mint	*Mentha arvensis*
field pussytoes	*Antennaria neglecta*
fireweed	*Epilobium angustifolium ssp. angustifolium*
five-leaved bramble	*Rubus pedatus*
five-stamened mitrewort	*Mitella pentandra*
fleabane species	*Erigeron* sp.
fragile fern	*Cystopteris fragilis*
fragrant white rein orchid	*Platanthera dilatata* var. *albiflora*
fragrant white rein orchid	*Platanthera dilatata* var. *dilatata*
Franklin's phacelia	*Phacelia franklinii*
fringecup	*Tellima grandiflora*
fringed grass-of-Parnassus	*Parnassia fimbriata*
fringed loosestrife	*Lysimachia ciliata*
globe-mallow species	*Sphaeralcea* sp.
goatsbeard	*Aruncus dioicus*
golden corydalis	*Corydalis aurea*
golden dock	*Rumex fueginus*
golden-saxifrage species	*Chrysosplenium* sp.
graceful cinquefoil	*Potentilla gracilis* var. *fastigiata*
grass-leaved pondweed	*Potamogeton gramineus*
Great Lakes rein orchid	*Platanthera huronensis*
great northern aster	*Canadanthus modestus*
greater bladderwort	*Utricularia macrorhiza*
green wintergreen	*Pyrola chlorantha*
grooved agrimony	*Agrimonia striata*
ground-cedar	*Diphasiastrum complanatum*
ground-pine	*Lycopodium dendroideum*
harsh paintbrush	*Castilleja hispida var. hispida*
hawksbeard species	*Crepis* sp.
hawkweed species	*Hieracium* sp.
heart-leaved arnica	*Arnica cordifolia*
heart-leaved twayblade	*Listera cordata*
hemlock water-parsnip	*Sium suave*
hemp	*Apocynum cannabinum*
hispid yellowcress	*Rorippa palustris* ssp. *hispida*
Holboell's rockcress	*Arabis holboellii* var. *secunda*
hooded ladies' tresses	*Spiranthes romanzoffiana*
Hooker's fairybells	*Prosartes hookeri* var. *oregana*
Hornemann's willowherb	*Epilobium hornemannii* ssp. *hornemannii*
Howell's pussytoes	*Antennaria howellii* ssp. *howellii*

TABLE D2 Cont'd

Common Name	Scientific Name
Indian hellebore	*Veratrum viride*
indian-pipe	*Monotropa uniflora*
kidney-leaved buttercup	*Ranunculus abortivus*
kidney-leaved violet	*Viola renifolia*
kinnikinnick	*Arctostaphylos uva-ursi*
kneeling angelica	*Angelica genuflexa*
lady fern	*Athyrium filix-femina* ssp. *cyclosorum*
lamb's-quarters species	*Chenopodium* sp.
lance-leaved stonecrop	*Sedum lanceolatum* var. *lanceolatum*
large round-leaved rein orchid	*Platanthera orbiculata*
large-leaved avens	*Geum macrophyllum* ssp. *macrophyllum*
leafy aster	*Symphyotrichum foliaceum* var. *foliaceum*
least moonwort	*Botrychium simplex var. compositum*
leatherleaf saxifrage	*Leptarrhena pyrolifolia*
leathery grape fern	*Botrychium multifidum*
lesser bladderwort	*Utricularia minor*
lesser wintergreen	*Pyrola minor*
lingonberry	*Vaccinium vitis-idaea* ssp. *minus*
little buttercup	*Ranunculus uncinatus*
long-bracted frog orchid	*Coeloglossum viride* var. *virescens*
long-headed anemone	*Anemone cylindrica*
long-leaved starwort	*Stellaria longifolia*
Macoun's buttercup	*Ranunculus macounii*
maidenhair spleenwort	*Asplenium trichomanes* ssp. *trichomanes*
male fern	*Dryopteris filix-mas* ssp. *filix-mas*
maple-leaved goosefoot	*Chenopodium simplex*
marsh cinquefoil	*Comarum palustre*
marsh horsetail	*Equisetum palustre*
marsh skullcap	*Scutellaria galericulata*
marsh speedwell	*Veronica scutellata*
marsh violet	*Viola palustris* var. *palustris*
meadow arnica	*Arnica chamissonis* ssp. *chamissonis*
meadow horsetail	*Equisetum pratense*
Menzies' campion	*Silene menziesii* var. *menziesii*
Menzies' pipsissewa	*Chimaphila menziesii*
Mexican mosquito fern	*Azolla mexicana*
Michigan moonwort	*Botrychium michiganense* sp. *nov. ined.*
monkey-flower species	*Mimulus* sp.
mountain arnica	*Arnica latifolia*
mountain blue-eyed-grass	*Sisyrinchium montanum*
mountain cliff fern	*Woodsia scopulina*
mountain moonwort	*Botrychium montanum*
mountain sagewort	*Artemisia norvegica* ssp. *saxatilis*
mountain sweet-cicely	*Osmorhiza berteroi*
musk-flower	*Mimulus moschatus* var. *moschatus*
mustard species	*Sisymbrium* sp.
nagoonberry	*Rubus Arcticus* ssp. *acaulis*
narrow beech fern	*Phegopteris connectilis*
narrow-leaved bur-reed	*Sparganium angustifolium*
narrow-leaved collomia	*Collomia linearis*
narrow-leaved hawkweed	*Hieracium umbellatum* ssp. *umbellatum*
narrow-leaved willowherb	*Epilobium leptophyllum*
nodding beggarticks	*Bidens cernua*
northern bedstraw	*Galium boreale*
northern fairy-candelabra	*Androsace septentrionalis*

TABLE D2 Cont'd

Common Name	Scientific Name
northern fir-moss	*Huperzia selago*
northern gentian	*Gentianella amarella* ssp. *acuta*
northern grass-of-Parnassus	*Parnassia palustris*
northern green rein orchid	*Platanthera aquilonis*
northern hound's-tongue	*Cynoglossum boreale*
northern pondweed	*Potamogeton alpinus*
northern scouring-rush	*Equisetum variegatum* ssp. *variegatum*
northern starflower	*Trientalis europaea* ssp. *Arctica*
northern starwort	*Stellaria calycantha*
northern water horehound	*Lycopus uniflorus*
northern water-starwort	*Callitriche hermaphroditica*
northern wormwood	*Artemisia campestris* ssp. *pacifica*
northwestern moonwort	*Botrychium pinnatum*
northwestern twayblade	*Listera caurina*
Norwegian cinquefoil	*Potentilla norvegica*
oak fern	*Gymnocarpium dryopteris*
one-leaved rein orchid	*Platanthera obtusata* ssp. *obtusata*
one-sided wintergreen	*Orthilia secunda* var. *obtusata*
one-sided wintergreen	*Orthilia secunda* var. *secunda*
orange agoseris	*Agoseris aurantiaca* ssp. *aurantiaca*
orchid species	*Cephalanthera sp.*
ostrich fern	*Matteuccia struthiopteris*
oval-leaved blueberry	*Vaccinium ovalifolium*
Parry's campion	*Silene parryi*
parsley fern	*Cryptogramma acrostichoides*
partridge-foot	*Luetkea pectinata*
pathfinder	*Adenocaulon bicolor*
pearly everlasting	*Anaphalis margaritacea*
Pennsylvanian bittercress	*Cardamine pensylvanica*
Philadelphia fleabane	*Erigeron philadelphicus*
phlox species	*Linanthus* sp.
pinedrops	*Pterospora andromedea*
pink corydalis	*Corydalis sempervirens*
pink monkey-flower	*Mimulus lewisii*
pink mountain-heather	*Phyllodoce empetriformis*
pink twink	*Microsteris gracilis* var. *gracilis*
pink wintergreen	*Pyrola asarifolia*
poison ivy	*Toxicodendron rydbergii*
pondweed species	*Potamogeton* sp.
prairie pepper-grass	*Lepidium densiflorum*
prince's pine	*Chimaphila umbellata* ssp. *occidentalis*
ptarmigan club-moss	*Lycopodium lagopus*
purple peavine	*Lathyrus nevadensis* var. *pilosellus*
purple-leaved willowherb	*Epilobium ciliatum* ssp. *ciliatum*
pussytoes species	*Antennaria* sp.
queen's cup	*Clintonia uniflora*
racemose pussytoes	*Antennaria racemosa*
rattlesnake fern	*Botrychium virginianum*
rattlesnake-plantain	*Goodyera oblongifolia*
rayless alkali aster	*Symphyotrichum ciliatum*
rayless alpine butterweed	*Packera pauciflora*
Richardson's geranium	*Geranium richardsonii*
Rocky Mountain pond-lily	*Nuphar polysepala*
rosy pussytoes	*Antennaria rosea*
rosy twistedstalk	*Streptopus lanceolatus* var. *curvipes*

TABLE D2 Cont'd

Common Name	Scientific Name
rough-fruited fairybells	*Prosartes trachycarpa*
rough-stemmed fleabane	*Erigeron strigosus* var. *strigosus*
round-leaved sundew	*Drosera rotundifolia* var. *rotundifolia*
round-leaved violet	*Viola orbiculata*
running club-moss	*Lycopodium clavatum* var. *clavatum*
rush aster	*Symphyotrichum boreale*
scarlet paintbrush	*Castilleja miniata* var. *miniata*
Scouler's hawkweed	*Hieracium scouleri*
scouring-rush	*Equisetum hyemale* ssp. *affine*
self-heal	*Prunella vulgaris* ssp. *lanceolata*
sharptooth angelica	*Angelica arguta*
short-awned ricegrass	*Piptatherum pungens*
short-fruited tansymustard	*Descurainia pinnata* ssp. *brachycarpa*
showy aster	*Eurybia conspicua*
shrubby penstemon	*Penstemon fruticosus* var. *fruticosus*
sibbaldia	*Sibbaldia procumbens*
Siberian yarrow	*Achillea alpina*
single delight	*Moneses uniflora*
Sitka columbine	*Aquilegia formosa* ssp. *formosa*
Sitka valerian	*Valeriana sitchensis*
skullcap species	*Scutellaria* sp.
skunk cabbage	*Lysichiton americanus*
slender hawkweed	*Hieracium gracile*
slender rein orchid	*Platanthera stricta*
small bedstraw	*Galium trifidum* ssp. *columbianum*
small bedstraw	*Galium trifidum* ssp. *trifidum*
small bur-reed	*Sparganium natans*
small pondweed	*Potamogeton pusillus* ssp. *pusillus*
small white violet	*Viola macloskeyi*
small yellow water-buttercup	*Ranunculus gmelinii*
small-flowered blue-eyed Mary	*Collinsia parviflora*
small-flowered forget-me-not	*Myosotis laxa*
small-flowered lupine	*Lupinus polycarpus*
smooth alumroot	*Heuchera glabra*
smooth aster	*Symphyotrichum laeve* var. *geyeri*
smooth daisy	*Erigeron glabellus* ssp. *pubescens*
smooth sumac	*Rhus glabra*
speedwell species	*Veronica sp.*
spikelike goldenrod	*Solidago simplex* var. *nana*
spikelike goldenrod	*Solidago simplex* var. *simplex*
spiny wood fern	*Dryopteris expansa*
spoon-shaped moonwort	*Botrychium spathulatum*
spotted coralroot	*Corallorhiza maculata* var. *maculata*
spreading dogbane	*Apocynum androsaemifolium* var. *androsaemifolium*
stalked moonwort	*Botrychium pedunculosum*
star-flowered false Solomon's-seal	*Maianthemum stellatum*
starwort species	*Stellaria sp.*
sticky cinquefoil	*Drymocallis glandulosa* var. *glandulosa*
sticky false asphodel	*Triantha glutinosa*
stiff club-moss	*Lycopodium annotinum*
stonecrop species	*Sedum* sp.
straight-up suncress	*Boechera stricta*
strawberry-blite	*Chenopodium capitatum*
stream violet	*Viola glabella*
streambank butterweed	*Packera pseudaurea* var. *pseudaurea*

TABLE D2 Cont'd

Common Name	Scientific Name
striped coralroot	*Corallorhiza striata* var. *striata*
subalpine daisy	*Erigeron peregrinus* ssp. *peregrinus*
swamp hedge-nettle	*Stachys palustris* ssp. *pilosa*
swamp horsetail	*Equisetum fluviatile*
sweet coltsfoot	*Petasites frigidus* var. *frigidus*
sweet coltsfoot	*Petasites frigidus* var. *nivalis*
sweet-scented bedstraw	*Galium triflorum*
tall annual willowherb	*Epilobium brachycarpum*
tall blue lettuce	*Lactuca biennis*
tall Jacob's-ladder	*Polemonium acutiflorum*
tall Oregon-grape	*Mahonia aquifolium*
thick-leaved starwort	*Stellaria crassifolia*
three-leaved false Solomon's-seal	*Maianthemum trifolium*
three-leaved foamflower	*Tiarella trifoliata* var. *trifoliata*
three-leaved goldthread	*Coptis trifolia*
thyme-leaved speedwell	*Veronica serpyllifolia var. humifusa*
tiger lily	*Lilium columbianum*
timber milk-vetch	*Astragalus miser* var. *miser*
toothed wood fern	*Dryopteris carthusiana*
touch-me-not species	*Impatiens* sp.
trailing blackberry	*Rubus ursinus* ssp. *macropetalus*
triangle moonwort	*Botrychium lanceolatum* ssp. *lanceolatum*
tufted loosestrife	*Lysimachia thyrsiflora*
twinflower	*Linnaea borealis* ssp. *borealis*
twistedstalk species	*Streptopus* sp.
umbel bittercress	*Cardamine umbellata*
umber pussytoes	*Antennaria umbrinella*
upswept moonwort	*Botrychium ascendens*
veiny meadowrue	*Thalictrum venulosum*
velvet-leaved blueberry	*Vaccinium myrtilloides*
water avens	*Geum rivale*
water smartweed	*Persicaria amphibia* var. *emersa*
water-milfoil species	*Myriophyllum* sp.
western bittercress	*Cardamine occidentalis*
western bog-laurel	*Kalmia microphylla* ssp. *microphylla*
western coralroot	*Corallorhiza mertensiana*
western meadowrue	*Thalictrum occidentale*
western moonwort	*Botrychium hesperium*
western oak fern	*Gymnocarpium disjunctum*
western tea-berry	*Gaultheria ovatifolia*
western yellowcress	*Rorippa curvisiliqua*
white cinquefoil	*Drymocallis convallaria*
white hawkweed	*Hieracium albiflorum*
white mountain-heather	*Cassiope mertensiana* var. *mertensiana*
white pussytoes	*Antennaria microphylla*
white water-buttercup	*Ranunculus aquatilis* var. *aquatilis*
white wintergreen	*Pyrola elliptica*
white-flowered willowherb	*Epilobium lactiflorum*
wild calla	*Calla palustris*
wild ginger	*Asarum caudatum*
wild lily-of-the-valley	*Maianthemum canadense*
wild sarsaparilla	*Aralia nudicaulis*
wild strawberry	*Fragaria virginiana* var. *glauca*
willow weed	*Persicaria lapathifolia*
willowherb species	*Epilobium* sp.

TABLE D2 Cont'd

Common Name	Scientific Name
wood horsetail	*Equisetum sylvaticum*
wood strawberry	*Fragaria vesca var. americana*
woolly groundsel	*Packera cana*
yarrow	*Achillea millefolium* var. *alpicola*
yellow avens	*Geum aleppicum*
yellow coralroot	*Corallorhiza trifida*
yellow evening-primrose	*Oenothera villosa* ssp. *strigosa*
yellow monkey-flower	*Mimulus guttatus*
yellow mountain-avens	*Dryas drummondii* var. *drummondii*
yellow penstemon	*Penstemon confertus*
yellow rattle	*Rhinanthus minor*
yellow water-buttercup	*Ranunculus flabellaris*
yellowcress species	*Rorippa* sp.
GRASSES, SEDGES, RUSHES	
alpine rush	*Juncus alpinoarticulatus*
Altai fescue	*Festuca altaica*
annual hairgrass	*Deschampsia danthonioides*
Arctagrostis species	*Arctagrostis* sp.
awl-fruited sedge	*Carex stipata* var. *stipata*
bald sedge	*Carex tonsa* var. *tonsa*
Baltic rush	*Juncus balticus*
beaked sedge	*Carex utriculata*
Bebb's sedge	*Carex bebbii*
bent sedge	*Carex deflexa*
bentgrass species	*Agrostis* sp.
bigleaf sedge	*Carex amplifolia*
blue wildrye	*Elymus glaucus* ssp. *glaucus*
bluegrass species	*Poa* sp.
bluejoint reedgrass	*Calamagrostis canadensis* var. *canadensis*
bristle-stalked sedge	*Carex leptalea* ssp. *leptalea*
brome species	*Bromus* sp.
bronze sedge	*Carex aenea*
brown sedge species	*Carex* sp.
brownish sedge	*Carex brunnescens*
brownish sedge	*Carex brunnescens* ssp. *alaskana*
bulrush species	*Scirpus* sp.
Buxbaum's sedge	*Carex buxbaumii*
California brome	*Bromus carinatus*
canarygrass species	*Phalaris* sp.
Columbia brome	*Bromus vulgaris*
common spike-rush	*Eleocharis palustris*
common sweetgrass	*Hierochloe hirta* ssp. *Arctica*
Crawford's sedge	*Carex crawfordii*
creeping spike-rush	*Eleocharis macrostachya*
Cusick's sedge	*Carex cusickii*
dagger-leaf rush	*Juncus ensifolius* var. *ensifolius*
Dewey's sedge	*Carex deweyana* var. *deweyana*
Dudley's rush	*Juncus dudleyi*
false melic	*Schizachne purpurascens*
fescue species	*Festuca* sp.
few-flowered sedge	*Carex pauciflora*
field sedge	*Carex praegracilis*
fowl bluegrass	*Poa palustris*
fowl mannagrass	*Glyceria striata*
fox sedge	*Carex vulpinoidea*

TABLE D2 Cont'd

Common Name	Scientific Name
foxtail barley	*Hordeum jubatum* ssp. *jubatum*
fringed brome	*Bromus ciliatus*
fuzzy-spiked wildrye	*Leymus innovatus*
golden sedge	*Carex aurea*
green sedge	*Carex viridula* ssp. *viridula*
grey sedge	*Carex canescens* ssp. *canescens*
hair bentgrass	*Agrostis scabra*
hairy wildrye	*Elymus hirsutus*
hard-stemmed bulrush	*Schoenoplectus acutus*
hay sedge	*Carex siccata*
Hood's sedge	*Carex hoodii*
Hudson Bay clubrush	*Trichophorum alpinum*
Idaho fescue	*Festuca idahoensis*
inflated sedge	*Carex exsiccata*
jointed rush	*Juncus articulatus*
junegrass	*Koeleria macrantha*
Kellogg's sedge	*Carex kelloggii*
Kentucky bluegrass	*Poa pratensis*
lesser blader sedge	*Carex vesicaria*
lesser-panicled sedge	*Carex diandra*
little meadow-foxtail	*Alopecurus aequalis*
long-bracted sedge	*Carex retrorsa*
low northern sedge	*Carex concinna*
many-flowered wood-rush	*Luzula multiflora* ssp. *multiflora*
Melica species	*Melica* sp.
Merten's sedge	*Carex mertensii*
narrow-leaved cotton-grass	*Eriophorum angustifolium*
needle spike-rush	*Eleocharis acicularis*
nodding trisetum	*Trisetum cernuum*
nodding wood-reed	*Cinna latifolia*
northern clustered sedge	*Carex arcta*
northwestern sedge	*Carex concinnoides*
pinegrass	*Calamagrostis rubescens*
poor sedge	*Carex magellanica* ssp. *irrigua*
poverty oatgrass	*Danthonia spicata*
reed canarygrass	*Phalaris arundinacea*
reed mannagrass	*Glyceria grandis*
Rocky Mountain fescue	*Festuca saximontana*
Ross' sedge	*Carex rossii*
rough fescue	*Festuca campestris*
rough-leaved ricegrass	*Oryzopsis asperifolia*
rush species	*Juncus* sp.
sheathed sedge	*Carex vaginata*
shore sedge	*Carex limosa*
showy sedge	*Carex spectabilis*
Sitka sedge	*Carex sitchensis*
slender rush	*Juncus tenuis*
slender sedge	*Carex lasiocarpa* ssp. *americana*
slender wheatgrass	*Elymus trachycaulus* ssp. *subsecundus*
slender wheatgrass	*Elymus trachycaulus* ssp. *trachycaulus*
slimstem reedgrass	*Calamagrostis stricta* ssp. *stricta*
small-awned sedge	*Carex microchaeta* ssp. *microchaeta*
small-flowered bulrush	*Scirpus microcarpus*
small-flowered wood-rush	*Luzula parviflora*
smooth-stemmed sedge	*Carex laeviculmis*

TABLE D2 Cont'd

Common Name	Scientific Name
soft-leaved sedge	*Carex disperma*
spike bentgrass	*Agrostis exarata*
spike-rush species	*Eleocharis* sp.
star sedge	*Carex echinata* ssp. *echinata*
tall mannagrass	*Glyceria elata*
tall trisetum	*Trisetum canescens*
tender sedge	*Carex tenera*
thick-headed sedge	*Carex pachystachya*
thread rush	*Juncus filiformis*
timber oatgrass	*Danthonia intermedia*
toad rush	*Juncus bufonius*
tuberous rush	*Juncus nodosus*
water sedge	*Carex aquatilis* ssp. *stans*
water sedge	*Carex aquatilis* var. *aquatilis*
weak-nerved sedge	*Carex infirminervia*
western fescue	*Festuca occidentalis*
woolly sedge	*Carex pellita*
yellow sedge	*Carex flava*
MOSSES, LICHENS, LIVERWORTS	
Abietinella moss	*Abietinella abietina*
alpine foam	*Stereocaulon alpinum*
Amblystegium moss	*Amblystegium serpens* var. *juratzkanum*
Amblystegium moss	*Amblystegium serpens* var. *serpens*
Anacolia moss	*Anacolia menziesii*
angelhair	*Ramalina thrausta*
apple pelt	*Peltigera malacea*
Aulacomnium moss	*Aulacomnium androgynum*
Aulacomnium moss	*Aulacomnium palustre*
barbilophozia	*Barbilophozia lycopodioides*
Barbula moss	*Barbula unguiculata*
Bartramia moss	*Bartramia pomiformis*
bighorn pixie	*Cladonia cornuta*
black-bellied pelt	*Peltigera rufescens*
black-saddle pelt	*Peltigera neckeri*
blepharostoma	*Blepharostoma trichophyllum*
boreal horsehair	*Bryoria implexa*
boreal pixie-cup	*Cladonia borealis*
Brachydontium moss species	*Brachydontium* sp.
Brachythecium moss	*Brachythecium albicans*
Brachythecium moss	*Brachythecium erythrorrhizon*
Brachythecium moss	*Brachythecium rutabulum*
Brachythecium moss	*Brachythecium salebrosum*
Brachythecium moss	*Brachythecium velutinum* var. *velutinum*
bronzed pixie	*Cladonia gracilis* ssp. *turbinata*
brown-eyed sunshine	*Vulpicida canadensis*
Bryocaulon lichen species	*Bryocaulon* sp.
Bryum moss	*Bryum pseudotriquetrum*
budding bone	*Hypogymnia occidentalis*
Calliergon moss	*Calliergon giganteum*
Campylium moss	*Campylium stellatum* var. *stellatum*
cat paw	*Nephroma bellum*
Ceratodon moss	*Ceratodon purpureus* var. *purpureus*
chalk foam	*Stereocaulon spathuliferum*
Cirriphyllum moss	*Cirriphyllum cirrosum*

TABLE D2 Cont'd

Common Name	Scientific Name
Cladina lichen species	*Cladina* sp.
Climacium moss	*Climacium dendroides*
coarser rockwool	*Pseudephebe minuscula*
cottontail foam	*Stereocaulon paschale*
Cratoneuron moss	*Cratoneuron filicinum*
crinkled wrinkle	*Tuckermannopsis platyphylla*
diamond pelt	*Peltigera membranacea*
Dichodontium moss	*Dichodontium pellucidum*
Dicranella moss species	*Dicranella* sp.
Dicranum moss	*Dicranum flagellare*
Dicranum moss	*Dicranum fuscescens* var. *fuscescens*
Dicranum moss	*Dicranum montanum*
Dicranum moss	*Dicranum polysetum*
Dicranum moss	*Dicranum scoparium*
Dicranum moss	*Dicranum tauricum*
Dicranum moss	*Dicranum undulatum*
Dicranum moss species	*Dicranum* sp.
dimpled pelt	*Peltigera horizontalis*
Diplophyllum liverwort	*Diplophyllum obtusifolium*
Distichium moss	*Distichium capillaceum*
dog bone	*Hypogymnia tubulosa*
dog paw	*Nephroma helveticum* ssp. *sipeanum*
Drepanocladus moss species	*Drepanocladus* sp.
ectomorphic reindeer	*Cladina mitis*
edible horsehair	*Bryoria fremontii*
effervescent tarpaper	*Collema furfuraceum* var. *furfuraceum*
elfin candleflame	*Candelaria concolor*
embossed beard	*Usnea substerilis*
Eurhynchium moss	*Eurhynchium pulchellum*
eyed chestnut	*Cetraria sepincola*
eyed foam	*Stereocaulon tomentosum*
false yarrow species	*Chaenactis* sp.
familiar witch's hair	*Alectoria sarmentosa* ssp. *sarmentosa*
felt pelt	*Peltigera canina*
Fissidens moss	*Fissidens bryoides*
flattened thornbush	*Kaernefeltia merrillii*
Floerke's barbilophozia	*Barbilophozia floerkei*
forking bone	*Hypogymnia imshaugii*
Funaria moss	*Funaria hygrometrica*
gesturing pixie	*Cladonia digitata*
gilded sunshine	*Vulpicida pinastri*
granulating crottle	*Parmelia hygrophila*
granulating pixie-cup	*Cladonia chlorophaea*
gray horsehair	*Bryoria capillaris*
gray reindeer	*Cladina rangiferina*
greater pied pixie	*Cladonia phyllophora*
greater toad pelt	*Peltigera scabrosa*
green starburst	*Parmeliopsis ambigua*
greenlight	*Nephroma Arcticum*
grey starburst	*Parmeliopsis hyperopta*
hammered crottle	*Parmelia sulcata*
Hedwigia moss	*Hedwigia ciliata*
Homalothecium moss	*Homalothecium aeneum*
Homalothecium moss	*Homalothecium fulgescens*
hooded rosette	*Physcia adscendens*

TABLE D2 Cont'd

Common Name	Scientific Name
Hylocomiastrum moss species	*Hylocomiastrum* sp.
hyphenated icelandmoss	*Cetraria ericetorum*
Hypnum moss	*Hypnum circinale*
Hypnum moss	*Hypnum pallescens*
Hypnum moss	*Hypnum revolutum* var. *revolutum*
Hypnum moss	*Hypnum vaucheri*
Isothecium moss	*Isothecium myosuroides*
Jamesoniella liverwort	*Jamesoniella autumnalis*
Jungermannia liverwort	*Jungermannia leiantha*
Jungermannia liverwort species	*Jungermannia* sp.
knight's plume	*Ptilium crista-castrensis*
lesser organpipe pixie	*Cladonia crispata*
lesser ribbed pixie	*Cladonia cariosa*
Lophocolea liverwort	*Lophocolea minor*
Lophozia liverwort	*Lophozia minor*
Lophozia liverwort	*Lophozia ventricosa*
lungwort	*Lobaria pulmonaria*
mama littlehorn pixie	*Cladonia coniocraea*
Maritime woollybear	*Polychidium contortum*
medium hot pixie	*Cladonia deformis*
Menzies' *Metaneckera* moss	*Metaneckera menziesii*
midnight vinyl	*Leptogium saturninum*
Mnium moss	*Mnium ambiguum*
Mnium moss species	*Mnium* sp.
monk's hood	*Hypogymnia physodes*
mountain wolf	*Letharia lupina*
nebulous camouflage	*Melanelia disjuncta*
nit beard	*Usnea subfloridana*
Oligotrichum moss	*Oligotrichum aligerum*
Oligotrichum moss	*Oncophorus wahlenbergii*
Oligotrichum moss	*Orthotrichum lyellii*
Oligotrichum moss	*Orthotrichum obtusifolium*
Oligotrichum moss	*Orthotrichum speciosum* var. *speciosum*
overlapping camouflage	*Melanelia panniformis*
pale-footed horsehair	*Bryoria fuscescens*
Palustriella moss	*Palustriella falcata*
papa littlehorn pixie	*Cladonia ochrochlora*
pebbled crottle	*Parmelia saxatilis*
pebbled pixie-cup	*Cladonia pyxidata*
Pellia liverwort	*Pellia neesiana*
Philonotis moss	*Philonotis fontana* var. *fontana*
pimpled paw	*Nephroma resupinatum*
pincushion sunburst	*Xanthoria polycarpa*
Plagiomnium moss	*Plagiomnium ciliare*
Plagiomnium moss	*Plagiomnium cuspidatum*
Plagiomnium moss	*Plagiomnium ellipticum*
Plagiomnium moss	*Plagiomnium medium*
Plagiomnium moss	*Plagiothecium laetum*
Pogonatum moss	*Pogonatum urnigerum*
Pohlia moss	*Pohlia cruda*
Pohlia moss	*Pohlia nutans*
Pohlia moss species	*Pohlia* sp.
Polychidium lichen species	*Polychidium* sp.
Polytrichum moss	*Polytrichum commune var. commune*
Polytrichum moss	*Polytrichum juniperinum*

TABLE D2 Cont'd

Common Name	Scientific Name
Polytrichum moss	*Polytrichum piliferum*
Polytrichum moss	*Polytrichum strictum*
powder-headed shadow	*Phaeophyscia orbicularis*
powder-ringed beard	*Usnea lapponica*
Pseudoleskeella moss	*Pseudoleskeella tectorum*
Pterigynandrum moss	*Pterigynandrum filiforme*
Ptilidium liverwort	*Ptilidium californicum*
Ptilidium liverwort	*Ptilidium pulcherrimum*
punctured ribbon	*Ramalina dilacerata*
Pylaisiella moss	*Pylaisiella polyantha*
quill pixie	*Cladonia amaurocraea*
Racomitrium moss	*Racomitrium canescens* ssp. *canescens*
Racomitrium moss	*Racomitrium heterostichum*
Racomitrium moss	*Racomitrium lanuginosum*
Racomitrium moss species	*Racomitrium* sp.
ragbag	*Platismatia glauca*
Ramboldia lichen	*Ramboldia gowardiana*
red-stemmed feathermoss	*Pleurozium schreberi*
Rhizomnium moss	*Rhizomnium glabrescens*
Rhizomnium moss	*Rhizomnium nudum*
Rhizomnium moss	*Rhizomnium pseudopunctatum*
Rhizomnium moss	*Rhizomnium punctatum*
Rhytidiadelphus moss	*Rhytidiadelphus loreus*
Rhytidiadelphus moss	*Rhytidiadelphus triquetrus*
Rhytidiopsis moss	*Rhytidiopsis robusta*
rippled ring	*Arctoparmelia centrifuga*
royal pixie-cup	*Cladonia carneola*
ruffled pelt	*Peltigera leucophlebia*
Saelania moss	*Saelania glaucescens*
salted badge	*Imshaugia aleurites*
Sanionia moss	*Sanionia uncinata*
scantily clad pixie	*Cladonia acuminata*
Scapania liverwort	*Scapania americana*
Scapania liverwort	*Scapania undulata*
Scapania liverwort species	*Scapania* sp.
scarecrow's beard	*Usnea scabrata*
Schistidium moss	*Schistidium apocarpum*
Schistidium moss	*Schistidium frigidum*
Schistidium moss	*Schistidium rivulare*
Scorpidium moss	*Scorpidium scorpioides*
Scouleria moss	*Scouleria aquatica*
shape-shifting pixie	*Cladonia multiformis*
shape-shifting wrinkle	*Tuckermannopsis orbata*
shrublet sunburst	*Xanthoria candelaria*
silver-edge pelt	*Peltigera aphthosa*
silver-lined wrinkle	*Tuckermannopsis chlorophylla*
singing pixie	*Cladonia cenotea*
skeptical sunburst	*Xanthomendoza fulva*
Sphagnum moss	*Sphagnum capillifolium*
Sphagnum moss	*Sphagnum palustre*
Sphagnum moss	*Sphagnum papillosum*
Sphagnum moss	*Sphagnum squarrosum*
Sphagnum moss	*Sphagnum warnstorfii*
Sphagnum moss species	*Sphagnum* sp.
star-nosed reindeer	*Cladina stellaris*

TABLE D2 Cont'd

Common Name	Scientific Name
starred rocktripe	*Umbilicaria angulata*
starving pixie	*Cladonia rei*
step moss	*Hylocomium splendens*
stump soldiers	*Cladonia botrytes*
sugar-frosted beard	*Usnea hirta*
Syntrichia moss	*Syntrichia ruralis*
tattered rag	*Platismatia herrei*
temporary pelt	*Peltigera didactyla*
Tetraphis moss	*Tetraphis pellucida*
thorn pixie	*Cladonia uncialis*
thorn pixie	*Cladonia uncialis*
Thuidium moss	*Thuidium recognitum*
Timmia moss	*Timmia austriaca*
Timmia moss	*Timmia megapolitana* ssp. *bavarica*
Tomentypnum moss	*Tomentypnum nitens*
Tritomaria liverwort	*Tritomaria quinquedentata*
trumpeting pixie	*Cladonia fimbriata*
undulating pelt	*Peltigera neopolydactyla*
valley oakmoss	*Evernia prunastri*
Warnstorfia moss	*Warnstorfia fluitans*
whiskered camouflage	*Melanelixia subargentifera*
woodland owl	*Solorina saccata*
Xanthoparmelia lichen	*Xanthoparmelia coloradoensis*
WEEDS, AGRONOMICS[1,2,3]	
butter-and-eggs	***Linaria vulgaris***
Canada thistle	***Cirsium arvense***
common hound's-tongue	***Cynoglossum officinale***
Dalmatian toadflax	***Linaria genistifolia* ssp. *dalmatica***
diffuse knapweed	***Centaurea diffusa***
spotted knapweed	***Centaurea stoebe* ssp. *micranthos***
Cleavers*	*Galium aparine**
common burdock*	*Arctium minus**
great burdock*	*Arctium lappa**
hoary alyssum*	*Berteroa incana**
orange hawkweed (orange-red king devil)*	*Hieracium aurantiacum**
oxeye daisy*	*Leucanthemum vulgare**
Quackgrass*	*Elymus repens**
Russian knapweed*	*Acroptilon repens**
viper's bugloss*	*Echium vulgare**
alfalfa	*Medicago sativa* ssp. *falcata*
alsike clover	*Trifolium hybridum*
annual bluegrass	*Poa annua*
annual hawksbeard	*Crepis tectorum*
annual knawel	*Scleranthus annuus*
birds-foot trefoil	*Lotus corniculatus*
black bindweed	*Fallopia convolvulus*
black medic	*Medicago lupulina*
bladder campion	*Silene vulgaris*
blue forget-me-not	*Myosotis stricta*
blue water speedwell	*Veronica anagallis-aquatica*
blunt broom sedge	*Carex tribuloides*
box-elder	*Acer negundo*
bristly stickseed	*Lappula squarrosa*
bull thistle	*Cirsium vulgare*
Canada bluegrass	*Poa compressa*

TABLE D2 Cont'd

Common Name	Scientific Name
Canadian goldenrod	*Solidago canadensis*
Canadian wild lettuce	*Lactuca canadensis*
catnip	*Nepeta cataria*
cheatgrass	*Bromus tectorum*
chicory	*Cichorium intybus*
colonial bentgrass	*Agrostis capillaris*
common chickweed	*Stellaria media*
common dandelion	*Taraxacum officinale*
common dwarf snapdragon	*Chaenorhinum minus*
common evening-primrose	*Oenothera biennis*
common knotweed	*Polygonum aviculare*
common lilac	*Syringa vulgaris*
common orache	*Atriplex patula*
common plantain	*Plantago major*
common purslane	*Portulaca oleracea*
common speedwell	*Veronica officinalis*
common St. John's-wort	*Hypericum perforatum*
common stork's-bill	*Erodium cicutarium* ssp. *cicutarium*
common sunflower	*Helianthus annuus*
common tansy	*Tanacetum vulgare*
common timothy	*Phleum pratense*
common vetch	*Vicia sativa var. sativa*
common watercress	*Nasturtium officinale*
corn brome	*Bromus squarrosus*
creeping bentgrass	*Agrostis stolonifera*
creeping buttercup	*Ranunculus repens*
crested wheatgrass	*Agropyron cristatum* ssp. *pectinatum*
cultivated apple	*Malus pumila*
curled dock	*Rumex crispus*
cursed buttercup	*Ranunculus sceleratus* var. *sceleratus*
dovefoot geranium	*Geranium molle*
dwarf mallow	*Malva neglecta*
eastern eyebright	*Euphrasia nemorosa*
European bush-cranberry	*Viburnum opulus* var. *opulus*
European forget-me-not	*Myosotis scorpioides*
European mountain-ash	*Sorbus aucuparia*
European rush	*Juncus effusus* ssp. *effusus*
European water-plantain	*Alisma plantago-aquatica*
field filago	*Logfia arvensis*
field forget-me-not	*Myosotis arvensis*
field pennycress	*Thlaspi arvense*
field wood-rush	*Luzula campestris*
flagellate hawkweed	*Hieracium flagellare* ssp. *flagellare*
flixweed	*Descurainia sophia*
French hawksbeard	*Crepis nicaeensis*
garden asparagus	*Asparagus officinalis*
giant-hyssop	*Agastache foeniculum*
grass-leaved starwort	*Stellaria graminea*
great mullein	*Verbascum thapsus*
green sorrel	*Rumex acetosa* ssp. *acetosa*
hairy cat's-ear	*Hypochaeris radicata*
hairy wheatgrass	*Thinopyrum intermedium* ssp. *barbulatum*
hard fescue	*Festuca trachyphylla*
hemp-nettle	*Galeopsis tetrahit*
horseweed	*Conyza canadensis*

TABLE D2 Cont'd

Common Name	Scientific Name
intermediate cinquefoil	*Potentilla intermedia*
Italian ryegrass	*Lolium multiflorum*
knotted clover	*Trifolium striatum*
lady's-thumb	*Persicaria maculosa*
lamb's-quarters	*Chenopodium album* ssp. *album*
lemon thyme	*Thymus pulegioides*
Loesel's tumble-mustard	*Sisymbrium loeselii*
madwort	*Asperugo procumbens*
meadow brome	*Bromus commutatus*
meadow buttercup	*Ranunculus acris*
meadow fescue	*Schedonorus pratensis*
meadow salsify	*Tragopogon pratensis*
mottled hawkweed	*Hieracium maculatum*
mouse-ear chickweed	*Cerastium fontanum* ssp. *triviale*
mouse-ear hawkweed	*Hieracium pilosella*
night-flowering catchfly	*Silene noctiflora*
oak-leaved goosefoot	*Chenopodium glaucum* var. *glaucum*
orchard grass	*Dactylis glomerata*
Oriental false wheatgrass	*Eremopyrum orientale*
oval-leaved knotweed	*Polygonum arenastrum*
perennial sow-thistle	*Sonchus arvensis* ssp. *arvensis*
prickly lettuce	*Lactuca serriola*
prickly sow-thistle	*Sonchus asper*
purslane speedwell	*Veronica peregrina* var. *peregrina*
rattlesnake grass	*Bromus briziformis*
red clover	*Trifolium pratense*
red fescue	*Festuca rubra* ssp. *rubra*
red sand-spurry	*Spergularia rubra*
redtop	*Agrostis gigantea*
ribwort plantain	*Plantago lanceolata*
Robert's geranium	*Geranium robertianum*
rough pigweed	*Amaranthus retroflexus*
scentless mayweed (scentless chamomile)	*Tripleurospermum inodorum*
shepherd's purse	*Capsella bursa-pastoris*
small mallow	*Malva rotundifolia*
soft brome	*Bromus hordeaceus* ssp. *hordeaceus*
spotted medic	*Medicago arabica*
stinging nettle	*Urtica dioica ssp. dioica*
sulphur cinquefoil	*Potentilla recta*
sweet vernalgrass	*Anthoxanthum odoratum*
tall fescue	*Schedonorus arundinaceus*
tall tumble-mustard	*Sisymbrium altissimum*
thyme-leaved sandwort	*Arenaria serpyllifolia*
thyme-leaved speedwell	*Veronica serpyllifolia* var. *serpyllifolia*
trailing cinquefoil	*Potentilla anglica*
tufted vetch	*Vicia cracca* ssp. *cracca*
turnip	*Brassica napus*
wall lettuce	*Mycelis muralis*
wall speedwell	*Veronica arvensis*
water meadow-foxtail	*Alopecurus geniculatus*
water mint	*Mentha aquatica*
white clover	*Trifolium repens*
white cockle	*Silene latifolia* ssp. *alba*
white sweet-clover	*Melilotus alba*
wild basil savory	*Clinopodium vulgare*

TABLE D2 Cont'd

Common Name	Scientific Name
wild carrot	*Daucus carota*
wild marjoram	*Origanum vulgare*
wool-grass	*Scirpus atrocinctus*
wormwood	*Artemisia absinthium*
yellow bristlegrass	*Setaria pumila* ssp. *pumila*
yellow clover	*Trifolium aureum*
yellow king devil	*Hieracium caespitosum*
yellow salsify	*Tragopogon dubius*
yellow sweet-clover	*Melilotus officinalis*

Notes: 1 Species nomenclature and the status of species as native or not is determined according to the BC Species and Ecosystem Explorer (BC MOE 2013), with more current taxonomic information drawn from NatureServe (2012a), when necessary. Where the BC *Weed Control Act* nomenclature differs from these sources, the *Weed Control Act* name for the species has been provided in brackets following the ACIMS or CDC name. Where no species nomenclature is available from the BC Species and Ecosystem Explorer (BC MOE 2013), only the BC *Weed Control Act* name is provided.

2 **Bold** font denotes Provincially Noxious weeds.

3 * denotes Regionally Noxious weeds.

TABLE D3

BLACK PINES TO HOPE OBSERVED PLANT SPECIES – BY TYPE AND COMMON NAME

Common Name	Scientific Name
TREES	
amabilis fir	*Abies amabilis*
balsam poplar	*Populus balsamifera*
bigleaf maple	*Acer macrophyllum*
black cottonwood	*Populus trichocarpa*
coast Douglas-fir	*Pseudotsuga menziesii* var. *menziesii*
Douglas maple	*Acer glabrum* var. *douglasii*
Engelmann spruce	*Picea engelmannii*
grand fir	*Abies grandis*
MH	*Tsuga mertensiana*
paper birch	*Betula papyrifera* var. *papyrifera*
PP	*Pinus ponderosa*
Rocky Mountain Douglas-fir	*Pseudotsuga menziesii* var. *glauca*
shore pine	*Pinus contorta* var. *contorta*
Sitka spruce	*Picea sitchensis*
subalpine fir	*Abies lasiocarpa* var. *lasiocarpa*
trembling aspen	*Populus tremuloides*
vine maple	*Acer circinatum*
western hemlock	*Tsuga heterophylla*
western redcedar	*Thuja plicata*
western white pine	*Pinus monticola*
western yew	*Taxus brevifolia*
white spruce	*Picea glauca*
SHRUBS	
baldhip rose	*Rosa gymnocarpa*
Bebb's willow	*Salix bebbiana*
birch-leaved spirea	*Spiraea betulifolia* ssp. *lucida*
bitter cherry	*Prunus emarginata*
black gooseberry	*Ribes lacustre*
black hawthorn	*Crataegus douglasii* var. *douglasii*
black twinberry	*Lonicera involucrata*
choke cherry	*Prunus virginiana* ssp. *demissa*
coastal red elderberry	*Sambucus racemosa* var. *arborescens*
common snowberry	*Symphoricarpos albus* var. *albus*
currant species	*Ribes* sp.
Cusick's saskatoon	*Amelanchier cusickii*
dwarf juniper	*Juniperus communis* var. *depressa*
glaucous-leaved honeysuckle	*Lonicera dioica* var. *glaucescens*
green alder	*Alnus viridis* ssp. *crispa*
hardhack	*Spiraea douglasii* ssp. *douglasii*
highbush-cranberry	*Viburnum edule*
Labrador tea	*Rhododendron groenlandicum*
mock-orange	*Philadelphus lewisii*
mountain alder	*Alnus incana* ssp. *tenuifolia*
narrow-leaf willow	*Salix exigua* var. *exigua*
Nootka rose	*Rosa nutkana* var. *nutkana*
northern gooseberry	*Ribes oxyacanthoides* ssp. *irriguum*
Pacific ninebark	*Physocarpus capitatus*
Pacific willow	*Salix lasiandra* var. *lasiandra*
pink spirea	*Spiraea douglasii* ssp. *menziesii*
plane-leaved willow	*Salix planifolia*
prairie rose	*Rosa woodsii* ssp. *ultramontana*
prairie saskatoon	*Amelanchier alnifolia* var. *alnifolia*
prickly rose	*Rosa acicularis* ssp. *sayi*

TABLE D3 Cont'd

Common Name	Scientific Name
pyramid spirea	*Spiraea pyramidata*
red alder	*Alnus rubra*
red raspberry	*Rubus idaeus* ssp. *strigosus*
red swamp currant	*Ribes triste*
red-flowering currant	*Ribes sanguineum* var. *sanguineum*
red-osier dogwood	*Cornus stolonifera*
redstem ceanothus	*Ceanothus sanguineus*
Rocky Mountain juniper	*Juniperus scopulorum*
rose species	*Rosa* sp.
salmonberry	*Rubus spectabilis*
saskatoon species	*Amelanchier* sp.
Scouler's willow	*Salix scouleriana*
silverberry	*Elaeagnus commutata*
Sitka alder	*Alnus viridis* ssp. *sinuata*
Sitka mountain-ash	*Sorbus sitchensis* var. *sitchensis*
Sitka willow	*Salix sitchensis*
snowberry species	*Symphoricarpos* sp.
snowbrush	*Ceanothus velutinus* var. *velutinus*
soopolallie	*Shepherdia canadensis*
squaw currant	*Ribes cereum* var. *cereum*
sticky currant	*Ribes viscosissimum*
stink currant	*Ribes bracteosum*
subalpine spirea	*Spiraea splendens*
tall blueberry willow	*Salix pseudomyrsinites*
thimbleberry	*Rubus parviflorus* var. *parviflorus*
Utah honeysuckle	*Lonicera utahensis*
water birch	*Betula occidentalis*
wax-myrtle species	*Myrica* sp.
western bluegrass	*Pascopyrum smithii*
western mountain-ash	*Sorbus scopulina* var. *scopulina*
western snowberry	*Symphoricarpos occidentalis*
western trumpet	*Lonicera ciliosa*
willow species	*Salix* sp.
FORBS, DWARF SHRUBS	
Agoseris species	*Agoseris* sp.
Alaska rein orchid	*Piperia unalascensis*
Alaska violet	*Viola langsdorfii*
Alaskan blueberry	*Vaccinium alaskaense*
Aleutian mugwort	*Artemisia tilesii*
alpine leafybract aster	*Symphyotrichum foliaceum* var. *apricum*
alpine speedwell	*Veronica wormskjoldii* var. *wormskjoldii*
alpine-wintergreen	*Gaultheria humifusa*
alumroot species	*Heuchera* sp.
American speedwell	*Veronica beccabunga* var. *americana*
American vetch	*Vicia americana*
American water-plantain	*Alisma triviale*
American wintercress	*Barbarea orthoceras*
Arctic lupine	*Lupinus Arcticus* ssp. *Arcticus*
Arctic pearlwort	*Sagina saginoides*
arnica	*Arnica fulgens*
arrowleaf balsamroot	*Balsamorhiza sagittata*
arrow-leaved groundsel	*Senecio triangularis*
arum-leaved arrowhead	*Sagittaria cuneata*
ballhead waterleaf	*Hydrophyllum capitatum* var. *capitatum*
baneberry	*Actaea rubra*

TABLE D3 Cont'd

Common Name	Scientific Name
barestem desert-parsley	*Lomatium nudicaule*
bastard toad-flax	*Comandra umbellata* var. *umbellata*
beaked hazelnut	*Corylus cornuta var. californica*
big sagebrush	*Artemisia tridentata* ssp. *tridentata*
bittercress species	*Cardamine* sp.
black huckleberry	*Vaccinium membranaceum*
black sanicle	*Sanicula marilandica*
Blake's knotweed	*Polygonum achoreum*
blue lettuce species	*Lactuca* sp.
blue skullcap	*Scutellaria lateriflora*
blue violet species	*Viola* sp.
blueberry species	*Vaccinium* sp.
blunt-leaved yellowcress	*Rorippa curvipes*
boreal starwort	*Stellaria borealis* ssp. *borealis*
bracken fern	*Pteridium aquilinum* ssp. *lanuginosum*
bracted lousewort	*Pedicularis bracteosa* var. *bracteosa*
Brewer's mitrewort	*Mitella breweri*
brittle prickly-pear cactus	*Opuntia fragilis*
broad-fruited bur-reed	*Sparganium eurycarpum*
broadleaf lupine	*Lupinus latifolius* var. *latifolius*
broad-leaved penstemon	*Penstemon ovatus*
broad-leaved starflower	*Trientalis borealis* ssp. *latifolia*
broad-leaved willowherb	*Epilobium latifolium*
brown-eyed Susan	*Gaillardia aristata*
buckbean	*Menyanthes trifoliata*
bunchberry	*Cornus canadensis*
buttercup species	*Ranunculus* sp.
butterweed species	*Senecio* sp.
campion species	*Silene* sp.
Canada goldenrod	*Solidago lepida* var. *lepida*
Canada violet	*Viola canadensis* var. *rugulosa*
centaury species	*Centaurium* sp.
chickweed monkey-flower	*Mimulus alsinoides*
chocolate lily	*Fritillaria affinis* var. *affinis*
Circaea species	*Circaea* sp.
clasping twistedstalk	*Streptopus amplexifolius* var. *amplexifolius*
cliff fern species	*Woodsia* sp.
clover species	*Trifolium* sp.
club-fruited willowherb	*Epilobium clavatum*
club-moss species	*Lycopodium* sp.
clustered broomrape	*Orobanche fasciculata*
clustered tarweed	*Madia glomerata*
coast goldenrod species	*Solidago* sp.
coast penstemon	*Penstemon serrulatus*
columbine species	*Aquilegia* sp.
common butterwort	*Pinguicula vulgaris* ssp. *macroceras*
common camas	*Camassia quamash* ssp. *maxima*
common cattail	*Typha latifolia*
common duckweed	*Lemna minor*
common harebell	*Campanula rotundifolia*
common hornwort	*Ceratophyllum demersum*
common horsetail	*Equisetum arvense*
common mare's-tail	*Hippuris vulgaris*
common mitrewort	*Mitella nuda*
common rabbit-bush	*Ericameria nauseosa* var. *speciosa*

TABLE D3 Cont'd

Common Name	Scientific Name
common silverweed	*Potentilla anserina*
Cooley's hedge-nettle	*Stachys chamissonis* var. *cooleyae*
cow-parsnip	*Heracleum maximum*
cow-wheat	*Melampyrum lineare* var. *lineare*
creamy peavine	*Lathyrus ochroleucus*
crisp starwort	*Stellaria crispa*
curly-cup gumweed	*Grindelia squarrosa* var. *quasiperennis*
cut-leaved anemone	*Anemone multifida* var. *multifida*
cut-leaved daisy	*Erigeron compositus*
cut-leaved foamflower	*Tiarella trifoliata* var. *laciniata*
cut-leaved water horehound	*Lycopus americanus*
dangling suncress	*Boechera retrofracta*
desert-parsley species	*Lomatium* sp.
devil's club	*Oplopanax horridus*
diverse-leaved cinquefoil	*Potentilla diversifolia* var. *diversifolia*
dock species	*Rumex* sp.
Douglas's knotweed	*Polygonum douglasii*
Draba species	*Draba* sp.
dull Oregon-grape	*Mahonia nervosa*
dwarf blueberry	*Vaccinium caespitosum*
dwarf rattlesnake orchid	*Goodyera repens*
early blue violet	*Viola adunca* var. *adunca*
edible thistle	*Cirsium edule* var. *macounii*
elephant's-head lousewort	*Pedicularis groenlandica*
enchanter's-nightshade	*Circaea alpina* ssp. *alpina*
fairy-slipper	*Calypso bulbosa* var. *americana*
false azalea	*Menziesia ferruginea* ssp. *ferruginea*
false bugbane	*Trautvetteria caroliniensis*
false lily-of-the-valley	*Maianthemum dilatatum*
false Solomon's-seal	*Maianthemum racemosum* ssp. *amplexicaule*
false toad-flax	*Geocaulon lividum*
falsebox	*Paxistima myrsinites*
fan-leaved cinquefoil	*Potentilla flabellifolia*
field chickweed	*Cerastium arvense*
field locoweed	*Oxytropis campestris* var. *cusickii*
field milk-vetch	*Astragalus agrestis*
field mint	*Mentha arvensis*
field pussytoes	*Antennaria neglecta*
fireweed	*Epilobium angustifolium* ssp. *angustifolium*
five-leaved bramble	*Rubus pedatus*
five-stamened mitrewort	*Mitella pentandra*
fleabane species	*Erigeron* sp.
floating-leaved pondweed	*Potamogeton natans*
forget-me-not species	*Myosotis* sp.
fragile fern	*Cystopteris fragilis*
fragrant white rein orchid	*Platanthera dilatata* var. *albiflora*
fragrant white rein orchid	*Platanthera dilatata* var. *dilatata*
fringecup	*Tellima grandiflora*
Galium species	*Galium* sp.
Geranium species	*Geranium sp.*
giant-hyssop species	*Agastache* sp.
glasswort species	*Salicornia* sp.
globeflower	*Trollius albiflorus*
globe-mallow species	*Sphaeralcea* sp.
goatsbeard	*Aruncus dioicus*

TABLE D3 Cont'd

Common Name	Scientific Name
golden fleabane	*Erigeron aureus*
golden-aster	*Heterotheca villosa* var. *minor*
graceful cinquefoil	*Potentilla gracilis* var. *fastigiata*
Great Basin nemophila	*Nemophila breviflora*
green rein species	*Platanthera* sp.
green rein species	*Platanthera* sp.
green wintergreen	*Pyrola chlorantha*
grey hawksbeard	*Crepis intermedia*
grey horsebrush	*Tetradymia canescens*
groundsel species	*Senecio* sp.
grouseberry	*Vaccinium scoparium*
harsh paintbrush	*Castilleja hispida* var. *hispida*
hawksbeard species	*Crepis* sp.
hawkweed species	*Hieracium* sp.
heart-leaved arnica	*Arnica cordifolia*
heart-leaved twayblade	*Listera cordata*
hemlock water-parsnip	*Sium suave*
hemp	*Apocynum cannabinum*
Heracleum species	*Heracleum* sp.
hillside milk-vetch	*Astragalus collinus* var. *collinus*
hispid yellowcress	*Rorippa palustris* ssp. *hispida*
Holboell's rockcress	*Arabis holboellii* var. *secunda*
hooded ladies' tresses	*Spiranthes romanzoffiana*
Hornemann's willowherb	*Epilobium hornemannii* ssp. *hornemannii*
horsetail species	*Equisetum* sp.
Howell's pussytoes	*Antennaria howellii* ssp. *howellii*
Indian hellebore	*Veratrum viride*
Kamchatka rockcress	*Arabidopsis lyrata* ssp. *kamchatica*
kidney-leaved buttercup	*Ranunculus abortivus*
kidney-leaved violet	*Viola renifolia*
kinnikinnick	*Arctostaphylos uva-ursi*
lady fern	*Athyrium filix-femina* ssp. *cyclosorum*
lance-leaved stonecrop	*Sedum lanceolatum* var. *lanceolatum*
large-flowered agoseris	*Agoseris grandiflora*
large-fruited desert-parsley	*Lomatium macrocarpum*
large-leaved avens	*Geum macrophyllum* ssp. *macrophyllum*
leafy aster	*Symphyotrichum foliaceum* var. *foliaceum*
leafy dwarf knotweed	*Polygonum minimum*
leatherleaf saxifrage	*Leptarrhena pyrolifolia*
leathery grape fern	*Botrychium multifidum*
lemonweed	*Lithospermum ruderale*
lesser wintergreen	*Pyrola minor*
lily species	*Lilium sp.*
Lindley's aster	*Symphyotrichum ciliolatum*
linear-leaved daisy	*Erigeron linearis*
little buttercup	*Ranunculus uncinatus*
little western bittercress	*Cardamine oligosperma*
littlebells polemonium	*Polemonium micranthum*
long-leaved fleabane	*Erigeron corymbosus*
long-leaved starwort	*Stellaria longifolia*
long-stalked starwort	*Stellaria longipes* var. *longipes*
low pussytoes	*Antennaria dimorpha*
lupine species	*Lupinus* sp.
Lyall's anemone	*Anemone lyallii*
Macoun's buttercup	*Ranunculus macounii*

TABLE D3 Cont'd

Common Name	Scientific Name
maidenhair spleenwort	*Asplenium trichomanes* ssp. *trichomanes*
marsh cinquefoil	*Comarum palustre*
marsh skullcap	*Scutellaria galericulata*
marsh speedwell	*Veronica scutellata*
marsh violet	*Viola palustris* var. *palustris*
meadow aster	*Symphyotrichum campestre*
meadow death-camas	*Zigadenus venenosus* var. *venenosus*
Melampyrum species	*Melampyrum* sp.
Menzies' campion	*Silene menziesii* var. *menziesii*
Menzies' pipsissewa	*Chimaphila menziesii*
Michaux's mugwort	*Artemisia michauxiana*
milk-vetch species	*Astragalus* sp.
miner's-lettuce	*Claytonia perfoliata* ssp. *perfoliata*
monkey-flower species	*Mimulus* sp.
moonwort species	*Botrychium* sp.
mountain arnica	*Arnica latifolia*
mountain cliff fern	*Woodsia scopulina*
Mountain pond-lily species	*Nuphar* sp.
mountain sneezeweed	*Helenium autumnale* var. *montanum*
mountain sweet-cicely	*Osmorhiza berteroi*
narrow-leaved collomia	*Collomia linearis*
narrow-leaved hawkweed	*Hieracium umbellatum* ssp. *umbellatum*
narrow-leaved montia	*Montia linearis*
narrow-leaved stephanomeria	*Stephanomeria tenuifolia*
nodding chickweed	*Cerastium nutans*
nodding onion	*Allium cernuum* var. *cernuum*
northern bedstraw	*Galium boreale*
northern bog violet	*Viola nephrophylla var. cognata*
northern gentian	*Gentianella amarella* ssp. *acuta*
northern geranium	*Geranium erianthum*
northern rice-root	*Fritillaria camschatcensis*
northern scouring-rush	*Equisetum variegatum* ssp. *variegatum*
northern starwort	*Stellaria calycantha*
northern water horehound	*Lycopus uniflorus*
northern wormwood	*Artemisia campestris* ssp. *pacifica*
northwestern twayblade	*Listera caurina*
Norwegian cinquefoil	*Potentilla norvegica*
Nuttall's pussytoes	*Antennaria parvifolia*
oak fern	*Gymnocarpium dryopteris*
oceanspray	*Holodiscus discolor*
old man's whiskers	*Geum triflorum* var. *ciliatum*
one-leaved foamflower	*Tiarella trifoliata var. unifoliata*
one-sided wintergreen	*Orthilia secunda* var. *secunda*
onion species	*Allium* sp.
orange agoseris	*Agoseris aurantiaca* ssp. *aurantiaca*
Oregon stonecrop	*Sedum oreganum*
oval-leaved blueberry	*Vaccinium ovalifolium*
owl-clover species	*Castilleja* sp.
Pacific bleeding heart	*Dicentra formosa*
Pacific crab apple	*Malus fusca*
Pacific water-parsley	*Oenanthe sarmentosa*
parsnip-flowered buckwheat	*Eriogonum heracleoides* var. *angustifolium*
partridge-foot	*Luetkea pectinata*
pathfinder	*Adenocaulon bicolor*
Oregon stonecrop	*Sedum oreganum*

TABLE D3 Cont'd

Common Name	Scientific Name
pearly everlasting	*Anaphalis margaritacea*
Pennsylvanian bittercress	*Cardamine pensylvanica*
penstemon species	*Penstemon* sp.
pepper-grass species	*Lepidium* sp.
Philadelphia fleabane	*Erigeron philadelphicus*
phlox species	*Phlox* sp.
piggy-back plant	*Tolmiea menziesii*
pinedrops	*Pterospora andromedea*
pink monkey-flower	*Mimulus lewisii*
pink mountain-heather	*Phyllodoce empetriformis*
pink twink	*Microsteris gracilis* var. *gracilis*
pink wintergreen	*Pyrola asarifolia*
poison ivy	*Toxicodendron rydbergii*
popcornflower species	*Plagiobothrys* sp.
prairie pepper-grass	*Lepidium densiflorum*
prairie sagewort	*Artemisia frigida*
pretty oxytrope	*Oxytropis sericea* var. *speciosa*
pretty shootingstar	*Dodecatheon pulchellum* var. *cusickii*
prince's pine	*Chimaphila umbellata* ssp. *occidentalis*
pulse milk-vetch	*Astragalus tenellus*
purple dragonhead	*Physostegia parviflora*
purple peavine	*Lathyrus nevadensis* var. *pilosellus*
purple-leaved willowherb	*Epilobium ciliatum* ssp. *ciliatum*
pussytoes species	*Antennaria* sp.
queen's cup	*Clintonia uniflora*
racemose pussytoes	*Antennaria racemosa*
rattlesnake fern	*Botrychium virginianum*
rattlesnake-plantain	*Goodyera oblongifolia*
rayless alkali aster	*Symphyotrichum ciliatum*
red goosefoot	*Chenopodium rubrum* var. *rubrum*
red huckleberry	*Vaccinium parvifolium*
redstem springbeauty	*Claytonia rubra* ssp. *rubra*
ribbon-leaf pondweed	*Potamogeton epihydrus*
riverbank anemone	*Anemone virginiana* var. *cylindroidea*
rockcress species	*Arabidopsis* sp.
Rocky Mountain helianthella	*Helianthella uniflora* var. *douglasii*
Rocky Mountain pond-lily	*Nuphar polysepala*
red goosefoot	*Chenopodium rubrum* var. *rubrum*
rosy pussytoes	*Antennaria rosea*
rough-fruited fairybells	*Prosartes trachycarpa*
rough-stemmed fleabane	*Erigeron strigosus* var. *strigosus*
round-leaved alumroot	*Heuchera cylindrica* var. *cylindrica*
round-leaved violet	*Viola orbiculata*
running club-moss	*Lycopodium clavatum* var. *clavatum*
sagebrush buttercup	*Ranunculus glaberrimus* var. *glaberrimus*
sagebrush mariposa lily	*Calochortus macrocarpus* var. *macrocarpus*
sagebrush species	*Artemisia* sp.
salal	*Gaultheria shallon*
saxifrage species	*Leptarrhena* sp.
saxifrage species	*Saxifraga* sp.
scarlet paintbrush	*Castilleja miniata* var. *miniata*
Scouler's hawkweed	*Hieracium scouleri*
scouring-rush	*Equisetum hyemale* ssp. *affine*
seablite	*Suaeda calceoliformis*
self-heal	*Prunella vulgaris* ssp. *lanceolata*

TABLE D3 Cont'd

Common Name	Scientific Name
shaggy fleabane	*Erigeron pumilus* var. *intermedius*
sharptooth angelica	*Angelica arguta*
shore buttercup	*Ranunculus cymbalaria*
short-beaked agoseris	*Agoseris glauca var. dasycephala*
short-fruited tansymustard	*Descurainia pinnata* ssp. *brachycarpa*
showy aster	*Eurybia conspicua*
showy daisy	*Erigeron speciosus*
showy Jacob's-ladder	*Polemonium pulcherrimum* var. *pulcherrimum*
showy locoweed	*Oxytropis splendens*
showy milkweed	*Asclepias speciosa*
showy pussytoes	*Antennaria pulcherrima* ssp. *pulcherrima*
shrubby penstemon	*Penstemon fruticosus* var. *fruticosus*
sibbaldia	*Sibbaldia procumbens*
Siberian miner's-lettuce	*Claytonia sibirica*
sickletop lousewort	*Pedicularis racemosa*
silky lupine	*Lupinus sericeus* var. *sericeus*
silverleaf phacelia	*Phacelia hastata*
silverweed species	*Potentilla* sp.
Sitka columbine	*Aquilegia formosa* ssp. *formosa*
Sitka valerian	*Valeriana sitchensis*
skunk cabbage	*Lysichiton americanus*
slender fringecup	*Lithophragma tenellum*
slender hawksbeard	*Crepis atribarba ssp. originalis*
slender plantain	*Plantago elongata*
slender rein orchid	*Platanthera stricta*
small bedstraw	*Galium trifidum* ssp. *trifidum*
small twistedstalk	*Streptopus streptopoides* ssp. *brevipes*
small yellow water-buttercup	*Ranunculus gmelinii*
small-flowered alumroot	*Heuchera micrantha* var. *diversifolia*
small-flowered blue-eyed Mary	*Collinsia parviflora*
small-flowered forget-me-not	*Myosotis laxa*
small-flowered fringecup	*Lithophragma parviflorum* var. *parviflorum*
small-flowered lupine	*Lupinus polycarpus*
small-flowered penstemon	*Penstemon procerus* var. *procerus*
small-flowered willowherb	*Epilobium minutum*
small-leaved montia	*Montia parvifolia* var. *flagellaris*
smooth alumroot	*Heuchera glabra*
smooth aster	*Symphyotrichum laeve* var. *geyeri*
spear-leaved fleabane	*Erigeron lonchophyllus*
spikelike goldenrod	*Solidago simplex* var. *nana*
spiny wood fern	*Dryopteris expansa*
spotted coralroot	*Corallorhiza maculata* var. *maculata*
spotted saxifrage	*Saxifraga bronchialis* ssp. *austromontana*
spreading dogbane	*Apocynum androsaemifolium* var. *androsaemifolium*
springbank clover	*Trifolium wormskioldii*
springbeauty species	*Claytonia* sp.
star-flowered false Solomon's-seal	*Maianthemum stellatum*
starwort species	*Stellaria* sp.
stickseed species	*Lappula* sp.
sticky false asphodel	*Triantha glutinosa*
sticky purple geranium	*Geranium viscosissimum* var. *viscosissimum*
stiff club-moss	*Lycopodium annotinum*
straight-up suncress	*Boechera stricta*
strawberry-blite	*Chenopodium capitatum*

TABLE D3 Cont'd

Common Name	Scientific Name
stream violet	*Viola glabella*
streambank springbeauty	*Claytonia parviflora* ssp. *parviflora*
striped coralroot	*Corallorhiza striata* var. *striata*
subalpine daisy	*Erigeron peregrinus* ssp. *callianthemus*
swale desert-parsley	*Lomatium ambiguum*
swamp horsetail	*Equisetum fluviatile*
sweet coltsfoot	*Petasites frigidus var. frigidus*
sweet coltsfoot	*Petasites frigidus* var. *palmatus*
sweet-cicely species	*Osmorhiza* sp.
sword fern	*Polystichum munitum*
tall annual willowherb	*Epilobium brachycarpum*
tall blue lettuce	*Lactuca biennis*
tall Oregon-grape	*Mahonia aquifolium*
tarragon	*Artemisia dracunculus*
thin-leaved bedstraw	*Galium bifolium*
thistle species	*Cirsium* sp.
Thompson's paintbrush	*Castilleja thompsonii*
thread-leaved fleabane	*Erigeron filifolius*
thread-leaved phacelia	*Phacelia linearis*
threadstalk milk-vetch	*Astragalus filipes*
three-leaved foamflower	*Tiarella trifoliata* var. *trifoliata*
three-toothed mitrewort	*Mitella trifida*
tiger lily	*Lilium columbianum*
timber milk-vetch	*Astragalus miser* var. *miser*
trailing blackberry	*Rubus ursinus* ssp. *macropetalus*
trailing fleabane	*Erigeron flagellaris*
trailing yellow violet	*Viola sempervirens*
triangle moonwort	*Botrychium lanceolatum* ssp. *lanceolatum*
tufted white prairie aster	*Symphyotrichum ericoides* var. *pansum*
twin arnica	*Arnica sororia*
twinflower	*Linnaea borealis ssp. borealis*
umber pussytoes	*Antennaria umbrinella*
upland larkspur	*Delphinium nuttallianum*
vanilla-leaf	*Achlys triphylla*
veiny meadowrue	*Thalictrum venulosum*
verticillate water-milfoil	*Myriophyllum verticillatum*
vetch species	*Vicia* sp.
Wallace's selaginella	*Selaginella wallacei*
wavy water nymph	*Najas flexilis*
wavy-leaved thistle	*Cirsium undulatum*
Weiser milk-vetch	*Astragalus beckwithii* var. *weiserensis*
western bittercress	*Cardamine occidentalis*
western blue flax	*Linum lewisii* ssp. *lewisii*
western buttercup	*Ranunculus occidentalis* var. *occidentalis*
western cliff fern	*Woodsia oregana* ssp. *oregana*
western flowering dogwood	*Cornus nuttallii*
western groundsel	*Senecio integerrimus* var. *exaltatus*
western hawksbeard	*Crepis occidentalis* ssp. *costata*
western maiden-hair fern	*Adiantum aleuticum* var. *aleuticum*
western meadowrue	*Thalictrum occidentale*
western mountainbells	*Stenanthium occidentale*
western mugwort	*Artemisia ludoviciana ssp. ludoviciana*
western oak fern	*Gymnocarpium disjunctum*
western polypody	*Polypodium hesperium*
western rattlesnake-root	*Prenanthes alata*

TABLE D3 Cont'd

Common Name	Scientific Name
western springbeauty	*Claytonia lanceolata*
western stickseed	*Lappula occidentalis* var. *occidentalis*
western tea-berry	*Gaultheria ovatifolia*
western trillium	*Trillium ovatum* var. *ovatum*
western willow aster	*Symphyotrichum lanceolatum* ssp. *hesperium*
white clematis	*Clematis ligusticifolia var. ligusticifolia*
white hawkweed	*Hieracium albiflorum*
white pussytoes	*Antennaria microphylla*
white sagebrush	*Artemisia ludoviciana* ssp. *gnaphaloides*
white water-buttercup	*Ranunculus aquatilis var. aquatilis*
white-flowered willowherb	*Epilobium lactiflorum*
white-veined wintergreen	*Pyrola picta*
wild bergamot	*Monarda fistulosa* var. *menthaefolia*
wild ginger	*Asarum caudatum*
wild sarsaparilla	*Aralia nudicaulis*
wild strawberry	*Fragaria virginiana* var. *glauca*
willowherb species	*Epilobium* sp.
wood saxifrage	*Saxifraga mertensiana*
wood strawberry	*Fragaria vesca* var. *americana*
woolly cinquefoil	*Potentilla hippiana* var. *hippiana*
woolly plantain	*Plantago patagonica*
woollypod milk-vetch	*Astragalus purshii* var. *purshii*
worm-leaved stonecrop	*Sedum stenopetalum*
yarrow	*Achillea millefolium* var. *alpicola*
yellow avens	*Geum aleppicum*
yellow bell	*Fritillaria pudica*
yellow columbine	*Aquilegia flavescens*
yellow hedysarum	*Hedysarum sulphurescens*
yellow rattle	*Rhinanthus minor*
yellowcress species	*Rorippa* sp.
Yellow-flowered Knotweed	*Polygonum ramosissimum*
GRASSES, SEDGES, RUSHES	
alpine fescue	*Festuca brachyphylla*
alpine timothy	*Phleum alpinum*
Arctagrostis species	*Arctagrostis* sp.
awl-fruited sedge	*Carex stipata* var. *stipata*
bald spike-rush	*Eleocharis erythropoda*
Baltic rush	*Juncus balticus*
beaked sedge	*Carex utriculata*
bentgrass species	*Agrostis* sp.
blue wildrye	*Elymus glaucus* ssp. *glaucus*
bluebunch wheatgrass	*Pseudoroegneria spicata* ssp. *inermis*
bluegrass species	*Poa* sp.
bluejoint reedgrass	*Calamagrostis canadensis var. canadensis*
blunt spike-rush	*Eleocharis obtusa*
bristle-stalked sedge	*Carex leptalea ssp. leptalea*
brome species	*Bromus* sp.
brown sedge species	*Carex* sp.
Canada wildrye	*Elymus canadensis*
Columbia brome	*Bromus vulgaris*
Columbia needlegrass	*Achnatherum nelsonii* ssp. *dorei*
common spike-rush	*Eleocharis palustris*
common sweetgrass	*Hierochloe hirta* ssp. *Arctica*
Crawford's sedge	*Carex crawfordii*
dagger-leaf rush	*Juncus ensifolius* var. *ensifolius*

TABLE D3 Cont'd

Common Name	Scientific Name
Dewey's sedge	*Carex deweyana* var. *deweyana*
Drummond's rush	*Juncus drummondii* var. *drummondii*
Falkland Island sedge	*Carex macloviana*
fescue species	*Festuca* sp.
field sedge	*Carex praegracilis*
fowl bluegrass	*Poa palustris*
foxtail barley	*Hordeum jubatum* ssp. *jubatum*
fringed brome	*Bromus ciliatus*
giant wildrye	*Leymus cinereus*
hair bentgrass	*Agrostis scabra*
hairgrass species	*Deschampsia* sp.
Hitchcock's wood-rush	*Luzula hitchcockii*
Hood's sedge	*Carex hoodii*
Idaho fescue	*Festuca idahoensis*
Indian ricegrass	*Achnatherum hymenoides*
inflated sedge	*Carex exsiccata*
inland rush	*Juncus interior*
inland sedge	*Carex interior*
junegrass	*Koeleria macrantha*
Kentucky bluegrass	*Poa pratensis* ssp. *agassizensis*
large-flowered triteleia	*Triteleia grandiflora*
lesser-panicled sedge	*Carex diandra*
little meadow-foxtail	*Alopecurus aequalis*
long-bracted sedge	*Carex retrorsa*
low northern sedge	*Carex concinna*
many-flowered wood-rush	*Luzula multiflora* ssp. *multiflora*
many-headed sedge	*Carex sychnocephala*
Melica species	*Melica* sp.
Mertens' rush	*Juncus mertensianus*
Merten's sedge	*Carex mertensii*
mountain hairgrass	*Vahlodea atropurpurea*
mutton grass	*Poa fendleriana ssp. longiligula*
neat spike rush	*Eleocharis nitida*
needle spike-rush	*Eleocharis acicularis*
needle-and-thread grass	*Hesperostipa comata* ssp. *comata*
nodding wood-reed	*Cinna latifolia*
oatgrass species	*Danthonia* sp.
Pacific brome	*Bromus pacificus*
Pacific wood-rush	*Luzula comosa* var. *comosa*
pinegrass	*Calamagrostis rubescens*
polargrass	*Arctagrostis latifolia* ssp. *arundinacea*
reed canarygrass	*Phalaris arundinacea*
reed mannagrass	*Glyceria grandis*
ricegrass species	*Achnatherum* sp.
Rocky Mountain fescue	*Festuca saximontana*
Ross' sedge	*Carex rossii*
rough fescue	*Festuca campestris*
rough-leaved ricegrass	*Oryzopsis asperifolia*
rush species	*Juncus* sp.
sand dropseed	*Sporobolus cryptandrus*
Sandberg's bluegrass	*Poa secunda* ssp. *secunda*
shore sedge	*Carex limosa*
Sitka sedge	*Carex sitchensis*
slender rush	*Juncus tenuis*
slender wheatgrass	*Elymus trachycaulus* ssp. *trachycaulus*

TABLE D3 Cont'd

Common Name	Scientific Name
small-flowered bulrush	*Scirpus microcarpus*
small-flowered wood-rush	*Luzula parviflora*
smooth-stemmed sedge	*Carex laeviculmis*
soft-leaved sedge	*Carex disperma*
spike-rush species	*Eleocharis* sp.
star sedge	*Carex echinata* ssp. *echinata*
tall mannagrass	*Glyceria elata*
thick-headed sedge	*Carex pachystachya*
thickspike wildrye	*Elymus lanceolatus* ssp. *lanceolatus*
toad rush	*Juncus bufonius*
tuberous rush	*Juncus nodosus*
tufted hairgrass	*Deschampsia cespitosa* ssp. *cespitosa*
water sedge	*Carex aquatilis* var. *aquatilis*
western fescue	*Festuca occidentalis*
wheatgrass species	*Elymus* sp.
wood-rush species	*Luzula* sp.
woolly eriophyllum	*Eriophyllum lanatum* var. *leucophyllum*
woolly sedge	*Carex pellita*
MOSSES, LICHENS, LIVERWORTS	
Abietinella moss	*Abietinella abietina*
Allocetraria lichen species	*Allocetraria* sp.
Andreaea moss	*Andreaea rupestris* var. *rupestris*
Antitrichia moss	*Antitrichia californica*
apple pelt	*Peltigera malacea*
Atrichum moss	*Atrichum selwynii*
Aulacomnium moss	*Aulacomnium androgynum*
Aulacomnium moss	*Aulacomnium palustre*
Barbula moss	*Barbula convoluta* var. *convoluta*
Barbula moss	*Barbula unguiculata*
barely hopping rockfrog	*Xanthoparmelia wyomingica*
bighorn pixie	*Cladonia cornuta* ssp. *cornuta*
black-bellied pelt	*Peltigera rufescens*
black-saddle pelt	*Peltigera neckeri*
blistered rocktripe	*Umbilicaria hyperborea*
boreal pixie-cup	*Cladonia borealis*
born-again pelt	*Peltigera praetextata*
Brachythecium moss	*Brachythecium albicans*
Brachythecium moss	*Brachythecium erythrorrhizon*
Brachythecium moss	*Brachythecium hylotapetum*
Brachythecium moss	*Brachythecium rivulare*
Brachythecium moss	*Brachythecium salebrosum*
Brachydontium moss species	*Brachydontium* sp.
bronzed pixie	*Cladonia gracilis* ssp. *turbinata*
brown-eyed sunshine	*Vulpicida canadensis*
Bryobrittonia moss species	*Bryobrittonia* sp.
Bryocaulon lichen species	*Bryocaulon* sp.
Bryum moss	*Bryum argenteum*
Bryum moss	*Bryum caespiticium*
Bryum moss	*Bryum miniatum*
Bryum moss species	*Bryum* sp.
budding bone	*Hypogymnia occidentalis*
Calliergon moss	*Calliergon richardsonii*
Ceratodon moss	*Ceratodon purpureus* var. *purpureus*
Climacium moss	*Climacium dendroides*
Coscinodon moss	*Coscinodon calyptratus*

TABLE D3 Cont'd

Common Name	Scientific Name
Cratoneuron moss	*Cratoneuron filicinum*
crinkled wrinkle	*Tuckermannopsis platyphylla*
deer fern	*Blechnum spicant*
Dicranum moss	*Dicranum fragilifolium*
Dicranum moss	*Dicranum fuscescens* var. *fuscescens*
Dicranum moss	*Dicranum polysetum*
Dicranum moss	*Dicranum scoparium*
Dicranum moss	*Dicranum tauricum*
Didymodon moss	*Didymodon vinealis* var. *vinealis*
dog bone	*Hypogymnia tubulosa*
Drepanocladus moss species	*Drepanocladus* sp.
durable rockleather	*Melanelia stygia*
ectomorphic reindeer	*Cladina mitis*
edible horsehair	*Bryoria fremontii*
elegant sunburst	*Xanthoria elegans*
Encalypta moss species	*Encalypta* sp.
Eurhynchium moss	*Eurhynchium pulchellum* var. *barnesii*
Eurhynchium moss	*Eurhynchium pulchellum* var. *pulchellum*
extra hot pixie	*Cladonia sulphurina*
eyed foam	*Stereocaulon tomentosum*
eyed mossthorns	*Polychidium muscicola*
familiar witch's hair	*Alectoria sarmentosa* ssp. *sarmentosa*
felt pelt	*Peltigera canina*
forking bone	*Hypogymnia imshaugii*
Funaria moss	*Funaria hygrometrica*
gilded frost	*Physconia enteroxantha*
gilded sunshine	*Vulpicida pinastri*
goodlooking readhead	*Nodobryoria abbreviata*
granulating pixie-cup	*Cladonia chlorophaea*
gray horsehair	*Bryoria capillaris*
gray reindeer	*Cladina rangiferina*
greater pied pixie	*Cladonia phyllophora*
greater ribbed pixie	*Cladonia symphycarpia*
green starburst	*Parmeliopsis ambigua*
green-eyed rockbright	*Rhizoplaca melanophthalma*
grey starburst	*Parmeliopsis hyperopta*
Grimmia moss	*Grimmia alpestris*
Grimmia moss	*Grimmia anodon*
Grimmia moss	*Grimmia montana*
Grimmia moss	*Grimmia ovalis*
Grimmia moss species	*Grimmia* sp.
ground frost	*Physconia muscigena*
gumboot pixie	*Cladonia gracilis* ssp. *elongata*
hammered crottle	*Parmelia sulcata*
hoary false yarrow	*Chaenactis douglasii* var. *douglasii*
Homalothecium moss	*Homalothecium aeneum*
Homalothecium moss	*Homalothecium nuttallii*
hyphenated icelandmoss	*Cetraria ericetorum* ssp. *reticulata*
hyphenated ribbon	*Ramalina farinacea*
Hypnum moss	*Hypnum revolutum* var. *revolutum*
Hypogymnia lichen species	*Hypogymnia sp.*
knight's plume	*Ptilium crista-castrensis*
lesser ribbed pixie	*Cladonia cariosa*
lesser toad pelt	*Peltigera venosa*
mama littlehorn pixie	*Cladonia coniocraea*

TABLE D3 Cont'd

Common Name	Scientific Name
Maritime woollybear	*Polychidium contortum*
medium hot pixie	*Cladonia deformis*
mesomorphic reindeer	*Cladina arbuscula* ssp. *beringiana*
Mnium moss	*Mnium spinulosum*
monk's hood	*Hypogymnia physodes*
moss tarts	*Psoroma hypnorum*
Neckera moss	*Neckera douglasii*
nested sunburst	*Xanthomendoza fallax*
orange-footed pixie	*Cladonia ecmocyna* ssp. *intermedia*
Orthotrichum moss	*Orthotrichum laevigatum*
Orthotrichum moss	*Orthotrichum rupestre*
pagoda pixie	*Cladonia cervicornis* ssp. *verticillata*
pale-footed horsehair	*Bryoria fuscescens*
pebbled crottle	*Parmelia saxatilis*
pebbled pixie-cup	*Cladonia pyxidata*
Peltigera lichen species	*Peltigera* sp.
perforated rocktripe	*Umbilicaria torrefacta*
Philonotis moss	*Philonotis fontana* var. *americana*
Philonotis moss	*Philonotis fontana* var. *fontana*
pied pelt	*Peltigera kristinssonii*
pimpled paw	*Nephroma resupinatum*
pink-eyed rockbright	*Rhizoplaca chrysoleuca*
Plagiomnium moss	*Plagiomnium ellipticum*
Plagiomnium moss	*Plagiomnium insigne*
Pohlia moss	*Pohlia cruda*
Pohlia moss	*Pohlia nutans*
Pohlia moss species	*Pohlia* sp.
Polychidium lichen species	*Polychidium* sp.
Polytrichum moss	*Polytrichum commune* var. *commune*
Polytrichum moss	*Polytrichum juniperinum*
Polytrichum moss	*Polytrichum piliferum*
powdered paw	*Nephroma parile*
powder-ringed beard	*Usnea lapponica*
progressive camouflage	*Melanohalea elegantula*
Pterygoneurum moss	*Pterygoneurum ovatum*
Pterygoneurum moss	*Pterygoneurum subsessile*
Pylaisiella moss	*Pylaisiella polyantha*
Racomitrium moss	*Racomitrium brevipes*
Racomitrium moss	*Racomitrium canescens* ssp. *canescens*
Racomitrium moss	*Racomitrium elongatum*
Racomitrium moss	*Racomitrium heterostichum*
ragbag	*Platismatia glauca*
red-stemmed feathermoss	*Pleurozium schreberi*
Rhizomnium moss	*Rhizomnium glabrescens*
Rhizomnium moss	*Rhizomnium magnifolium*
Rhytidiadelphus moss	*Rhytidiadelphus loreus*
Rhytidiadelphus moss	*Rhytidiadelphus triquetrus*
Rhytidiopsis moss	*Rhytidiopsis robusta*
Rhytidium moss	*Rhytidium rugosum*
rimmed rockleather	*Melanelia hepatizon*
rosetted pixie-cup	*Cladonia pocillum*
ruffled pelt	*Peltigera leucophlebia*
sandpaper stippleback	*Dermatocarpon reticulatum*
Sanionia moss	*Sanionia uncinata*
Schistidium moss	*Schistidium frigidum*

TABLE D3 Cont'd

Common Name	Scientific Name
Schistidium moss	*Schistidium papillosum*
Scouleria moss	*Scouleria aquatica*
shrublet sunburst	*Xanthoria candelaria*
silver-edge pelt	*Peltigera aphthosa*
silver-lined wrinkle	*Tuckermannopsis chlorophylla*
smirking frost	*Physconia perisidiosa*
speckled icelandmoss	*Cetraria islandica* ssp. *islandica*
Sphagnum moss species	*Sphagnum* sp.
starving pixie	*Cladonia rei*
step moss	*Hylocomium splendens*
Stereocaulon lichen species	*Stereocaulon* sp.
sugar-frosted beard	*Usnea hirta*
Syntrichia moss	*Syntrichia caninervis*
Syntrichia moss	*Syntrichia princeps*
Syntrichia moss	*Syntrichia ruralis*
Syntrichia moss species	*Syntrichia* sp.
tattered rag	*Platismatia herrei*
Tetraphis moss	*Tetraphis pellucida*
thorn pixie	*Cladonia uncialis*
Thuidium moss	*Thuidium recognitum*
Timmia moss	*Timmia austriaca*
Trachybryum moss	*Trachybryum megaptilum*
trumpeting pixie	*Cladonia fimbriata*
undulating pelt	*Peltigera neopolydactyla*
Usnea lichen species	*Usnea* sp.
valley oakmoss	*Evernia prunastri*
valley wolf	*Letharia vulpina*
whiskered camouflage	*Melanelixia subargentifera*
wire horsehair	*Bryoria glabra*
woolly horsehair	*Bryoria lanestris*
wounded pixie	*Cladonia gracilis* ssp. *vulnerata*
WEEDS, AGRONOMICS[1,2,3]	
butter-and-eggs	***Linaria vulgaris***
Canada thistle	***Cirsium arvense***
common dodder	***Cuscuta epithymum***
common hound's-tongue	***Cynoglossum officinale***
Dalmatian toadflax	***Linaria genistifolia* ssp. *dalmatica***
diffuse knapweed	***Centaurea diffusa***
spotted knapweed	***Centaurea stoebe* ssp. *micranthos***
Cleavers*	*Galium aparine**
common burdock*	*Arctium minus**
great burdock*	*Arctium lappa**
hoary alyssum*	*Berteroa incana**
orange hawkweed (orange-red king devil)*	*Hieracium aurantiacum**
summer-cypress*	*Kochia scoparia**
viper's bugloss*	*Echium vulgare**
elm	*Ulmus* sp.
alfalfa	*Medicago sativa* ssp. *falcata*
alsike clover	*Trifolium hybridum*
American black nightshade	*Solanum americanum*
annual bluegrass	*Poa annua*
annual hawksbeard	*Crepis tectorum*
barren fescue	*Vulpia bromoides*
birds-foot trefoil	*Lotus corniculatus*
black cherry	*Prunus serotina*

TABLE D3 Cont'd

Common Name	Scientific Name
black medic	*Medicago lupulina*
black mustard	*Brassica* sp
bull thistle	*Cirsium vulgare*
Canada bluegrass	*Poa compressa*
Canadian goldenrod	*Solidago canadensis*
catnip	*Nepeta cataria*
cheatgrass	*Bromus tectorum*
Chewing's fescue	*Festuca rubra* ssp. *commutata*
chicory	*Cichorium intybus*
clasping-leaved pepper-grass	*Lepidium perfoliatum*
common chickweed	*Stellaria media*
common dandelion	*Taraxacum officinale*
common draba	*Draba verna*
common evening-primrose	*Oenothera biennis*
common foxglove	*Digitalis purpurea*
common groundsel	*Senecio vulgaris*
common mugwort	*Artemisia vulgaris*
common plantain	*Plantago major*
common purslane	*Portulaca oleracea*
common sow-thistle	*Sonchus oleraceus*
common speedwell	*Veronica officinalis*
common St. John's-wort	*Hypericum perforatum*
common stork's-bill	*Erodium cicutarium* ssp. *cicutarium*
common tansy	*Tanacetum vulgare*
common timothy	*Phleum pratense*
common velvet-grass	*Holcus lanatus*
common vetch	*Vicia sativa* var. *sativa*
common watercress	*Nasturtium officinale*
compact rush	*Juncus conglomeratus*
corn brome	*Bromus squarrosus*
corn-spurry	*Spergula arvensis*
creeping bentgrass	*Agrostis stolonifera*
creeping buttercup	*Ranunculus repens*
creeping yellowcress	*Rorippa sylvestris*
crested wheatgrass	*Agropyron cristatum* ssp. *pectinatum*
curled dock	*Rumex crispus*
corn-spurry	*Spergula arvensis*
creeping bentgrass	*Agrostis stolonifera*
creeping buttercup	*Ranunculus repens*
creeping yellowcress	*Rorippa sylvestris*
crested wheatgrass	*Agropyron cristatum* ssp. *pectinatum*
curled dock	*Rumex crispus*
Dalmatian toadflax	*Linaria genistifolia* ssp. *dalmatica*
Deptford pink	*Dianthus armeria*
desert alyssum	*Alyssum desertorum*
early hairgrass	*Aira praecox*
eastern cottonwood	*Populus deltoides* ssp. *deltoides*
eastern eyebright	*Euphrasia nemorosa*
European bittersweet	*Solanum dulcamara* var. *dulcamara*
European field bittercress	*Cardamine pratensis* ssp. *pratensis*
European hawkweed	*Hieracium lachenalii*
European rush	*Juncus effusus* ssp. *effusus*
European water-plantain	*Alisma plantago-aquatica*
falseflax	*Camelina sativa*
field filago	*Logfia arvensis*

TABLE D3 Cont'd

Common Name	Scientific Name
field forget-me-not	*Myosotis arvensis*
field hedge-nettle	*Stachys arvensis*
field pennycress	*Thlaspi arvense*
field wood-rush	*Luzula campestris*
flagellate hawkweed	*Hieracium flagellare* ssp. *flagellare*
flixweed	*Descurainia sophia*
great mullein	*Verbascum thapsus*
green sorrel	*Rumex acetosa* ssp. *acetosa*
hairy bittercress	*Cardamine hirsuta*
hairy cat's-ear	*Hypochaeris radicata*
hairy vetch	*Vicia villosa ssp. villosa*
hairy wheatgrass	*Thinopyrum intermedium ssp. barbulatum*
hard fescue	*Festuca trachyphylla*
hare's-foot clover	*Trifolium arvense*
hedge mustard	*Sisymbrium officinale*
hemp-nettle	*Galeopsis tetrahit*
hornseed buttercup	*Ranunculus testiculatus*
horseweed	*Conyza canadensis*
interrupted apera	*Apera interrupta*
Japanese brome	*Bromus japonicus*
Kentucky bluegrass	*Poa pratensis* ssp. *pratensis*
king devil	*Hieracium praealtum*
kingdevil hawkweed	*Hieracium floribundum*
lamb's-quarters	*Chenopodium album* ssp. *album*
lance-leaved violet	*Viola lanceolata* ssp. *lanceolata*
large barnyard-grass	*Echinochloa crusgalli*
littlepod flax	*Camelina microcarpa*
Loesel's tumble-mustard	*Sisymbrium loeselii*
madwort	*Asperugo procumbens*
marsh cudweed	*Gnaphalium uliginosum*
meadow buttercup	*Ranunculus acris*
moth mullein	*Verbascum blattaria*
mouse-ear chickweed	*Cerastium fontanum* ssp. *triviale*
mouse-ear hawkweed	*Hieracium pilosella*
narrow-leaved everlasting peavine	*Lathyrus sylvestris*
night-flowering catchfly	*Silene noctiflora*
nipplewort	*Lapsana communis*
oak-leaved goosefoot	*Chenopodium glaucum* var. *glaucum*
orchard grass	*Dactylis glomerata*
oval-leaved knotweed	*Polygonum arenastrum*
perennial sow-thistle	*Sonchus arvensis* ssp. *arvensis*
prickly lettuce	*Lactuca serriola*
prickly sow-thistle	*Sonchus asper*
rattail fescue	*Vulpia myuros*
red clover	*Trifolium pratense*
red sand-spurry	*Spergularia rubra*
ribwort plantain	*Plantago lanceolata*
rigid sunflower	*Helianthus rigidus* var. *subrhomboideus*
Robert's geranium	*Geranium robertianum*
Russian olive	*Elaeagnus angustifolia*
Russian thistle	*Salsola tragus*
sainfoin	*Onobrychis viciifolia*
salad burnet	*Sanguisorba minor* ssp. *muricata*
Scotch broom	*Cytisus scoparius*
sheep sorrel	*Rumex acetosella*

TABLE D3 Cont'd

Common Name	Scientific Name
shepherd's purse	*Capsella bursa-pastoris*
silvery cinquefoil	*Potentilla argentea*
small touch-me-not	*Impatiens parviflora*
smooth cat's-ear	*Hypochaeris glabra*
sticky chickweed	*Cerastium glomeratum*
stinging nettle	*Urtica dioica* ssp. *dioica*
stinking chamomile	*Anthemis cotula*
sulphur cinquefoil	*Potentilla recta*
sweet rocket	*Hesperis matronalis*
sweet vernalgrass	*Anthoxanthum odoratum*
tall tumble-mustard	*Sisymbrium altissimum*
tansy ragwort	*Senecio jacobaea*
tomatillo	*Physalis philadelphica*
tufted vetch	*Vicia cracca* ssp. *cracca*
turnip	*Brassica napus*
tutsan	*Hypericum androsaemum*
umbellate chickweed	*Holosteum umbellatum*
water meadow-foxtail	*Alopecurus geniculatus*
weeping alkaligrass	*Puccinellia distans*
white clover	*Trifolium repens*
white cockle	*Silene latifolia* ssp. *alba*
white mignonette	*Reseda alba*
white sweet-clover	*Melilotus alba*
wild marjoram	*Origanum vulgare*
woolgrass	*Scirpus cyperinus*
wormwood	*Artemisia absinthium*
yellow clover	*Trifolium aureum*
yellow salsify	*Tragopogon dubius*
yellow sweet-clover	*Melilotus officinalis*
white sweet-clover	*Melilotus alba*

Notes: 1 Species nomenclature and the status of species as native or not is determined according to the BC Species and Ecosystem Explorer (BC MOE 2013), with more current taxonomic information drawn from NatureServe (2012a), when necessary. Where the BC *Weed Control Act* nomenclature differs from these sources, the *Weed Control Act* name for the species has been provided in brackets following the ACIMS or CDC name. Where no species nomenclature is available from the BC Species and Ecosystem Explorer (BC MOE 2013), only the BC *Weed Control Act* name is provided.

2 **Bold** font denotes Provincially Noxious weeds.

3 * denotes Regionally Noxious weeds.

TABLE D4

HOPE TO BURNABY OBSERVED PLANT SPECIES – BY TYPE AND COMMON NAME

Common Name	Scientific Name
TREES	
balsam poplar	*Populus balsamifera*
bigleaf maple	*Acer macrophyllum*
black cottonwood	*Populus trichocarpa*
Douglas maple	*Acer glabrum* var. *douglasii*
grand fir	*Abies grandis*
paper birch	*Betula papyrifera* var. *papyrifera*
pine species	*Pinus* sp.
Rocky Mountain Douglas-fir	*Pseudotsuga menziesii* var. *glauca*
shore pine	*Pinus contorta* var. *contorta*
Sitka spruce	*Picea sitchensis*
vine maple	*Acer circinatum*
western hemlock	*Tsuga heterophylla*
western redcedar	*Thuja plicata*
SHRUBS	
baldhip rose	*Rosa gymnocarpa*
bitter cherry	*Prunus emarginata*
black elderberry	*Sambucus racemosa* var. *melanocarpa*
black gooseberry	*Ribes lacustre*
black twinberry	*Lonicera involucrata*
blue elderberry	*Sambucus cerulea* var. *cerulea*
buckthorn species	*Rhamnus* sp.
cascara	*Rhamnus purshiana*
clustered wild rose	*Rosa pisocarpa*
coastal red elderberry	*Sambucus racemosa* var. *arborescens*
common snowberry	*Symphoricarpos albus* var. *albus*
currant species	*Ribes* sp.
glaucous-leaved honeysuckle	*Lonicera dioica* var. *glaucescens*
green alder	*Alnus viridis* ssp. *crispa*
hardhack	*Spiraea douglasii* ssp. *douglasii*
mock-orange	*Philadelphus lewisii*
Nootka rose	*Rosa nutkana* var. *hispida*
Nootka rose	*Rosa nutkana* var. *nutkana*
northern blackcurrant	*Ribes hudsonianum* var. *hudsonianum*
Pacific ninebark	*Physocarpus capitatus*
prairie saskatoon	*Amelanchier alnifolia* var. *alnifolia*
prickly rose	*Rosa acicularis* ssp. *sayi*
red alder	*Alnus rubra*
red raspberry	*Rubus idaeus* ssp. *strigosus*
red-osier dogwood	*Cornus stolonifera*
redstem ceanothus	*Ceanothus sanguineus*
rose species	*Rosa* sp.
salmonberry	*Rubus spectabilis*
Scouler's willow	*Salix scouleriana*
Sitka mountain-ash	*Sorbus sitchensis* var. *grayi*
Sitka willow	*Salix sitchensis*
skunk currant	*Ribes glandulosum*
stink currant	*Ribes bracteosum*
tall blueberry willow	*Salix pseudomyrsinites*
thimbleberry	*Rubus parviflorus* var. *parviflorus*
trapper's tea	*Rhododendron neoglandulosum*
water birch	*Betula occidentalis*
western mountain-ash	*Sorbus scopulina* var. *cascadensis*
western mountain-ash	*Sorbus scopulina* var. *scopulina*

TABLE D4 Cont'd

Common Name	Scientific Name
western trumpet	*Lonicera ciliosa*
FORBS, DWARF SHRUBS	
Alaska club-moss	*Diphasiastrum sitchense*
American speedwell	*Veronica beccabunga* var. *americana*
American wintercress	*Barbarea orthoceras*
baneberry	*Actaea rubra*
beaked hazelnut	*Corylus cornuta* var. *californica*
big sagebrush	*Artemisia tridentata* ssp. *tridentata*
big-leaved sandwort	*Moehringia macrophylla*
bittercress species	*Cardamine* sp.
black raspberry	*Rubus leucodermis*
blue skullcap	*Scutellaria lateriflora*
bracken fern	*Pteridium aquilinum* ssp. *lanuginosum*
broad-leaved starflower	*Trientalis borealis* ssp. *latifolia*
buttercup species	*Ranunculus* sp.
butterweed species	*Senecio* sp.
Calla species	*Calla* sp.
Canada goldenrod	*Solidago lepida* var. *lepida*
chickweed species	*Cerastium* sp.
clasping twistedstalk	*Streptopus amplexifolius* var. *amplexifolius*
common agrimony	*Agrimonia gryposepala*
common cattail	*Typha latifolia*
common duckweed	*Lemna minor*
common horsetail	*Equisetum arvense*
common touch-me-not	*Impatiens noli-tangere*
Cooley's hedge-nettle	*Stachys chamissonis* var. *cooleyae*
cow-parsnip	*Heracleum maximum*
crab apple species	*Malus* sp.
creamy peavine	*Lathyrus ochroleucus*
crisp starwort	*Stellaria crispa*
cut-leaved foamflower	*Tiarella trifoliata* var. *laciniata*
cut-leaved water horehound	*Lycopus americanus*
devil's club	*Oplopanax horridus*
diverse-leaved water-starwort	*Callitriche heterophylla* ssp. *bolanderi*
dock species	*Rumex* sp.
Draba species	*Draba* sp.
dull Oregon-grape	*Mahonia nervosa*
emersed bur-reed	*Sparganium emersum*
enchanter's-nightshade	*Circaea alpina* ssp. *alpina*
Eschscholtz's rockcress	*Arabis eschscholtziana*
false lily-of-the-valley	*Maianthemum dilatatum*
false Solomon's-seal	*Maianthemum racemosum* ssp. *amplexicaule*
falsebox	*Paxistima myrsinites*
field chickweed	*Cerastium arvense*
fireweed	*Epilobium angustifolium* ssp. *angustifolium*
five-stamened mitrewort	*Mitella pentandra*
fleabane species	*Erigeron* sp.
floating-leaved pondweed	*Potamogeton natans*
forget-me-not species	*Myosotis* sp.
fragile fern	*Cystopteris fragilis*
fringecup	*Tellima grandiflora*
giant horsetail	*Equisetum telmateia* ssp. *braunii*
glasswort species	*Salicornia* sp.
goatsbeard	*Aruncus dioicus*
green spleenwort	*Asplenium viride*

TABLE D4 Cont'd

Common Name	Scientific Name
harsh paintbrush	*Castilleja hispida* var. *hispida*
hawkweed species	*Hieracium* sp.
Hooker's fairybells	*Prosartes hookeri* var. *oregana*
Howell's pussytoes	*Antennaria howellii* ssp. *howellii*
Indian-plum	*Oemleria cerasiformis*
lady fern	*Athyrium filix-femina* ssp. *cyclosorum*
large-leaved avens	*Geum macrophyllum* ssp. *macrophyllum*
leafy dwarf knotweed	*Polygonum minimum*
licorice fern	*Polypodium glycyrrhiza*
limestone maidenhair spleenwort	*Asplenium trichomanes* ssp. *quadrivalens*
little western bittercress	*Cardamine oligosperma*
Lobelia species	*Lobelia* sp.
long-leaved starwort	*Stellaria longifolia*
lupine species	*Lupinus* sp.
maiden-hair fern species	*Adiantum* sp.
male fern	*Dryopteris filix-mas* ssp. *filix-mas*
marsh cinquefoil	*Comarum palustre*
marsh skullcap	*Scutellaria galericulata*
mitrewort species	*Mitella* sp.
mountain sweet-cicely	*Osmorhiza berteroi*
mustard species	*Sisymbrium* sp.
narrow-leaved bur-reed	*Sparganium angustifolium*
narrow-leaved hawkweed	*Hieracium umbellatum* ssp. *umbellatum*
nodding beggarticks	*Bidens cernua*
northern starwort	*Stellaria calycantha*
oak fern	*Gymnocarpium dryopteris*
oceanspray	*Holodiscus discolor*
oval-leaved blueberry	*Vaccinium ovalifolium*
Pacific bleeding heart	*Dicentra formosa*
Pacific waterleaf	*Hydrophyllum tenuipes*
Pacific water-parsley	*Oenanthe sarmentosa*
pearlwort species	*Sagina* sp.
pearly everlasting	*Anaphalis margaritacea*
Pennsylvanian bittercress	*Cardamine pensylvanica*
Penstemon species	*Penstemon* sp.
pepper-grass species	*Lepidium* sp.
Philadelphia fleabane	*Erigeron philadelphicus*
piggy-back plant	*Tolmiea menziesii*
pink wintergreen	*Pyrola asarifolia*
prairie agoseris	*Agoseris glauca* var. *glauca*
prairie pepper-grass	*Lepidium densiflorum*
purple sweet-cicely	*Osmorhiza purpurea*
purple-leaved willowherb	*Epilobium ciliatum* ssp. *ciliatum*
red huckleberry	*Vaccinium parvifolium*
redstem springbeauty	*Claytonia rubra* ssp. *rubra*
rosy owl-clover	*Orthocarpus bracteosus*
rosy twistedstalk	*Streptopus lanceolatus* var. *curvipes*
rough-stemmed fleabane	*Erigeron strigosus* var. *strigosus*
Rubus species	*Rubus* sp.
sagebrush species	*Artemisia* sp.
salal	*Gaultheria shallon*
scarlet paintbrush	*Castilleja miniata* var. *miniata*
self-heal	*Prunella vulgaris* ssp. *lanceolata*
showy pussytoes	*Antennaria pulcherrima* ssp. *pulcherrima*
Siberian miner's-lettuce	*Claytonia sibirica*

TABLE D4 Cont'd

Common Name	Scientific Name
silverweed species	*Potentilla* sp.
Sitka columbine	*Aquilegia formosa* ssp. *formosa*
Sitka romanzoffia	*Romanzoffia sitchensis*
skunk cabbage	*Lysichiton americanus*
slender fringecup	*Lithophragma tenellum*
small bedstraw	*Galium trifidum* ssp. *columbianum*
small bedstraw	*Galium trifidum* ssp. *trifidum*
small-flowered alumroot	*Heuchera micrantha* var. *diversifolia*
small-flowered lupine	*Lupinus polycarpus*
smooth alumroot	*Heuchera glabra*
speedwell species	*Veronica* sp.
spikelike goldenrod	*Solidago simplex* var. *nana*
spiny wood fern	*Dryopteris expansa*
spotted touch-me-not	*Impatiens capensis*
spreading dogbane	*Apocynum androsaemifolium* var. *androsaemifolium*
springbeauty species	*Claytonia* sp.
star-flowered false Solomon's-seal	*Maianthemum stellatum*
starwort species	*Stellaria* sp.
swamp hedge-nettle	*Stachys palustris* ssp. *pilosa*
swamp horsetail	*Equisetum fluviatile*
sweet coltsfoot	*Petasites frigidus* var. *frigidus*
sweet-scented bedstraw	*Galium triflorum*
sword fern	*Polystichum munitum*
tall Oregon-grape	*Mahonia aquifolium*
three-leaved foamflower	*Tiarella trifoliata* var. *trifoliata*
thyme-leaved speedwell	*Veronica serpyllifolia* var. *humifusa*
tiger lily	*Lilium columbianum*
toothed wood fern	*Dryopteris carthusiana*
trailing blackberry	*Rubus ursinus* ssp. *macropetalus*
uplifting suncress	*Boechera divaricarpa*
vanilla-leaf	*Achlys triphylla*
vari-leaved collomia	*Collomia heterophylla*
vetch species	*Vicia* sp.
wallflower species	*Erysimum* sp.
water-purslane	*Ludwigia palustris*
western dock	*Rumex occidentalis*
western hawksbeard	*Crepis occidentalis* ssp. *occidentalis*
western maiden-hair fern	*Adiantum aleuticum* var. *aleuticum*
western trillium	*Trillium ovatum* var. *ovatum*
white clematis	*Clematis ligusticifolia* var. *ligusticifolia*
white fawn lily	*Erythronium oregonum* ssp. *oregonum*
white hawkweed	*Hieracium albiflorum*
wild calla	*Calla palustris*
wild ginger	*Asarum caudatum*
wild strawberry	*Fragaria virginiana* var. *glauca*
willowherb species	*Epilobium* sp.
wintercress species	*Barbarea* sp.
wood strawberry	*Fragaria vesca* var. *americana*
yarrow	*Achillea millefolium* var. *alpicola*
yellow monkey-flower	*Mimulus guttatus*
yellow rattle	*Rhinanthus minor*
GRASSES, SEDGES, RUSHES	
Alaska brome	*Bromus sitchensis*
Arctagrostis species	*Arctagrostis* sp.
awl-fruited sedge	*Carex stipata* var. *stipata*

TABLE D4 Cont'd

Common Name	Scientific Name
Bebb's sedge	*Carex bebbii*
bentgrass species	*Agrostis* sp.
blue wildrye	*Elymus glaucus* ssp. *glaucus*
bluegrass species	*Poa* sp.
bluejoint reedgrass	*Calamagrostis canadensis* var. *canadensis*
blunt spike-rush	*Eleocharis obtusa*
bristle-stalked sedge	*Carex leptalea* ssp. *leptalea*
brome species	*Bromus* sp.
bronze sedge	*Carex aenea*
brown sedge species	*Carex* sp.
bulrush species	*Scirpus* sp.
California brome	*Bromus carinatus*
Columbia brome	*Bromus vulgaris*
Columbia needlegrass	*Achnatherum nelsonii* ssp. *dorei*
Crawford's sedge	*Carex crawfordii*
Cusick's sedge	*Carex cusickii*
Dewey's sedge	*Carex deweyana* var. *bolanderi*
Falkland Island sedge	*Carex macloviana*
field sedge	*Carex praegracilis*
forked wood-rush	*Luzula fastigiata*
fowl bluegrass	*Poa palustris*
grey sedge	*Carex canescens* ssp. *canescens*
hair bentgrass	*Agrostis scabra*
Henderson's sedge	*Carex hendersonii*
inflated sedge	*Carex exsiccata*
jointed rush	*Juncus articulatus*
Kentucky bluegrass	*Poa pratensis* ssp. *agassizensis*
meadow sedge	*Carex praticola*
Merten's sedge	*Carex mertensii*
nodding trisetum	*Trisetum cernuum*
nodding wood-reed	*Cinna latifolia*
reed canarygrass	*Phalaris arundinacea*
rush species	*Juncus* sp.
shore sedge	*Carex limosa*
short-stemmed sedge	*Carex brevicaulis*
showy sedge	*Carex spectabilis*
Sitka sedge	*Carex sitchensis*
slender rush	*Juncus tenuis*
slender wheatgrass	*Elymus trachycaulus* ssp. *trachycaulus*
slough sedge	*Carex obnupta*
small-flowered bulrush	*Scirpus microcarpus*
small-flowered wood-rush	*Luzula parviflora*
Smith's melic	*Melica smithii*
soft-stemmed bulrush	*Schoenoplectus tabernaemontani*
tall mannagrass	*Glyceria elata*
thick-headed sedge	*Carex pachystachya*
timber oatgrass	*Danthonia intermedia*
Tracy's sedge	*Carex tracyi*
water sedge	*Carex aquatilis var. aquatilis*
western fescue	*Festuca occidentalis*
western witchgrass	*Dichanthelium acuminatum* var. *fasciculatum*
wheatgrass species	*Elymus* sp.
MOSSES, LICHENS, LIVERWORTS	
Atrichum moss	*Atrichum undulatum*
Aulacomnium moss	*Aulacomnium androgynum*

TABLE D4 Cont'd

Common Name	Scientific Name
Brachydontium moss species	*Brachydontium* sp.
Brachythecium moss	*Brachythecium albicans*
Bryum moss species	*Bryum* sp.
Buckiella moss	*Buckiella undulata*
Climacium moss	*Climacium dendroides*
deer fern	*Blechnum spicant*
diamond pelt	*Peltigera membranacea*
Dicranum moss	*Dicranum fuscescens* var. *fuscescens*
Dicranum moss	*Dicranum scoparium*
dog bone	*Hypogymnia tubulosa*
downside seastorm	*Cetrelia cetrarioides*
elfin candleflame	*Candelaria concolor*
Eurhynchium moss	*Eurhynchium oreganum*
Eurhynchium moss	*Eurhynchium praelongum*
flapJack ribbon	*Ramalina pollinaria*
fringed pelt	*Peltigera pacifica*
granulating crottle	*Parmelia hygrophila*
granulating pixie-cup	*Cladonia chlorophaea*
gumboot pixie	*Cladonia gracilis* ssp. *elongata*
hammered crottle	*Parmelia sulcata*
Homalothecium moss	*Homalothecium fulgescens*
Homalothecium moss	*Homalothecium nuttallii*
hooded rosette	*Physcia adscendens*
hoodless rosette	*Physcia tenella*
hyphenated ribbon	*Ramalina farinacea*
Hypnum moss	*Hypnum revolutum* var. *revolutum*
imponderable pixie	*Cladonia umbricola*
king ruffle	*Parmotrema arnoldii*
Leucolepis moss	*Leucolepis acanthoneuron*
lipstick pixie	*Cladonia macilenta*
lungwort	*Lobaria pulmonaria*
mama littlehorn pixie	*Cladonia coniocraea*
monk's hood	*Hypogymnia physodes*
Neckera moss	*Neckera douglasii*
Orthotrichum moss	*Orthotrichum lyellii*
Peltigera lichen species	*Peltigera* sp.
pincushion sunburst	*Xanthoria polycarpa*
Plagiomnium moss	*Plagiomnium drummondii*
Plagiomnium moss	*Plagiomnium insigne*
Plagiomnium moss	*Plagiomnium venustum*
Pohlia moss	*Pohlia cruda*
Pohlia moss	*Pohlia* sp.
polished camouflage	*Melanelixia fuliginosa*
Polychidium lichen species	*Polychidium* sp.
Polytrichum moss	*Polytrichum commune* var. *commune*
Racomitrium moss	*Racomitrium elongatum*
Racomitrium moss	*Racomitrium heterostichum*
Racomitrium moss	*Racomitrium lanuginosum*
Ramalina lichen species	*Ramalina* sp.
ragbag	*Platismatia glauca*
red-stemmed feathermoss	*Pleurozium schreberi*
Rhizomnium moss	*Rhizomnium glabrescens*
Rhytidiadelphus moss	*Rhytidiadelphus loreus*
Rhytidiadelphus moss	*Rhytidiadelphus squarrosus*
Rhytidiadelphus moss	*Rhytidiadelphus triquetrus*

TABLE D4 Cont'd

Common Name	Scientific Name
Rhytidiadelphus moss species	*Rhytidiadelphus* sp.
ribboned rag	*Platismatia stenophylla*
Schistidium moss	*Schistidium papillosum*
Scorpidium moss	*Scorpidium scorpioides*
shrublet sunburst	*Xanthoria candelaria*
sponge pelt	*Peltigera retifoveata*
step moss	*Hylocomium splendens*
tattered rag	*Platismatia herrei*
Tetraphis moss	*Tetraphis pellucida*
trumpeting pixie	*Cladonia fimbriata*
valley oakmoss	*Evernia prunastri*
WEEDS, AGRONOMICS[1,2,3]	
Canada thistle	***Cirsium arvense***
Japanese knotweed	***Fallopia japonica***
purple loosestrife	***Lythrum salicaria***
spotted knapweed	***Centaurea stoebe* ssp. *micranthos***
cleavers*	*Galium aparine**
common burdock*	*Arctium minus**
great burdock*	*Arctium* sp.*
orange hawkweed (orange-red king devil)*	*Hieracium aurantiacum**
oxeye daisy*	*Leucanthemum vulgare**
quackgrass*	*Elymus repens**
wild chervil*	*Anthriscus sylvestris**
alfalfa	*Medicago sativa* ssp. *falcata*
alsike clover	*Trifolium hybridum*
American black nightshade	*Solanum americanum*
annual knawel	*Scleranthus annuus*
barren fescue	*Vulpia bromoides*
birds-foot trefoil	*Lotus corniculatus*
black medic	*Medicago lupulina*
bladder campion	*Silene vulgaris*
bull thistle	*Cirsium vulgare*
butterfly-bush	*Buddleja davidii*
Canada bluegrass	*Poa compressa*
Canadian goldenrod	*Solidago canadensis*
cheatgrass	*Bromus tectorum*
Chewing's fescue	*Festuca rubra* ssp. *commutata*
chicory	*Cichorium intybus*
clustered dock	*Rumex conglomeratus*
common chickweed	*Stellaria media*
common dandelion	*Taraxacum officinale*
common evening-primrose	*Oenothera biennis*
common forget-me-not	*Myosotis discolor*
common foxglove	*Digitalis purpurea*
common hawthorn	*Crataegus monogyna*
common plantain	*Plantago major*
common reed	*Phragmites australis* ssp. *australis*
common sow-thistle	*Sonchus oleraceus*
common St. John's-wort	*Hypericum perforatum*
common tansy	*Tanacetum vulgare*
common timothy	*Phleum pratense*
common velvet-grass	*Holcus lanatus*
common vetch	*Vicia sativa* var. *sativa*
creeping bentgrass	*Agrostis stolonifera*
creeping buttercup	*Ranunculus repens*

TABLE D4 Cont'd

Common Name	Scientific Name
curled dock	*Rumex crispus*
cutleaf evergreen blackberry	*Rubus laciniatus*
cut-leaved geranium	*Geranium dissectum*
Deptford pink	*Dianthus armeria*
dovefoot geranium	*Geranium molle*
early hairgrass	*Aira praecox*
eastern eyebright	*Euphrasia nemorosa*
English holly	*Ilex aquifolium*
English ivy	*Hedera helix*
European bittersweet	*Solanum dulcamara* var. *dulcamara*
European hawkweed	*Hieracium lachenalii*
European rush	*Juncus effusus* ssp. *effusus*
field forget-me-not	*Myosotis arvensis*
fortune meadowsweet	*Spiraea japonica* var. *fortunei*
goutweed	*Aegopodium podagraria*
great mullein	*Verbascum thapsus*
green sorrel	*Rumex acetosa* ssp. *acetosa*
ground-ivy	*Glechoma hederacea*
hairy bittercress	*Cardamine hirsuta*
hairy cat's-ear	*Hypochaeris radicata*
hard fescue	*Festuca trachyphylla*
hedge false bindweed	*Calystegia sepium* ssp. *sepium*
helleborine	*Epipactis helleborine*
hemp-nettle	*Galeopsis tetrahit*
Himalayan blackberry	*Rubus armeniacus*
hoary plantain	*Plantago media*
king devil	*Hieracium praealtum*
kingdevil hawkweed	*Hieracium floribundum*
lady's-thumb	*Persicaria maculosa*
large barnyard-grass	*Echinochloa crusgalli*
Loesel's tumble-mustard	*Sisymbrium loeselii*
meadow buttercup	*Ranunculus acris*
meadow fescue	*Schedonorus pratensis*
mountain bluet	*Centaurea* sp.
musk mallow	*Malva moschata*
night-flowering catchfly	*Silene noctiflora*
orchard grass	*Dactylis glomerata*
perennial ryegrass	*Lolium perenne*
perennial sow-thistle	*Sonchus arvensis* ssp. *uliginosus*
poison-hemlock	*Conium maculatum*
policeman's helmet	*Impatiens glandulifera*
pond water-starwort	*Callitriche stagnalis*
prickly lettuce	*Lactuca serriola*
prickly sow-thistle	*Sonchus asper*
rabbitfoot polypogon	*Polypogon monspeliensis*
rattail fescue	*Vulpia myuros*
red clover	*Trifolium pratense*
red fescue	*Festuca rubra ssp. rubra*
ribwort plantain	*Plantago lanceolata*
Robert's geranium	*Geranium robertianum*
Scotch broom	*Cytisus scoparius*
self-heal	*Prunella vulgaris* ssp. *vulgaris*
silver hairgrass	*Aira caryophyllea*
small touch-me-not	*Impatiens parviflora*
soft brome	*Bromus hordeaceus* ssp. *hordeaceus*

TABLE D4 Cont'd

Common Name	Scientific Name
spotted St. John's-wort	*Hypericum maculatum* ssp. *obtusiusculum*
sticky chickweed	*Cerastium glomeratum*
stinging nettle	*Urtica dioica* ssp. *dioica*
sulphur cinquefoil	*Potentilla recta*
sweet cherry	*Prunus avium*
sweet vernalgrass	*Anthoxanthum odoratum*
tall oatgrass	*Arrhenatherum elatius*
tansy ragwort	*Senecio jacobaea*
thyme-leaved speedwell	*Veronica serpyllifolia* var. *serpyllifolia*
tufted vetch	*Vicia cracca* ssp. *cracca*
upright hedge-parsley	*Torilis japonica*
wall lettuce	*Mycelis muralis*
water meadow-foxtail	*Alopecurus geniculatus*
weedy sunburst	*Xanthoria parietina*
white bedstraw	*Galium mollugo*
white clover	*Trifolium repens*
white sweet-clover	*Melilotus alba*
wood bittercress	*Cardamine flexuosa*
wood forget-me-not	*Myosotis sylvatica*
wood groundsel	*Senecio sylvaticus*
yellow archangel	*Lamium galeobdolon*
yellow clover	*Trifolium aureum*
yellow loosestrife	*Lysimachia vulgaris*

Notes:

1 Species nomenclature and the status of species as native or not is determined according to the BC Species and Ecosystem Explorer (BC MOE 2013), with more current taxonomic information drawn from NatureServe (2012a), when necessary. Where the BC *Weed Control Act* nomenclature differs from these sources, the *Weed Control Act* name for the species has been provided in brackets following the ACIMS or CDC name. Where no species nomenclature is available from the BC Species and Ecosystem Explorer (BC MOE 2013), only the BC *Weed Control Act* name is provided.

2 **Bold** font denotes Provincially Noxious weeds.

3 * denotes Regionally Noxious weeds.

APPENDIX E

PHOTOS

Plate 1 View of a beaked sedge marsh along the Edmonton to Hinton Segment (August 6, 2013).

Plate 2 View west at a beaked willow/red-osier dogwood community along the Edmonton to Edson Segment (July 17, 2013).

Plate 3 View north of a white birch/stiff club-moss woodland along the Edmonton to Edson Segment (July 19, 2013).

Plate 4 View of an ambilis fir - western redcedar/devil's club Moist Submaritime community along the Black Pines to Hope Segment (July 18, 2013).

Plate 5 View of a Bebb's willow/bluejoint reedgrass community along the Hargreaves to Darfield Segment (June 11, 2013).

Plate 6 View of a big sagebrush/bluebunch wheatgrass community along the Black Pines to Hope Segment (July 24, 2013).

Plate 7 View of a black cottonwood - red alder/salmonberry community along the Hope to Burnaby Segment (August 22, 013).

Plate 8 View of a common cattail marsh along the Hope to Burnaby Segment (July 14, 2013).

Plate 9 View of a Duglas-fir - PP/pinegrass community along the Black Pines to Hope Segment (June 4, 2013).

Plate 10 View of a Douglasfir - PP/snowbrush community along the Black Pines to Hope Segment (June 7, 2013).

Plate 11 View of a Douglas-fir/commonsnowberry - saskatoon along the Black Pines to Hope Segment (April 17, 2013).

Plate 12 Viw of a hard-stemmed bulrush deep marsh along the Hope to Burnaby Segment (April 28, 2013).

Plate 13 View of alodgepole pine/velvet-leaved blueberry/clad lichens community along the Hargreaves to Darfield Segment (June 29, 213).

Plate 14 View of a narrow-leaf willow shrubland along the Black Pines to Hope Segment (August 28, 2013).

Plate 15 View of a scrub birch/water sedge community along the Hargreaves to Darfield Segment (June 11, 2013.

Plate 16 View of a Sitka willow - Pacific willow/skunk cabbage community along the Hargreaves to Darfield Segment (June 14, 2013).

Pate 17 View of a swamp horsetail – beaked sedge marsh along the Hargreaves to Darfield Segment (June 16, 2013).

Plate 18 View of a western redcedar - Douglas-fir/vine maple community along the Hope to Burnaby Segment (Apil 13, 2013).

Plate 19 View of a western redcedar - paper birch/oak fern community along the Hargreaves to Darfield Segment (August 3, 2013).

Plate 20 View of a western redcedar – Sitka spruce/skunk cabbage community along the Hope to Burnaby Sgment (August 22, 2013).

Plate 21 View of a western redcedar/sword fern very dry maritime community along the Hope to Burnby Segment (April 13, 2013).

Plate 22 Close-up of Alaska moonwort observed along the Black Pines to Hope Segment (June 21, 2013).

Plate 23 View of habitat of Anastrophyllum liverwort and Riccardia liverwort along the Edmonton to Hinton Segment (May 21, 2013).

Plate 24 Bald sedge observed along the Hargreaves to Darfield Segment (August 13, 2013).

Plate 25 Close-up of Canada anemone observed along the Hargreaves to Darfield Segment (June 26, 2013).

Plate 26 Close-up of captate sedge observed along the Edmonton to Hinton Segment (August 9, 2013).

Plate 27 Crested wood fern observed along the Hargreaves to Darfield Segment (June 23, 2013).

Plate 28 Close-up of golden saxifrage observed along the Edmonton to Hinton Segment (June 8, 2013).

Plate 29 Population of goldthread observed along the Edmonton to Hinton Segment (July 21, 2013).

Plate 30 Least moonwort observed along the Hargreaves to Darfield Segment (June 19, 2013).

Plate 31 Many-headed sedge observed along the Black Pines to Hope Segment (August 28, 2013).

Plate 32 Meadow bitter cress observed along the Edmonton to Hinton Segment (June 13, 2013).

Plate 33 View of habitat of potential Mexican mosquito fern observed alon the Hargreaves to Darfield Segment (August 3, 2013).

Plate 34 Michigan moonwort observed along the Hargreaves to Darfield Segment (June 29, 2013).

Plate 35 Moose moonwort observed along the Hargreaves to Darfield Segment (June 27, 2013).

Plate 36 Population of Pacific waterleaf observed along the Hope to Burnaby Segment (May 8, 2013).

Plate 37 Prairie wedge grass observed along the Edmonton to Hinton Segment (August 4, 2013).

Plate 38 Riverbank anemone observed along the Hargreaves to Darfield Segment (August 2, 2013).

Plate 39 Close-up of scalloped grape fern/dainty moonwort observed along the Hargreaves to Darfield Segment (June 27, 2013).

Plate 40 Short-tail rush observed along the Edmonton to Hinton Segment (August 13, 2013).

Plate 41 Silvery sedge observed along the Hargreaves to Darfield Segment (June 22, 2013).

Plate 42 Slended naiad observed along the Edmonton to Hinton Segment (August 6, 2013).

Plate 43 Slender spike rush observed along the Hope to Burnaby Segment (July 18, 2013).

Plate 44 Snakeskin liverwort observed along the Edmonton to Hinton Segment (July 20, 2013).

Plate 45 Spatulate grape fern/spoon-shaped moonwort observed along the Hargreaves to Darfield Segment (June 21, 2013).

Plate 46 Stalked moonwort observed along the Hargeaves to Darfield Segment (June 29, 2013).

Plate 47 Tall blue lettuce observed along the Edmonton to Hinton Segment (July 19, 2013).

Plate 48 Population of tender sedge observed along the Hargreaves to Darfield Segment (August 3, 2013).

Plate 49 Upswept moonwort observed along the Hargreaves to Darfield Segment (June 24, 2013).

Plate 50 Western moonwort observed along the Hargreaves to Darfield Segment (June 29, 2013).

Plate 51 Western oak fern observed along the Edmonton to Hinton Segment (August 10, 2013).

Plate 52 White wintergreen observed along the Hargreaves to Darfield Segment (June 18, 2013).

APPENDIX F

LOCATION FOR THE OCCURRENCES OF RARE PLANTS, LICHENS AND ECOOGICAL COMMUNITIES OBSERVED ALONG THE TRANS MOUNTAIN EXPANSION PROJECT

Species (Provincial Rank) [Federal Rank][2]	Legal Location	RK[3]	Abundance and Distribution	Relation to Corridor/Project Coponent	Discussion	UTM (Zone Easting, Northing)
Alberta						
Physciella lichen (Not listed in Alberta.)	5-25-51-25 W4M	28.10	Found on the bark of a dead alder stump in a riparian area.	Specimen was collected approximately 20 m south from the centre of the proposed pipeline corridorpipeline corridor.	Identification confirmed by a Lichenologist following surveys. A revisit is required to assess population size and extent.	12U 329703, 5923202
snakeskin liverwort (S2)	8-6-53-27 W4M	62.77 to 62.88	Approximately 50 clusters were observed in a 20 m x10 m hummocky seepage area draining into Atim creek in a mature forest. Clusters were found in wet depressions among hummocks and extended into the creek edge.	Population occurred approximately 55 m southwest from the centre of the proposed pipeline corridor.	--	12U 303761, 5937158 12U 303763, 5937165 12U 303773, 5937155 12U 303774, 5937064
golden saxifrage (S3?)	8-6-53-27 W4M	62.87	Seven plants were observed in a 20 m x 20 m hummocky seepage area draining into Atim creek in a mature forest.	Population occurred approximately 55 m southwest from the centre of the proposed pipeline corridor.	--	12U 303778, 5937166 12U 303763, 5937162 12U 303772, 5937168 12U 303780, 5937164
Anastrophyllum liverwort (S2)	9-11-53-3 W5M	87.50	Found on a log in a deciduous forest.	Specimen was collected approximately 10 m north from the centre of the proposed pipeline corridor.	Identification confirmed by a Bryologist following surveys. A revisit is required to assess population size and extent.	11U 677246, 5938344
saxifrage species	15-9-53-3 W5M	91.27	Population abundance and extent was not determined since plant could not be confirmed to species.	Plants occurred 20 m north from the centre of the proposed pipeline corridor.	An early-season revisit is required to confirm species identity. If rare, population size and extent will be determined.	11U 673492, 5938543
golden saxifrage (S3?)	10-9-53-3 W5M to 11-9-53-3 W5M	91.35 to 91.43	Approximately 150-200 plants were observed in a 75 m x15 m sedge-dominated hummocky organic wetland area.	Population occurred approximately 50 m south from the centre of the proposed pipeline corridor.	A revisit is recommended to determine the full extent of population.	11U 673325, 5938479 11U 673399, 5938478
beaked willow/red-osier dogwood (S3?)	11-10-53-4 W5M	100.92 to 100.98	Community was observed along 75 m of corridor and extended at least 45 m of the corridor width. Community was located in a flat shrubby swamp.	Community was observed from approximately 20 m north of the centre of the proposed pipeline corridor and extended at least another 45 m north as well as continuing outside the proposed pipeline corridor.	--	11U 664939, 5938120 11U 664943, 5938100 11U 664960, 5938133 11U 664980, 5938112 11U 665008, 5938135 11U 665012, 5938126
Atrichum moss (S2)	15-16-53-5 W5M	112.86	Found on exposed soil on an existing power line and pipeline right-of-way.	Plant occurred approximately 40 m south from the centre of the proposed pipeline corridor.	Identification confirmed by a Bryologist following surveys. A revisit is required to assess population size and extent.	11U 654046, 5939652
Sarmenthypnum moss (S2)	15-16-53-5 W5M	113.32	Found on a rock by a stream.	Plant occurred approximately 50 m south from the centre of the proposed pipeline corridor.	Identification confirmed by a Bryologist following surveys. A revisit is required to assess population size and extent.	11U 653589, 5939628
Anastrophyllum liverwort (S2)	3-19-53-7 W5M	136.58	100 individuals were observed in a 150 cm^2 area.	Plants occurred approximately 20 m south from the centre of the proposed pipeline corridor.	--	11U 630718, 5939372
droplet notchwort (S2)	3-19-53-7 W5M	136.58	Found on a tree stump in the last stages of decay in a white spruce, aspen and birch forest.	Plants occurred approximately 20 m south from the centre of the proposed pipeline corridor.	Expert Bryologist has confirmed mitigation is not required (Belland pers. comm.).	11U 630718, 5939372
Riccardia liverwort (S2)	3-19-53-7 W5M	136.58	100 individuals were observed in a 150 cm^2 area.	Plants occurred approximately 20 m south from the centre of the proposed pipeline corridor.	--	11U 630718, 5939372
dragon Cladonia lichen (S2)	3-19-53-7 W5M	136.61	Found in a white spruce and aspen forest.	Plant occurred approximately 35 m south from the centre of the proposed pipeline corridor.	Identification confirmed by a Lichenologist following surveys. A revisit is required to assess population size and extent.	11U 630695, 5939383
saxifrage species	10-22-53-8 W5M	141.07	Population abundance and extent was not determined since plant could not be confirmed to species.	Plant occurred approximately 26 m north from the centre of the proposed pipeline corridor.	An early-season revisit is required to confirm species identity. If rare, population size and extent will be determined.	11U 626303, 5939922
tall blue lettuce (S2)	11-22-53-8 W5M	141.59 to 141.60	15 plants were observed in a 21 m x 17 m wet area with an open canopy within a birch forest.	Plants occurred from 38-55 m north from the centre of the proposed pipeline corridor.	--	11U 625774, 5939960 11U 625782, 5939953 11U 625783, 5939958 11U 625786, 5939949 11U 625792, 5939967
white birch/stiff club-moss woodland (S2?)	11-22-53-8 W5M	141.61 to 141.65	Community was observed in an approximately 81 m x 41 m area adjacent to a dredged canal found at its southern boundary.	Community occurred from 28-109 m north from the centre of the proposed pipeline corridor.	--	11U 625725, 5939963 11U 625728, 5939984 11U 625740, 5939960 11U 625743, 5939966 11U 625750, 5939960 11U 625752, 5939960 11U 625755, 5939981 11U 625756, 5940040 11U 625769, 5939994
white birch/stiff club-moss woodland (S2?)	12-22-53-8 W5M	141.79 to 141.82	Community was observed in an 8 m x 26 m area adjacent to a dredged canal found at its southern boundary. The densest cover of stiff club-moss is at the eastern extent of the community.	Community occurred from 28-36 m north from the centre of the proposed pipeline corridor.	--	11U 625559, 5939964 11U 625569, 5939969 11U 625571, 5939962 11U 625585, 5939967

Species (Provincial Rank) [Federal Rank][2]	Legal Location	RK[3]	Abundance and Distribution	Relation to Corridor/Project Coponent	Discussion	UTM (Zone Easting, Northing)
white birch/stiff club-moss woodland (S2?)	12-22-53-8 W5M	141.87 to 141.92	Community was observed in a 13 m x 52 m area in a horizontal treed fen, with a dredged canal found at its southern boundary. Also regularly placed dredged canals to the north and south. These modifications may have created conditions suitable for this community to occur.	Community occurred from 36-52 m north from the centre of the proposed pipeline corridor.	--	11U 625456, 5939978 11U 625471, 5939977 11U 625477, 5939989 11U 625508, 5939989 11U 625509, 5939976
saxifrage species	9-24-53-10 W5M	157.16	Approximately 20 individuals although plant could not be confirmed to species.	Plants occurred approximately 29 m south from the centre of the proposed pipeline corridor.	An early-season revisit is required to confirm species identity. If rare, population extent will be determined.	11U 610366, 5939525
snakeskin liverwort (S2)	12-23-53-10 W5M	159.84 to 159.85	Three patches consisting of approximately 100 thalli, 200 thalli and 200 thalli respectively were observed in a 40 m x 10 m area of a treed riparian fen in bare wet soil under where a spruce tree used to be.	The patches all occurred south from the centre of the proposed pipeline corridor at approximately 11 m for the smaller population and 37 m and 40 m for the larger populations.	--	11U 607706, 5939563 11U 607709, 5939567 11U 607720, 5939601
saxifrage species	12-23-53-10 W5M	159.84 to 159.85	> 500 plants were observed among snakeskin liverwort found at the same location. Plant could not be confirmed to species.	The population occurred between 11-40 m south from the centre of the proposed pipeline corridor.	An early-season revisit is required to confirm species identity.	11U 607706, 5939563 11U 607709, 5939567 11U 607720, 5939601
Cladonia lichen (S1)	11-29-53-11 W5M	174.49 to 174.50	Found on a soft forest log within a coniferous forest.	Specimen was collected approximately 30 m north from the centre of the proposed pipeline corridor.	In process of confirming identification by layer chromatography. If confirmed a revisit is required to assess population size and extent.	11U 593261, 5940871
goldthread (S3, W)	12-29-53-11 W5M	174.82 to 174.89	> 500 leaves were observed in a 60 m x 65 m area within a young aspen and birch stand in a flat shrubby swamp.	Population occurred between 34-60 m north from the centre of the proposed pipeline corridor.	--	11U 592863, 5940884 11U 592872, 5940884 11U 592878, 5940903 11U 592890, 5940916 11U 592894, 5940885 11U 592936, 5940877
goldthread (S3, W)	12-29-53-11 W5M to 12-30-53-11 W5M	174.91 to 176.29	> 460 leaves were observed in a dozen patches ranging in area from 20 cm x 50 cm to 240 m x 35 m in open lodgepole pine woodland habitat. Plants occurred regularly, although at times discontinuously, throughout the existing right-of-way both to the north and south but most prominently to the south.	Plants occurred between approximately 35 m north to 45 m south from the centre of the proposed pipeline corridor.	--	11U 591470, 5940846 11U 591502, 5940847 11U 591555, 5940833 11U 591729, 5940825 11U 591816, 5940841 11U 591946, 5940836 11U 592001, 5940821 11U 592063, 5940841 11U 592144, 5940847 11U 592299, 5940873 11U 592319, 5940824 11U 592354, 5940807 11U 592382, 5940841 11U 592591, 5940829 11U 592604, 5940814 11U 592620, 5940831 11U 592622, 5940868 11U 592719, 5940821 11U 592720, 5940823 11U 592727, 5940816 11U 592599, 5940854 11U 592426, 5940843 11U 592446, 5940836 11U 592446, 5940847 11U 592449, 5940837 11U 592512, 5940818 11U 592536, 5940834 11U 592539, 5940801 11U 592553, 5940820 11U 592848, 5940832
meadow bitter cress (S3, W)	5-26-53-14 W5M	199.81 to 199.84	Two plants were observed approximately 18 m apart within a shrubby riparian fen.	Plants occurred approximately 6 m north from the centree of the proposed pipeline corridor.	--	11U 568550, 5939920 11U 568568, 5939932
golden saxifrage (S3?)	5-26-53-14 W5M	199.82 to 199.84	27 plants were observed along a 29 m length within a shrubby riparian fen area on the existing right-of-way.	Plants occurred within 8 m north from the centre of the proposed pipeline corridor.	--	11U 568549, 5939920 11U 568560, 5939929

Species (Provincial Rank) [Federal Rank][2]	Legal Location	RK[3]	Abundance and Distribution	Relation to Corridor/Project Coponent	Discussion	UTM (Zone Easting, Northing)
golden saxifrage (S3?)	9-24-53-15 W5M to 16-24-53-15 W5M	206.89 to 206.93	72 plants were observed in a 10 m x 34 m area along the banks and muddy drainages (deep riparian marsh) of January Creek in the shaded by mature willows and white spruce.	Population occurred between approximately 42-55 m north from the centre of the proposed pipeline corridor.	--	11U 561714, 5938948 11U 561715, 5938945 11U 561723, 5938941 11U 561724, 5938945 11U 561732, 5938944 11U 561736, 5938941 11U 561738, 5938935 11U 561749, 5938935
prairie wedge grass (S2)	14-14-53-18 W5M	240.11	Approximately six culms were observed in a 3 m x 1 m area within the existing right-of-way in a shrubby basin fen area with cattle activity.	Plants occurred between 15-18 m north from the centre of the proposed pipeline corridor.	--	11U 529891, 5937183 11U 529893, 5937178
Blasia liverwort (S1)	14-14-53-18 W5M	240.18	Found on bare soil in a wet area at the bottom of a hill in a tamarack, white spruce and balsam fir forest.	Specimen was collected approximately 20 m south from the centre of the proposed pipeline corridor.	Identification confirmed by a Bryologist following surveys. A revisit is required to assess population size and extent.	11U 529816, 5937167
golden saxifrage (S3?)	15-15-53-18 W5M	241.57	Approximately 150 plants were observed in a 10 m x 10 m area of a treed horizontal fen within black spruce and tamarack.	Plants occurred approximately 6 m south from the centre of the proposed pipeline corridor.	--	11U 528585, 5937189 11U 528587, 5937180 11U 528591, 5937183
snakeskin liverwort (S2)	10-17-53-18 W5M	244.78 to 244.95	> 1000 thalli were observed in a 100 m x 1 m area as well as a few patches in swamps of approximately 2 m x 2m within the vicinity. Plants grew on bare soil along both banks of the Little Sundance Creek within mature white spruce forest. Plants occurred beyond the assessment area and on the opposite bank and swampy areas associated with the creek.	Plants associated with the creek occurred at 24 m north from the centre of the proposed pipeline corridor. Those associated with the swampy drainage area occurred from 8-21 m north from the centre of the proposed pipeline corridor.	A revisit is recommended to determine the full extent of the population.	11U 525496, 5936626 11U 525522, 5936612 11U 525563, 5936652 11U 525635, 5936655 11U 525667, 5936670
golden saxifrage (S3?)	7-17-53-18 W5M	244.88	11 plants were observed within a 5 m radius of the recorded UTM at an intermittent drainage in an old mixedwood forest. Location contained standing water between hummocks.	Plants occurred approximately 35 m south from the centre of the proposed pipeline corridor.	--	11U 525573, 5936592
prairie wedge grass (S2)	7-17-53-18 W5M	245.12	Approximately 24 culms were observed in a 1 m x 0.4 m area in the riparian marsh hummocks at the edge of the bank of Little Sundance Creek.	Plants occurred approximately 20 m north from the centre of the proposed pipeline corridor.	--	11U 525330, 5936561
Anastrophyllum liverwort (S2)	10-18-53-18 W5M	246.53	Found at a creek within a mature white spruce stand.	Specimen was collected approximately 200 m north from the centre of the proposed pipeline corridor.	Identification confirmed by a Bryologist following surveys. A revisit is required to assess population size and extent.	11U 523968, 5936623
golden saxifrage (S3?)	5-18-53-18 W5M	247.88 to 247.89	Approximately 75 plants were observed in a 10 m x 15 m area within a gramminoid-dominated portion of a shrubby riparian swamp surrounding Sundance Creek.	Plants occurred approximately 40 m southeast from the centre of the proposed pipeline corridor.	--	11U 522903, 5936428 11U 522904, 5936411 11U 522912, 5936417 11U 522914, 5936422
beaked sedge marsh (S2)	2-5-53-19 W5M	257.07	Community was observed in a sedge zone of a deep basin marsh around a small lake although not immediately adjacent to the lake but as a band in the middle. May be more extensive on the east side of a small lake heading north. West side of lake did not appear to contain this community.	Community occurred between 15-35 m north from the centre of the proposed pipeline corridor.	--	11U 515833, 5932828
slender naiad (S2)	2-5-53-19 W5M	257.10	Population size and extent is unknown. Plant occurred within a small lake which was surrounded by a deep basin marsh and therefore difficult to access. Only one patch was observed in a 0.4 m x 0.4 m area.	Plants occurred approximately 36 m south from the centre of the proposed pipeline corridor.	--	11U 515799, 5932775
prairie wedge grass (S2)	3-1-53-20 W5M	260.94 to 260.95	Approximately 58 culms were observed in a 13 m x 8 m area along a cleared roadside margin.	Plants occurred between 30-43 m south from the centre of the proposed pipeline corridor.	--	11U 512078, 5932712 11U 512090, 5932701
golden saxifrage (S3?)	3-1-53-20 W5M to 4-1-53-20 W5M	261.03 to 261.41	> 150 plants were observed in a 380 m length including along a treed horizontal fen.	Plants occurred approximately 30 m south from the centre of the proposed pipeline corridor.	--	11U 512002, 5932688 11U 511975, 5932686 11U 511631, 5932613 11U 511659, 5932618
linear-leaved pondweed (S2)	1-5-53-20 W5M	267.11	> 100 plants were observed in a an open water pond's loose muddy bottom. Plants appeared to be scattered along the lake margin in a > 50 m x 2 m area.	Plants occurred approximately 30 m north from the centre of the proposed pipeline corridor and are expected to occur off the proposed corridor within its lake habitat.	--	11U 506283, 5932825
golden saxifrage (S3?)	6-6-53-20 W5M	269.56	Approximately 120 plants were observed within 2m of the recorded UTM on the side of a pool within a riparian marsh by an unnamed creek.	Plants occurred approximately 64 m south from the centre of the proposed pipeline corridor.	--	11U 503924, 5933044
capitate sedge (S3, W)	13-32-52-21 W5M	278.70 to 278.77	> 100 plants were observed on the existing right-of-way in a 2-17 m x 75 m area.	Plants occurred between 13-27 m north from the centre of the proposed pipeline corridor.	--	11U 495340, 5932109 11U 495385, 5932111 11U 495391, 5932105 11U 495401, 5932121 11U 495409, 5932112
prairie wedge grass (S2)	5-31-52-21 W5M	280.78	Approximately 44 culms were observed in a 17 m x 1.5 m area.	Plants occurred between 5-22 m north from the centre of the proposed pipeline corridor.	--	11U 493625, 5931539 11U 493631, 5931534 11U 493633, 5931527

Species (Provincial Rank) [Federal Rank][2]	Legal Location	RK[3]	Abundance and Distribution	Relation to Corridor/Project Coponent	Discussion	UTM (Zone Easting, Northing)
capitate sedge (S3, W)	6-3-53-22 W5M	284.90 to 285.0	Three subpopulations were observed. The first consisted of 40-50 clusters, containing 10-75 culms per cluster, observed in a 25 m x 20 m area. The second consisted of 3 culms approximately 10 m west of the first. The third consisted of 18 culms approximately 30 m northwest of the second. Plants were found in an open area on the existing right-of-way in rolling mixedwood hills at mid-slope.	The largest subpopulation occurred at approximately 50 m south from the centre of the proposed pipeline corridor. The second and third subpopulations occurred at approximately 24 m to 50 m south respectively from the centre of the proposed pipeline corridor.	--	11U 489715, 5932801 11U 489746, 5932782 11U 489765, 5932784 11U 489776, 5932771 11U 489778, 5932773 11U 489781, 5932768 11U 489785, 5932763 11U 489790, 5932767
capitate sedge (S3, W)	2-3-53-22 W5M	285.17	Approximately 30 culms were observed. Plants were found in an open area on the existing right-of-way in rolling mixedwood hills at mid-slope.	Plants occurred approximately 20 m southwest of the centre of the proposed pipeline corridor	--	11U 489560, 5932866
rush species	6-3-53-22 W5M	285.42	An unknown sedge was collected for later identification. Population abundance and extend was not determined.	Plants occurred approximately 45 m south from the centre of the proposed pipeline corridor.	If determined to be rare a revisit is required to assess population size and extent.	11U 489314, 5932941
prairie wedge grass (S2)	6-3-53-22 W5M	285.44	11 culms were observed in a 2 m x 2 m area within a clearing.	Plants occurred approximately 43-45 m south from the centre of the proposed pipeline corridor.	--	11U 489303, 5932953
western oak fern (S1)	7-4-53-22 W5M to 10-4-53-22 W5M	286.81 to 286.84	Two subpopulations were observed. The first consisted of 150 plants in a 22 m x 10 m area. The second consisted of 200 plants in a 25 m x 12 m area. Both subpopulations were found at the base of a hill.	The first subpopulation occurred from approximately 25 m north to the centre of the proposed pipeline corridor. The second subpopulation occurred from approximately 50-62 m south from the centre of the proposed pipeline corridor.	--	11U 488004, 5933330 11U 488006, 5933311 11U 488008, 5933309 11U 488011, 5933317 11U 488031, 5933259 11U 488050, 5933262 11U 488054, 5933262
Pellia species	15-36-52-23 W5M	291.86	Found at the edge of a moist vertical stream under speckled alder.	Specimen was collected approximately 4 m north from the centre of the proposed pipeline corridor.	Identification confirmed by a Bryologist following surveys. A revisit is required to assess population size and extent.	11U 483238, 5932152
snakeskin liverwort (S2)	15-36-52-23 W5M	291.78 to 291.87	> 100 thalli were observed in > 85 m x 3 m area. Plants were found on a creek bank on vertical sides where shaded and on bare soil with mosses.	Plants occurred from approximately 15 m north to 10 m south from the centre of the proposed pipeline corridor.	--	11U 483235, 5932133 11U 483244, 5932152 11U 483301, 5932191 11U 483238, 5932147
prairie wedge grass (S2)	15-36-52-23 W5M	291.89	Approximately 3 culms were observed in a 1 m x 0.2 m area alongside a trail on the existing right-of-way.	Plants occurred approximately 14 m south from the centre of the proposed pipeline corridor.	--	11U 483221, 5932121
prairie wedge grass (S2)	12-26-52-23 W5M	295.30 to 295.31	Two subpopulations were observed. The first consisted of approximately 10 culms in a 2 m x 1 m area. The second consisted of 9 culms in a 2 m x 0.5 m area. The plants were found along Ponoka Creek.	The first subpopulation occurred 43 m north from the centre of the proposed pipeline corridor. The second subpopulation occurred 30 m south from the centre of the proposed pipeline corridor.	--	11U 480641, 5930314 11U 480657, 5930242
Pellia species	11-21-52-23 W5M	298.58	Found on bare soil on the vertical side of a creek within a spruce and black cottonwood forest.	Specimen was collected approximately 31 m south from the centre of the proposed pipeline corridor.	Identification confirmed by a Bryologist following surveys. A revisit is required to assess population size and extent.	11U 477954, 5928658
snakeskin liverwort (S2)	11-21-52-23 W5M	298.58	Approximately 13 thalli were observed in a 40 cm x 20 cm area along a creek bank adjacent to mosses.	Plants occurred approximately 27 m south from the centre of the proposed pipeline corridor.	--	11U 477958, 5928657
scalloped grape fern (S1)	13-14-50-26 W5M	333.34	6 plants were observed within a 0.5 m radius of the recorded UTM.	Plants occurred approximately 45 m southeast from the centre of the proposed pipeline corridor.	--	11U 453291, 5908430
spatulate grape fern (S2)	10-10-50-26 W5M	335.80	3 plants were observed within a 30 cm radius of the recorded UTM on a gravel ridge west of a campground trail.	Plants occurred approximately 60 m east from the centre of the proposed pipeline corridor.	--	11U 452248, 5906226
Schistidium moss (Not listed in Alberta.)	2-4-50-26 W5M	338.68	Found on a rock within a power line right-of-way.	Specimen was collected approximately 50 m east from the centre of the proposed pipeline corridor.	--	11U 450838 5903734
short-tail rush (S2)	14-33-49-26 W5M	339.29	> 50 plants were observed in a shubby basin fen in an approximately 5 m band around the margins of a calcareous, marly pond which was approximately 25 m x 25 m.	Plants occurred approximately 20 to 45 m north from the centre of the proposed pipeline corridor.	--	11U 450347, 5903365
BC						
bald sedge (S2S3, Blue)	b-031-L/083-D-14 to d-021-L/083-D-14	508.00 to 508.47	> 1,000 plants were observed in a 450 m x 55 m area predominantly in sandy areas along the existing right-of-way including in sandy patches within very open forests.	Plants occurred from 54 m west of centre to the centre of the proposed pipeline corridor.	--	11U 339741, 5868730 11U 339909, 5868341 10U 742810, 5872190 10U 742821, 5872176 10U 742850, 5872176 10U 742857, 5872170 10U 742936, 5872011 10U 742993, 5871839
bald sedge (S2S3, Blue)	d-021-L/083-D-14	508.56	Two patches were observed in a 5 m x 1 m area within a very open forest.	Plants occurred 2-5 m south from the centre of the proposed pipeline corridor.	--	10U 743155, 5871810
bald sedge (S2S3, Blue)	d-021-L/083-D-14	508.61	One patch was observed within a very open forest.	Plants occurred 12 m south from the centre of the proposed pipeline corridor.	--	10U 743199, 5871804
bald sedge (S2S3, Blue)	a-021-L/083-D-14	509.16	One patch was observed within a very open forest.	Plants occurred 16 m southwest from the centre of the proposed pipeline corridor.	--	10U 743471, 5871356

Species (Provincial Rank) [Federal Rank][2]	Legal Location	RK[3]	Abundance and Distribution	Relation to Corridor/Project Coponent	Discussion	UTM (Zone Easting, Northing)
bald sedge (S2S3, Blue)	b-030-K/083-D-14	509.37	One patch was observed within a very open forest. There was a large sandy patch just adjacent although no plants were observed there in the late-season.	Plants occurred 28 m northeast from the centre of the proposed pipeline corridor.	--	10U 743640, 5871230
lodgepole pine/velvet-leaved blueberry/clad lichens (S2S3, Blue)	b-030-K/083-D-14	509.4		Community occurred at the centre of the proposed pipeline corridor.	Revisit is required to test soil and confirm rare community. Community extent will be determined with rare community confirmation.	11U 340429, 5867673
bald sedge (S2S3, Blue)	c-020-K/083-D-14	509.68 to 509.85	Plants were observed throughout a 172 m length along the proposed pipeline corridor. Population abundance was not recorded.	Plants occurred between approximately 44 m southwest to 8 m northeast from the centre of the proposed pipeline corridor.	A revisit is recommended to assess population size and distribution.	11U 340596, 5867451 11U 340705, 5867317 11U 340605, 5867365
lodgepole pine/velvet-leaved blueberry/clad lichens (S2S3, Blue)	c-020-K/083-D-14	509.8 to 509.85	Community was observed in a 54 m x 46 m area.	Community occurs from 3 m west to approximately 40 m east of centre of the proposed pipeline corridor.	Revisit is required to test soil and confirm rare community.	11U 340664, 5867353 11U 340676, 5867330 11U 340689, 5867337 11U 340705, 5867317 11U 340719, 5867347
bald sedge (S2S3, Blue)	d-020-K/083-D-14	509.97	One patch was observed within a very open forest.	Plants occurred 41 m southwest from the centre of the proposed pipeline corridor.	--	10U 743990, 5870732
bald sedge (S2S3, Blue)	a-020-K/083-D-14 to b-019-K/083-D-14	510.49 to 510.59	> 1,000 plants were observed over a 100 m length along the proposed pipeline corridor.	Plants occurred between approximately 8 m east of centre to the centre of the proposed pipeline corridor. A few plants also occurred 51 m west from the centre of the proposed pipeline corridor adjacent to Highway 5.	--	11U 341086, 5866805 11U 341142, 5866717 11U 341087, 5866706
lodgepole pine/velvet-leaved blueberry/clad lichens (S2S3, Blue)	a-020-K/083-D-14 to b-019-K/083-D-14	510.49 to 510.59	Community parallels the centre of the proposed pipeline corridor for approximately 110 m.	Community occurs immediately adjacent and east from the centre of the proposed pipeline corridor.	Revisit is required to test soil and confirm rare community. Community extent will be determined with community confirmation.	11U 341086, 5866805 11U 341120, 5866763 11U 341142, 5866717
bald sedge (S2S3, Blue)	b-019-K/083-D-14	510.67 to 510.69	> 200 plants were observed in an approximately 80 m x 10 m area. Plants occurred on sandy disturbed areas and on mineral soil including at the edge of forests but did not extend into well vegetated forest.	Plants occurred between approximately 10 m west to 67 m east from the centre of the proposed pipeline corridor.	--	11U 341184, 5866643 11U 341227, 5866665 11U 341242, 5866695
bald sedge (S2S3, Blue)	c-009-K/083-D-14	510.84 to 510.99	> 200 plants were observed in an approximately 146 m x 30 m area. Plants occurred on sandy disturbed areas and on mineral soil including at the edge of forests but did not extend into well vegetated forest.	Plants occurred between approximately 10 m east to 32 m west from the centre of the proposed pipeline corridor.	--	11U 341265, 5866497 11U 341358, 5866455 11U 341363, 5866435 11U 341369, 5866394
bald sedge (S2S3, Blue)	c-009-K/083-D-14 to a-009-K/083-D-14	511.14 to 511.66	> 2,000 plants were observed in an approximately 640 m x 50 m area. Plants occurred on sandy disturbed areas and on mineral soil including at the edge of forests but did not extend into well vegetated forest.	Plants occurred between approximately 35 m east to 32 m west from the centre of the proposed pipeline corridor.	--	11U 341459, 5866274 11U 341736, 5865871 11U 341788, 5865871
western moonwort (S2S3, Blue)	c-009-K/083-D-14	511.16 to 511.17	12 plants were observed in a 12 m x 2 m area in an open, sandy and grassy existing right-of-way containing scattered small lodgepole pine.	Plants occurred 23-26 m west from the centre of the proposed pipeline corridor.	--	11U 341465, 5866243 11U 341468, 5866235
stalked moonwort (S2, Red)	c-009-K/083-D-14	511.16 to 511.17	2 plants were observed in a 9 m x 2 m area in an open, sandy and grassy existing right-of-way containing scattered small lodgepole pine.	Plants occurred 23-26 m west from the centre of the proposed pipeline corridor.	--	11U 341465, 5866243 11U 341468, 5866235
western moonwort (S2S3, Blue)	c-009-K/083-D-14 to a-009-K/083-D-14	511.22 to 511.63	> 100 plants were observed in an approximately 407 m x 15 m area in an open, sandy and grassy existing right-of-way containing scattered small lodgepole pine.	Plants occurred from 29-32 m west from the centre of the proposed pipeline corridor.	--	11U 341493, 5866198 11U 341497, 5866189 11U 341736, 5865871
stalked moonwort (S2, Red)	c-009-K/083-D-14	511.22	A single plant was observed. Plants occurred in an open, sandy and grassy existing right-of-way containing scattered small lodgepole pine.	Plants occurred 27 m west from the centre of the proposed pipeline corridor.	--	11U 341495, 5866198
stalked moonwort (S2, Red)	a-009-K/083-D-14	511.54	A single plant was observed. Plants occurred in an open, sandy and grassy existing right-of-way containing scattered small lodgepole pine.	Plants occurred 27 m west from the centre of the proposed pipeline corridor.	--	11U 341689, 5865940
Michigan moonwort (S1S3, Red)	a-009-K/083-D-14	511.58 to 511.63	3 plants were observed in a 42 m x 5 m area in an open, sandy and grassy existing right-of-way containing scattered small lodgepole pine.	Plants occurred between 27-32 m west from the centre of the proposed pipeline corridor.	--	11U 341714, 5865905 11U 341736, 5865871
stalked moonwort (S2, Red)	a-009-K/083-D-14	511.62	A single plant was observed. Plants occurred in an open, sandy and grassy existing right-of-way containing scattered small lodgepole pine.	Plants occurred 31 m west from the centre of the proposed pipeline corridor.	--	11U 341729, 5865879
bald sedge (S2S3, Blue)	b-076-F/083-D-14	515.10	3 plants were observed in a 5 m x 1 m raised area of exposed soil along an existing right-of-way.	Plants occurred at approximately 10 m west from the centre of the proposed pipeline corridor.	--	11U 343826, 5863101
bald sedge (S2S3, Blue)	a-076-F/083-D-14	515.28 to 515.34	> 50 plants were observed in a 60 m x 5 m area along an existing right-of-way.	Plants occurred at approximately 10 m west from the centre of the proposed pipeline corridor.	--	11U 343936, 5862957 11U 343971, 5862906
bald sedge (S2S3, Blue)	a-044-F/083-D-14 to c-013-F/083-D-14	519.01 to 521.34	> 600 plants were observed at sandy locations throughout a 2.3 km x 50 m area. Plants were mostly associated with the existing right-of-way.	There is one location where plants occurred to 58 m east from the centre of the proposed pipeline corridor. Otherwise, the majority of plants occurred from 35 m west to 14 m east from the centre of the proposed pipeline corridor	--	11U 345589, 5860013 11U 346070, 5857757 11U 346072, 5857795
western moonwort (S2S3, Blue)	d-034-F/083-D-14	519.38	6 plants were observed in a 1 m x 0.4 m area along the edge of an existing right-of-way.	Plants occurred between 14-16 m west from the centre of the proposed pipeline corridor.	--	11U 345710, 5859657
Michigan moonwort (S1S3, Red)	d-034-F/083-D-14	519.46	Abundance and distribution was not recorded.	Plant occurred approximately 3 m west from the centre of the proposed pipeline corridor.	A revisit is recommended to assess population size and extent.	11U 345744, 5859591
western moonwort (S2S3, Blue)	d-034-F/083-D-14	519.47	10 plants were observed in a 4 m x 2 m area along the edge of an existing right-of-way.	Plants occurred between 14-16 m west from the centre of the proposed pipeline corridor.	--	11U 345744, 5859571

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western moonwort (S2S3, Blue)	b-023-F/083-D-14	520.79 to 520.98	Approximately 34 plants were observed in a 180 m length along the edge of an existing right-of-way.	Plants occurred approximately 14 m west from the centre of the proposed pipeline corridor.	--	11U 346049, 5858307 11U 346050, 5858177 11U 346061, 5858119
Michigan moonwort (S1S3, Red)	b-023-F/083-D-14	520.87 to 520.89	4 plants were observed within a 20 m length along the west side of an existing right-of-way.	Plants occurred approximately 10 m west from the centre of the proposed pipeline corridor.	--	11U 346053, 5858231 11U 346054, 5858211 11U 346054, 5858222
stalked moonwort (S2, Red)	b-023-F/083-D-14	520.88	A single plant was observed along the edge of an existing right-of-way.	Plants occurred approximately 14 m west from the centre of the proposed pipeline corridor.	--	11U 346054, 5858222
bald sedge (S2S3, Blue)	d-094-C/083-D-14	523.06 to 523.14	Approximately 70 plants were observed in a 80 m x 20 m area along a road allowance, an existing right-of-way and into a forest.	Plants occurred between 9 m east and 17 m west from the centre of the proposed pipeline corridor.	--	11U 345744, 5856039 11U 345752, 5856115 11U 345761, 5856069 11U 345765, 5856028
bald sedge (S2S3, Blue)	d-094-C/083-D-14 to a-094-C/083-D-14	523.18 to 523.63	Plants were observed throughout an existing right-of-way for approximately 440 m. Population abundance was not recorded.	Plants occurred between approximately 20-40 m east from the centre of the proposed pipeline corridor.	A revisit is recommended to determine the population size.	11U 345762, 5855993 11U 345765, 5855553
dainty moonwort (S2S3, Blue)	d-094-C/083-D-14 to a-094-C/083-D-14	523.27 to 523.49		Population occurs over a 200 m length along an existing right-of-way, approximately 30 m east from the centre of the proposed pipeline corridor.	Species confirmation is still needed. A revisit is required to confirm the species and determine the population size and extent.	11U 345748, 5855687 11U 345749, 5855896
lodgepole pine/velvet-leaved blueberry/clad lichens (S2S3, Blue)	d-094-C/083-D-14 to a-094-C/083-D-14	523.36 to 523.53	Community was observed in patches over a 175 m length adjacent to an existing right-of-way.	Community occurred between approximately 5 m east to 16 m west from the centre of the proposed pipeline corridor.	Revisit is required to test soil and confirm rare community.	11U 345691, 5855696 11U 345702, 5855649 11U 345706, 5855797 11U 345710, 5855821
stalked moonwort (S2, Red)	d-094-C/083-D-14	523.43 to 523.45	Population abundance was not recorded, however, plants were observed over an approximate 25 m length.	Plants occurred between approximately 28-36 m east from the centre of the proposed pipeline corridor.	A revisit is recommended to determine the population size.	11U 345739, 5855728 11U 345749, 5855749
lodgepole pine/velvet-leaved blueberry/clad lichens (S2S3, Blue)	d-094-C/083-D-14	523.38	Identified to be a potential rare community based on TEM plot data. Extent still to be determined.	Community occurred approximately 11 m east from the centre of the proposed corridor.	Revisit required from expert BC Ecologist to confirm rare community.	11U 345720, 5855799
Bebb's willow/bluejoint reedgrass (S3, Blue)	a-094-C/083-D-14	523.60 to 523.90	Identified to be a potential rare community during wetland surveys.	Community occurred approximately 49 m west from the centre of the proposed corridor.	Confirmation of rare community still required.	11U 345669, 5855617
stalked moonwort (S2, Red)	d-063-C/083-D-14	526.17	6 plants were observed in a 1.5 m x 0.25 m sandy area on an existing right-of-way.	Plants occurred at 32 m east from the centre of the proposed pipeline corridor.	--	11U 346517, 5853260
bald sedge (S2S3, Blue)	d-063-C/083-D-14 to b-062-C/083-D-14	526.18 to 526.90	Approximately 250 plants were observed in a 716 m x 7 m area alongside a sandy trial in an existing right-of-way.	Plants occurred between approximately 33-35 m east from the centre of the proposed pipeline corridor.	--	11U 346521, 5853250 11U 346880, 5852625
western moonwort (S2S3, Blue)	d-063-C/083-D-14	526.18 to 526.19	2 plants were observed in a 1 m x 1 m area along an existing right-of-way.	Plants occurred at approximately 35 m east from the centre of the proposed pipeline corridor.	--	11U 346525, 5853250 11U 346525, 5853249
western moonwort (S2S3, Blue)	c-062-C/083-D-14	526.40 to 526.44	4 plants were observed in a 35 m x 2 m area along an existing right-of-way.	Plants occurred between approximately 28-35 m east from the centre of the proposed pipeline corridor.	--	11U 346632, 5853062 11U 346649, 5853029
Peltigera lichen, *Peltigera conspersa* (undescribed)	b-062-C/083-D-14	526.58	Found along a dry sandy right-of-way.	Specimen was collected approximately 8 m east from the centre of the proposed pipeline corridor.	Expert Lichenologist has confirmed mitigation is not required (Goward pers. comm.).	11U 346694, 5852891
bald sedge (S2S3, Blue)	d-021-C/083-D-14 to a-021-C/083-D-14	530.47 to 531.04	Plants were observed only on a disturbed sandy road area over a 560 m length and to 1 m on either side of the road.	Plants occur only a few metres east from the centre of the proposed pipeline corridor.	Population size was not recorded. A revisit is recommended to determine population size.	10U 752515, 5853047 10U 752560, 5853609
bald sedge (S2S3, Blue)	c-011-C/083-D-14	531.40 to 531.44	Approximately 30-40 plants were observed in a 55 m x 25 m area on exposed mineral soil on a disturbed roadbed through an open lodgepole pine forest.	Plants occurred between approximately 66-90 m west from the centre of the proposed pipeline corridor.	--	11U 347621, 5848481 11U 347627, 5848521 11U 347608, 5848516 11U 347631, 5848517 11U 347635, 5848520
bald sedge (S2S3, Blue)	c-011-C/083-D-14	531.47	A single plant was observed on exposed mineral soil on a disturbed roadbed through an open lodgepole pine forest.	Plant occurred at 67 m west from the centre of the proposed pipeline corridor.	--	11U 347620, 5848448
stalked moonwort (S2, Red)	a-011-C/083-D-14	531.78	A single plant was observed along an existing right-of-way.	Plant occurred at 8 m east from the centre of the proposed pipeline corridor.	--	11U 347792, 5848172
bald sedge (S2S3, Blue)	a-011-C/083-D-14	531.98 to 532.02	4 plants were observed in a 20 m x 2 m area on exposed mineral soil on a disturbed roadbed through an open lodgepole pine forest.	Plants occurred at 17 m east from the centre of the proposed pipeline corridor.	--	11U 347841, 5847980 11U 347847, 5847944
western moonwort (S2S3, Blue)	a-011-C/083-D-14	532.06 to 532.07	Approximately 10-12 plants were observed in a 12 m x 5 m open and disturbed weedy area along an existing right-of-way.	Plants occurred at 5 m east from the centre of the proposed pipeline corridor.	--	11U 347846, 5847902 11U 347848, 5847891
bald sedge (S2S3, Blue)	a-011-C/083-D-14 to d-001-C/083-D-14	532.14 to 532.41	> 800 plants were observed in a 272 m x 15 m area on exposed mineral soil on a disturbed roadbed through an open lodgepole pine forest.	Plants occurred between approximately 4-11 m east from the centre of the proposed pipeline corridor.	--	11U 347861, 5847822 11U 347905, 5847643 11U 347914, 5847555
stalked moonwort (S2, Red)	d-001-C/083-D-14	532.34	A single plant was observed along an existing right-of-way.	Plant occurred at 26 m east from the centre of the proposed pipeline corridor.	--	11U 347923, 5847631
bald sedge (S2S3, Blue)	d-001-C/083-D-14 to a-001-C/083-D-14	532.65 to 532.70	3 plants observed in a 54 m x 10 m area on exposed mineral soil on a disturbed roadbed through an open lodgepole pine forest.	Plants occurred at 5 m east from the centre of the proposed pipeline corridor.	--	11U 347918, 5847264 11U 347920, 5847316

Species (Provincial Rank) [Federal Rank][2]	Legal Location	RK[3]	Abundance and Distribution	Relation to Corridor/Project Coponent	Discussion	UTM (Zone Easting, Northing)
scrub birch/water sedge (S3, Blue)	b-001-C/083-D-14	532.7	Identified to be a potential rare community during wetland surveys.	Community occurred approximately 66 m west from the centre of the proposed corridor.	Confirmation of rare community still required.	11U 347853, 5847325
bald sedge (S2S3, Blue)	a-001-C/083-D-14 to d-091-K/083-D-11	532.93 to 533.29	> 550 plants were observed in a 365 m x 10 m area on exposed mineral soil on a disturbed roadbed through an open lodgepole pine forest.	Plant occurred at the centre of the proposed pipeline corridor.	--	11U 347775, 5846696 11U 347872, 5847046
stalked moonwort (S2, Red)	a-001-C/083-D-14	533.01	A single plant was observed along an existing right-of-way.	Plant occurred at 16 m east from the centre of the proposed pipeline corridor.	--	11U 347860, 5846963
bald sedge (S2S3, Blue)	d-091-K/083-D-11 to c-081-K/083-D-11	533.52 to 534.37	> 400 plants were observed in an 818 m x 10 m area on exposed mineral soil on a disturbed roadbed through an open lodgepole pine forest.	Plants occurred between approximately 4-9 m east from the centre of the proposed pipeline corridor.	--	11U 347329, 5845756 11U 347709, 5846480
bald sedge (S2S3, Blue)	c-081-K/083-D-11 to d-072-K/083-D-11	534.6 to 535.41	> 1,000 plants were observed in an 810 m length along an existing right-of-way. Plants were predominantly in the more recently disturbed areas (roadside) and less in the revegetated areas.	Plants occurred between 10-50 m east from the centre of the proposed pipeline corridor.	--	11U 346988, 5844774 11U 347184, 5845215 11U 347322, 5845519
lodgepole pine/velvet-leaved blueberry/clad lichens (S2S3, Blue)	b-081-K/083-D-11 to a-082-K/083-D-11	534.83 to 535.14	Community was observed in patches within an approximately 300 m x 20 m area.	Community occurred from 26-55 m west from the centre of the proposed pipeline corridor.	Revisit is required to test soil and confirm rare community.	10U 752123, 5849185 10U 752141, 5849221 10U 752158, 5849218 10U 752245, 5849471
bald sedge (S2S3, Blue)	c-040-J/083-D-11	539.39 to 539.46	Two subpopulations were observed, the first consisting of 1 plant and the second consisting of 38 plants in a 21 m x 3 m area. The first subpopulation is approximately 45 m north of the second.	Plants occurred between 20-25 m west from the centre of the proposed pipeline corridor.	--	11U 348007, 5841060 11U 348009, 5841004 11U 348014, 5841013 11U 348016, 5840990
dainty moonwort (S2S3, Blue)	c-040-J/083-D-11	539.58 to 539.63	18 plants were observed in a 50 m x 7 m area along the edge of an existing right-of-way.	Plants occurred between 18-23 m southwest from the centre of the proposed pipeline corridor.	--	11U 348092, 5840894 11U 348096, 5840862 11U 348116, 5840856
moose moonwort (S1S3, Red)	c-040-J/083-D-11	539.59	A single plant was observed along the edge of an existing right-of-way.	Plant occurred approximately 20 m southwest from the centre of the proposed pipeline corridor.	--	11U 348091, 5840883
echo moonwort (S1S2, Red)	c-040-J/083-D-11	539.65	Location of this plant contained greater than 50 Botrychia (including a second rare Botrychium) in an approximately 10 m x 40 m area.	Plant occurred approximately 10 m west from the centre of the proposed pipeline corridor.	The identification of this plant was confirmed following the survey hence a revisit is required to assess population size and extent.	10U 753560, 5845076
mountain moonwort (S1S2, Red)	c-040-J/083-D-11	539.65	Location of this plant contained greater than 50 Botrychia (including a second rare Botryhcium) in an approximately 10 m x 40 m area.	Plant occurred approximately 10 m west from the centre of the proposed pipeline corridor.	The identification of this plant was confirmed following the survey hence a revisit is required to assess population size and extent.	10U 753560, 5845076
dainty moonwort (S2S3, Blue)	b-040-J/083-D-11	539.74 to 539.77	11 plants were observed in a 30 m X 1.5 m area along the edge of an existing right-of-way.	Plants occurred approximately 19 m southwest from the centre of the proposed pipeline corridor.	--	11U 348193, 5840763 11U 348197, 5840756 11U 348208, 5840740
stalked moonwort (S2, Red)	b-040-J/083-D-11	539.88	13 plants were observed in a 2m x 12m area along an existing right-of-way.	Plants occurred 17 m southwest from the centre of the proposed pipeline corridor.	--	11U 348268, 5840654
dainty moonwort (S2S3, Blue)	b-040-J/083-D-11	539.89	3 plants were observed in a 20 cm x 5 cm area along the edge of an existing right-of-way.	Plants occurred approximately 20 m southwest from the centre of the proposed pipeline corridor.	--	11U 348274, 5840645
dainty moonwort (S2S3, Blue)	a-040-J/083-D-11	540.06 to 540.09	5 plants were observed in a 5 m x 1 m area along the edge of an existing right-of-way.	Plants occurred approximately 15 m southwest from the centre of the proposed pipeline corridor.	--	11U 348389, 5840514 11U 348411, 5840489
lodgepole pine/velvet-leaved blueberry/clad lichens (S2S3, Blue)	d-076-G/083-D-11 to c-075-G/083-D-11	546.68 to 546.86	Community was observed in patches on both sides of an existing right-of-way in an approximately 200 m x 70 m area.	Community occurred between 18 m east to 20-80 m west from the centre of the proposed pipeline corridor.	Revisit is required to test soil and confirm rare community.	10U 757726, 5840075 10U 757746, 5840024 10U 757749, 5840087 10U 757796, 5840017 10U 757812, 5839942 10U 757820, 5839973 10U 757835, 5840008 10U 757841, 5839909 10U 757869, 5839971
swamp horsetail - beaked sedge marsh (S3, Blue)	d-030-H/083-D-11	553.9 to 554.1	Identified to be a potential rare community during wetland surveys.	Community occurred approximately 50 m southwest from the centre of the proposed corridor.	Confirmation of rare community still required.	10U 356730, 5830481 10U 356747, 5830490
golden-saxifrage species	c-008-H/083-D-11	556.18 to 556.20	9 plants observed in a 22 m x 10 m area on the banks of a flowing creek by a forest edge.	Plants occurred between 5-10 m east from the centre of the proposed pipeline corridor.	An early-season revisit is required to confirm species identity.	10U 764434, 5833825 10U 764439, 5833804 10U 764441, 5833803
swamp horsetail - beaked sedge marsh (S3, Blue)	a-019-A/083-D-11	565.4 to 565.6	Identified to be a potential rare community during wetland surveys.	Community occurred approximately 71 m west from the centre of the proposed corridor.	Confirmation of rare community still required.	11U 357106, 5820138
Canada anemone (S2S3, Blue)	a-019-A/083-D-11	565.70 to 565.77	Approximately 440 plants were observed in 5 subpopulations within a 65 m x 8 m area. Subpopulations occurred in the open on an existing right-of-way.	Plants occurred between 5-11 m east from the centre of the proposed pipeline corridor.	--	11U 357074, 5819742 11U 357079, 5819785 11U 357082, 5819803 11U 357083, 5819768 11U 357086, 5819809

Species (Provincial Rank) [Federal Rank][2]	Legal Location	RK[3]	Abundance and Distribution	Relation to Corridor/Project Coponent	Discussion	UTM (Zone Easting, Northing)
montane Dicranum moss (S3, Blue)	a-074-G/083-D-06	580.30 to 580.31	Found on a spruce log.	Specimen was collected approximately 3 m west from the centre of the proposed pipeline corridor.	Identification was confirmed by a Bryologist following the survey. A revisit is required to assess population size and extent.	11U 352639, 5806955
dainty moonwort (S2S3, Blue)	b-064-G/083-D-06	581.24	A single plant was observed in an open meadow within an old burned clear-cut.	Plants occurred 5 m southeast from the centre of the proposed pipeline corridor.	--	11U 352019, 5806304
dainty moonwort (S2S3, Blue)	a-065-G/083-D-06	581.50	3 plants were observed in a 20 m x 20 m area. Plants were found in a shaded opening within a regenerated burnt clear-cut at the edge of the open meadow.	Plants occurred approximately 12 m southeast from the centre of the proposed pipeline corridor.	--	11U 351865, 5806089
dainty moonwort (S2S3, Blue)	d-055-G/083-D-06	582.00	A single plant was observed in a 1 cm x 1 cm area along the exiting right-of-way.	Plant occurred approximately 40 m west from the centre of the proposed pipeline corridor.	--	10U 759891, 5810327
stalked moonwort (S2, Red)	a-015-G/083-D-06	586.28	A single plant was observed within a revegetating existing right-of-way.	Plant occurred 8 m west from the centre of the proposed pipeline corridor.	--	11U 351340, 5801567
stalked moonwort (S2, Red)	a-015-G/083-D-06	586.48	2 plants were observed in a 10 cm x 10 cm area within a revegetating existing right-of-way.	Plants occurred 23 m east from the centre of the proposed pipeline corridor.	--	11U 351444, 5801386
montane Dicranum moss (S3, Blue)	a-005-G/083-D-06	587.13	On a Douglas-fir log at the edge of a forest.	Specimen was collected 30 m west from the centre of the proposed pipeline corridor.	Identification confirmed by a Bryologist following surveys. A revisit is required to assess population size and extent.	11U 351527, 5800744
western moonwort (S2S3, Blue)	d-095-B/083-D-06	587.68 to 587.72	21 plants were observed in a 50 m x 5 m area at a forest edge along an existing right-of-way.	Plants occurred between 10 m west to 16 m east from the centre of the proposed pipeline corridor.	--	11U 351505, 5800204 11U 351526, 5800160
Michigan moonwort (S1S3, Red)	d-095-B/083-D-06	587.68 to 587.72	26 plants were observed in a 50 m x 5 m area at a forest edge along an existing right-of-way.	Plants occurred between 10 m west to 16 m east from the centre of the proposed pipeline corridor.	--	11U 351505, 5800204 11U 351526, 5800160
stalked moonwort (S2, Red)	d-095-B/083-D-06	587.68 to 587.72	3 plants were observed in a 50 m x 5 m area within a revegetating existing right-of-way.	Plants occurred between 10 m west to 16 m east from the centre of the proposed pipeline corridor.	--	11U 351505, 5800204 11U 351526, 5800160
Michigan moonwort (S1S3, Red)	a-095-B/083-D-06	588.17	2 plants were observed in a 1 m x 1 m area at a forest edge along an existing right-of-way.	Plants occur approximately 4 m west from the centre of the proposed pipeline corridor.	--	11U 351453, 5799718
western moonwort (S2S3, Blue)	a-095-B/083-D-06	588.18	A single plant was observed at a forest edge along an existing right-of-way.	Plants occurred at 3 m west from the centre of the proposed pipeline corridor.	--	11U 351452, 5799707
western moonwort (S2S3, Blue)	b-075-B/083-D-06	590.23 to 590.24	Approximately 25-30 plants were observed in a 10 m x 10 m area along an existing right-of-way being encroached with native revegetation.	Plants occurred at 5 m west from the centre of the proposed pipeline corridor.	--	11U 351138, 5797693 11U 351142, 5797699
western moonwort (S2S3, Blue)	c-065-B/083-D-06	590.53 to 590.55	Approximately 40-50 plants were observed in a 23 m x 10 m area along an existing right-of-way being encroached with native revegetation.	Plants occurred at 4 m west from the centre of the proposed pipeline corridor.	--	11U 351078, 5797386 11U 351080, 5797409
western moonwort (S2S3, Blue)	b-065-B/083-D-06	590.91	10 plants were observed in a 10 m x 5 m area along an existing right-of-way being encroached with native revegetation.	Plants occurred at 4 m west from the centre of the proposed pipeline corridor.	--	11U 351117, 5797023
western moonwort (S2S3, Blue)	b-065-B/083-D-06	591.01 to 591.07	Approximately 30-40 plants were observed in a 60 m x 10 m area along an existing right-of-way being encroached with native revegetation.	Plants occurred between 8 m east to 2 m west from the centre of the proposed pipeline corridor.	--	11U 351111, 5796871 11U 351116, 5796913 11U 351116, 5796930
upswept moonwort (S2, Red)	b-065-B/083-D-06	591.07	Two plants were observed in a 24 m x 5 m area along an existing right-of-way being encroached with native revegetation.	Plants occurred 2 m west from the centre of the proposed pipeline corridor.	--	11U 351111, 5796871
western moonwort (S2S3, Blue)	b-065-B/083-D-06 to d-055-B/083-D-06	591.19 to 591.40	Approximately 50-70 plants were observed in a 220 m x 10 m area along an existing right-of-way being encroached with native revegetation.	Plants occurred between 4-15 m west from the centre of the proposed pipeline corridor.	--	11U 351105, 5796748 11U 351134, 5796639 11U 351172, 5796605 11U 351185, 5796565
upswept moonwort (S2, Red)	c-055-B/083-D-06	591.30	8 plants were observed in a 2 m x 2 m area along an existing right-of-way being encroached with native revegetation.	Plants occurred 15 m west from the centre of the proposed pipeline corridor.	--	11U 351134, 5796639
stalked moonwort (S2, Red)	c-055-B/083-D-06	591.36	2 plants were observed in a 2 m x 1 m area along an existing right-of-way being encroached with native revegetation.	Plants occurred 8 m west from the centre of the proposed pipeline corridor.	--	11U 351175, 5796599
western moonwort (S2S3, Blue)	c-039-J/083-D-03	603.72 to 603.78	Approximately 137 plants were observed in a 55 m x 10 m area from the crest to the mid-point of a hill along an existing right-of-way	Plants occurred between approximately 3-15 m west from the centre of the proposed pipeline corridor.	--	11U 347101, 5785177 11U 347108, 5785234
Bebb's willow/bluejoint reedgrass (S3, Blue)	d-063-F/083-D-03	611 to 611.2	Identified to be a potential rare community during wetland surveys.	Community occurred approximately 13 m west from the centre of the proposed corridor.	Confirmation of rare community still required.	11U 343809, 5778922
common cattail Marsh (S3, Blue)	b-005-F/083-D-03	617.1 to 617.5	Identified to be a potential rare community during wetland surveys.	Community occurred approximately 70 m east from the centre of the proposed corridor.	Confirmation of rare community still required.	11U 341822, 5773409
Sitka willow - Pacific willow/skunk cabbage (S2, Red)	c-076-C/083-D-03	619.9 to 620.0	Identified to be a potential rare community during wetland surveys.	Community occurred approximately 220 m west from the centre of the proposed corridor.	Confirmation of rare community still required.	11U 341043, 5770708

Species (Provincial Rank) [Federal Rank][2]	Legal Location	RK[3]	Abundance and Distribution	Relation to Corridor/Project Coponent	Discussion	UTM (Zone Easting, Northing)
crested wood fern (S2S3, Blue)	d-066-C/083-D-03 to c-066-C/083-D-03	620.75 to 621.04	Approximately 187 plants were observed in an approximately 260 m x 80 m area predominantly along the northern and western edge of a lake riparian area but a few were also observed within the adjacent forest.	Population occurred predominantly on and slightly off the proposed corridor. It extends between 7-94 m east from the centre of the proposed pipeline corridor on the northern side of the lake. Along the western side of the lake plants occurred from 7-50 m east from the centre of the proposed pipeline corridor.	--	11U 340853, 5769856 11U 340884, 5769902 11U 340887, 5769908 11U 340893, 5769918 10U 752162, 5773630 10U 752184, 5773675 10U 752191, 5773697 10U 752233, 5773766 10U 752246, 5773778 10U 752275, 5773793 10U 752287, 5773799 10U 752306, 5773795 10U 752327, 5773837 10U 752328, 5773794 10U 752338, 5773794 10U 752376, 5773779
common cattail Marsh (S3, Blue)	c-066-C/083-D-03	620.7 to 621.1	Identified to be a potential rare community during wetland surveys.	Community occurred approximately 50 m southeast from the centre of the proposed corridor.	Confirmation of rare community still required.	11U 341070, 5769962
montane Dicranum moss (S3, Blue)	b-056-C/083-D-03	622.47	Found on a cut edge of old cedar log in a cedar, birch and hemlock forest.	Specimen was collected approximately 12 m west from the centre of the proposed pipeline corridor.	Identification was confirmed by a Bryologist following the survey. A revisit is required to assess population size and extent.	11U 340659, 5768488
finger ring (S2S3, Blue)	b-056-C/083-D-03	622.61	Found on the rock face of a talus slope.	Specimen was collected approximately 70 m east from the centre of the proposed pipeline corridor.	Identification was confirmed by a Lichenologist following the survey. A revisit is required to assess population size and extent.	11U 340714, 5768327
common cattail Marsh (S3, Blue)	c-066-C/083-D-03	638.9 to 639.0	Identified to be a potential rare community during wetland surveys.	Community occurred approximately 50 m southwest from the centre of the proposed corridor.	Confirmation of rare community still required.	11U 340040, 5754258
common cattail Marsh (S3, Blue)	b-093-C/082-M-14 to d-084-C/082-M-14	649.4 to 649.8	Identified to be a potential rare community during wetland surveys.	Community occurred approximately 30 m west from the centre of the proposed corridor.	Confirmation of rare community still required.	11U 342554, 5744259 11U 342515, 5744202
cut notchwort (S1)	c-056-C/082-M-14	654.00	Found on a decaying decorticated log.	Specimen was collected approximately 29 m east from the centre of the proposed pipeline corridor.	Identification was confirmed by a Bryologist following the survey. A revisit is required to assess population size and extent.	11U 339804, 5741137
montane Dicranum moss (S3, Blue)	c-056-C/082-M-14	654.04	Found on a decaying decorticated log in a skunk cabbage swamp under birch.	Specimen was collected approximately 40 m east from the centre of the proposed pipeline corridor.	Identification was confirmed by a Bryologist following the survey. A revisit is required to assess population size and extent.	11U 339791, 5741102
silvery sedge (SU)	b-056-C/082-M-14	654.31 to 654.32	7 plants were observed in a 4 m x 2 m area within a large treed marsh.	Plants occurred 47-48 m east from the centre of the proposed pipeline corridor.	--	11U 339749, 5740856 11U 339751, 5740853
swamp horsetail - beaked sedge marsh (S3, Blue)	b-088-K/082-M-11	661.1 to 661.8	Identified to be a potential rare community during wetland surveys.	Community occurred approximately 10 m southeast from the centre of the proposed corridor.	Confirmation of rare community still required.	11U 338351, 5734475
western moonwort (S2S3, Blue)	b-079-K/082-M-11	663.14	12 plants were observed in an approximately 10 m x 5 m area on a private access road overgrown with vegetation.	Plants occurred 61-65 m north from the centre of the proposed pipeline corridor.	--	11U 336830, 5733120 11U 336838, 5733120
western moonwort (S2S3, Blue)	d-070-K/082-M-11	663.52	6 plants were observed in a 1 m x 1 m area along a game trail and on the west side of a large shrubby swamp.	Plants occurred 4 m east from the centre of the proposed pipeline corridor.	--	11U 336647, 5732761
western moonwort (S2S3, Blue)	c-060-K/082-M-11 to d-051-L/082-M-11	664.69 to 664.77	31 plants were observed in an approximately 80 m x 13 m area along an existing right-of-way overgrown with vegetation. They occurred in 3 subpopulations. The first at the very north consisted of 14 plants in a 5 m x 3 m area; the second, 44 m southwest of the first, consisted of 16 plants in a 8 m x 5 m area; and the third, 36 m southwest of the second, consisted of a single plant.	Plants occurred between 2 m east to 11 m west from the centre of the proposed pipeline corridor.	--	11U 335820, 5731862 11U 335852, 5731877 11U 335891, 5731898
crested wood fern (S2S3, Blue)	d-042-L/082-M-11	666.02 to 666.11	> 116 plants were observed in an approximately 85 m x 20-50 m area. Plants were found in a shrubby wetland and to a lesser extent in an open fen area.	Plants occurred between the centre of the proposed pipeline corridor to 50 m east from the centre of the proposed pipeline corridor.	--	11U 334892, 5730933 11U 334895, 5730961 11U 334908, 5731017 10U 749443, 5734488 10U 749463, 5734403 10U 749493, 5734472
spoon-shaped moonwort (S1, Red)	a-042-L/082-M-11	666.42	A single plant was observed in a grassy open meadow although more may be present.	Plant occurred 20 m northwest from the centre of the proposed pipeline corridor.	--	11U 334674, 5730702
stalked moonwort (S2, Red)	a-042-L/082-M-11	666.43 to 666.46	> 25 plants were observed in a 40 m x 25 m area in a grassy open meadow.	Plants occurred between 7-45 m northwest from the centre of the proposed pipeline corridor.	--	11U 334672, 5730687 11U 334677, 5730682 11U 334677, 5730688 11U 334677, 5730654
Alaska moonwort (not ranked by BC CDC, S1S3 according to Natureserve)	a-042-L/082-M-11	666.43	A single plant was observed in a grassy open meadow.	Plant occurred 11 m west from the centre of the proposed pipeline corridor.	--	11U 334672, 5730687

Species (Provincial Rank) [Federal Rank][2]	Legal Location	RK[3]	Abundance and Distribution	Relation to Corridor/Project Coponent	Discussion	UTM (Zone Easting, Northing)
fox sedge (S2S3, Blue)	d-024-L/082-M-11	668.95	2 plants were observed in a 30 cm x 30 cm area on the edge of a disturbed right-of-way near a wet area at the base of a slope.	Plant identification was confirmed following survey hence the approximate location is 7 m east from the centre of the proposed pipeline corridor.	A revisit is required to assess population size and extent.	10U 747504, 5732495
silvery sedge (SU)	b-009-L/082-M-11	674.69 to 674.70	10 plants were observed in a 12 m x 20 m area within a treed swamp in the proposed corridor. Only a single plant was also observed by Hwy 5 off the proposed corridor.	All but one plant was observed in the proposed corridor from approximately 28-44 m south from the centre of the proposed pipeline corridor.	--	11U 327948, 5727286 11U 327950, 5727296 11U 327956, 5727282
Peltigera lichen, *Peltigera conspersa* (undescribed)	d-009-I/082-M-12	683.26	Found on bare soil in an open grassy area with a Douglas-fir canopy.	Specimen was collected 29 m south of the centre of the proposed pipeline corridor.	Expert Lichenologist has confirmed mitigation is not required (Goward pers. comm.).	11U 319788, 5727903
hard-stemmed bulrush Deep Marsh (S3, Blue)	c-026-G/082-M-12	695.3	Identified to be a potential rare community during wetland surveys.	Community occurred approximately 80 m northwest from the centre of the proposed corridor.	Confirmation of rare community still required.	11U 313164, 5720728
common cattail Marsh (S3, Blue)	b-026-G/082-M-12	695.67	Identified to be a potential rare community based on TEM plot data. Extent still to be determined.	Community occurred approximately 28 m southeast from the centre of the proposed corridor.	Revisit required from expert BC Ecologist to confirm rare community.	11U 313011, 5720380
common cattail Marsh (S3, Blue)	b-020-F/082-M-12	708.7	Identified to be a potential rare community during wetland surveys.	Community occurred approximately 10 m northeast from the centre of the proposed corridor.	Confirmation of rare community still required.	11U 300979, 5719745
Bebb's willow/bluejoint reedgrass (S3, Blue)	a-057-E/082-M-12	715.5 to 715.8	Identified to be a potential rare community during wetland surveys.	Community occurred approximately 70 m southwest from the centre of the proposed corridor.	Confirmation of rare community still required.	11U 295646, 5723651
common cattail Marsh (S3, Blue)	c-038-H/092-P-09	728.75 to 728.77	Community is approximately 15 m wide and greater than 57 m in length.	Community occurred from 47 m to greater than 100 m west from the centre of the proposed pipeline corridor.	Revisit is required to test soil and confirm rare community.	10U 700741, 5722389 10U 700741, 5722380 10U 700744, 5722395 10U 700786, 5722362 10U 700794, 5722367
tender sedge (S2S3, Blue)	d-010-H/092-P-09 to b-010-H/092-P-09	732.25 to 732.55	> 625 plants were observed distributed over an approximately 320 m x 190 m area. The east half of the proposed corridor consisted of small patches of plants at numerous wet depressions within a hayfield as well as towards the south, larger patches (totalling > 200 plants) within a large wetland complex containing a beaver dam. The west half of the proposed corridor contained approximately 300 plants at a draw 110 m x 20 m in area extending northwest from the centre of the proposed corridor as well as additional small patches further north.	Plants occurred between 64-118 m east to121 m west from the centre of the proposed pipeline corridor.	--	10U 699394, 5719073 10U 699408, 5718933 10U 699436, 5718839 10U 699436, 5719121 10U 699468, 5719149 10U 699484, 5718878 10U 699525, 5719161 10U 699383, 5718882 10U 699402, 5718964 10U 699476, 5718926 10U 699519, 5718987 10U 699533, 5719063 10U 699537, 5719053 10U 699544, 5719042 10U 699563, 5719022 10U 699577, 5719067 10U 699578, 5719019 10U 699583, 5719037 10U 699585, 5719054
tender sedge (S2S3, Blue)	a-081-B/092-P-09 to b-081-B/092-P-09	734.65 to 734.81	Plants are found in 3 subpopulations within an approximately 180 m x 150 m wetland network within a tame pasture. The first subpopulation consists of approximately 85 plants in an 83 m x 44 m area. The second consists of approximately 20 plants in a 40 m x 10 m area and the third consisted of approximately 40 plants in a 40 m x 10 m area.	The first subpopulation occurred approximately 71-125 m southeast from the centre of the proposed pipeline corridor. The second occurred 17-20 m northwest from the centre of the proposed pipeline corridor and the third occurred 80-90 m southeast from the centre of the proposed pipeline corridor.	--	10U 698706, 5716960 10U 698718, 5716975 10U 698727, 5716845 10U 698741, 5716977 10U 698761, 5716866 10U 698848, 5716893 10U 698865, 5716971 10U 698873, 5716941 10U 698906, 5716953
Bebb's willow/bluejoint reedgrass (S3, Blue)	c-073-B/092-P-09	737.0 to 737.1	Identified to be a potential rare community during wetland surveys.	Community occurred approximately 80 m north from the centre of the proposed corridor.	Confirmation of rare community still required.	10U 696554, 5716588
least moonwort (S2S3, Blue)	d-075-B/092-P-09	738.06	A single plant was observed near the south edge of an existing right-of-way.	Plant occurred at the centre of the proposed pipeline corridor.	--	10U 695528, 5716397
whip fork moss (S3, Blue)	a-076-B/092-P-09	739.19	Found on a rotting log in a small clearing.	Specimen was collected 30 m southeast of the centre of the proposed pipeline corridor.	Identification confirmed by a Bryologist following surveys. A revisit is required to assess population size and extent.	10U 694572, 5715922
tender sedge (S2S3, Blue)	c-057-B/092-P-09	741.15	Population abundance was not recorded since the plant was identified following the survey. Plant was found in a moist depression on an existing road. Location appeared to be a seepage area from an uphill slope heading southeast towards the end of Lemieux Lake.	Plant occurred at the centre of the proposed pipeline corridor.	A revisit is required to assess population size and extent.	10U 693381, 5714461

Species (Provincial Rank) [Federal Rank][2]	Legal Location	RK[3]	Abundance and Distribution	Relation to Corridor/Project Coponent	Discussion	UTM (Zone Easting, Northing)
white wintergreen (S2S3, Blue)	d-078-J/092-P-08	749.16	45 plants were observed in a 10 m x 5 m area just inside the edge of a forest.	Plants occurred approximately 68-74 m east from the centre of the proposed pipeline corridor.	--	10U 693126, 5706824 10U 693128, 5706825 10U 693138, 5706822
Peltigera lichen, *Peltigera conspersa* (undescribed)	d-078-J/092-P-08	749.16	Found on a fire damaged decaying stump.	Specimen was collected 77 m southeast of the centre of the proposed pipeline corridor.	Expert Lichenologist has confirmed mitigation is not required (Goward pers. comm.).	10U 693133, 5706822
western redcedar - paper birch/oak fern (S2S3, Blue)	b-078-J/092-P-08	749.71 to 749.81	Community extended approximately 80 m x 30 m adjacent to an existing right-of-way.	Community occurred between 20-60 m east from the centre of the proposed pipeline corridor.	Revisit is required to test soil and confirm rare community.	10U 692839, 5706386 10U 692862, 5706300 10U 692863, 5706375
Mexican mosquito fern (S2, Red) [Threatened/Threatened]	c-068-J/092-P-08	749.95	Plant was suspected to have been observed at a large pond at this location.	Pond occurred between 35-70 m east from the centre of the proposed pipeline corridor.	A revisit is required to confirm species presence and document population size and extent.	10U 692862, 5706156
whip fork moss (S3, Blue)	d-046-G/092-P-08	762.13	Found on a boulder at the toe of a birch and hawthorne slope.	Specimen was collected 140 m east of the centre of the proposed pipeline corridor.	Identification confirmed by a Bryologist following surveys. A revisit is required to assess population size and extent.	10U 695386, 5694898
riverbank anemone (S3, Blue)	d-085-B/092-P-08 to a-085-B/092-P-08	768.12 to 768.19	38 plants were observed in an approximately 70 m x 13 m area adjacent to a forested riparian area and extending further into a forested area along the edge of an open trail.	Plants occurred between approximately 1 m west to 10 m east from the centre of the proposed pipeline corridor.	--	10U 696595, 5689240 10U 696598, 5689242 10U 696602, 5689311 10U 696608, 5689247
riverbank anemone (S3, Blue)	c-060-J/092-I-16	Approximately 62 m west from the bank of the North Thompson River and 30-40 m south of the proposed Black Pines power line.	42 plants were observed in a 15 m x 7 m area on a ridged embankment of the North Thompson River.	Plants occurred approximately 30-40 m south of the proposed power linefor the Black Pines Pump Station.	--	10U 693431, 5649464 10U 693436, 5649463 10U 693435, 5649456 10U 693436, 5649456 10U 693441, 5649454 10U 693430, 5649462 10U 693433, 5649465
Douglas-fir/common snowberry - saskatoon (S2, Red)	a-041-K/092-I-16	812.13	Identified to be a potential rare community based on TEM plot data. Extent still to be determined	Community occurred approximately 68 m west from the centre of the proposed corridor.	Revisit required from expert BC Ecologist to confirm rare community.	10U 692850, 5648270
many-headed sedge (S3, Blue)	a-021-K/092-I-16	814.26	6 plants were observed in a 4 m x 2 m area on a well used path through an overflow area between upland slope and North Thompson River floodplain.	Pond occurred between 49 m south from the centre of the proposed pipeline corridor.	--	10U 692845, 5646156 10U 692840, 5646158
big sagebrush/bluebunch wheatgrass (S2, Red)	d-071-L/092-I-09	840.78	Identified to be a potential rare community based on TEM plot data. Extent still to be determined.	Community occurred approximately 51 m southeast from the centre of the proposed corridor.	Revisit required from expert BC Ecologist to confirm rare community.	10U 684789, 5623012
narrow-leaf willow Shrubland (S2, Red)	d-035-L/092-I-09 to a-035-L/092-I-09	846.92 to 846.94	One of three similar communities on the south shore of the Thompson River. This community is in the river, which was not flooded at time of survey, and is 150 m long by 10-50 m wide.	Community occurred between 30-195 m east from the centre of the proposed pipeline corridor.	Revisit is required to test soil and confirm rare community.	10U 681774, 5619134 10U 681680, 5619151 10U 681818, 5619190 10U 681768, 5619166 10U 681841, 5619138 10U 681675, 5619139
narrow-leaf willow Shrubland (S2, Red)	a-035-L/092-I-09 to b-034-L/092-I-09	847.11 to 847.17	Second of three similar communities on the south shore of the Thompson River. It consists of a series of patches along the shoreline that extend over approximately 342 m.	Community occurred between 201 m east to 149 m west from the centre of the proposed pipeline corridor.	Revisit is required to test soil and confirm rare community.	10U 681890, 5618948 10U 681890, 5618940 10U 681833, 5618942 10U 681800, 5618928 10U 681789, 5618933 10U 681748, 5618934 10U 681548, 5618917
narrow-leaf willow Shrubland (S2, Red)	a-035-L/092-I-09	847.26 to 847.27	Third of three similar communities on the south shore of the Thompson River. Consists of a single small patch that was 14 m long.	Community occurred between 13-27 m west from the centre of the proposed pipeline corridor.	Revisit is required to test soil and confirm rare community.	10U 681705, 5618801 10U 681720, 5618799
common cattail Marsh (S3, Blue)	c-092-D/092-I-09	862.4 to 862.5	Identified to be a potential rare community during wetland surveys.	Community occurred approximately 40 m east from the centre of the proposed corridor.	Confirmation of rare community still required.	10U 684157, 5606563
spotted beard (S3, Blue)	d-062-D/092-I-09	865.17	Found on a fallen Douglas-fir.	Specimen was collected approximately 13 m east from the centre of the proposed pipeline corridor.	Expert Lichenologist has confirmed mitigation is not required (Goward pers. comm.).	10U 684923, 5603881
birdnest vinyl (S2?, Red)	c-040-C/092-I-09	868.58	Found on talus slope on wood and often over mosses.	Specimen was collected approximately 15 m west from the centre of the proposed pipeline corridor.	Identification confirmed by a Lichenologist following surveys. A revisit is required to assess population size and extent.	10U 686323, 5600760
Peltigera lichen, *Peltigera conspersa* (undescribed)	c-040-C/092-I-09	868.58	On talus slope on wood and often over mosses.	Specimen was collected approximately 15 m west from the centre of the proposed pipeline corridor.	Identification confirmed by a Lichenologist following surveys. A revisit is required to assess population size and extent.	10U 686323, 5600760
Peltigera lichen, *Peltigera sp. nov blue* (undescribed)	c-040-C/092-I-09	868.58	On talus slope on wood and often over mosses.	Specimen was collected approximately 15 m west from the centre of the proposed pipeline corridor.	Identification confirmed by a Lichenologist following surveys. A revisit is required to assess population size and extent.	10U 686323, 5600760

Species (Provincial Rank) [Federal Rank][2]	Legal Location	RK[3]	Abundance and Distribution	Relation to Corridor/Project Coponent	Discussion	UTM (Zone Easting, Northing)
big sagebrush/bluebunch wheatgrass (S2, Red)	d-050-G/092-I-02 to a-050-G/092-I-02	927.29 to 927.54	Community was observed in a 263 m x 250 area.	Community occurred between 117-163 m west to 96-116 m east from the centre of the proposed pipeline corridor.	Revisit is required to test soil and confirm rare community.	10U 661475, 5554652 10U 661517, 5554644 10U 661524, 5554569 10U 661606, 5554703 10U 661628, 5554455 10U 661642, 5554691 10U 661660, 5554693 10U 661729, 5554577 10U 661737, 5554676 10U 661742, 5554449
Syntrichia moss (S3?, Blue)	b-030-G/092-I-02	929.63	Found within tame pasture.	Specimen was collected 15 m east of the centre of the proposed pipeline corridor.	Expert Bryologist has confirmed mitigation is not required (McIntosh pers. comm.).	11U 660861, 5552582
Douglas-fir/common snowberry - saskatoon (S2, Red)	c-065-C/092-I-02	936.60	Identified to be a potential rare community based on TEM plot data. Extent still to be determined.	Specimen was collected 39 m northwest of the centre of the proposed pipeline corridor.	Revisit required from expert BC Ecologist to confirm rare community.	10U 656792, 5547169
Douglas-fir - PP/snowbrush (S3, Blue)	c-054-L/092-H-15	952.03	Identified to be a potential rare community based on TEM plot data. Extent still to be determined.	Community occurred approximately 75 m northeast from the centre of the proposed corridor.	Revisit required from expert BC Ecologist to confirm rare community.	10U 648986, 5536623
Douglas-fir - PP/pinegrass (S3, Blue)	c-014-E/092-H-15	966.50	Identified to be a potential rare community based on TEM plot data. Extent still to be determined.	Community occurred approximately 70 m east from the centre of the proposed corridor.	Revisit required from expert BC Ecologist to confirm rare community.	10U 649116, 5523633
Douglas-fir - PP/pinegrass (S3, Blue)	c-085-D/092-H-15	969.47 to 969.48	Identified to be a potential rare community based on TEM plot data. Extent still to be determined.	Community occurred approximately 61 m east from the centre of the proposed corridor.	Revisit required from expert BC Ecologist to confirm rare community.	10U 648588, 5520778
hybrid spruce species - Douglas-fir/subalpine fir (Unique community)	b-020-D/092-H-15	978.12	A unique community was observed over a 150 m x 60 m area. Botanist (T. Brumandl) noted that in his 35 years as a BEC Ecologist he had never seen such an outstanding example of an old forest with such large trees (approximately 80 cm dibh and > 35 m tall) in this ecosystem type [MSdm2 05(01)].	Community occurred from the centre to 40 m east of the centre of the proposed pipeline corridor.	--	10U 644237, 5513758
Alaska moonwort (not ranked by BC CDC, S1S3 according to Natureserve)	d-002-I/092-H-11 to a-002-I/092-H-11	988.48 to 988.56	Plant was found with other Botrychia and identification was confirmed following field surveys.	Plant occurred between approximately 13 m east to 8 m west from the centre of the proposed pipeline corridor	Revisit is required to assess population size and extent.	10U 643172, 5503877 10U 643179, 5503887 10U 643168, 5503927 10U 643183, 5503957
amabilis fir - western redcedar/devil's club Moist Submaritime (S3, Blue)	b-094-B/092-H-11	1007.91	Community was observed in a 60 m x 50 m area and consisted of a small patch of old growth CwHms1 06 at the base of a slope (Refer to Appendix C for description of site series).	Community occurred 14 m east from the centre of the proposed pipeline corridor.	Revisit is required to test soil and confirm rare community.	10U 631872, 5493165
slender spike rush (S1, Red)	b-094-B/092-H-11	1008.05	One patch was observed at a seepage site on an old logging road, however, more may exist along the logging road which crosses the proposed pipeline corridor.	Plants occurred 91 m east from the centre of the proposed pipeline corridor	Plant identity was confirmed following the surveys. Although plant was found just outside of the proposed pipeline corridor a revisit is required to assess if population extends into corridor and if so determine the population size.	10U 631880, 5493003
amabilis fir - western redcedar/devil's club Moist Submaritime (S3, Blue)	a-047-B/092-H-11	1013.19	Community was observed in a 50 m x 40 m area and consisted of juvenile plants.	Community occurred 7 m west from the centre of the proposed pipeline corridor.	Revisit is required to test soil and confirm rare community.	10U 629909, 5488461
Usnea lichen (undescribed)	c-027-B/092-H-11	1014.42	Found on Hemlock and Douglas-fir branches in forest understory.	Specimen was collected at 48 m east from the centre of proposed pipeline corridor.	Identification confirmed by a Lichenologist following the surveys. A revisit is required to assess population size and extent.	10U 629708, 5487267
mountain candlewax (S2S3, Blue)	c-080-J/092-H-06	1021.92	Found on a dead interior Douglas-fir branch.	Specimen was collected at 2 m southwest from the centre of proposed pipeline corridor.	Expert Lichenologist has confirmed mitigation is not required (Goward pers. comm.).	10U 626919, 5482554
brown-eyed wolf (S3?, Blue)	c-080-J/092-H-06	1021.92	Found on a dead interior Douglas-fir branch.	Specimen was collected approximately 12 m southwest from the centre of proposed pipeline corridor.	Expert Lichenologist has confirmed mitigation is not required (Goward pers. comm.).	10U 626919, 5482554
Racomitrium moss (S2S3, Blue)	c-024-K/092-H-06	1028.71	Found on a west facing slope, on the underside of a large old birch hole.	Specimen was collected approximately 40 m southeast from the centre of proposed pipeline corridor.	Identification confirmed by a Bryologist following the surveys. A revisit is required to assess population size and extent.	10U 623495, 5477592
campion species	d-058-F/092-H-06	1036.73 to 1036.75	5 plants were observed in a 1 m x 30 m area on the north edge of an existing right-of-way on a dry south facing rocky slope.	Plants occurred 2-14 m from the centre of the proposed pipeline corridor.	Species confirmation still required.	10U 620542, 5471220 10U 620558, 5471246
western redcedar - Douglas-fir/vine maple (S2S3, Blue)	c-044-E/092-H-06	1043.43	Identified to be a potential rare community based on TEM plot data. Extent still to be determined.	Community occurred approximately 42 m southeast from the centre of the proposed corridor.	Revisit required from expert BC Ecologist to confirm rare community.	10U 614472, 5470314
western redcedar - Douglas-fir/vine maple (S2S3, Blue)	d-075-J/092-H-04	1072.72	Identified to be a potential rare community based on TEM plot data. Extent still to be determined.	Community occurred approximately 36 m east from the centre of the proposed corridor.	Revisit required from expert BC Ecologist to confirm rare community.	10U 595990, 5453791
common cattail Marsh (S3, Blue)	a-021-K/092-H-04	1080.25 to 1080.28	Community was observed in a 35 m length.	Community occurred between 4 m west to 14 m east from the centre of the proposed pipeline corridor.	Revisit is required to test soil and confirm rare community. Community extent will be determined with community confirmation.	10U 590690, 5448903 10U 590709, 5448877
western redcedar/sword fern Very Dry Maritime (S2S3 , Blue)	b-085-B/092-G-01	1115.50	Identified to be a potential rare community based on TEM plot data. Extent still to be determined.	Community occurred approximately 35 m north from the centre of the proposed corridor.	Revisit required from expert BC Ecologist to confirm rare community.	10U 559699, 5435360
common cattail Marsh (S3, Blue)	c-086-B/092-G-01	1116.58 to 1116.61	Community was observed in a15 m x 30 m area.	Community occurred between the centre and 15 m northeast from the centre of the proposed pipeline corridor.	Revisit is required to test soil and confirm rare community.	10U 558741, 5435822 10U 558754, 5435829 10U 558743, 5435828 10U 558766, 5435808

Species (Provincial Rank) [Federal Rank][2]	Legal Location	RK[3]	Abundance and Distribution	Relation to Corridor/Project Coponent	Discussion	UTM (Zone Easting, Northing)
Pacific waterleaf (S2, Red)	d-087-B/092-G-01	1117.09 to 1117.15	17 plants were observed in a 20 m x 3 m area growing under the shade of a mature bigleaf maple forest.	Plants occurred between the centre to 3 m northeast of the centre of the proposed pipeline corridor.	--	10U 558326, 5436047 10U 558288, 5436054 10U 558276, 5436059 10U 558269, 5436061
Pacific waterleaf (S2, Red)	a-097-B/092-G-01 to a-098-B/092-G-01	1117.44 to 1118.42	> 12,000 plants were observed in three subpopulations in an approximately 970 m x 100 m area. On the south half of the proposed corridor were two subpopulations, the first consisting of 10,000 plants in a 500 m x 50 m area and the second consisting of a 1000 plants in a 50 m x 50 m area. The third subpopulation consisted of 1000 plants in a 500 m x 50 m area on the north half of the proposed pipeline corridor.	Subpopulations in the south half of the corridor occurred between 38-72 m southfrom the centre of the proposed pipeline corridor. The subpopulation in the north half of the corridor occurred between 8-30 m north from the centre of the proposed pipeline corridor.	--	10U 557011, 5436258 10U 557038, 5436160 10U 557570, 5436162 10U 557647, 5436131 10U 557985, 5436130
Pacific waterleaf (S2, Red)	c-089-B/092-G-01 to d-090-B/092-G-01	1119.79 to 1120.12	>12,000 plants were observed in a 310 m x 130 m area with. The majority were found on the north half of the proposed pipeline corridor. On the south side there were only a few scattered patches.	Plants occurred from 19 m south to 92 m north of the centre of the proposed pipeline corridor.	--	10U 555529, 5435933 10U 555549, 5435948 10U 555600, 5436050 10U 555652, 5435983 10U 555669, 5436016 10U 555830, 5435836
western redcedar/sword fern Very Dry Maritime (S2S3 , Blue)	c-029-F/092-G-01	1129.63	Identified to be a potential rare community based on TEM plot data. Extent still to be determined.	Community occurred approximately 37 m north from the centre of the proposed corridor.	Revisit required from expert BC Ecologist to confirm rare community.	10U 546694, 5439331
black cottonwood –red alder/salmonberry (S3, Blue)	a-073-H/092-G-02	1142.54 to 1142.76	Community was observed along a 200 m length of the proposed corridor and was approximately 75 m wide.	Community occurred between 15-25 m south to 90 m south from the centre of the proposed corridor.	Revisit is required to test soil and confirm rare community.	10U 534491, 5443350 10U 534278, 5443409
western redcedar – Sitka spruce/skunk cabbage (S3?, Blue)	b-073-H/092-G-02	1142.99 to approximately 1143.03	Community was observed along an elevated streambed. To the south of the centre of the proposed corridor, approximately 45 m x 60 m is found on the proposed corridor and 150 m x 60 m is found off the proposed corridor and extends further south.	Community occurred through the full southern half of the proposed corridor.	Revisit is required to test soil and confirm rare community.	10U 534060, 5443497 10U 534010, 5443462
black cottonwood –red alder/salmonberry (S3, Blue)	d-076-H/092-G-02	1145.62 to approximately 1145.64	Community was observed along the floodplain of a large creek. To the south of the centre of the proposed corridor, 80 m x 50 m occurred within the corridor while another 80 m x 50 m occurred outside off the proposed corridor. The community may extend north of the centre of the proposed corridor.	Community occurred from the centre to approximately 30-40 m south of the centre of the proposed corridor.	Revisit is required to test soil and confirm rare community. Community extent will be determined when confirming community.	10U 531459, 5443982 10U 531466, 5443991 10U 531486, 5444027
hard-stemmed bulrush Deep Marsh (S3, Blue)	b-098-H/092-G-02	1148.7 to 1148.8	Identified to be a potential rare community during wetland surveys.	Community occurred approximately 37 m north from the centre of the proposed corridor.	Confirmation of rare community still required.	10U 529216, 5445296

Souces: ACIMS 2013a,b,c, BC MOE 2013 COSEWIC 2013a, Government of Canada 2013, NatureServe 2012a

Notes:

1. Provincial (S) ranks are assigned by the provincial and federal CDC(s); in cases of conflict or missing data, the provincial CDC will have preference. Ranks range from 1 (five or fewer occurrences) to 5 (demonstrably secure under present conditions); all definitions below are adapted from NatureServe (2012b).
   - S1 = Critically Imperilled: because of extreme rarity or because of some factor(s) making it especially vulnerable to extirpation. Typically five or fewer occurrences or very few remaining individuals (< 1,000).
   - S2 = Imperilled: because of rarity or because of some factor(s) making it very vulnerable to extirpation. Typically 6-20 occurrences or few remaining individuals (1,000-3,000).
   - S3 = Vulnerable: because rare and uncommon, or found in a restricted range (even if abundant at some locations), or because of other factors making it vulnerable to extirpation. Typically 21-100 occurrences or between 3,000 and 10,000 individuals.
   - S#S# = Range Rank: a numeric range rank (*e.g.*, S2S3) is used to indicate the range of uncertainty about the exact status of the element.
   - SU = Unrankable: currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
   - S#? = Inexact numeric rank: denotes inexact numeric rank.
   - SNR = Conservation status not yet assessed.
   - W = Watch List: elements that are not currently considered as high conservation concern, but there is some information to suggest that they may become rare should there be significant alteration to the element's habitats or population. Data for watch listed elements are collected by ACIMS (ACIMS 2013c).

   BC Provincial List (BC CDC 2012a).

   Red List: includes species that have been legally designated as Endangered or Threatened under the BC *Wildlife Act*, are extirpated, or are candidates for such designation.

   Blue List: includes species not immediately threatened, but of concern because of characteristics that make them particularly sensitive to human activities or natural events.
2. The Federal Rank is described providing the COSEWIC designation first followed by the *SARA* designation.

   The COSEWIC 2013a ranking definition is as follows:

   Threatened: a species likely to become Endangered if limiting factors are not reversed.

   SARA. The *SARA* establishes Schedule 1 as the list of species to be protected on all federal lands in Canada.

   Threatened: a species that is likely to become an Endangered species if nothing is done to reverse the factors leading to its extirpation or extinction.
3. All RKs are approximate.