



- Kilometre Post (KP)
- Proposed Kettle River Lateral Loop Christina River Section

- Proposed Right-of-way
- Proposed Temporary Workspace
- Proposed Log Deck

**Rare Vegetation**

- ▲ Point
- Extent

**FIGURE 3.3-3A**

**OCCURRENCES OF  
RARE VEGETATION OBSERVED**  
**VEGETATION TECHNICAL REPORT FOR THE  
PROPOSED NOVA GAS TRANSMISSION LTD.  
2017 NGTL SYSTEM EXPANSION  
(KETTLE RIVER LATERAL LOOP CHRISTINA RIVER SECTION)**



UTM Zone: 12N  
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KP Proposed Pipeline Routing/Footprint: NGTL 2014a;  
Rare Vegetation: TERA, a CH2M HILL Company 2014c; Hydrology: NRCAN 2007-2011; Grid: Altalis 2009a.

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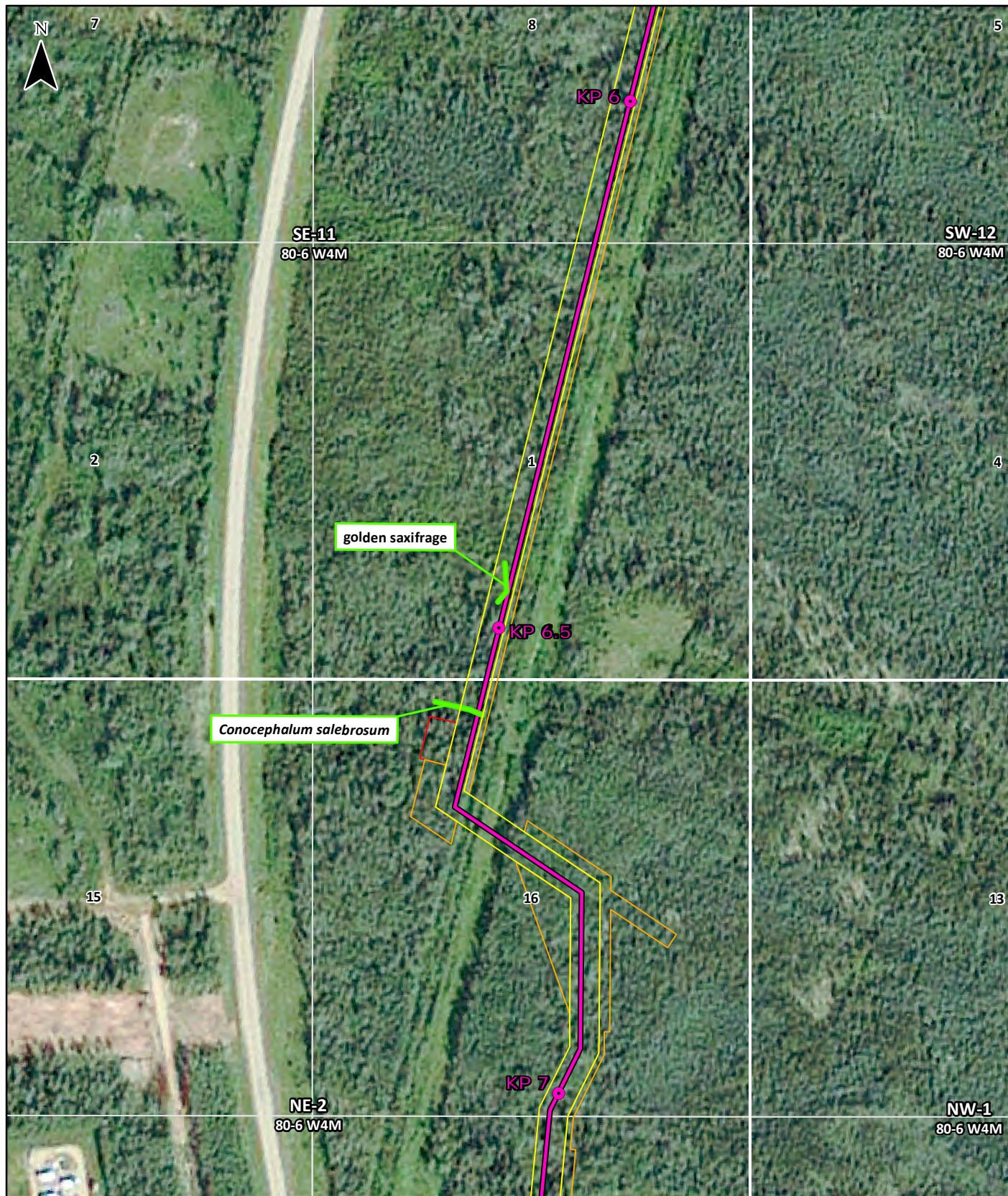
March 2015

650028

Mapped By: DR

Checked By: JB





- Kilometre Post (KP)
- Proposed Kettle River Lateral Loop Christina River Section

- Proposed Right-of-way
- Proposed Temporary Workspace
- Proposed Log Deck

- Rare Vegetation**
- ▲ Point
  - Extent

**FIGURE 3.3-3B**  
**OCCURRENCES OF**  
**RARE VEGETATION OBSERVED**  
**VEGETATION TECHNICAL REPORT FOR THE**  
**PROPOSED NOVA GAS TRANSMISSION LTD.**  
**2017 NGTL SYSTEM EXPANSION**  
**(KETTLE RIVER LATERAL LOOP CHRISTINA RIVER SECTION)**



UTM Zone 12N  
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 Rare Vegetation: TERA, a CH2M HILL Company 2014c; Hydrology: NRCAN 2007-2011; Grid: Altalis 2009a.

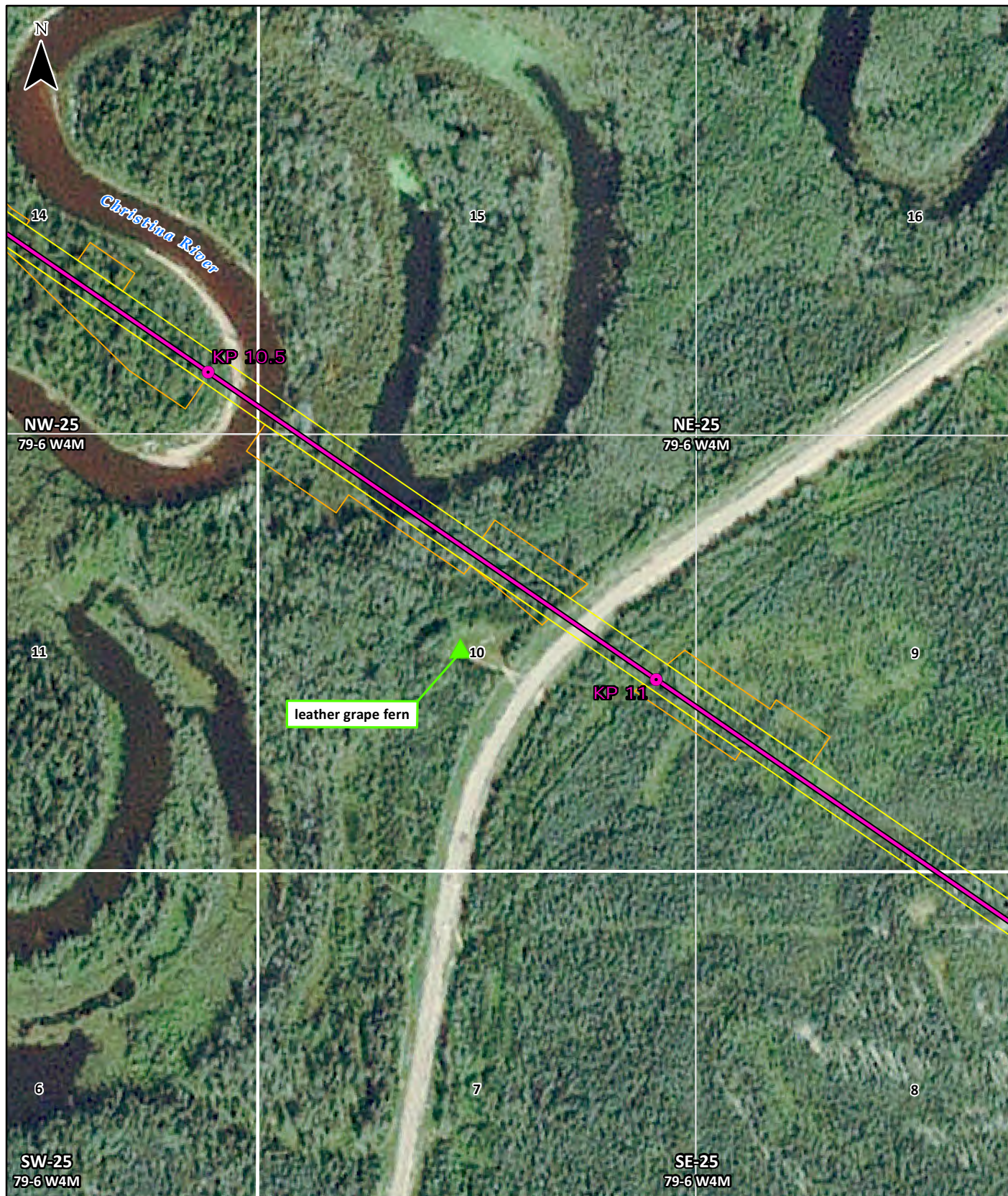
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 (All Locations Approximate)

March 2015	650028
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**FIGURE 3.3-3C**  
**OCCURRENCES OF**  
**RARE VEGETATION OBSERVED**  
**VEGETATION TECHNICAL REPORT FOR THE**  
**PROPOSED NOVA GAS TRANSMISSION LTD.**  
**2017 NGTL SYSTEM EXPANSION**  
**(KETTLE RIVER LATERAL LOOP CHRISTINA RIVER SECTION)**

● Kilometre Post (KP)  
 Proposed Kettle River Lateral Loop Christina River Section

Proposed Right-of-way  
 Proposed Temporary Workspace  
 Proposed Log Deck

**Rare Vegetation**  
 Point  
 Extent



UTM Zone: 12N  
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 KP, Proposed Pipeline Routing/Footprint: NGTL 2014a;  
 Rare Vegetation: TERA, a CH2M HILL Company 2014c; Hydrology: NRCAN 2007-2011; Grid: Altalis 2009a.  
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SCALE: 1:5,000  
  
 (All Locations Approximate)

March 2015	650028
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### 3.4 Non-Native and Invasive Species

#### 3.4.1 Results of the Literature/Desktop Review

The Project crosses Clear Hills County, Saddle Hills County, Northern Sunrise County, MD of Opportunity No. 17 and the RM of Wood Buffalo. A summary of counties, MDs and RMs encountered by the Project is provided in Table 3.4-1.

TABLE 3.4-1

**SUMMARY OF COUNTIES, MUNICIPAL DISTRICTS  
AND REGIONAL MUNICIPALITIES ENCOUNTERED BY THE PROJECT**

Project Component	Clear Hills County	Saddle Hills County	Municipal District of Opportunity	Regional Municipality of Wood Buffalo	Northern Sunrise County
Boundary Lake Section	X				
Bear Canyon Section		X			
Pelican Lake Section			X	X	
Christina River Section				X	
Alces River Unit Addition	X				
Otter Lake Unit Addition					X

Weeds of concern in Clear Hills County include those listed in the Alberta *Weed Control Act* (Zylstra pers. comm.). Weeds of concern in Saddle Hills County include scentless chamomile, common toadflax, Canada thistle (creeping thistle), hawkweed species and common tansy (Armagost pers. comm.). Weeds of concern in the RM of Wood Buffalo include those listed in the Alberta *Weed Control Act* and a RM representative noted that it is important that all equipment is cleaned before it moves to prevent seed spread (Stone pers. comm.).

As of March 2015, no response has been received from the MD of Opportunity No. 17 and Northern Sunrise County regarding weeds of concern within their districts.

#### 3.4.2 Results of the Field Data Collection

No Prohibited Noxious weeds were observed along the Project route. Three Noxious weeds (Canada thistle [creeping thistle], perennial sow-thistle and scentless chamomile) were observed along the Project route. The following non-listed, non-native species also occur along the Project: absinthe wormwood; alfalfa; alsike clover; annual hawks-beard; awnless brome; bird's-foot trefoil; cicer milk vetch; clover species; common dandelion; common plantain; hemp-nettle; lamb's-quarters; low cudweed; orchard grass; pineappleweed; red clover; sainfoin; summer cypress; Timothy; water foxtail; white sweet-clover; wild buckwheat; and yellow sweet-clover.

Weedy species were observed primarily on the existing rights-of-way adjacent to the proposed pipeline routes and disturbed areas adjacent to proposed compressor stations. Vegetation surveys prioritized rare plant habitat. The survey intensity for existing rights-of-way was low, therefore, it is likely there are more weed infestations along the Project than observed during vegetation surveys. The abundance of weedy species along the Project route varies from low to moderate. Densities correspond to the density distribution guide provided in the AESRD Rangeland Health Assessment Guide (Adams *et al.* 2009) and are as follows:

- low (1 to 4);
- moderate (5 to 9); and
- high (10 to 13).

A list of all weed species observed during the vegetation survey for each proposed pipeline route and compressor station is provided in Appendices D to I. Where Alberta *Weed Control Act* nomenclature differs

from the ACIMS list of all elements (AESRD 2014d), the ACIMS name for the species has been provided in brackets following the *Weed Control Act* name. Weed location and abundance data are presented in Appendix J. The density classes presented in Appendix K follow the density distribution guide provided in the AESRD Rangeland Health Assessment Guide (Adams *et al.* 2009).

### Boundary Section

Canada thistle (creeping thistle) and perennial sow-thistle density was low during the vegetation survey. A few individual Canada thistle (creeping thistle) plants were observed in a mixedwood forest located in the SE 6-87-13 W6M. Only one patch of perennial sow-thistle was observed in the SE 12-18-13 W6M growing in a drainage (Figure 3.4-1).

### Bear Canyon Section

Canada thistle (creeping thistle) density was low during the vegetation survey. Several patches were observed in NW 23-79-10 W6M, SE 8-80-10 W6M and SW 19-80-10 W6M mostly growing on an existing pipeline right-of-way in a variety of vegetation communities (Figure 3.4-2). More patches are likely to occur along the existing pipeline right-of-way due to previous disturbance.

### Pelican Lake Section

Perennial sow-thistle density was low during the vegetation survey. A few perennial sow-thistle individuals were observed growing in a regenerating deciduous forest located in SE 30-85-18 W4M (Figure 3.4-3).

### Christina River Section

Perennial sow-thistle density was low during the vegetation survey. One patch was observed on the existing right-of-way located in NW 26-80-6 W4M. A few individuals were observed in a cutblock located in SE 23-80-6 W4M (Figure 3.4-4).

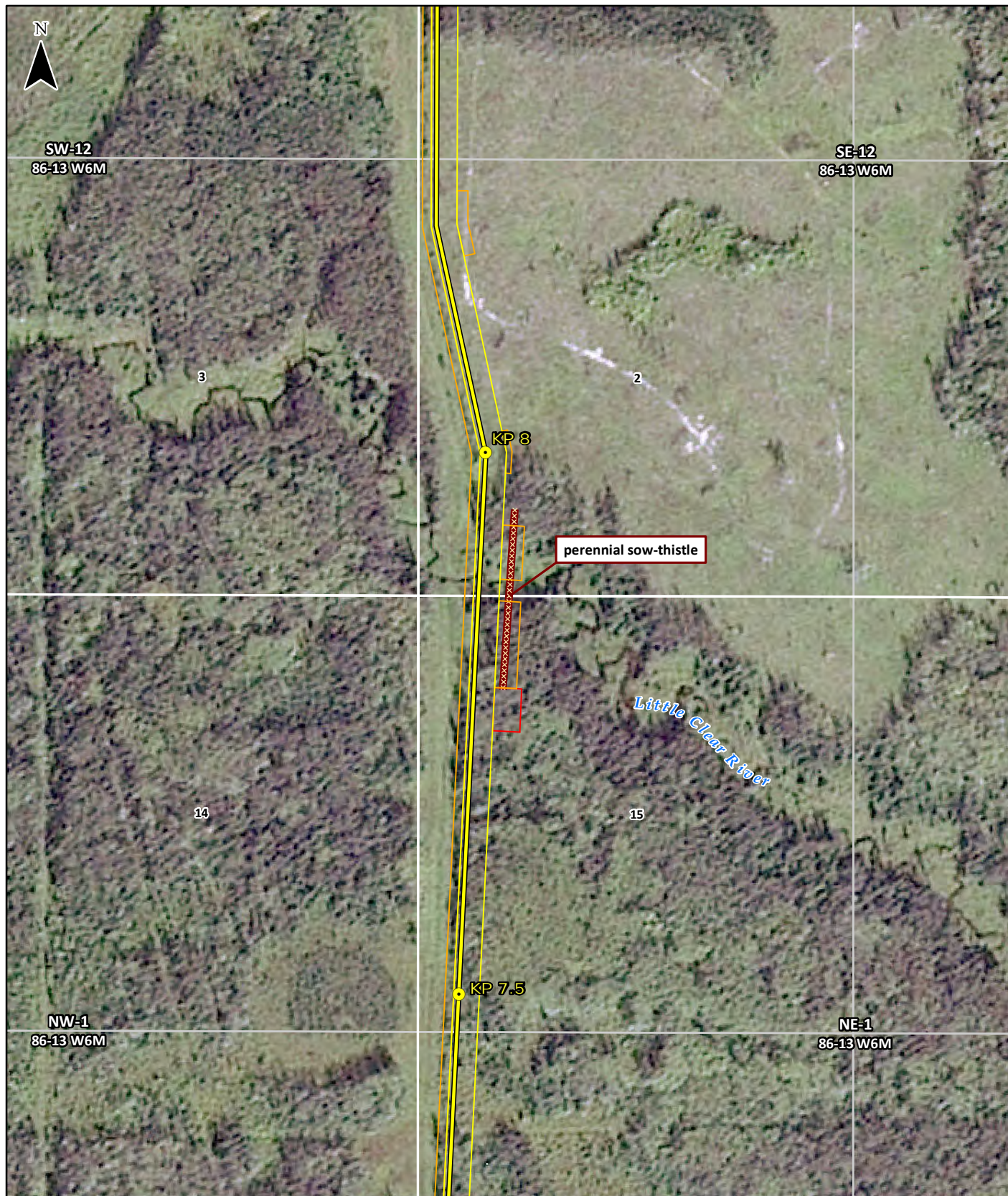
### Alces River Unit Addition

Canada thistle (creeping thistle) and perennial sow-thistle density was low during the vegetation survey (Appendix C, Plate 12). Several individual Canada thistle (creeping thistle) plants were observed in a disturbed area located in the W1/2 13-85-13 W6M (Appendix C, Plate 13). A few individual perennial sow-thistle plants were observed in a disturbed area located in W1/2 13-85-13 W6M (Figure 3.4-5).

### Otter Lake Unit Addition

Scentless chamomile density was low during the vegetation survey. A single individual was observed in a disturbed area located in N1/2 8-91-16 W5M (Appendix C, Plate 14) (Figure 3.4-6).





- Kilometre Post (KP)
- Proposed Northwest Mainline Loop Boundary Lake Section
- Noxious Weed
- Proposed Right-of-way
- Proposed Temporary Workspace
- Proposed Log Deck

**FIGURE 3.4-1A**  
**OCCURRENCES OF**  
**NON-NATIVE AND INVASIVE SPECIES OBSERVED**  
**VEGETATION TECHNICAL REPORT FOR THE**  
**PROPOSED NOVA GAS TRANSMISSION LTD.**  
**2017 NGTL SYSTEM EXPANSION**  
**(NORTHWEST MAINLINE LOOP BOUNDARY LAKE SECTION)**



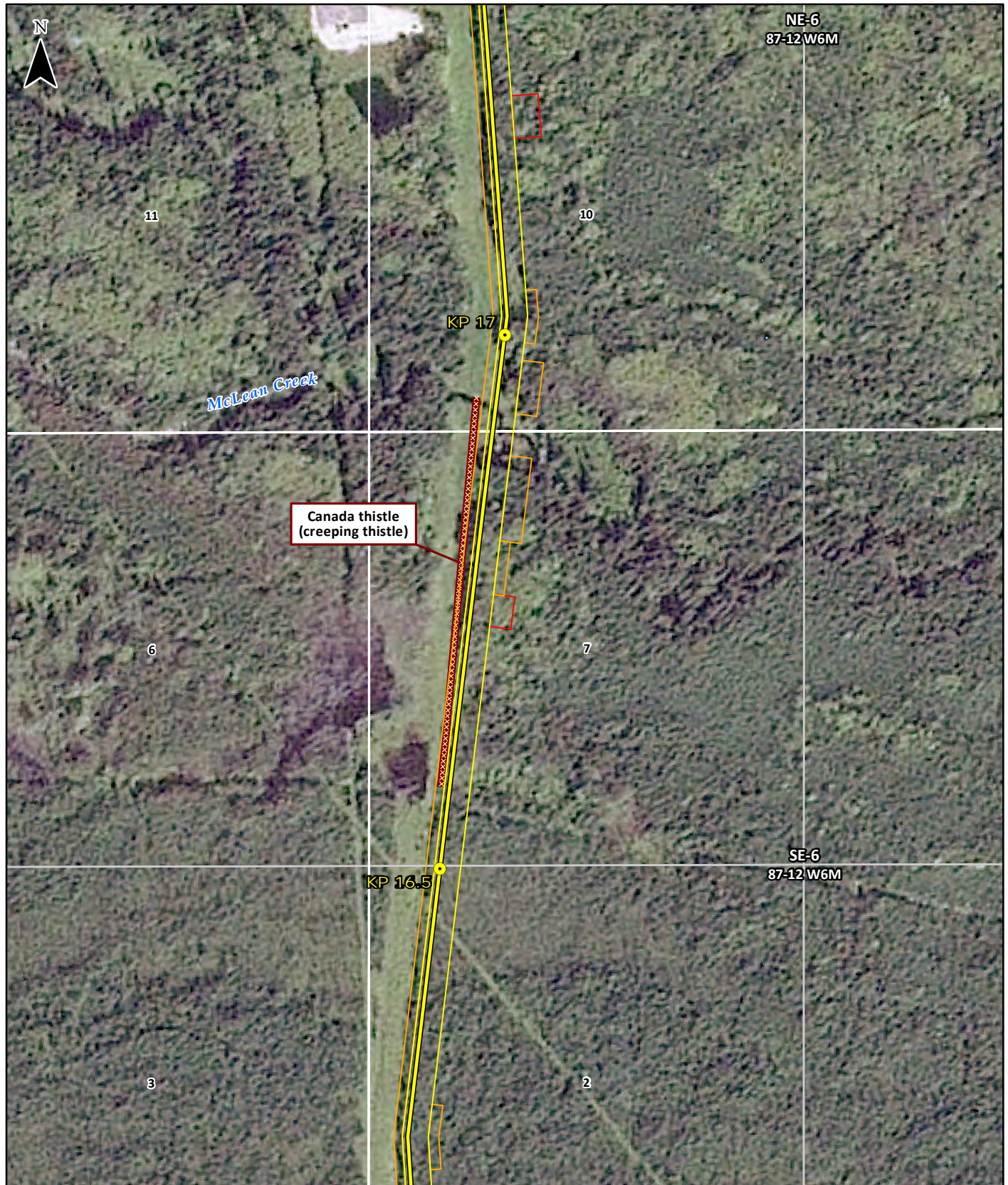
Imagery: 2013 SPOT6 ©2015 CNES, Licensed by BlackBridge Geomatics Corp. www.blackbridge.com;  
 KP, Proposed Pipeline Routing/Footprint: NGTL 2014a;  
 Noxious Weed: TERA, a CH2M HILL Company 2015; Hydrology: NRCan 2007-2011; Grid: AltaUS 2009a.  
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 0 50 100 150 m  
 (All Locations Approximate)

March 2015	650026
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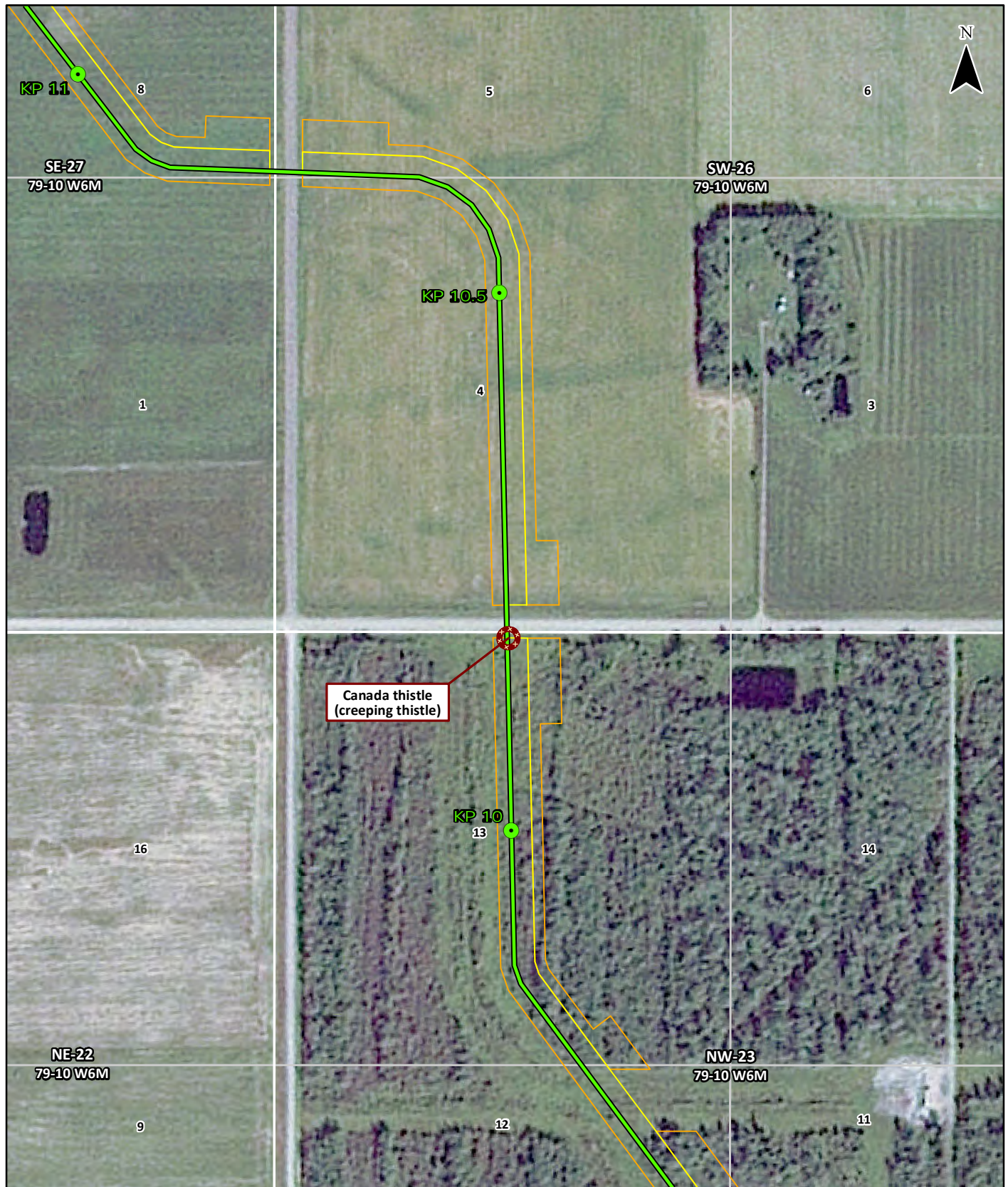




- |  |  |
|--|--|
|  Kilometre Post (KP)                                    |  Proposed Right-of-way        |
|  Proposed Northwest Mainline Loop Boundary Lake Section |  Proposed Temporary Workspace |
|  Noxious Weed   |  Proposed Log Deck            |

**FIGURE 3.4-1B**  
**OCCURRENCES OF**  
**NON-NATIVE AND INVASIVE SPECIES OBSERVED**  
**VEGETATION TECHNICAL REPORT FOR THE**  
**PROPOSED NOVA GAS TRANSMISSION LTD.**  
**2017 NGTL SYSTEM EXPANSION**  
**(NORTHWEST MAINLINE LOOP BOUNDARY LAKE SECTION)**





- |   |  |
|---|--|
|  Kilometre Post (KP)                                       |  Proposed Right-of-way        |
|  Proposed Northwest Mainline Loop No.2 Bear Canyon Section |  Proposed Temporary Workspace |
|  Noxious Weed  |  Proposed Log Deck            |

**FIGURE 3.4-2A**  
**OCCURRENCES OF**  
**NON-NATIVE AND INVASIVE SPECIES OBSERVED**  
**VEGETATION TECHNICAL REPORT FOR THE**  
**PROPOSED NOVA GAS TRANSMISSION LTD.**  
**2017 NGTL SYSTEM EXPANSION**  
**(NORTHWEST MAINLINE LOOP NO.2 BEAR CANYON SECTION)**



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 KP, Proposed Pipeline Routing/Footprint: NGTL 2014a;  
 Noxious Weed: TERA, a CH2M HILL Company 2015; Hydrology: NRCan 2007-2011; Grid: AltaLIS 2009a.

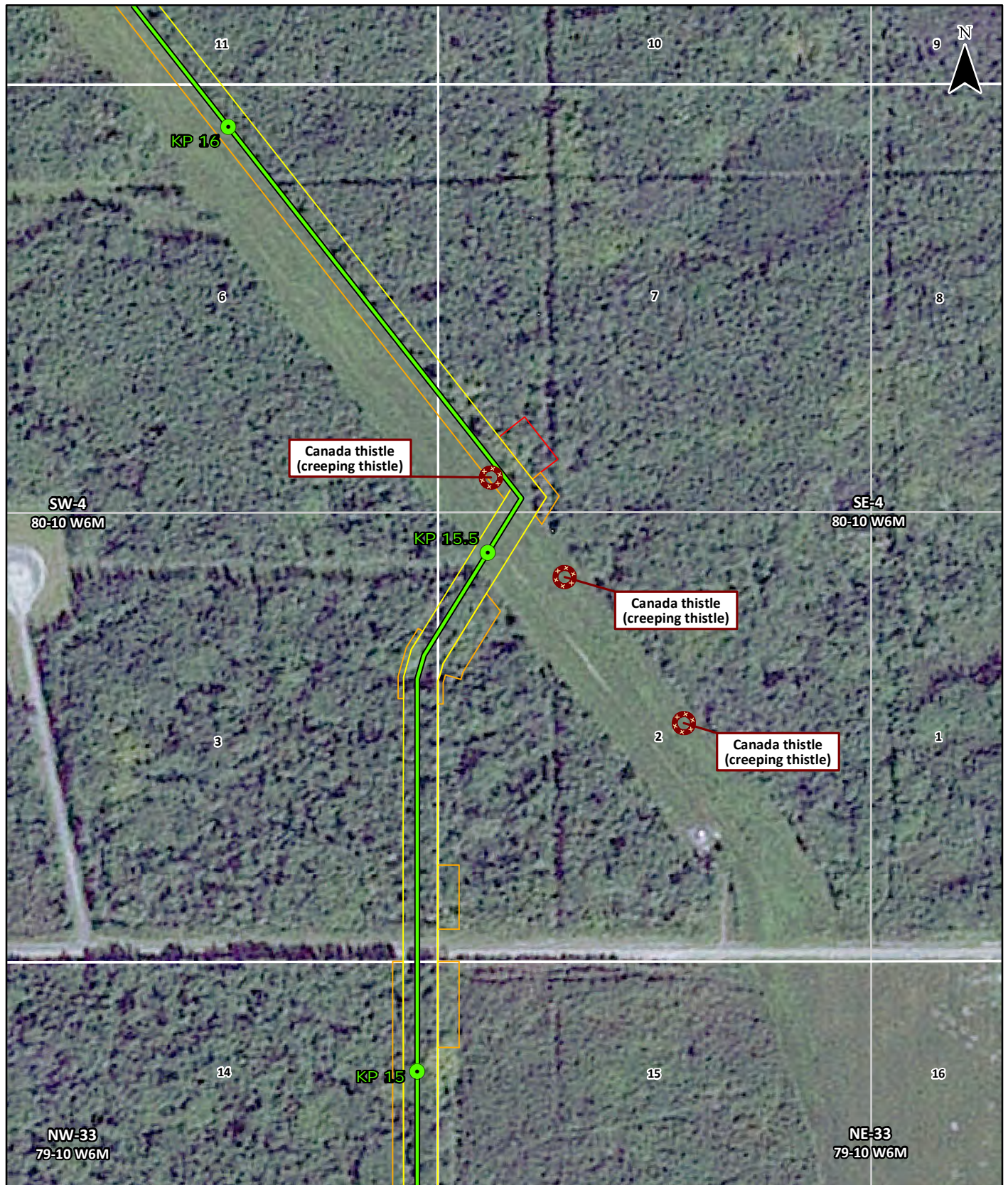
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 0 50 100 150 m  
 (All Locations Approximate)

March 2015	650027
Mapped By: DR	Checked By: EH





- Kilometre Post (KP)
- Proposed Northwest Mainline Loop No.2 Bear Canyon Section
- Noxious Weed
- Proposed Right-of-way
- Proposed Temporary Workspace
- Proposed Log Deck

**FIGURE 3.4-2B**  
**OCCURRENCES OF**  
**NON-NATIVE AND INVASIVE SPECIES OBSERVED**  
**VEGETATION TECHNICAL REPORT FOR THE**  
**PROPOSED NOVA GAS TRANSMISSION LTD.**  
**2017 NGTL SYSTEM EXPANSION**  
**(NORTHWEST MAINLINE LOOP NO.2 BEAR CANYON SECTION)**



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 KP, Proposed Pipeline Routing/Footprint: NGTL 2014a;  
 Noxious Weed: TERA, a CH2M HILL Company 2015; Hydrology: NRCAN 2007-2011; Grid: AltaLIS 2009a.

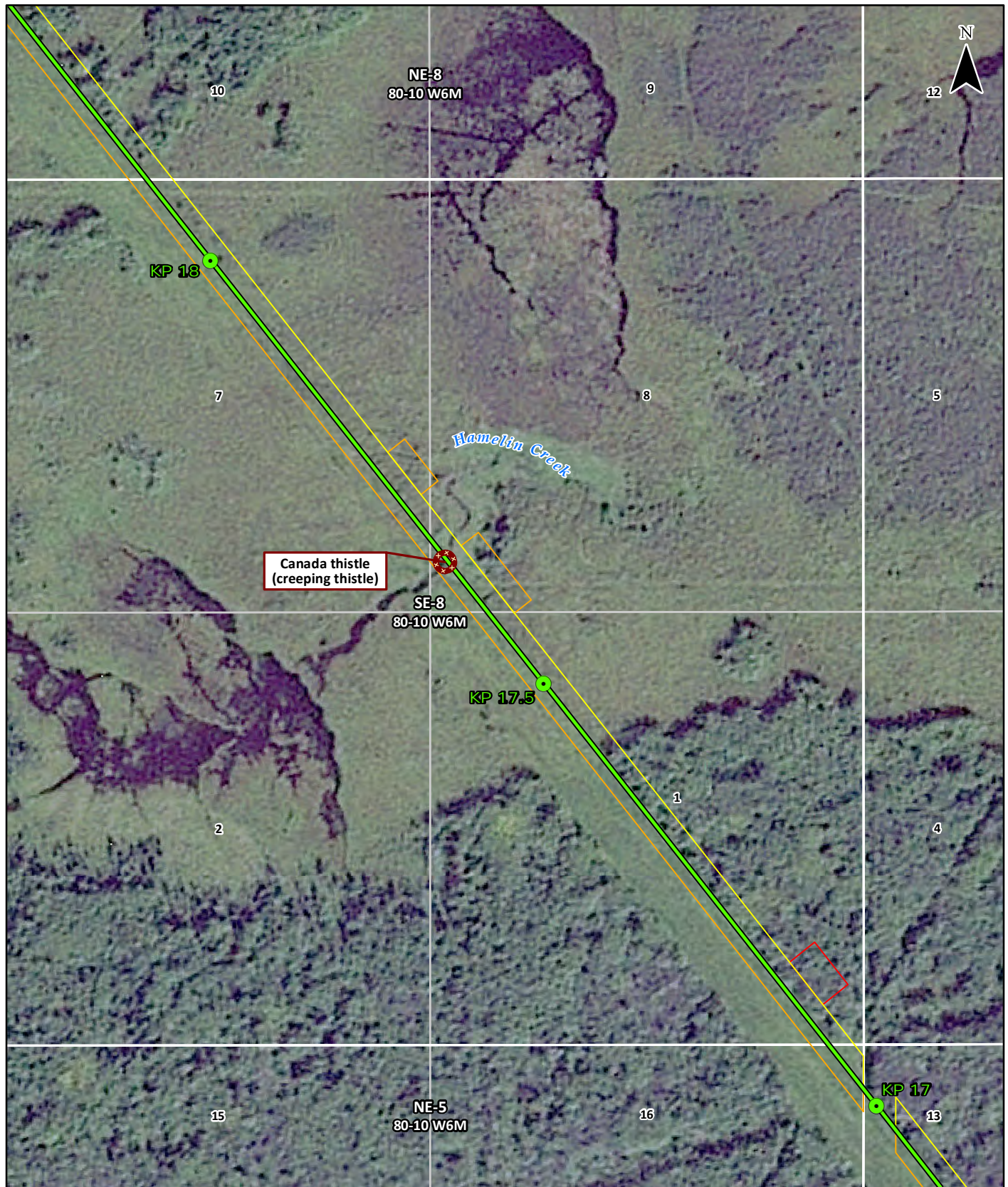
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SCALE: 1:5,000  
 0 50 100 150 m  
 (All Locations Approximate)

March 2015	650027
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- |   |  |
|---|--|
|  Kilometre Post (KP)                                       |  Proposed Right-of-way        |
|  Proposed Northwest Mainline Loop No.2 Bear Canyon Section |  Proposed Temporary Workspace |
|  Noxious Weed  |  Proposed Log Deck            |

**FIGURE 3.4-2C**  
**OCCURRENCES OF**  
**NON-NATIVE AND INVASIVE SPECIES OBSERVED**  
**VEGETATION TECHNICAL REPORT FOR THE**  
**PROPOSED NOVA GAS TRANSMISSION LTD.**  
**2017 NGTL SYSTEM EXPANSION**  
**(NORTHWEST MAINLINE LOOP NO.2 BEAR CANYON SECTION)**



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 0 50 100 150 m  
 (All Locations Approximate)

March 2015	650027
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- |   |  |
|---|--|
|  Kilometre Post (KP)                                       |  Proposed Right-of-way        |
|  Proposed Northwest Mainline Loop No.2 Bear Canyon Section |  Proposed Temporary Workspace |
|  Noxious Weed  |  Proposed Log Deck            |

**FIGURE 3.4-2D**  
**OCCURRENCES OF**  
**NON-NATIVE AND INVASIVE SPECIES OBSERVED**  
**VEGETATION TECHNICAL REPORT FOR THE**  
**PROPOSED NOVA GAS TRANSMISSION LTD.**  
**2017 NGTL SYSTEM EXPANSION**  
**(NORTHWEST MAINLINE LOOP NO.2 BEAR CANYON SECTION)**



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 Noxious Weed: TERA, a CH2M HILL Company 2015; Hydrology: NRCAN 2007-2011; Grid: AltaLIS 2009a.

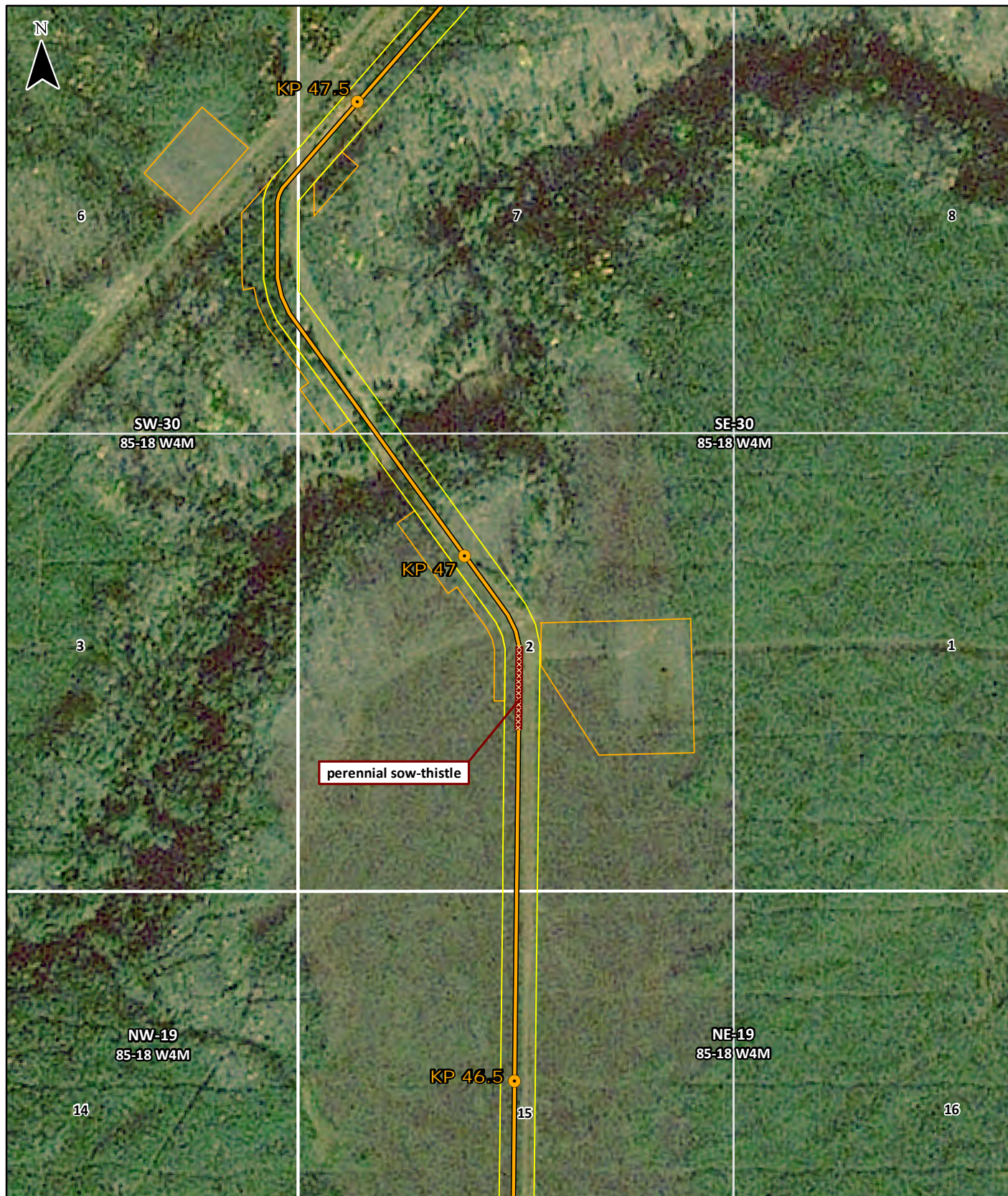
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 0 50 100 150 m  
 (All Locations Approximate)

March 2015	650027
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- Kilometre Post (KP)
- Proposed Liege Lateral Loop No. 2 Pelican Lake Section
- - - - - Noxious Weed
- Proposed Right-of-way
- Proposed Temporary Workspace

**FIGURE 3.4-3**  
**OCCURRENCES OF**  
**NON-NATIVE AND INVASIVE SPECIES OBSERVED**  
**VEGETATION TECHNICAL REPORT FOR THE**  
**PROPOSED NOVA GAS TRANSMISSION LTD.**  
**2017 NGTL SYSTEM EXPANSION**  
**(LIEGE LATERAL LOOP NO.2 PELICAN LAKE SECTION)**



UTM Zone 12N  
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 KP, Proposed Pipeline Routing/Footprint: NGTL 2014b;  
 Noxious Weed: TERA, a CH2M HILL Company 2015; Grid: AltaLIS 2009a.  
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 (All Locations Approximate)

March 2015	650029
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- |  |                              |
|--|------------------------------|
| Kilometre Post (KP)  | Proposed Right-of-way        |
| Proposed Kettle River Lateral Loop Christina River Section | Proposed Temporary Workspace |
| Noxious Weed   | Proposed Log Deck            |

**FIGURE 3.4-4**  
**OCCURRENCES OF**  
**NON-NATIVE AND INVASIVE SPECIES OBSERVED**  
**VEGETATION TECHNICAL REPORT FOR THE**  
**PROPOSED NOVA GAS TRANSMISSION LTD.**  
**2017 NGTL SYSTEM EXPANSION**  
**(KETTLE RIVER LATERAL LOOP CHRISTINA RIVER SECTION)**



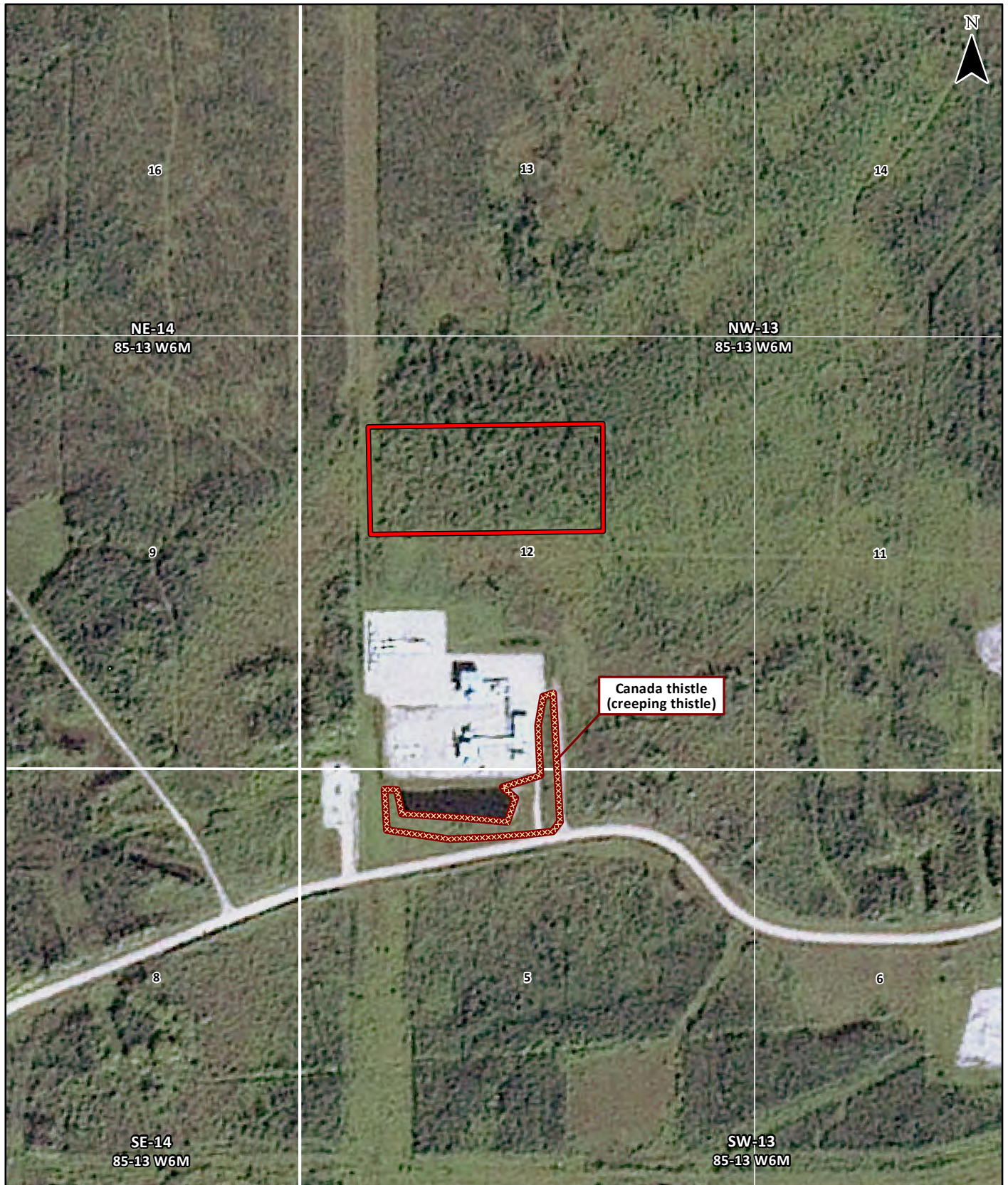
UTM Zone 12N  
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 KP, Proposed Pipeline Routing/Footprint: NGTL 2014a;  
 Noxious Weed: TERA, a CH2M HILL Company 2015; Grid: Altalis 2009a.  
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 0 50 100 150 m  
 (All Locations Approximate)

March 2015	650028
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- Proposed Alces River Compressor Station Unit Addition
- Noxious Weed

**FIGURE 3.4-5**  
**OCCURRENCES OF**  
**NON-NATIVE AND INVASIVE SPECIES OBSERVED**  
**VEGETATION TECHNICAL REPORT FOR THE**  
**PROPOSED NOVA GAS TRANSMISSION LTD.**  
**2017 NGTL SYSTEM EXPANSION**  
**(ALCES RIVER COMPRESSOR STATION UNIT ADDITION)**



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 Proposed Compressor Station Unit Addition: NGTL 2014c;  
 Noxious Weed: TERA, a CH2M HILL Company 2015; Grid: Altalis 2009a.

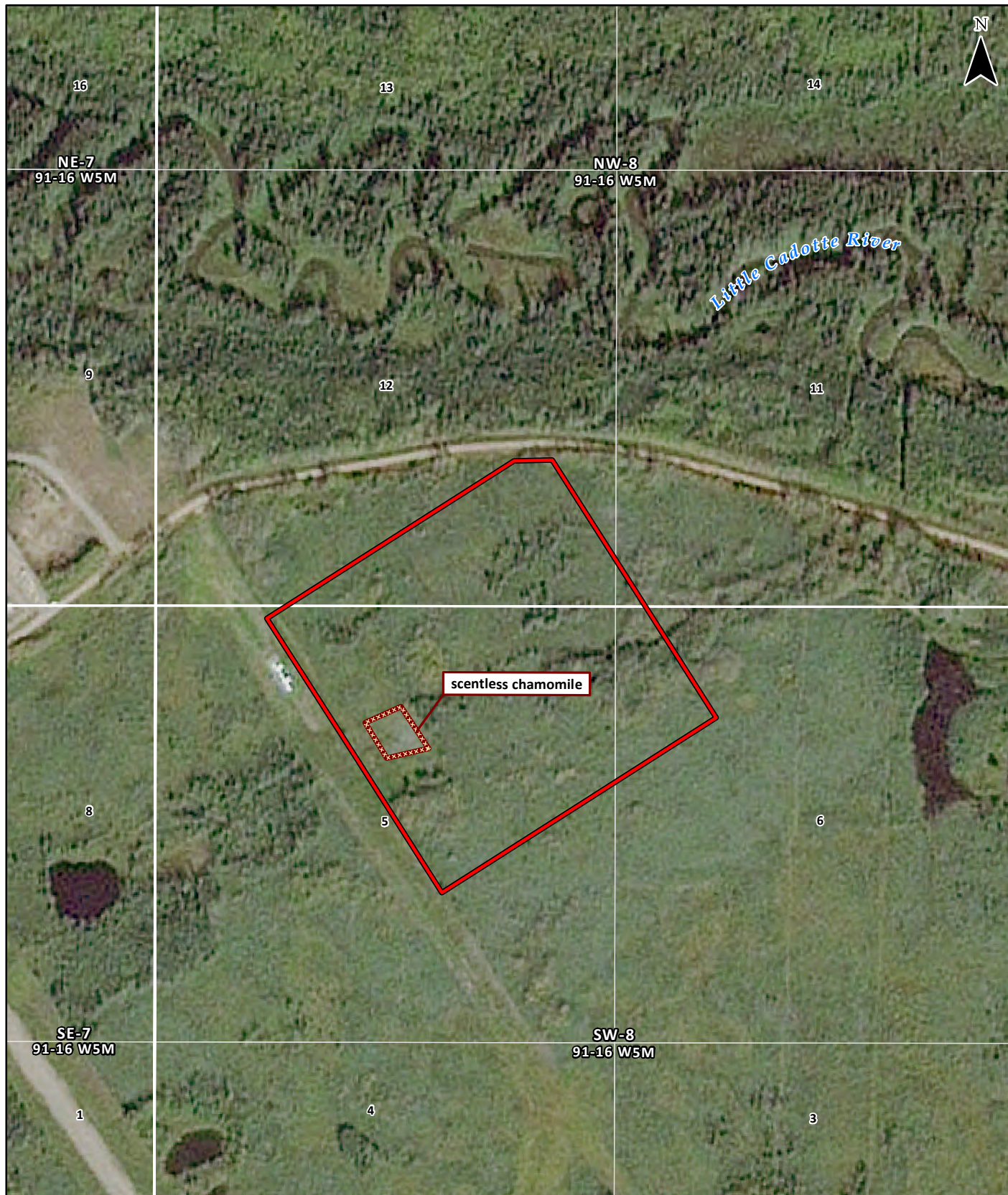
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SCALE: 1:5,000  
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 (All Locations Approximate)

March 2015	652345
Mapped By: DR	Checked By: EH





-  Proposed Otter Lake Compressor Station Unit Addition
-  Noxious Weed

**FIGURE 3.4-6**  
**OCCURRENCES OF**  
**NON-NATIVE AND INVASIVE SPECIES OBSERVED**  
**VEGETATION TECHNICAL REPORT FOR THE**  
**PROPOSED NOVA GAS TRANSMISSION LTD.**  
**2017 NGTL SYSTEM EXPANSION**  
**(OTTER LAKE COMPRESSOR STATION UNIT ADDITION)**



### 3.5 Forest Health

#### 3.5.1 Results of the Literature/Desktop Review

The Boundary Lake and Bear Canyon sections, as well as the Otter Lake Unit Addition are situated within an Inactive Holding Zone as part of the Alberta *Mountain Pine Beetle Management Strategy* (ASRD 2007). The prime objective of the Inactive Holding Zone is to ensure MPB populations remain static from year to year (ASRD 2007).

The Pelican Lake Section is situated within a Leading Edge Zone as part of the Alberta *Mountain Pine Beetle Management Strategy* (ASRD 2007). The prime objective of the Leading Edge Zone is to reduce and maintain MPB populations and prevent spread to an endemic level (ASRD 2007).

The Christina River Section and Alces River Unit Addition are not situated in any MPB Management Zones (AESRD 2013) and as such is not subject to any requirements or restrictions related to MPB management.

A summary of MPB Management Areas encountered by the Project are provided in Table 3.5-1.

**TABLE 3.5-1**

**SUMMARY OF MPB MANAGEMENT AREAS ENCOUNTERED BY THE PROJECT**

Project Component	Leading Edge Zone	Active Holding Zone	Inactive Holding Zone
Boundary Lake Section			X
Bear Canyon Section			X
Pelican Lake Section	X		
Christina River Section <sup>1</sup>			
Alces River Unit Addition <sup>1</sup>			
Otter Lake Unit Addition			X

**Notes:** 1 Pipeline and Compressor Station are not within MPB Management Areas.

Please refer to the Timber Salvage Plan (CCI Inc. 2015) for a background review of bark beetle infestations known from the vicinity of the Project.

#### 3.5.2 Results of the Field Data Collection

Signs of MPB were observed along the Boundary Lake and Bear Canyon sections. Trees and forest stands affected by MPB ranged from a few dead trees to extensive areas. There were no signs of MPB outbreaks in a MPB zone that requires active MPB management along the Project.

##### Boundary Lake Section

Several extensive areas that showed signs of MPB were noted during the vegetation survey along the Boundary Lake Section (Plate 15). Locations where signs of MPB were observed are listed below.

- 25-85-13 W6M;
- 1-86-13 W6M;
- 12-86-13 W6M;
- 13-86-13 W6M;
- 24-86-13 W6M;
- 25-86-13 W6M;
- 36-86-13 W6M;
- 17-87-12 W6M;
- 18-88-12 W6M;
- 19-88-12 W6M;
- 30-88-12 W6M;
- 31-88-12 W6M;
- 6-89-12 W6M;
- 7-89-12 W6M;
- 19-89-12 W6M;
- 20-89-12 W6M;
- SW 6-90-13 W6M;
- NW 32-91-12 W6M;
- 20-92-12 W6M;
- 29-92-12 W6M;
- 32-92-12 W6M;
- 5-93-12 W6M;
- 8-93-12 W6M;
- 17-93-12 W6M;



- 30-87-12 W6M;
- 6-88-12 W6M;
- 7-88-12 W6M;
- 29-89-12 W6M;
- 30-89-12 W6M;
- SE 31-89-12 W6M;
- 21-93-12 W6M; and
- 17-94-12 W6M.

### Bear Canyon Section

Several small areas that showed signs of MPB were noted during the vegetation survey along the Bear Canyon Section at NE 18-80-10 W6M and NW 8-80-10 W6M.

### Pelican Lake Section

No signs of MPB were observed along the Pelican Lake Section.

### Christina River Section

No signs of MPB were observed along the Christina River Section.

### Alces River Unit Addition

No signs of MPB were observed at the Alces River Unit Addition.

### Otter Lake Unit Addition

No signs of MPB were observed at the Otter Lake Unit Addition.

## **3.6 Late-Successional Forests**

### **3.6.1 Results of the Literature/Desktop Review**

A clear, universally accepted definition for late-successional forest does not exist (Geowest Environmental Consultants Ltd. [Geowest] 1996, Hilbert and Wiensczyk 2007, Hunter 1989, Spies 2004). In general, definitions of late-successional forest within the scientific literature focus on the presence of structural characteristics such as large old living trees, large standing dead trees or snags (dead trees broken off at the top), complex canopy structure and coarse woody material (*i.e.*, logs) in both the terrestrial and aquatic environment (Franklin and Spies 1991, as reviewed in Braumandl and Holt 2000, Geowest 1996, Hilbert and Wiensczyk 2007). This concept of late-successional forest is from an ecological perspective and considers the composition and function of late-successional forests to generally be a result of underlying structural characteristics (Franklin and Spies 1991, as reviewed in Braumandl and Holt 2000).

Late-successional forests are widely recognized as being biologically diverse ecosystems (Franklin and Spies 1991). Structural characteristics result in microclimatic conditions utilized by specialized organisms (*e.g.*, lichens, amphibians) (Spies 1998, Bunnell *et al.* 1999) and provide habitat for fish, wildlife and vegetation (Geowest 1996, Spies 1998, Bunnell *et al.* 1999). Obligate cavity nesters such as the pileated woodpecker are particularly abundant in late-successional forest because of habitat preferences for large dead trees or snags (Franklin and Spies 1991, Bunnell *et al.* 1999). Late-successional forests also constitute prime ungulate winter range because of high understory foliage availability, abundant litterfall (including lichens) and reduced snow depth due to canopy cover (Bunnell *et al.* 1999). Several species, including woodland caribou, are closely associated with late-successional forests (Franklin and Spies 1991, Bunnell *et al.* 1999).

Late-successional forests provide valuable ecosystem functions including air and water purification, carbon storage, nutrient regeneration, soil maintenance, pest control (via insectivorous bats and insects), genetic biodiversity and micro/macro climatic control (Zahner 1996 as cited in Hilbert and Wiensczyk 2007). Aesthetic, spiritual and recreational appeal are also valued in late-successional forests (Hunter 1989, Spies 2004).

Structural characteristics associated with late-successional forests may provide habitat, or result in uncommon ecological conditions that may provide habitat for adapted organisms including rare vegetation and rare ecological communities (Geowest 1996, Spies 1998). Forest fires are common in the boreal forest



and interrupt the successional sequences that produce late-successional forests (Johnson and Miyanishi 1995). Due to the historical prevalence of forest fires in the boreal forest, late-successional forests are infrequently encountered and may be limited in extent or distribution. Therefore, where late-successional forests are encountered, such habitats may be considered to have high potential to support rare vegetation and rare ecological communities.

The retention of late-successional forests are incorporated into Forest Management Plans developed by forestry companies for their respective Forest Management Agreement (FMA) areas. These detailed forest management plans are regulated provincially under the *Forests Act* with strict standards that consider both environmental and socio-economic values and include a determination of retention rates for forest stands at various seral stages (ASRD 2006).

### **3.6.2 Results of the Field Data Collection**

Approximately 54.2 ha of potential late-successional mixedwood forests estimated to have an age ranging from 110 to 120 years old are traversed by the proposed routes. Areas where potential late-successional forests are encountered by the proposed route are provided in Table 3.6-1.

Late-successional forest was verified in some locations in the field and classified as structural stage 7. Structural stage 7 is defined as 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; time since disturbance is generally greater than 100 years (BC MFR and BC MOE 2010, with modifications for Alberta).

#### **Boundary Lake Section**

There are approximately 266.2 ha of late-successional forest in the Vegetation LSA. Of this, 20.7 ha (8% of the total late-successional forest in the Vegetation LSA) will be cleared during construction of the Project. The area of late-successional forest to be cleared for the Project is identified for each forestry disposition holder in Table 3.6-1.

#### **Bear Canyon Section**

There are approximately 142.6 ha of late-successional forest in the Vegetation LSA. Of this, 13.6 ha (10% of the total late-successional forest in the Vegetation LSA) will be cleared during construction of the Project. The area is not managed under a FMA.

#### **Pelican Lake Section**

There are approximately 112.6 ha of late-successional forest in the Vegetation LSA. Of this, 11.7 ha (10% of the total late-successional forest in the Vegetation LSA) will be cleared during construction of the Project. The Pelican Lake Section is within the Alberta-Pacific Forest Products Incorporated (ALPAC) FMA area.

#### **Christina River Section**

There are approximately 99.3 ha of late-successional forest in the Vegetation LSA. Of this, 8.2 ha (8% of the total late-successional forest in the Vegetation LSA) will be cleared during construction of the Project. The Christina River Section is within the ALPAC Forest Products Incorporated FMA area.

#### **Alces River Unit Addition**

There is no late-successional forest in the Vegetation LSA. No late-successional forest will be cleared during construction of the Project. The area is not managed under a FMA.

#### **Otter Lake Unit Addition**

There is no late-successional forest in the Vegetation LSA. No late-successional forest will be cleared during construction of the Project. The Otter Lake Unit Addition is within the Daishowa-Marubeni International Ltd. (East) FMA area.



TABLE 3.6-1

## AREA OF LATE-SUCCESSIONAL FOREST TO BE CLEARED WITHIN FORESTRY DISPOSITIONS

Disposition Holder	Total Late-Successional Forest in LSA (ha) <sup>1</sup>	Total Late-Successional Forest in Footprint (ha) <sup>1</sup>	Proportion of Late-Successional Forest to be Cleared from LSA (%)
<b>Boundary Lake Section</b>			
Manning Diversified Products Ltd.	6.4	0.9	14
Daishow-Marubeni International Ltd. (West)	189.5	15	8
N/A	70.2	4.8	7
<b>Bear Canyon Section</b>			
N/A	142.6	13.6	10
<b>Pelican Lake Section</b>			
ALPAC	112.6	11.7	10
<b>Christina River Section</b>			
ALPAC	99.3	8.2	8
<b>Alces River Unit Addition</b>			
N/A	--	--	--
<b>Otter Lake Unit Addition</b>			
Daishow-Marubeni International Ltd. (East)	--	--	--

**Note:** 1 All areas are approximate.

### 3.7 Aboriginal Field Study Program

A review of collected data during the Aboriginal Field Study Program and discussions of potential Project-related effects as well as the mitigation measures described in the ESA for the Project were conducted directly with the participating community representatives during the biophysical field studies. Confidential and proprietary information was reviewed directly with the participating community representatives during the biophysical field studies to confirm accuracy as well as seek approval, where warranted, for the inclusion and consideration of any confidential and proprietary information in Project planning.

TERA provided follow-up opportunities for the communities that participated in 2011, 2014 and 2015 biophysical field studies in March 2015 to review and validate the summary of issues raised by participating community representatives during these studies. Details are provided in Appendix 10 of the ESA.

#### 3.7.1 Results of the Field Data Collection

##### Boundary Section

Vegetation in the Boundary Lake Section Vegetation RSA is harvested by Aboriginal community members for food, medicinal, spiritual and utilitarian purposes. The knowledge of precise locations and/or uses of medicinal plants held by the participants is proprietary to communities. Vegetation resources identified by participants were:

- rat root;
- cattail;
- high bush blueberry;
- low-bush cranberry;
- strawberry root;
- rhubarb;
- Labrador tea;
- mint;
- spruce trees;
- birch trees;
- shelf fungus; and
- tamarack trees.



Participants explained that rat root and cattail grow on muskeg, in swampy areas and around the edge of lakes and ponds. Rat root is used for both medicinal and spiritual practices. Rat root was described as having a strong smell similar to peppermint or ginger. In order to locate rat root it is best to take off your shoes and feel for the root with bare feet, since it feels like branches in the soil. It is important to leave the top (grass) when harvesting, because rat root will keep growing. Rat root is best harvested in the fall, as it is less potent during the summer. Participants explained that when rat root is harvested, an offering of tobacco must be left as a sign of respect. It was also explained that large amounts of rat root should be harvested in order to distribute the harvest to both friends and family.

Cattails were identified and a participant explained that cattails can be eaten. Cattails are picked in the spring while they are green. To harvest cattails, the entire brown section of the plant must be taken. Participants explained that once picked, cattails are boiled or steamed in a pot of water and then covered in butter and salt, and eaten like corn on the cob. Cattails can also be ground to produce flour, which can then be mixed with water to make an edible paste.

High bush blueberries were identified in a clearing of Jack pine. High bush blueberries usually grow in muskeg and are eaten by birds. The berries are picked in August, and occasionally in September if the weather is warm. Participants explained that high bush blueberries need to be picked before they become shrivelled or frozen, unlike choke cherries, which get sweeter and "taste less like sawdust" once they are frozen. A participant reported that their mother cans high bush blueberries in the fall. Another participant explained that they freeze the berries once they are picked and have them on dessert throughout the winter.

A participant identified a patch of low-bush cranberries growing in muskeg where there was also sporadic black spruce and plenty of Labrador tea. Similar to high bush blueberry, it was explained that the participant's family cans low-bush cranberries by adding sugar and gelatin. Low-bush cranberries ripen during the fall, which is the best time to pick them.

Participants identified strawberry root, which was used for medicinal purposes.

Rhubarb was identified, but it had not yet ripened as it was still hollow. The stalks of rhubarb look red and green when it is picked. A participant reported that wild rhubarb is found around lakes, but not typically in muskeg. Rhubarb is usually harvested in the early summer, and is prepared by the removal of its leaves and cleansing of its stalks. The stems are then boiled with sugar and berries until it becomes stringy and looks similar to stew. Rhubarb can be used as a traditional medicine.

A participant identified Labrador tea and reported that it can be used as a traditional medicine. May and June are good months to pick and preserve herbs. Knowledge of herbs and survival is given to participants through their parents and grandparents. Participants explained that Aboriginal groups in the past would use Labrador tea to test a creek for water quality when choosing camping sites. In order to do this they would make tea. If the water of the tea was dark, then the water was not good to drink. If the water of the tea turned red, then the water was good to drink. The tea mixture could then be placed in a refrigerator and be consumed in similar fashion to iced tea.

Participants explained that mint was hard to find but they had found some near Heg Lake while boating and fishing. When you are near mint, you can smell it right away. Mint grows near the water, and mostly on lakes rather than rivers. In order to dry the leaves of mint, it is best to hang them. A handful of dried mint is regularly added to tea.

Spruce gum was identified and explained to have powerful medicinal properties.

Participants identified birch trees and explained that birch had many uses. Sap or syrup from birch trees is collected during the month of June by inserting a spike and then letting the sap drip into a bucket. The sap can be used as a good medicine when it is sometimes mixed into tea. Birch bark can be used as a fire starter. Birch bark can also be commonly used to make a moose call instrument. In order to make the instrument, individuals cut around the trunk twice (about a foot apart) and then make an incision down, connecting the two first cuts. The bark is then peeled off and rolled into a cone with one end narrow for blowing and one end wider for the sound to come out. This moose calling instrument was explained to be made in the fall during hunting season and can be used to call both bull and cow.



A participant identified a shelf fungus called "konk." Fungus can be dried and burned in your house to clear the air and for medicinal purposes. It can also be burned to get rid of mosquitos.

Large tamaracks were identified north-west of a compressor station. Tamarack can be used to make fence posts due to their durability. Tamarack was also explained to be used for medicinal purposes.

Concerns related to vegetation that were identified during biophysical field studies by Aboriginal participants can be found in the Aboriginal Field Study Participation and Traditional Land Use Report (Appendix 10 of the ESA).

### Bear Canyon Section

Vegetation in the Bear Canyon Section Vegetation RSA is harvested by Aboriginal community members for food, medicinal and utilitarian purposes. The knowledge of precise locations and/or uses of medicinal plants held by the participants is proprietary to communities.

A species of vegetation was identified as a medicinal plant. The plant can also be used for traditional smudging and also to enable people to "smell good". An additional unidentified species of vegetation was identified by participants and it was explained that the yellow and white flowers of the plant are harvested during the summer.

Participants identified a strong mint-like smell, and explained that this was Labrador tea. It was explained that leaves and stem are picked and dried, which are then used to make tea. Participants explained that they themselves have never picked the tea before, but did harvest the plant to take home and make Labrador tea for the first time.

Participants noted that the forest in the Project area was not particularly healthy as evidenced by the bark of poplar trees not being smooth. Cotton wood trees were identified by participants and it was explained that cotton wood trees are a good indicator of groundwater.

Concerns related to vegetation that were identified during biophysical field studies by Aboriginal participants can be found in the Aboriginal Field Study Participation and Traditional Land Use Report (Appendix 10 of the ESA).

### Pelican Lake Section

Vegetation in the Pelican Lake Section Vegetation RSA is harvested by Aboriginal community members for food, medicinal, spiritual and utilitarian purposes. The knowledge of precise locations and/or uses of medicinal plants held by the participants is proprietary to the community. Vegetation resources identified by participants were:

- spruce trees;
- birch trees;
- low-bush cranberry;
- mint;
- old man's beard;
- balsam trees;
- bush cranberry;
- caribou lichen;
- muskeg;
- old man's beard; and
- spruce.

A participant identified gum on a spruce tree, which can be used for medicinal purposes. The medicinal properties of spruce gum were also explained to be most potent when it was a few days old.

Birch trees were identified growing along the banks of an unnamed tributary to the Athabasca River. An optimum condition for birch trees to grow is being close to open water, as it is easier for the trees to pull water through their roots. Open areas with lots of sunlight, where there is less competition for nutrition, is another optimum growing condition for birch trees.



Low-bush cranberry was identified and it was explained that the berries are regularly picked by Aboriginal community members. A participant explained that berries can be eaten as is, however, are often made into jams or jellies. Berries are picked from summer to fall when ripe. Cranberries are also often eaten by bears.

A species of vegetation was explained to be very difficult to find as it is rare and also has a very distinctive smell. The plant can be harvested in the fall. The plant was identified and participants explained that it can be used for smudging and medicinal purposes. A participant explained that this plant is traded with tobacco as an offering and is also given to Elders as a gift in exchange for knowledge.

Participants identified mint and explained that it can be used for specific medicinal purposes. Mint is best picked in the late summer and early fall, and is often found near wet areas such as muskegs, creeks, lakes and sloughs. Mint must be dried by hanging upside down, as it will rot if laid flat. Participants explained that they consume mint tea and that it is also commonly drunk among their community members.

Old man's beard was identified growing on a spruce tree and also a dying balsam fir tree. Participants indicated that community members use old man's beard to start fires and it is commonly used for this purpose during hunting and trapping activities. Old man's beard is an excellent food for caribou. Caribou lichen was also identified on the same spruce tree and was also identified as excellent food for caribou.

Concerns related to vegetation that were identified during biophysical field studies by Aboriginal participants can be found in the Aboriginal Field Study Participation and Traditional Land Use Report (Appendix 10 of the ESA).

### Christina River Section

Vegetation in the Christina River Section Vegetation RSA is harvested by Aboriginal community members for food and utilitarian purposes. The knowledge of precise locations and/or uses of medicinal plants held by the participants is proprietary to the community. Vegetation resources identified by participants were:

- blueberries;
- mint;
- cattail plant;
- cranberries;
- Labrador tea; and
- lichen.

Participants identified blueberries and it was explained that blueberries are a good food-source for small furbearing wildlife.

Mint was identified as growing on the banks of an unnamed tributary to the Kettle River. It was explained that wild mint grows in wet areas in dense vegetation, where light is filtered by the canopy. Participants also explained that mint can be collected all year-round, but it is harvested primarily by Elders in August.

Cattails were identified along the banks of a beaver pond. Participants explained that cattails were easy to identify due to their proximity to water and by the bulbous flowers that emanate from the apex of the main shoot. It was also explained that cattail grows in water of poor quality and that the flower has a material concealed within it which can be used as a fire starter. The root of cattails can also be eaten as a vegetable and tastes similar to onions.

Cranberries were identified growing in moss. Participants explained that cranberries are bright red, numerous in the muskeg, and are juicy with a sour aftertaste. Cranberries ripen in late August and can be harvested in September. In addition to being a valuable food source to Aboriginal communities during hunting and camping, bears, birds, moose, deer and rodents also consume cranberries.



Labrador tea growing alongside the proposed right-of-way was identified by a participant. It was explained that Labrador tea grows in muskeg and can be harvested year-round.

Two species of lichen was identified by a participant. It was explained by the participant that caribou eat the two species of lichen identified, which grow on trees and on the ground. A participant reported that it may take up to 20 years for ground lichen to regrow.

Concerns related to vegetation that were identified during biophysical field studies by Aboriginal participants can be found in the Aboriginal Field Study Participation and Traditional Land Use Report (Appendix 10 of the ESA).

#### Alces River Unit Addition

Participants did not provide TEK pertaining to vegetation for the Alces River Unit Addition.

#### Otter Lake Unit Addition

Participants did not provide TEK pertaining to vegetation for the Otter Lake Unit Addition.

### **3.8 Survey Limitations**

Classification and delineation of vegetation communities were based on field notes recorded by vegetation specialists during helicopter overflights and ground surveys within the Vegetation LSA but did not extend into the Vegetation RSA.

In accordance with established rare vegetation survey guidelines, TERA recommends conducting both an early-season and a late-season vegetation survey (ANPC 2012), between June 1 and August 31, in order to assess the presence of rare vegetation species throughout the growing season. For this Project, only one vegetation survey was completed due to Project timing limitations. The species list, therefore, should not be considered a complete inventory.

This vegetation survey does not address all bryophyte/lichen species. However, all identifiable bryophyte and lichen species have been reported in the same manner as vascular species.

Due to their site-specific nature, rare vegetation surveys can only be conducted on the known Project Footprint and their results cannot necessarily be extrapolated to route realignments and additions made after vegetation surveys have been conducted.

Although rare vegetation surveys can confirm the presence of rare vegetation, they cannot definitively determine that rare vegetation is not present at a site.



## **4.0 SUMMARY**

Vegetation communities, rare vegetation species, non-native and invasive species, signs of MPB, late-successional forest, issues and concerns raised by participating Aboriginal communities and TEK were documented, collected and observed during the literature review and vegetation surveys. Table 4.0-1 briefly summarizes the results of the literature review and vegetation surveys.



TABLE 4.0-1

## SUMMARY OF RESULTS OF LITERATURE REVIEW AND VEGETATION SURVEYS

Key Environmental Issue	Boundary Lake Section	Bear Canyon Section	Pelican Lake Section	Christina River Section	Alces River Unit Addition	Otter Lake Unit Addition
Federally Rare Vegetation	No SARA or COSEWIC-listed species were observed.	No SARA or COSEWIC-listed species were observed.	No SARA or COSEWIC-listed species were observed.	No SARA or COSEWIC-listed species were observed.	No SARA or COSEWIC-listed species were observed.	No SARA or COSEWIC-listed species were observed.
Provincially Rare Vegetation	No species designated under the <i>Alberta Wildlife Act</i> were observed. Pinesap, an ACIMS-listed vegetation species, was observed.	No species designated under the <i>Alberta Wildlife Act</i> were observed. No ACIMS-listed vegetation species were observed.	No species designated under the <i>Alberta Wildlife Act</i> were observed. Golden saxifrage, an ACIMS-listed vegetation species was observed.	No species designated under the <i>Alberta Wildlife Act</i> were observed. ACIMS-listed vegetation species, golden saxifrage, leather grape fern and snakeskin liverwort, were observed.	No species designated under the <i>Alberta Wildlife Act</i> were observed. No ACIMS-listed vegetation species were observed.	No species designated under the <i>Alberta Wildlife Act</i> were observed. No ACIMS-listed vegetation species were observed.
Rare Ecological Communities	No ACIMS-listed ecological communities were observed.	No ACIMS-listed ecological communities were observed.	No ACIMS-listed ecological communities were observed.	No ACIMS-listed ecological communities were observed.	No ACIMS-listed ecological communities were observed.	No ACIMS-listed ecological communities were observed.
Environmentally Significant Areas	29.4 km (32% of its total length)	2 km (7.5% of its total length)	3.1 km (8.5% of its total length)	29 km (51.5% of its total length)	Not within an Environmentally Significant Area	Within an Environmentally Significant Area
Non-Native and Invasive Species	A few individual Canada thistle (creeping thistle) plants and one patch of perennial sow-thistle were observed.	Several patches of Canada thistle (creeping thistle) were observed.	A few individual perennial sow-thistle plants were observed.	A few individual plants and one patch of perennial sow-thistle were observed.	Several individual Canada thistle (creeping thistle) plants and a few individual perennial sow-thistle plants were observed.	A single individual scentless chamomile plant was observed.
Forest Composition and Health	Signs of MPB were observed.	Signs of MPB were observed.	No signs of MPB were observed.	No signs of MPB were observed.	No signs of MPB were observed.	No signs of MPB were observed.
Late-Successional Forests	Approximately 8% of late-successional forest will be cleared from the LSA.	Approximately 10% of late-successional forest will be cleared from the LSA.	Approximately 10% of late-successional forest will be cleared from the LSA.	Approximately 8% of late-successional forest will be cleared from the LSA.	No late-successional forest will be cleared during construction of the Project	No late-successional forest will be cleared during construction of the Project



#### 4.1 Recommended Supplemental Surveys

Vegetation community classification was completed for the Project within the Vegetation LSA. In order to complete community classification to ecosite phase for the Project within the Vegetation RSA supplemental vegetation community classification surveys are recommended in 2015.

Due to the late-season timing of the vegetation survey, many early flowering species could not be seen or identified. It is recommended that an early-season rare vegetation survey be conducted in priority habitats for rare vegetation, such as riparian areas in June 2015.

Due to their site-specific nature, rare vegetation surveys can only be conducted on the known Project Footprint. The survey results cannot necessarily be extrapolated to route realignments and Footprint additions made after the vegetation surveys have been conducted. Therefore, the following actions are recommended for the proposed Project:

- conduct a desktop review to determine which segments of the revised route are representative of the different vegetation types in the area and/or have high potential to support rare vegetation or rare ecological communities (the desktop review process is detailed in Section 2.0);
- conduct a supplemental vegetation survey during late season 2015 along Project segments selected during the desktop review and/or along segments of the Project that were revised since completion of the 2014 vegetation survey and/or Project segments that are in close proximity to rare vegetation populations observed during the 2014 vegetation survey (see Section 3.3.2); and
- in the event route changes occur after supplemental studies have been conducted, conduct further review to determine whether additional vegetation surveys are warranted prior to construction.

Due to the presence of previously recorded tracked bryophyte and lichen species occurrences in proximity to the Pelican Lake Section, and based on the likelihood of tracked bryophyte and lichen species being encountered by the Project, TERA recommends that collections be conducted in 2015. Specimens need to be collected and confirmed in a lab following the survey due to the difficulty of confirming most bryophyte and lichen species in the field, TERA recommends that a modified tracked bryophyte and lichen survey be conducted on the Boundary Lake, Bear Canyon, Pelican Lake and Christina River sections, and the Alces River Unit Addition in conjunction with the vegetation survey.

The TERA methodology for modified tracked bryophyte and lichen surveys utilises principles from ABMI (ABMI 2010d) which was designed to yield the greatest diversity in the least amount of time. TERA botanists will collect bryophyte and lichen specimens from representative locations along the Project as guided by the modified methodology and list of priority habitats. Specimens will be sent to bryologists and lichenologists for identification.

Several areas were identified as late-successional forest along the Project. During the supplemental vegetation survey it is recommended locations of potential late-successional forest that were not visited in 2014, be visited to confirm the presence of late-successional forest along the Project.

Refer to Section 11.0 of the ESA for details regarding the proposed timing of surveys and submission to the NEB.

#### 4.2 General Vegetation Recommendations

Although the proposed pipeline routes have been aligned as much as possible to be adjacent to existing dispositions in order to reduce environmental impacts, some impacts will inevitably occur during the construction phase and throughout the operation life of the Project. General mitigative measures to reduce potential environmental impacts on vegetation during construction and operation of the pipelines and compressor stations are provided in the Environmental Protection Plan (EPP) prepared for this Project



(Appendices 1A to 1G of the ESA). Additional mitigation measures are summarized in Table 1 of the EPP (Appendices 1A to 1G of the ESA).

#### **4.3 Rare Vegetation and Rare Ecological Community Recommendations**

In accordance with the spirit and intent of the *Environmental Assessment Best Practice Guide for Wildlife at Risk in Canada* (Canadian Wildlife Service 2004), TERA has developed site-specific mitigative measures for all occurrences of rare vegetation observed along the Project. These recommended mitigative measures are intended to eliminate or reduce potential construction-related impacts to occurrences of rare vegetation observed along the Project.

Recommended site-specific mitigative measures are summarized in Table 1 of the EPP for each pipeline and compressor station.

## 5.0 REFERENCES

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*TERA wishes to acknowledge those people identified in the Personal Communications for their assistance in supplying information and comments incorporated into this report.*

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## APPENDIX A

### POTENTIAL RARE VEGETATION SPECIES IN THE BOREAL FOREST - CENTRAL MIXEDWOOD, BOREAL FOREST - DRY MIXEDWOOD, BOREAL FOREST - LOWER BOREAL HIGHLANDS, BOREAL FOREST - UPPER BOREAL HIGHLANDS, FOOTHILLS - LOWER FOOTHILLS NATURAL SUBREGIONS OF THE PROPOSED PROJECT

Scientific Name	Common Name	Habitat	Provincial Designations	Federal/Global Designations	Natural Subregion <sup>3</sup>	Right-of-Way within Known Species Range <sup>4</sup>	Preferred Habitat on Proposed Right-of-Way <sup>4</sup>
<b>VASCULAR PLANTS</b>							
<i>Agrostis exarata</i>	spike redtop	Moist slopes, open areas; usually areas that hold snow late in the growing season. Flowering from late June to August.	S2 <sup>1</sup> May Be At Risk	--	CMW, LFH	BL, BC, AR	BL, BC, PL
<i>Anemone quinquefolia</i>	wood anemone	Moist woods. Flowering in July.	S1 <sup>1</sup> May Be At Risk	--	CMW, LFH	--	BL, BC, PL, CR, AR, OL
<i>Arabis arundinacea</i>	mouse-ear cress	Moist, saline shores and flats by springs and lakes. Flowering from late April to June.	S1 <sup>1</sup> May Be At Risk	--	CMW	--	--
<i>Artemisia tilesii</i>	Herriot's sagewort	Open woods and river flats. Flowering from July to October.	S3 (W) <sup>1</sup> Sensitive	--	CMW, DMW	BL, BC, AR	BL, BC, PL, CR, AR, OL
<i>Aster engelmannii</i>	elegant aster	Open montane woods. Flowering from July to August.	S3S4 (W) <sup>1</sup>	--	CMW	--	--
<i>Astragalus bodinii</i>	Bodin's milk vetch	Gravelly banks and moist, sandy meadows. Flowering in July.	S1 <sup>1</sup> May Be At Risk	--	CMW, LBH	--	BL, BC, PL
<i>Blysmus rufus</i>	red bulrush	Saline fens and poorly drained iron-rich ponds. Flowering in July.	S1 <sup>1</sup>	--	CMW	--	--
<i>Bolboschoenus fluviatilis</i>	river bulrush	Margins of ponds and lakes. Flowering from June to July.	S1 <sup>1</sup> May Be At Risk	--	DMW	--	BC, BL, CR, PL, AR
<i>Boschniakia rossica</i>	ground-cone	Open woodland and scrub; parasitic on alder. Flowering in July.	S1 <sup>1</sup> May Be At Risk	--	LBH	--	BL, BC, PL, CR, AR, OL



Scientific Name	Common Name	Habitat	Provincial Designations	Federal/Global Designations	Natural Subregion <sup>3</sup>	Right-of-Way within Known Species Range <sup>4</sup>	Preferred Habitat on Proposed Right-of-Way <sup>4</sup>
<i>Botrychium ascendens</i>	ascending grape fern	Stream floodplain habitats dominated by deciduous shrubs. Flowering in late spring to midsummer.	S2 <sup>1</sup> May Be At Risk	G3 <sup>2</sup>	DMW	--	BL, BC, CR
<i>Botrychium crenulatum</i>	scalloped grape fern	Dry, open areas. Flowering from mid spring to late summer.	S1 <sup>1</sup> May Be At Risk	G3 <sup>2</sup>	LBH	--	BL, BC, AR, OL
<i>Botrychium hesperium</i>	western grape fern	Mesic grassy slopes, wooded areas. Flowering from early spring to early fall.	SU <sup>1</sup>	--	LBH	--	BL, BC, PL, CR, AR, OL
<i>Botrychium lanceolatum</i>	lance-leaved grape fern	Wet rocky slopes, meadows and woods. Flowering from late spring to midsummer.	S2 <sup>1</sup> Sensitive	--	LBH	BL, AR, OL	BL, BC, PL, CR, AR, OL
<i>Botrychium matricariifolium</i>	chamomile grape fern	Mesic grassy slopes. Flowering from early spring to early fall.	S1 <sup>1</sup>	--	DMW	--	BL, BC
<i>Botrychium michiganense</i>	Michigan grape fern	Open, grassy areas.	SU <sup>1</sup>	G3 <sup>2</sup>	DMW	--	BL, BC
<i>Botrychium multifidum</i> var. <i>intermedium</i>	leather grape fern	Moist sandy areas, fields.	S3 (W) <sup>1</sup>	--	CMW, DMW, LFH	BL, BC, PL, CR, AR	BL, BC, CR, AR
<i>Botrychium oneidense</i>	blunt-lobed grape fern	Moist, shady, acidic woods and swamps.	S1 <sup>1</sup>	--	CMW	PL	BL, BC, PL, CR, AR
<i>Botrychium pallidum</i>	pale moonwort	Open fields, occasionally shaded habitats.	S1 <sup>1</sup> May Be At Risk	G3 <sup>2</sup>	DMW	--	CR
<i>Botrychium pinnatum</i>	northwestern grape fern	Moist or wet, open places. Flowering from June to August.	S3 <sup>1</sup> Sensitive	--	CMW, DMW, LBH, LFH, UBH	--	BL, BC, PL, CR, AR, OL
<i>Botrychium simplex</i>	dwarf grape fern	Moist meadows and shores. Flowering from mid spring to early fall.	S2 <sup>1</sup> May Be At Risk	--	DMW	--	BL, BC, PL, CR
<i>Calamagrostis lapponica</i>	Lapland reed grass	Moist to dry gravelly slopes at high elevations. Flowering in August.	S1 <sup>1</sup> Sensitive	--	LBH	BL, BC	--
<i>Campanula aparinoides</i>	marsh bellflower	Wet meadows and marshes.	S1 <sup>1</sup> May Be At Risk	--	CMW	--	BL, BC, PL, CR, AR

Scientific Name	Common Name	Habitat	Provincial Designations	Federal/Global Designations	Natural Subregion <sup>3</sup>	Right-of-Way within Known Species Range <sup>4</sup>	Preferred Habitat on Proposed Right-of-Way <sup>4</sup>
<i>Cardamine parviflora</i>	small bitter cress	Sandy soil and dry woods. Flowering in July.	S1 <sup>1</sup> May Be At Risk	--	CMW, DMW	BL, BC, AR	BL, BC, CR
<i>Cardamine pratensis</i>	meadow bitter cress	Bogs and swamps. Flowering from June to July.	S3 (W) <sup>1</sup> May Be At Risk	--	CMW, DMW, LBH, LFH, UBH	PL, CR	BL, BC, PL, CR, AR, OL
<i>Carex adusta</i>	browned sedge	Dry acid soil; moist sandy ground under pine; stony ground. Flowering in July.	S1 <sup>1</sup> May Be At Risk	--	CMW, LFH	CR	BL, BC, CR
<i>Carex arcta</i>	narrow sedge	Moist woods. Flowering in July.	S1 <sup>1</sup> May Be At Risk	--	CMW, LFH	--	BL, BC, PL, CR, AR, OL
<i>Carex capitata</i>	capitate sedge	Boggy and often calcareous areas. Flowering from June to August.	S3 (W) <sup>1</sup> Sensitive	--	CMW, DMW, LFH	--	BL, BC, PL, CR, AR, OL
<i>Carex heleonastes</i>	Hudson Bay sedge	Often calcareous bogs and marshes. Fruiting from June to August	S2 <sup>1</sup> Secure	--	CMW, DMW, LBH, LFH	BC, CR	BL, BC, PL, CR, AR, OL
<i>Carex hookerana</i>	Hooker's sedge	Plains, dry banks and open woods. Flowering in June.	S3 (W) <sup>1</sup> Sensitive	--	DMW		BL, BC, PL, CR, AR, OL
<i>Carex hystericina</i>	porcupine sedge	Shady marshes. Flowering from May to June.	S1 <sup>1</sup> May Be At Risk	--	CMW, DMW	--	BL, BC
<i>Carex incurviformis</i> var. <i>incurviformis</i>	seaside sedge	Gravelly, alpine/subalpine areas; salt marshes, tundra, sand dunes, river flats. Flowering in June.	S2 <sup>1</sup>	--	LFH	--	CR, PL
<i>Carex lacustris</i>	lakeshore sedge	Marshes and swampy woods. Flowering from July to August.	S2 <sup>1</sup> May Be At Risk	--	CMW, DMW, LFH	BC, PL, CR	BL, BC, PL, CR, AR
<i>Carex mertensii</i>	purple sedge	Moist montane woods and streambanks. Flowering from May to July.	S2 <sup>1</sup> Sensitive	--	DMW	--	--
<i>Carex oligosperma</i>	few-fruited sedge	Wet meadows and bogs. Flowering in July.	S3? <sup>1</sup> Sensitive	--	CMW, LBH	--	BL, BC, PL, CR, AR, OL
<i>Carex pedunculata</i>	stalked sedge	Forest edges. Flowering from May to June.	S1 <sup>1</sup> May Be At Risk	--	CMW, DMW	--	BL, BC, PL, CR, AR, OL



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<i>Carex podocarpa</i>	alpine sedge	Alpine/subalpine meadows. Flowering from June to July.	S2 <sup>1</sup> Sensitive	--	LFH	--	--
<i>Carex scoparia</i>	broom sedge	Moist open woodlands, moderate elevations. Flowering from June to July.	S1 <sup>1</sup> May Be At Risk	--	CMW	--	BL, BC, PL, CR, AR, OL
<i>Carex umbellata</i>	umbellate sedge	Dry open areas, often sandy. Fruiting from mid-March to mid-July	S2 <sup>1</sup>	--	CMW, LFH	--	BL, BC, CR, AR, OL
<i>Carex vulpinoidea</i>	fox sedge	Swampy ground. Flowering from May to July.	S2 <sup>1</sup> May Be At Risk	--	CWM, DMW	--	BL, BC, PL, CR, AR
<i>Chrysosplenium iowense</i>	golden saxifrage	Streambanks and marshy ground in shade. Flowering from May to June	S3? <sup>1</sup> Sensitive	G3? <sup>2</sup>	CMW, DMW, LBH, UBH, LFH	BC, PL, CR, AR, OL	BL, BC, PL, CR, AR, OL
<i>Coptis trifolia</i>	goldthread	Damp, mossy woods, muskeg, willow scrub and tundra. Flowering in July.	S3 (W) <sup>1</sup>	--	CMW, DMW, LFH	PL	BL, BC, PL, CR, AR, OL
<i>Cypripedium acaule</i>	stemless lady's-slipper	Wetlands, woods, sand dunes, sphagnum bogs. Flowering from late June to July.	S3 <sup>1</sup> Sensitive	--	CMW	--	BL, BC, PL, CR, AR, OL
<i>Cystopteris montana</i>	mountain bladder fern	Springy or damp calcareous places. Sporulating from summer to fall	S2 <sup>1</sup> May Be At Risk	--	CMW, LFH	--	--
<i>Danthonia spicata</i>	poverty oat grass	Dry to moist open areas and open woodland. Flowering in July. Produces fruit from late July to September.	S2 <sup>1</sup> May Be At Risk	--	CMW, DMW	--	BL, BC, PL, CR, AR, OL
<i>Deschampsia elongata</i>	slender hair grass	Meadows and open slopes. Flowering from June to July.	S1 <sup>1</sup> May Be At Risk	--	LFH	--	BL
<i>Diphasiastrum sitchense</i>	ground-fir	Open woods and barrens.	S2 <sup>1</sup> May Be At Risk	--	CMW, LBH	BL, PL	BL, BC, PL, CR
<i>Doellingeria umbellata</i> var. <i>pubens</i>	flat-topped white aster	Moist woods, thickets, meadows and swampy sites. Flowering from July to September.	S2 <sup>1</sup>	--	DMW	--	BL, BC, PL, CR, AR

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<i>Drosera linearis</i>	slenderleaf sundew	Marly bogs, wet calcareous shores. Flowering in July.	S3 (W) <sup>1</sup> Sensitive	--	CMW, DMW, LFH	--	BL, BC, PL, CR
<i>Dryopteris cristata</i>	crested shield fern	Moist woods and marshes.	S1 <sup>1</sup> May Be At Risk	--	CMW, DMW, LBH	--	BL, BC, PL, CR
<i>Dryopteris filix-mas</i>	male fern	Wooded slopes.	S1 <sup>1</sup> May Be At Risk	--	CMW	--	BL, BC, PL, CR
<i>Dryopteris fragrans</i>	fragrant shield fern	Siliceous rocks.	S3 (W) <sup>1</sup> Sensitive	--	LFH	--	--
<i>Elatine triandra</i>	waterwort	Muddy shores and shallow water. Flowering from early summer to fall.	S1 <sup>1</sup>	--	CMW	--	BL, BC, PL, AR
<i>Eleocharis elliptica</i>	slender spikerush	Neutral to calcareous wet places. Flowering from May to August.	S2? <sup>1</sup>	--	CMW, DMW, LFH	--	BL, BC, PL, CR, AR, OL
<i>Elodea bifoliata</i>	two-leaved waterweed	Slow moving water with sandy bottoms. Flowering from July to August.	S2 <sup>1</sup> May Be At Risk	--	DMW	--	BL, BC
<i>Elodea canadensis</i>	Canada waterweed	Still or slow-flowing running water in sloughs, ponds and lakes. Flowering from July to September.	SU <sup>1</sup>	--	CMW	--	--
<i>Epilobium halleianum</i>	Hall's willowherb	Moist ground. Flowering and produces fruit in July.	S1 <sup>1</sup> May Be At Risk	--	CMW	--	BL, BC, PL, CR, AR, OL
<i>Epilobium lactiflorum</i>	white willowherb	Moist streambanks and moist slopes to alpine elevations. Flowering from June to August.	S2 <sup>1</sup> May Be At Risk	--	CMW	--	BL, BC, PL, CR
<i>Eupatorium maculatum</i>	spotted Joe-pye weed	Marshy ground and moist open woods. Flowering from July to September.	S1S2 <sup>1</sup>	--	CMW, DMW	OL	BL, BC, PL, CR, AR
<i>Gentianopsis detonsa</i> ssp. <i>raupii</i>	northern fringed gentian	Moist banks and meadows. Flowering from late June to early August.	S1 <sup>1</sup>	G3G5T3T5 <sup>2</sup>	CMW	PL, CR	BL, BC, PL, CR, AR
<i>Geranium carolinianum</i>	Carolina wild geranium	Dry rocky woods, disturbed sites. Flowering from April to July.	S1 <sup>1</sup> Sensitive	--	CMW, DMW	--	BL, BC, PL, CR, AR, OL



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<i>Glyceria elata</i>	tufted tall manna grass	Streamsides, wet meadows. Flowering from May to July.	S2 <sup>1</sup> Sensitive	--	DMW, LFH	--	BL, BC, PL, CR
<i>Gymnocarpium disjunctum</i>	western oak fern	Moist forests, glades, rocky slopes and streambanks.	S1 <sup>1</sup> Sensitive	--	DMW, LFH	--	BL, BC, PL, CR, AR, OL
<i>Gymnocarpium jessoense</i>	northern oak fern	Rock crevices.	S1 <sup>1</sup> May Be At Risk	--	CMW, DMW	--	--
<i>Hedyotis longifolia</i>	long-leaved bluets	Open sandy woods and montane slopes. Flowering from June to July.	S2 <sup>1</sup>	--	CMW, DMW	--	BL, BC, CR
<i>Hypericum majus</i>	large Canada St. John's-wort	Moist depressions in sand dunes, sandy shores. Flowering from late June to September.	S2 <sup>1</sup> Sensitive	--	CMW, DMW	--	BL, CR
<i>Isoetes echinospora</i>	northern quillwort	Ponds and lakes; shallow water. Flowering in late August.	S2 <sup>1</sup> May Be At Risk	--	LBH	--	BL, BC, CR, AR
<i>Juncus brevicaudatus</i>	short-tail rush	Shores and marshes; pioneer on wet ground. Fruiting from midsummer to fall	S2 <sup>1</sup> Sensitive	--	CMW, DMW	CR	BL, BC, PL, CR, AR
<i>Juncus nevadensis</i>	Nevada rush	Wet areas. Flowering from July to August.	S1 <sup>1</sup> May Be At Risk	--	CMW	--	BL, BC, PL, CR, AR, OL
<i>Juncus stygius</i> var. <i>americanus</i>	marsh rush	Fens, mossy areas around springs and seepages. Flowering in August.	S2 <sup>1</sup>	--	CMW, DMW, LBH, LFH	--	BL, BC, PL, CR, AR, OL
<i>Lactuca biennis</i>	tall blue lettuce	Moist open woods. Flowering from July to August.	S2 <sup>1</sup> May Be At Risk	--	CMW, DMW, LFH	--	BL, BC, PL, CR, AR, OL
<i>Liparis loeselii</i>	Loesel's twayblade	Cool, moist ravines, bogs, or fens; wet, peaty or sandy meadows; exposed sand along edges of lakes; colonizes previously open and disturbed habitats during early and middle stages of reforestation. Flowering from May to August.	S1 <sup>1</sup> May Be At Risk	--	CMW, DMW	--	BL, BC, PL, CR, AR, OL
<i>Lomatogonium rotatum</i>	marsh felwort	Wet meadows and saline flats. Flowering from August to early September.	S2S3 <sup>1</sup> May Be At Risk	--	DMW	--	BL, BC, PL

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<i>Luzula acuminata</i>	sharp-pointed wood-rush	Moist woodland, clearings. Flowering from April to May.	S1 <sup>1</sup> May Be At Risk	--	CMW, DMW, LFH	--	BL, BC, PL, CR, AR, OL
<i>Luzula rufescens</i>	reddish wood-rush	Mixedwood forest. Flowering and fruiting in summer	S1 <sup>1</sup> Sensitive	--	CMW, DMW, LFH	OL	BL, BC, PL, CR, AR, OL
<i>Malaxis paludosa</i>	bog adder's-mouth	Black spruce bogs, in sphagnum moss. Flowering from June to August.	S1 <sup>1</sup> May Be At Risk	--	CMW, DMW	--	BL, BC, PL, CR, OL
<i>Mimulus guttatus</i>	yellow monkeyflower	Stream margins, meadows, springs. Flowering from July to August.	S2S3 <sup>1</sup>	--	CMW, LFH	--	BL, BC, PL, CR
<i>Monotropa hypopithys</i>	pinemap	Moist woods; saprophytic in coniferous woods. Flowering in July.	S2 <sup>1</sup> May Be At Risk	--	CMW, LFH	--	BL, BC, PL, CR, OL
<i>Muhlenbergia asperifolia</i>	scratch grass	Moist alkaline soil, especially where sandy.	S3 (W) <sup>1</sup> Sensitive	--	DMW	--	--
<i>Muhlenbergia racemosa</i>	marsh muhly	Sandhills and dry slopes. Flowering from late July to August. Produces fruit from August to September.	S2 <sup>1</sup> May Be At Risk	--	CMW, DMW	--	--
<i>Najas flexilis</i>	slender naiad	Ponds and streams. Flowering from July to August.	S2 <sup>1</sup> May Be At Risk	--	CMW, DMW, LFH	--	BL, BC, PL, CR, AR
<i>Nymphaea leibergii</i>	pygmy water-lily	Ponds and quiet waters. Flowering from June to September.	S1S2 <sup>1</sup> May Be At Risk	--	CMW, DMW	--	BL, BC, PL, CR, AR
<i>Nymphaea tetragona</i>	white water-lily	Lakes, ponds and slow-moving streams; likes deep and acidic water. Flowering throughout the summer.	S1 <sup>1</sup> May Be At Risk	--	CMW	--	BL, BC, PL, CR, AR
<i>Oryzopsis canadensis</i>	Canadian rice grass	Open woods and hillsides.	S1 <sup>1</sup>	--	DMW	--	BL, BC, PL, CR
<i>Oryzopsis micrantha</i>	little-seed rice grass	Dry open areas and rocky slopes; sandy woodlands. Flowering from June to July.	S2 <sup>1</sup>	--	DMW	--	BL, BC, CR
<i>Oxytropis campestris</i> var. <i>davisii</i>	northern locoweed	Alpine/subalpine and subalpine meadows and dry ridges. Flowering from June to August.	S2? <sup>1</sup>	G5T3 <sup>2</sup>	LFH	--	--



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<i>Panicum leibergii</i>	Leiberg's millet	Dry prairie and clearings. Flowering from June to July.	S1 <sup>1</sup>	--	DMW	--	--
<i>Pellaea glabella</i>	smooth cliff-brake	Dry limestone rocks. Sporulating from summer to fall.	S2 <sup>1</sup> May Be At Risk	--	CMW	--	--
<i>Pellaea glabella</i> ssp. <i>simplex</i>	smooth cliff-brake	Calcareous cliffs and ledges. Sporulating from summer to fall.	S2 <sup>1</sup>	--	CMW	--	--
<i>Phegopteris connectilis</i>	northern beech fern	Moist woodlands.	S2 <sup>1</sup> May Be At Risk	--	CMW, LFH		BL, BC, PL, CR, AR, OL
<i>Physostegia ledinghamii</i>	false dragonhead	Moist woods and streambanks. Flowering from July to September.	S3 (W) <sup>1</sup> May Be At Risk	G3? <sup>2</sup>	CMW, DMW, LBH	CR	BL, BC, PL, CR, AR, OL
<i>Pinguicula villosa</i>	small butterwort	Sphagnum bogs. Flowering from mid-June to July.	S2 <sup>1</sup> Sensitive	--	CMW, LBH	--	BL, BC, PL, CR, AR, OL
<i>Plantago canescens</i>	western ribgrass	Non-alkaline grassy and gravelly slopes. Flowering in June.	S3 (W) <sup>1</sup> Sensitive	--	DMW	OL	--
<i>Plantago maritima</i>	seaside plantain	Saline marshes. Flowering in June.	S1 <sup>1</sup> May Be At Risk	--	CMW	--	--
<i>Polygala paucifolia</i>	fringed milkwort	Marshy coniferous woods. Flowering from May to early July.	S1 <sup>1</sup> May Be At Risk	--	CMW	--	BL
<i>Polypodium sibiricum</i>	Siberian polypody	Shaded, sheltered slopes. Sporulating from summer to early fall.	S3 (W) <sup>1</sup> Sensitive	--	CMW	PL	BL, BC, PL, CR
<i>Potamogeton foliosus</i>	leafy pondweed	Shallow standing water. Flowering from July to September.	S2 <sup>1</sup>	--	CMW, DMW, LFH	PL	BL, BC, PL, CR, AR
<i>Potamogeton obtusifolius</i>	blunt-leaved pondweed	Lakes and ponds; cold springs, streams. Flowering from July to September.	S2 <sup>1</sup> Sensitive	--	DMW, LBH, LFH	--	BL, BC, PL, CR, AR
<i>Potamogeton robbinsii</i>	Robbins' pondweed	Shallow water. Flowering from August to September.	S1 <sup>1</sup> Sensitive	--	CMW, DMW	--	BL, BC, PL, CR, AR
<i>Potamogeton strictifolius</i>	linear-leaved pondweed	Wet places, submerged in water. Flowering from July to September.	S2 <sup>1</sup> Sensitive	--	CMW, LBH	CR	BL, BC, PL, CR, AR

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<i>Potentilla multifida</i>	branched cinquefoil	Gravel bars and open slopes. Flowering in July.	S1 <sup>1</sup>	--	CMW	--	BL, PL
<i>Primula egaliksensis</i>	Greenland primrose	Wet meadows and shores. Flowering from June to July.	S2 <sup>1</sup> Sensitive	--	LFH	--	BL, BC, PL CR,
<i>Pyrrocoma uniflora</i>	one-flowered ironplant	Dry to moist open slopes and banks. Flowering from May to September.	S3 (W) <sup>1</sup>	--	DMW	--	BL, BC, PL, CR, AR
<i>Ranunculus uncinatus</i>	hairy buttercup	Moist shaded woodland. Flowering from April to July.	S3 (W) <sup>1</sup> Sensitive	--	LFH	--	BL, BC, PL, CR, OL
<i>Rhynchospora capillacea</i>	slender beak-rush	Calcareous bogs. Flowering in July.	S1 <sup>1</sup> May Be At Risk	--	CMW, DMW	--	--
<i>Rubus x paracaulis</i>	hybrid dwarf raspberry	Boggy woods and marshes.	S1 <sup>1</sup>	--	DMW	--	BL, BC, PL, CR, AR, OL
<i>Ruppia cirrhosa</i>	widgeon-grass	Saline and alkaline lakes, ponds and ditches. Flowering in July.	S1 <sup>1</sup> Sensitive	--	DMW	--	--
<i>Sagittaria latifolia</i>	broad-leaved arrowhead	Ponds and lakes. Flowering in August.	S2 <sup>1</sup> May Be At Risk	--	CMW, DMW, LFH	--	BL, BC, CR, AR
<i>Salix raupii</i>	Raup's willow	Thickets in moist open forests and on gravel floodplains. Flowering in spring.	S1 <sup>1</sup> May Be At Risk	G2 <sup>2</sup>	LFH	--	BL, AR
<i>Salix sitchensis</i>	Sitka willow	Alluvial soil (Athabasca River). Flowering in May.	S1 <sup>1</sup> May Be At Risk	--	CMW, LBH	--	PL
<i>Schizachyrium scoparium</i> var. <i>scoparium</i>	little bluestem	Prairie grassland, foothills; calcareous soil. Flowering from July to August.	S3 (W) <sup>1</sup>	--	LFH		--
<i>Scirpus pallidus</i>	pale bulrush	Marshy areas. Flowering from June to July.	S1 <sup>1</sup> May Be At Risk	--	CMW	CR	BL, BC, PL, CR, AR
<i>Sisyrinchium septentrionale</i>	pale blue-eyed grass	Moist grassy areas. Flowering from May to July.	S3 <sup>1</sup> Sensitive	G3G4 <sup>2</sup>	CMW, DMW	--	--
<i>Sparganium glomeratum</i>	bur-reed	Ponds. Flowering in July.	S1 <sup>1</sup> May Be At Risk	--	CMW, DMW	--	BL, BC, PL, CR, AR

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<i>Sparganium hyperboreum</i>	northern bur-reed	Aquatic plants in shallow alpine/subalpine lakes. Flowering from July to August.	S1 <sup>1</sup> Sensitive	--	CMW	--	--
<i>Spartina pectinata</i>	prairie cord grass	Saline shores and marshes. Flowering from late June to July.	S1 <sup>1</sup> May Be At Risk	--	CMW	PL	--
<i>Spergularia salina</i>	salt-marsh sand spurry	Brackish or saline muds and sands. Flowering from May to August.	S2S3 <sup>1</sup> May Be At Risk	--	CMW	PL	--
<i>Sphenopholis obtusata</i>	prairie wedge grass	Moist meadows, open woods. Flowering from June to July.	S2 <sup>1</sup> May Be At Risk	--	CMW, DMW, LFH	--	BL, BC, PL, CR
<i>Spiranthes lacera</i>	northern slender ladies'-tresses	Small disturbed areas within moist mixedwood forests. Flowering in mid-July.	S1 <sup>1</sup> May Be At Risk	--	CMW	PL	BL, BC, PL, CR, AR, OL
<i>Stellaria crispa</i>	wavy-leaved chickweed	Moist woods, moderate elevations. Flowering from June to July.	S2 <sup>1</sup> May Be At Risk	--	CMW, LFH	BL, BC, AR	BL, BC, PL, CR, AR, OL
<i>Streptopus roseus</i>	rose mandarin	Moist coniferous forests. Flowering from June to July.	S1 <sup>1</sup>	--	CMW, LFH	--	BL, BC, PL, CR, OL
<i>Trichophorum clintonii</i>	Clinton's bulrush	Open woodland and turfy shores. Flowering from May to June.	S1 <sup>1</sup> May Be At Risk	--	CMW, DMW, LFH	--	BL, BC, PL, CR, OL
<i>Trichophorum pumilum</i>	dwarf bulrush	Calcareous bogs. Flowering in June.	S3 (W) <sup>1</sup> Sensitive	--	DMW	OL	--
<i>Viola pallens</i>	Macloskey's violet	Boggy or wet ground and wet thickets. Flowering from May to July.	S2S3 <sup>1</sup>	--	CMW, DMW, LFH	--	BL, BC, PL, CR, AR
<i>Wolffia borealis</i>	northern ducksmeal	Ponds, lakes and slow-moving streams. Flowering from summer to early fall (very rarely).	S3 (W) <sup>1</sup>	--	DMW	--	BL, BC, PL, CR, AR
<i>Wolffia columbiana</i>	watermeal	Floating or just beneath surface in beaver ponds. Reproduce only by budding.	S2 <sup>1</sup> Sensitive	--	CMW, DMW	--	BL, BC, PL, CR



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<b>NON-VASCULAR PLANTS</b>							
<i>Aloina brevirostris</i>	short-beaked rigid screw moss	Bare or disturbed soil or silt, roadside banks, calcareous boulders or gravel, low to moderate elevations.	S2 <sup>1</sup>	G3G5 <sup>2</sup>	CMW, DMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Aloina rigida</i>	aloe-like rigid screw moss	Rocks, banks, clay, sandy or gravelly soil in deserts, plains, or coniferous forests, moderate to high elevations.	S2 <sup>1</sup>	G3G5 <sup>2</sup>	CMW, DMW, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR
<i>Amblyodon dealbatus</i>	Amblydon moss	Rich fens; occurs sporadically on rotting wood and organic soil.	S2 <sup>1</sup> Sensitive	G3G5 <sup>2</sup>	CMW, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Anaptychia crinalis</i>	fringe lichen	Limey cliffs, full sun or partial shade, especially overlooking streams or lakes, rarely on shrubs.	S2 <sup>1</sup> May Be At Risk	--	DMW	N/A <sup>5</sup>	--
<i>Anastrophyllum helleranum</i>	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 <sup>1</sup>	--	CMW, DMW, LBH, LFH	N/A <sup>5</sup>	BL, BC, PL, CR
<i>Anomodon minor</i>	Anomodon moss	Bark, base of trees at breast height, calcareous rocks.	S1 <sup>1</sup> May Be At Risk	--	CMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Aongstroemia longipes</i>	Aongstroemia moss	Moist, exposed, sandy or silty soil depressions, stream banks in montane coniferous forests, subalpine regions, mountains and northern latitudes, low to high elevations.	S2 <sup>1</sup>	--	CMW, DMW, LFH	N/A <sup>5</sup>	BL, BC
<i>Athalamia hyalina</i>	Athalamia liverwort	Thin mineral soil over friable limestone, on open ground, ledges of eroding crags or tucked under boulders.	S2 <sup>1</sup>	--	LFH	N/A <sup>5</sup>	--
<i>Atrichum selwynii</i>	Atrichum moss	Soil, open or shaded habitats, bare roadside banks, overturned tree roots, low to high elevations.	S2 <sup>1</sup>	--	DMW, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL

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<i>Atrichum undulatum</i>	undulated crane's bill moss	Soil, dry weedy habitats, especially roadside ditches, low elevations.	S1S2 <sup>1</sup>	--	DMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Aulacomnium androgynum</i>	little groove moss	Tree trunks, rotten logs, stumps, sometimes on soil or soil over rock.	S2 <sup>1</sup> Sensitive	--	LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Bacidia bagliettoana</i>	dot lichen	Soil with humus over moss.	S2 <sup>1</sup>	--	CMW, DMW, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Bacidia pallens</i>	dot lichen	Grows on a number of woody plants, including Alnus, Salix, Betula, Picea and Abies species.	S1S3 <sup>1</sup>	G3G5 <sup>2</sup>	CMW, LBH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Barbilophozia attenuata</i>	Barbilophozia liverwort	Calcifuge, on circumneutral to acid soft sandstone to granite, tops of boulders and stone walls, ledges, vertical surfaces, thin layer of peat or humus. Also, steep peaty, sandy or loamy banks, decaying logs/stumps, trunks/bases of living trees.	S1 <sup>1</sup>	--	CMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Barbilophozia kunzeana</i>	Barbilophozia liverwort	Well-drained circumneutral or acid microhabitats, on peat, mosses, leaf litter, twigs, grassy tussocks, wet heaths, vally bogs, marshes, wet pastures, flushed rocky banks and streamsides.	S2 <sup>1</sup>	--	CMW, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Barbula coreensis</i>	Barbula moss	Unknown.	S1 <sup>1</sup>	G3G5 <sup>2</sup>	LFH	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Biatora porphyrospoda</i>	dot lichen	Unknown.	SNR <sup>1</sup>	GNR <sup>2</sup>	CMW, LBH	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Biatora pullata</i>	dot lichen	Unknown.	S1S3 <sup>1</sup>	GNR <sup>2</sup>	CMW, LBH	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Biatora subduplex</i>	disk lichen	Unknown.	SNR <sup>1</sup>	--	CMW	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Biatora turgidula</i>	dot lichen	Unknown.	S2 <sup>1</sup>	GNR <sup>2</sup>	LBH	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Biatora vacciniicola</i>	dot lichen	On twigs and at the base of shrub species including Alnus, Salix, Betula, Juniperus and Sorbus species.	S1? <sup>1</sup>	GNR <sup>2</sup>	CMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL

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<i>Biatora vernalis</i>	dot lichen	Mosses over rocks and tree bases, rarely directly on bark, usually in shaded forests.	SU <sup>1</sup>	--	CMW	PL	BL, BC, PL, CR, AR, OL
<i>Blasia pusilla</i>	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, lowlands to alpine elevations.	S1 <sup>1</sup>	--	CMW, DMW, LBH	BC	BL, BC, AR, OL
<i>Blindia acuta</i>	sharp-pointed weissia	Moist or dripping acidic rock faces, most common in montane to alpine habitats, low to high elevations.	S2 <sup>1</sup> Sensitive	--	CMW, DMW, LFH	N/A <sup>5</sup>	--
<i>Brachythecium acuminatum</i>	Brachythecium moss	Unknown.	S1S2 <sup>1</sup>	--	CMW, DMW, LFH	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Brachythecium acutum</i>	Brachythecium moss	Unknown.	SU <sup>1</sup>	GNRQ <sup>2</sup>	DMW	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Brachythecium frigidum</i>	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, lowlands to 3300 m ASL.	SU <sup>1</sup> Sensitive	--	CMW	N/A <sup>5</sup>	BL, BC, PL, CR
<i>Brachythecium hylotapetum</i>	Brachythecium moss	Soil, humus, rotten wood, forest litter, open places, lowlands to 2000 m ASL.	S3 <sup>1</sup> Sensitive	GU <sup>2</sup>	CMW, LBH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Brachythecium reflexum</i>	Brachythecium moss	Most common in the montane on soil, logs and litter.	S2 <sup>1</sup>	--	CMW, DMW	N/A <sup>5</sup>	--
<i>Brachythecium rutabulum</i>	Brachythecium moss	Soil, soil over rock, roots, logs, moist places, usually in lowlands.	S2? <sup>1</sup>	--	CMW, DMW, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Bryobrittonia longipes</i>	Bryobrittonia moss	Calcareous soils, along stream and river banks in arctic and montane habitats.	S2 <sup>1</sup> Sensitive	G3G4 <sup>2</sup>	CMW, DMW, LFH	PL	BL, BC



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<i>Bryoria nadvornikiana</i>	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 <sup>1</sup> May Be At Risk	GNR <sup>2</sup>	CMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Bryum algovicum</i>	Bryum moss	Probably restricted to calcareous habitats. Soil or rock in wet, seepy places, especially on bare sandy or gravelly seeps, or in wet crevices of cliffs.	S2 <sup>1</sup>	--	CMW, LBH, LFH	N/A <sup>5</sup>	--
<i>Bryum cyclophyllum</i>	round-leaved bryum	Moist ground, rock crevices, sandy soil in wet places.	S2 <sup>1</sup> Sensitive	--	LBH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Bryum flaccidum</i>	Bryum moss	Soft, moist bark in fissures of tree trunks or at the base of trees.	SU <sup>1</sup>	--	CMW, DMW, LBH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Bryum muehlenbeckii</i>	Bryum moss	Wet soil and stones, often near streams.	S1S2 <sup>1</sup> Sensitive	--	LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Bryum pallens</i>	Bryum moss	Wet soil, from lowlands to 2700 m ASL.	S2 <sup>1</sup>	--	CMW, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Bryum purpurascens</i>	Bryum moss	Wet, sandy soil.	S1 <sup>1</sup>	G3G4 <sup>2</sup>	LFH	N/A <sup>5</sup>	BL, BC, CR, AR, OL
<i>Bryum uliginosum</i>	Bryum moss	Wet calcareous soil or humus near seepage or rock crevices.	S2 <sup>1</sup>	G3G5 <sup>2</sup>	CMW, DMW, LFH	N/A <sup>5</sup>	--
<i>Buellia arborea</i>	button lichen	Unknown.	S1? <sup>1</sup>	GNR <sup>2</sup>	CMW	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Buellia griseovirens</i>	button lichen	Unknown.	SNR <sup>1</sup>	GNR <sup>2</sup>	CMW, LBH, UBH	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Buellia schaereri</i>	Schaerer's disc lichen	Unknown.	SNR <sup>1</sup>	GNR <sup>2</sup>	CMW	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Buxbaumia aphylla</i>	bug on a stick	Decaying wood, humus, shallow acidic soil, soil depressions on rock outcrops, well-lit to somewhat shaded sites, low to moderate elevations.	S2 <sup>1</sup> Sensitive	--	CMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Calicium glaucellum</i>	lichen	Unknown.	SNR <sup>1</sup>	G4G5 <sup>2</sup>	LBH	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Calicium salicinum</i>	stubble lichen	Unknown.	S1 <sup>1</sup>	--	CMW, LFH	N/A <sup>5</sup>	N/A <sup>5</sup>

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<i>Calicium trabinellum</i>	yellow collar stubble lichen	Wood.	S2 <sup>1</sup>	--	CMW, DMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Callicladium haldanianum</i>	Callicladium moss	Soil and decomposing logs.	S1 <sup>1</sup> Sensitive	--	CMW, DMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Caloplaca ahtii</i>	firedot lichen	Unknown.	SNR <sup>1</sup>	GNR <sup>2</sup>	CMW, LBH	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Caloplaca flavovirescens</i>	sulphur-firedot lichen	Rocks containing calcium such as limestone and sandstones; concrete.	S2S3 <sup>1</sup>	--	CMW	N/A <sup>5</sup>	--
<i>Caloplaca xanthostigmoidea</i>	firedot lichen	Unknown.	S1S3 <sup>1</sup>	GNR <sup>2</sup>	CMW, LFH	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Calypogeia integristipula</i>	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, montane block screes.	S1 <sup>1</sup>	--	CMW	N/A <sup>5</sup>	--
<i>Calypogeia muelleriana</i>	Calypogeia liverwort	Less tolerant of deep shade and constantly wet conditions, more often on peat than soil. Lowland to alpine elevations (near 0 m ASL to 920 m ASL).	S2 <sup>1</sup>	--	CMW, DMW, LBH	N/A <sup>5</sup>	BL, BC, PL, CR, OL
<i>Calypogeia suecica</i>	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 m ASL to 300 m ASL.	S1 <sup>1</sup>	--	CMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Campylium radicale</i>	Campylium moss	Wet places.	S2 <sup>1</sup>	G3G5 <sup>2</sup>	CMW, DMW, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Candelariella efflorescens</i>	powdery goldspeck lichen	Common on all kinds of bark and sometimes wood.	S1 <sup>1</sup>	--	CMW, LBH	PL	BL, BC, PL, CR, AR, OL
<i>Candelariella lutella</i>	goldspeck lichen	Unknown.	S1? <sup>1</sup>	GNR <sup>2</sup>	CMW	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Candelariella xanthostigma</i>	goldspeck lichen	Unknown.	SU <sup>1</sup>	--	LBH	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Catinaria atropurpurea</i>	Catinaria lichen	Unknown.	SNR <sup>1</sup>	GNR <sup>2</sup>	CMW	N/A <sup>5</sup>	N/A <sup>5</sup>

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<i>Cephalozia bicuspidata</i>	Cephalozia liverwort	Calcifuge, almost any moist or wet, shaded or insolated habitat on acidic, circumneutral or well-leached sand, loam, peat, humus, cliff ledges, boulders, rocks, rotting wood, lowland to alpine elevations.	S1 <sup>1</sup>	--	CMW, DMW	PL	BL, BC, PL, CR, AR, OL
<i>Cephalozia loitlesbergeri</i>	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 <sup>1</sup>	--	CMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Cephaloziella hampeana</i>	Cephaloziella liverwort	On living Sphagnum, tracks, waste ground and rocky slopes. Lowland to alpine elevations.	S1 <sup>1</sup>	--	CMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Cetrelia olivetorum</i>	sea-storm lichen	Unknown.	S1? <sup>1</sup>	G3G5 <sup>2</sup>	CMW	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Chaenotheca chrysocephala</i>	stubble lichen	Bark and wood of conifers or birch throughout the boreal region.	S2 <sup>1</sup>	--	LBH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Chaenothecopsis debilis</i>	stubble lichen	Unknown.	SNR <sup>1</sup>	GNR <sup>2</sup>	CMW	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Chiloscyphus polyanthos</i>	Chiloscyphus liverwort	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, humus-rich soil in wet woodlands and marshes. Lowland to alpine elevations.	S1 <sup>1</sup>	--	CMW, LFH	N/A <sup>5</sup>	BL, BC, PL, CR
<i>Cladonia acuminata</i>	Cladonia lichen	Calcareous soil.	S1? <sup>1</sup>	--	CMW	PL	--
<i>Cladonia bellidiflora</i>	floral pixie	Rotting wood and stumps, moss or soil.	S2S3 <sup>1</sup>	--	CMW, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Cladonia digitata</i>	finger pixie-cup	Well-rotted wood and peat, sometimes mossy tree bases.	S2 <sup>1</sup> May Be At Risk	G3G5 <sup>2</sup>	CMW	PL	BL, BC, PL, CR, AR, OL



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<i>Cladonia glauca</i>	Cladonia lichen	On humus-rich soil and peat bogs.	S1 <sup>1</sup> May Be At Risk	GNR <sup>2</sup>	CMW	N/A <sup>5</sup>	BL, BC, PL, CR, OL
<i>Cladonia gracilis</i> ssp. <i>gracilis</i>	smooth cladonia	Unknown.	SU <sup>1</sup>	G5TNR <sup>2</sup>	CMW	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Cladonia grayi</i>	Gray's cup lichen	Soils, rocks, bases of trees, stumps, logs and on mosses in roadsides and open woods.	S2S3 <sup>1</sup> May Be At Risk	GU <sup>2</sup>	CMW, LBH	PL	BL, BC, PL, CR, AR, OL
<i>Cladonia macrophylla</i>	Cladonia lichen	On soil among rocks.	S2 <sup>1</sup> May Be At Risk	GNR <sup>2</sup>	CMW, LBH	N/A <sup>5</sup>	--
<i>Cladonia merochlorophaea</i>	Cladonia lichen	Humus-rich soil, on tundra heaths and in bogs.	S2 <sup>1</sup> May Be At Risk	GU <sup>2</sup>	CMW, LBH	PL	BL, BC, PL, CR, OL
<i>Cladonia metacorallifera</i>	Cladonia lichen	On soil with some humus content.	S2 <sup>1</sup> May Be At Risk	GNR <sup>2</sup>	LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Cladonia norvegica</i>	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 <sup>1</sup> May Be At Risk	--	CMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Cladonia ochrochlora</i>	smooth-footed powderhorn	Decaying wood, rarely on soil.	S1? <sup>1</sup>	--	CMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Cladonia portentosa</i>	reindeer lichen	Sandy soil and humus or moss over sand. Stabilized dunes, roadcuts through dunes, dry areas in deflation plains, seashore cliffs, usually in exposed to partially shaded sites.	S1 <sup>1</sup>	GNR <sup>2</sup>	CMW	N/A <sup>5</sup>	--
<i>Cladonia ramulosa</i>	Cladonia lichen	Soil and rotting logs.	S1 <sup>1</sup> May Be At Risk	--	CMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Cladonia rei</i>	wand lichen	Soil or wood in the open.	S2 <sup>1</sup> May Be At Risk	G3G5 <sup>2</sup>	CMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL

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<i>Cladonia squamosa</i>	dragon cladonia lichen	Soil or logs in forests, sometimes in exposed sites, shade tolerant.	S2 <sup>1</sup> May Be At Risk	--	CMW, DMW, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Cladonia stricta</i>	Cladonia lichen	Unknown.	SU <sup>1</sup>	GNR <sup>2</sup>	CMW, LBH	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Cladonia stygia</i>	reindeer lichen	Northern bogs, also found in drier sites in boreal and arctic regions of the Northern Hemisphere.	S2 <sup>1</sup>	--	CMW, DMW, LBH, UBH	PL	BL, BC, PL, CR, AR, OL
<i>Cladonia symphy carpia</i>	split-peg lichen	Open areas on thin or sandy soil, especially in calcium-rich areas.	S2 <sup>1</sup> May Be At Risk	G3G5 <sup>2</sup>	DMW, LFH	N/A <sup>5</sup>	BL, BC, CR, AR, OL
<i>Cladonia umbricola</i>	shaded cladonia	Shaded habitats, almost exclusively on rotting wood.	S1 <sup>1</sup> May Be At Risk	G3G5 <sup>2</sup>	CMW, LBH, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Collema nigrescens</i>	blistered jelly lichen	Bark on hardwoods and shrubs in hardwood forests at low elevations.	S1 <sup>1</sup> May Be At Risk	--	LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Collema subflaccidum</i>	tree jelly lichen	Bark of hardwoods and occasionally conifers, especially in old forests. Also, on shaded or mossy rocks.	S2 <sup>1</sup>	--	LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Conardia compacta</i>	Conardia moss	Damp cliffs (especially limestone), logs, stumps, humus, bark at the base of trees in wooded swamps.	S2 <sup>1</sup>	G3G5 <sup>2</sup>	CMW, DMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Conocephalum salebrosum</i>	Snakeskin liverwort	Moist, shaded and calcareous habitats, along streams, near springs and bases of moist rocks and cliffs. More desiccation tolerant than C. conicum.	S2 <sup>1</sup>	GNR <sup>2</sup>	CMW, DMW, LBH, LFH	PL	BL, BC, PL, CR
<i>Cynodontium jenneri</i>	Cynodontium moss	Unknown.	SNR <sup>1</sup>	--	LBH	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Cyphelium tigillare</i>	soot lichen	Weathered wood of Picea, Thuja and Pinus species, old oak fence posts.	S2 <sup>1</sup>	--	CMW, DMW, LBH, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Dermatocarpon luridum</i>	brook lichen	Siliceous rocks including granite, in and along streams and at lake edges.	S2 <sup>1</sup> May Be At Risk	--	LBH	N/A <sup>5</sup>	--

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<i>Dermatocarpon moulinsii</i>	stippleback	Calcareous cliffs.	GNR <sup>1</sup> May Be At Risk	--	CMW	N/A <sup>5</sup>	--
<i>Desmatodon cernuus</i>	narrow-leafed chain-teeth moss	Soil in calcareous regions, lowlands to 2700 m ASL.	S1 <sup>1</sup>	G3G5 <sup>2</sup>	DMW	N/A <sup>5</sup>	--
<i>Desmatodon heimii</i>	long-stalked beardless moss	Moist, alkaline soil, banks, frost boils, lake shores, friable shale, near streams, low to high elevations (0 m ASL to 2900 m ASL).	S2 <sup>1</sup>	--	DMW	N/A <sup>5</sup>	BL, BC, PL, CR
<i>Dichelyma falcatum</i>	Dichelyma moss	Bases of boulders in stream beds, places that are flooded for part of the year, often in fast-moving water, rapids.	S2 <sup>1</sup> Sensitive	--	LBH	N/A <sup>5</sup>	BL, BC, PL
<i>Dicranella cerviculata</i>	red-necked fork moss	Disturbed sand, clay or peaty soil, roadbanks, low to medium elevations.	S1 <sup>1</sup> Sensitive	--	CMW, LBH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Dicranella crispa</i>	curl-leaved fork moss	Moist, sandy or silty soil, medium to high elevations.	S2 <sup>1</sup> Sensitive	G3G5 <sup>2</sup>	LFH	N/A <sup>5</sup>	BL, BC, AR, OL
<i>Dicranella heteromalla</i>	silky fork moss	Soil of shaded banks, along woodland trails, soil covering upturned roots, low to high elevations.	S1 <sup>1</sup> May Be At Risk	--	CMW, LBH, LFH	N/A <sup>5</sup>	BL, BC, PL, CR
<i>Dicranella subulata</i>	awl-leaved fork moss	Damp soil on banks, rocky places at low to medium elevations.	S2 <sup>1</sup> Sensitive	--	LFH	N/A <sup>5</sup>	BL, BC, PL, CR
<i>Dicranum ontariense</i>	cushion moss	Humus, soil, soil over rock, rarely rotten wood or stumps, mesic to dry coniferous woods, swamps and bogs at 60 m ASL to 1200 m ASL.	S1 <sup>1</sup>	--	DMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Dicranum spadiceum</i>	cushion moss	Fens, wet meadows, willow thickets, humus or soil on or around rocks at lake margins, occasionally drier habitats such as beach ridges at 10 m ASL to 2300 m ASL.	S2 <sup>1</sup>	--	CMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR



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<i>Dicranum tauricum</i>	broken-leaf moss	Rotten logs, stumps, tree bases in woodlands, humus or humus over rock at 150 m ASL to 2200 m ASL.	S1S2 <sup>1</sup> Sensitive	--	CMW, DMW, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Didymodon fallax</i>	fallacious screw moss	Soil, silt, conglomerate, dolomite, sandstone, concrete, culverts, gypsum, shale, calcareous rock, moderate to high elevations (200 m ASL to 3300 m ASL).	S2 <sup>1</sup> Sensitive	--	DMW	N/A <sup>5</sup>	BL, BC, AR, OL
<i>Didymodon rigidulus</i>	rigid screw moss	Basalt, calcareous outcrops and ledges, gravel, soil, silt, tundra, frost boils, along roads and paths, low to high elevations (0 m ASL to 3000 m ASL).	S2 <sup>1</sup>	--	DMW, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Dimerella pineti</i>	dimple lichen	Unknown.	S1 <sup>1</sup>	GNR <sup>2</sup>	LBH	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Drepanocladus capillifolius</i>	brown moss	Bogs, streams and lakes in lowlands to 3000 m ASL.	SU <sup>1</sup>	GU <sup>2</sup>	CMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Drepanocladus crassicosatus</i>	brown moss	Alkaline lake margins, marshy stream sides, spring ponds, pools in swampy habitats and aquatic in seepage sites.	S2 <sup>1</sup>	G3G5 <sup>2</sup>	CMW, DMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Drepanocladus sendtneri</i>	brown moss	Wet places, usually in calcareous regions, to about 3000 m ASL.	S1 <sup>1</sup>	--	CMW, LBH	N/A <sup>5</sup>	--
<i>Elixia flexella</i>	lichen	Unknown.	S1? <sup>1</sup>	GNR <sup>2</sup>	CMW, LBH	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Entodon concinnus</i>	Entodon moss	Soil or soil covered rocks in calcareous areas.	S2 <sup>1</sup> Sensitive	--	CMW, DMW	N/A <sup>5</sup>	--
<i>Entodon schleicheri</i>	Schleicher's silk moss	Rocks along canyon walls in woods, rotting logs, shaded rock ledges.	S1 <sup>1</sup> Sensitive	G3G5 <sup>2</sup>	CMW, DMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Eurhynchium praelongum</i>	Eurhynchium moss	Unknown.	SNR <sup>1</sup>	--	LBH	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Fissidens adianthoides</i>	maidenhair moss	Along streams and seepage areas, near waterfalls, in meadows, on soil, tree bases, decaying wood, dripping limestone, sandstone.	S2 <sup>1</sup>	--	LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL

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<i>Flavopunctelia soledica</i>	powder-edged speckled greenshield lichen	On many kinds of bark in open woods.	S2 <sup>1</sup> May Be At Risk	G3G5 <sup>2</sup>	CMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Fontinalis antipyretica</i>	aquatic moss	Stones, roots, twigs, streams, ponds and swamps at lowland to 3300 m ASL elevations.	S1 <sup>1</sup>	--	CMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Fontinalis dalecarlica</i>	Fontinalis moss	Attached to rocks and submerged in swiftly running water.	S1 <sup>1</sup> Sensitive	G3G5 <sup>2</sup>	LFH	N/A <sup>5</sup>	BL, BC, PL
<i>Fontinalis missourica</i>	Fontinalis moss	Submerged in shallow water of springs and streams.	S1 <sup>1</sup>	--	LFH	N/A <sup>5</sup>	BL, BC, PL, CR
<i>Funaria americana</i>	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 <sup>1</sup>	G3? <sup>2</sup>	CMW	N/A <sup>5</sup>	BL, BC, AR, OL
<i>Grimmia montana</i>	sun Grimmi moss	Exposed acidic granite and sandstone from moderate to high elevations (900 m ASL to 4000 m ASL).	S2 <sup>1</sup> Sensitive	--	LFH	N/A <sup>5</sup>	--
<i>Gymnocolea inflata</i>	Gymnocolea liverwort	Wet heath, bog, peaty pool edges, heathy slopes, acidic rocks, gravel, sand and loam, rotting wood, leaf litter, intermittently submerged to dry habitats at lowland to alpine elevations.	S1 <sup>1</sup>	--	CMW, LBH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Heterocladium procurrens</i>	Heterocladium moss	Unknown.	SNR <sup>1</sup>	G3G5 <sup>2</sup>	LBH	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Heterodermia speciosa</i>	powdered fringed lichen	Deciduous and coniferous trees in open boreal habitats.	S2 <sup>1</sup> May Be At Risk	--	CMW, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Hygroamblystegium noterophilum</i>	Hygroamblystegium moss	Calcareous rocks, usually submerged in shallow, running water, often associated with <i>Fissidens grandifrons</i> .	SU <sup>1</sup> Sensitive	--	CMW	N/A <sup>5</sup>	BL, BC, PL

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<i>Hygroamblystegium tenax</i>	Hygroamblystegium moss	Wet rocks in and beside streams in calcareous and non-calcareous habitats.	S2 <sup>1</sup>	--	CMW, LFH	N/A <sup>5</sup>	BL, BC, PL
<i>Hygrohypnum molle</i>	Hygrohypnum moss	Wet places at high elevations.	S1S2 <sup>1</sup> Sensitive	--	LFH	N/A <sup>5</sup>	--
<i>Hygrohypnum ochraceum</i>	Hygrohypnum moss	Rock, soil, or rotten wood in or near streams from lowlands to 4000 m ASL.	S2 <sup>1</sup> Sensitive	--	LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Hypnum callichroum</i>	Hypnum moss	Soil, rock and sometimes among grass in mountainous or arctic regions.	S1 <sup>1</sup> Sensitive	--	CMW	N/A <sup>5</sup>	--
<i>Hypnum pallescens</i>	Hypnum moss	Rocks and tree bases, usually in the mountains from 700 m ASL to 3000 m ASL.	S2 <sup>1</sup>	--	CMW, DMW, LFH	N/A <sup>5</sup>	--
<i>Hypnum subimponens</i>	Hypnum moss	Unknown.	SNR <sup>1</sup>	--	LBH	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Hypocenomyce anthracophila</i>	dot lichen	Coniferous wood.	S1 <sup>1</sup>	--	LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Hypocenomyce friesii</i>	clam lichen	Wood or bark of conifers or birch, especially charred logs and stumps.	S2 <sup>1</sup> May Be At Risk	G3G5 <sup>2</sup>	CMW, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Hypocenomyce leucococca</i>	clam lichen	Wood or bark of conifers or birch, especially charred logs or stumps.	S1S3 <sup>1</sup>	G3? <sup>2</sup>	CMW, LBH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Hypocenomyce sorophora</i>	clam lichen	Unknown.	SNR <sup>1</sup>	G2G4 <sup>2</sup>	CMW, LBH	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Hypocenomyce xanthococca</i>	clam lichen	Unknown.	SNR <sup>1</sup>	GNR <sup>2</sup>	CMW, LBH	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Hypogymnia metaphysodes</i>	deflated tube lichen	Exposed coniferous bark or wood at elevations greater than 1,000 m ASL, occasionally on alder or other trees at lower elevations.	S2 <sup>1</sup>	G3G5 <sup>2</sup>	DMW	N/A <sup>5</sup>	--
<i>Hypogymnia rugosa</i>	wrinkled tube lichen	Conifers, mainly in intermontane forests at high elevations.	S1S2 <sup>1</sup> May Be At Risk	--	DMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Lecania cyrtella</i>	Lecania lichen	Unknown.	SU <sup>1</sup>	GNR <sup>2</sup>	LBH	N/A <sup>5</sup>	N/A <sup>5</sup>



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<i>Lecania dubitans</i>	bean-spored rim-lichen	Poplar bark.	S2S4 <sup>1</sup>	--	CMW, DMW, LBH, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Lecanora boligera</i>	rim lichen	Unknown.	S2? <sup>1</sup>	GNR <sup>2</sup>	CMW, LBH, UBH	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Lecanora cateileia</i>	rim-lichen	Bark (in the west coast and Great Lakes regions).	S2 <sup>1</sup>	GNR <sup>2</sup>	CMW, LBH, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Lecanora chlarotera</i>	rim-lichen	Deciduous trees.	S2 <sup>1</sup>	--	LBH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Lecanora expallens</i>	rim-lichen	Woody plants and old wood, especially conifers.	S1? <sup>1</sup>	G3G5 <sup>2</sup>	CMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Lecanora farinaria</i>	rim-lichen	Unknown.	SNR <sup>1</sup>	GNR <sup>2</sup>	CMW	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Lecanora hybocarpa</i>	bumpy rim-lichen	Bark of hardwoods (rarely conifers) in well-lit woodlands or on isolated trees.	S2 <sup>1</sup>	--	CMW, LBH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Lecanora hypopta</i>	rim-lichen	Unknown.	SNR <sup>1</sup>	GNR <sup>2</sup>	CMW, LBH	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Lecanora hypoptoides</i>	rim-lichen	Unknown.	S2 <sup>1</sup>	GNR <sup>2</sup>	CMW, LBH	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Lecanora laxa</i>	rim-lichen	Unknown.	SNR <sup>1</sup>	GNR <sup>2</sup>	CMW, LBH	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Lecanora persimilis</i>	rim lichen	Unknown.	S2 <sup>1</sup>	GNR <sup>2</sup>	CMW, LBH	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Lecanora subintricata</i>	rim-lichen	Bark of woody plants and old wood.	S2S4 <sup>1</sup>	G3G5 <sup>2</sup>	CMW, LBH, UBH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Lecidea albohyalina</i>	tile lichen	Unknown.	SNR <sup>1</sup>	GNR <sup>2</sup>	CMW	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Lecidea carnulenta</i>	disk lichen	Unknown.	SNR <sup>1</sup>	--	CMW	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Lecidea laboriosa</i>	disk lichen	Unknown.	SU <sup>1</sup>	GNR <sup>2</sup>	CMW	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Lecidea leprarioides</i>	disk lichen	Unknown.	S2S4 <sup>1</sup>	GNR <sup>2</sup>	CMW, LBH, LFH, UBH	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Lecidea nylanderii</i>	disk lichen	Bark and wood of conifers.	S2S4 <sup>1</sup>	G3G5 <sup>2</sup>	CMW, LBH	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Lecidella elaeochroma</i>	disk lichen	Bark and twigs of trees and shrubs.	S1 <sup>1</sup>	--	CMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Lepraria incana</i>	dust lichen	Rocks and bark.	S2 <sup>1</sup>	GNR <sup>2</sup>	CMW, DMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Lepraria lobificans</i>	fluffy dust lichen	Tree bases, shaded rocks and mosses.	S1 <sup>1</sup>	GNR <sup>2</sup>	DMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Leptodictyum humile</i>	Leptodictyum moss	Damp places from lowlands to 3000 m ASL.	S1 <sup>1</sup> Sensitive	--	CMW, DMW, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL

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<i>Leptorhaphis atomaria</i>	Leptorhaphis lichen	Unknown.	SNR <sup>1</sup>	G3G5 <sup>2</sup>	CMW	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Leptorhaphis epidermidis</i>	Leptorhaphis lichen	Unknown.	S1S3 <sup>1</sup>	GNR <sup>2</sup>	CMW	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Leskea polycarpa</i>	Leskea moss	Hardwood tree bases in areas subject to flooding, occasionally on rocks.	S1 <sup>1</sup> Sensitive	--	DMW	N/A <sup>5</sup>	BL, BC, PL, CR
<i>Leskeella nervosa</i>	Leskeella moss	Bark and rock from lowlands to 2300 m ASL.	S2 <sup>1</sup> Sensitive	--	CMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Lichenomphalia umbellifera</i>	Lichenomphalia lichen	Rotting wood and peat.	S2S4 <sup>1</sup> May Be At Risk	GNR <sup>2</sup>	CMW, DWM, LBH, LFH, UBH	BC, PL	BL, BC, PL, CR, AR, OL
<i>Limprichtia cossonii</i>	Limprichtia moss	Calcareous fens, wet places (not submerged), edge of pools.	SU <sup>1</sup>	GU <sup>2</sup>	CMW, DMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Lophozia ascendens</i>	Lophozia ascendens	Unknown.	S1 <sup>1</sup>	--	DMW, LBH	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Lophozia badensis</i>	Lophozia liverwort	Shaded and insolated sites with moist sand, gravel, loam, clay, silt, limestone, chalk or mosses from lowland to alpine elevations.	S1 <sup>1</sup>	--	DMW, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Lophozia collaris</i>	Lophozia liverwort	Damp or well-drained habitats such as rocks in or beside streams, flushes and lakes, fen tussocks, steep banks at lowland to alpine elevations.	S1 <sup>1</sup>	--	CMW	N/A <sup>5</sup>	BL, BC, PL, CR
<i>Lophozia excisa</i>	Lophozia liverwort	Moist gravel, sand, loam, peat, humus-rich soil, mosses, decaying wood, tree bases (especially <i>Betula</i> species), shrub branches. Often insolated but also in woodlands at lowland to subalpine elevations.	S1 <sup>1</sup>	--	CMW	N/A <sup>5</sup>	BC, BL, CR, PL, AR, OL
<i>Lophozia guttulata</i>	Lophozia liverwort	Moist, decaying wood at subalpine elevations.	S2 <sup>1</sup>	--	CMW, DMW, LBH	N/A <sup>5</sup>	--

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<i>Lophozia heterocolpos</i>	Lophozia liverwort	Humus-rich soils, sandy alluvium, vertical and steep rocky banks with base-rich seepage, among mosses, lowland ravines, stream banks, montane crags at lowland to alpine elevations.	S2 <sup>1</sup>	--	CMW, DMW, LFH	N/A <sup>5</sup>	BL, BC, PL, CR
<i>Lophozia incisa</i>	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 <sup>1</sup>	--	CMW, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Lophozia laxa</i>	Lophozia liverwort	Unknown.	S1 <sup>1</sup>	--	CMW, LBH	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Lophozia longidens</i>	Lophozia liverwort	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 <sup>1</sup>	--	CMW, LBH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Lophozia obtusa</i>	Lophozia liverwort	Detritus, silt or rocks beside streams, other mosses, moist steep banks, woodlands, grassy or mossy turf, cliffs at lowland to subalpine elevations.	S1 <sup>1</sup>	--	CMW	N/A <sup>5</sup>	BL, BC, PL, CR
<i>Lophozia rutheana</i>	Lophozia liverwort	Calcareous fens at low elevations.	S1 <sup>1</sup>	--	CMW, LBH	N/A <sup>5</sup>	--
<i>Lophozia rutheana</i>	Lophozia liverwort	Wet, peaty soil beside mountain streams and in flushes below late-lying snow at alpine elevations.	S1 <sup>1</sup>	--	CMW, LBH	N/A <sup>5</sup>	--
<i>Mannia pilosa</i>	Mannia liverwort	Unknown.	S1 <sup>1</sup>	--	CMW, DMW, LFH	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Meesia longiseta</i>	Meesia moss	Calcareous fens, boggy woods.	S1 <sup>1</sup>	--	CMW, DMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Melanelia panniformis</i>	shingled camouflage lichen	Noncalcareous rock.	S1 <sup>1</sup> May Be At Risk	--	CMW	N/A <sup>5</sup>	--



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<i>Melanelixia fuliginosa</i>	camouflage lichen	Coniferous or deciduous bark or acidic rock.	S1S2 <sup>1</sup> May Be At Risk	--	CMW, LBH	PL	BL, BC, PL, CR, AR, OL
<i>Melanohalea infumata</i>	smoked camouflage lichen	Rock.	S2S3 <sup>1</sup>	GNR <sup>2</sup>	CMW	N/A <sup>5</sup>	--
<i>Melanohalea multispora</i>	many-spored camouflage lichen	Deciduous tree bark in humid or mountainous habitats.	S2S4 <sup>1</sup>	--	CMW, LFH	N/A <sup>5</sup>	BL, BC, AR, OL
<i>Melanohalea olivacea</i>	spotted camouflage lichen	Bark, especially birch, in boreal forests.	S1 <sup>1</sup>	G3G5 <sup>2</sup>	CMW, DMW	CR	BL, BC, PL, CR, AR, OL
<i>Melanohalea subelegantula</i>	camouflage lichen	Bark or wood in moist, low to moderate elevation forests.	S2S3 <sup>1</sup>	GNR <sup>2</sup>	DMW, LBH, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Melanohalea trabeculata</i>	camouflage lichen	Unknown.	S1? <sup>1</sup>	GNR <sup>2</sup>	CMW, LBH, LFH	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Micarea myriocarpa</i>	dot lichen	Unknown.	S1S2 <sup>1</sup>	GNR <sup>2</sup>	CMW	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Micarea prasina</i>	green dot lichen	Unknown.	S2S4 <sup>1</sup>	GNR <sup>2</sup>	CMW, LBH	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Micarea sylvicola</i>	dot lichen	Unknown.	S2? <sup>1</sup>	GNR <sup>2</sup>	CMW	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Mnium ambiguum</i>	Mnium moss	Soil, soil over rock in damp woods, often in calcareous regions from lowlands to 2000 m ASL.	S2 <sup>1</sup> Sensitive	--	CMW	N/A <sup>5</sup>	BL, BC, AR, OL
<i>Moerckia hibernica</i>	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 <sup>1</sup>	--	LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Mycobilimbia carneoalbida</i>	dot lichen	Unknown.	S2S4 <sup>1</sup>	GNR <sup>2</sup>	CMW, LBH	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Mycobilimbia epixanthoides</i>	dot lichen	Unknown.	S1? <sup>1</sup>	GNR <sup>2</sup>	CMW	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Mycobilimbia hypnorum</i>	dot lichen	Unknown.	S1 <sup>1</sup>	GNR <sup>2</sup>	CMW, LBH	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Mycoblastus affinis</i>	kindred blood lichen	Coniferous bark.	S2 <sup>1</sup>	G3G5 <sup>2</sup>	CMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Mycoblastus sanguinarius</i>	bloody-heart lichen	Bark and wood of conifers and birch.	S2 <sup>1</sup>	--	CMW, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL

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<i>Mycocalicium calicioides</i>	Mycocalicium lichen	Unknown.	S1 <sup>1</sup>	GNR <sup>2</sup>	DMW	N/A <sup>5</sup>	N/A <sup>56</sup>
<i>Mycocalicium subtile</i>	Mycocalicium lichen	Twigs and branches.	S2S4 <sup>1</sup>	--	CMW, DMW, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Mycoglaena myricae</i>	Mycoglaena lichen	Unknown.	SNR <sup>1</sup>	GNR <sup>2</sup>	CMW	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Myurella tenerrima</i>	Myurella moss	Soil in rock crevices in arctic and alpine habitats.	S2 <sup>1</sup> Sensitive	--	CMW	N/A <sup>5</sup>	--
<i>Myxobilimbia sabuletorum</i>	dot lichen	Moss over rocks (especially calcareous), mossy tree bases and bark.	S2 <sup>1</sup>	--	CMW, DMW, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Neckera pennata</i>	Neckera moss	Tree trunks, branches and rocks from lowlands to 3000 m ASL.	S2S3 <sup>1</sup> Sensitive	--	CMW, LFH	N/A <sup>5</sup>	BC, BL, PL, CR, AR, OL
<i>Nephroma bellum</i>	naked kidney lichen	Branches and twigs (especially coniferous), also mossy rocks in humid forests.	S2 <sup>1</sup>	G3G5 <sup>2</sup>	CMW, LBH, LFH, UBH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Nephroma helveticum</i>	fringed kidney lichen	Unknown.	S1S2 <sup>1</sup> Sensitive	--	LBH	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Ochrolechia gowardii</i>	Ochrolechia lichen	Unknown.	S1 <sup>1</sup>	GNR <sup>2</sup>	CMW	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Omphalina hudsoniana</i>	mushroom lichen	Unknown.	SNR <sup>1</sup>	GNR <sup>2</sup>	CMW	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Orthotrichum affine</i>	Orthotrichum moss	Trees, rarely on rock, from lowlands to 2700 m ASL.	SU <sup>1</sup>	G3G5 <sup>2</sup>	LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Pannaria conoplea</i>	shingle lichen	Bark, less frequently on rocks.	SU <sup>1</sup>	G3G4 <sup>2</sup>	CMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Pellia endiviifolia</i>	Pellia liverwort	Soil and rocks in shaded, moist or wet habitats from lowland to subalpine elevations.	S2 <sup>1</sup>	--	CMW, DMW, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL

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<i>Pellia epiphylla</i>	Pellia liverwort	Moist, well-drained, neutral or acidic, clay to gravel soils, humus, woodlands, roadside banks and ditches, above water level of streams and lakes, moist track, marshes, bogs, wet heaths, block scree, montane crags from lowland to alpine elevations.	S1 <sup>1</sup>	--	LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Pellia neesiana</i>	Pellia liverwort	Shaded micro-habitats among vascular plants in wet pastures, marshes, flushes, ditches, wet woodlands, damp tracks, and stream and lake banks from lowland to subalpine elevations.	S2 <sup>1</sup>	--	LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Peltigera britannica</i>	flaky freckle pelt lichen	Unknown.	SNR <sup>1</sup>	G3G5 <sup>2</sup>	LBH	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Peltigera collina</i>	tree pelt lichen	Unknown.	S2 <sup>1</sup> Sensitive	--	CMW, DMW	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Peltigera horizontalis</i>	flat fruited pelt lichen	Mossy soil, logs and rocks in forests.	S2S3 <sup>1</sup> May Be At Risk	--	CMW, DMW, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Peltigera polydactyla</i>	alternating dog-lichen	Soil, moss or mossy rock in forests.	S2 <sup>1</sup>	--	CMW, DMW, LBH, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Phaeocalicium compressulum</i>	Phaeocalicium lichen	Unknown.	S1 <sup>1</sup>	G2G3 <sup>2</sup>	CMW	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Phaeocalicium flabelliforme</i>	lichen	Unknown.	S1? <sup>1</sup>	GNR <sup>2</sup>	CMW	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Phaeophyscia adiasola</i>	shadow lichen	Mossy, base-rich rocks and deciduous trees and shrubs in intermontane environments at low elevations.	S1S3 <sup>1</sup> May Be At Risk	--	CMW	N/A <sup>5</sup>	--
<i>Phaeophyscia cernohorskyi</i>	shadow lichen	Hardwood bark and rock.	S1 <sup>1</sup>	--	DMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Phaeophyscia endococcina</i>	shadow lichen	Rock.	S2 <sup>1</sup>	G3G4 <sup>2</sup>	CMW	N/A <sup>5</sup>	--
<i>Phaeophyscia hirsuta</i>	shadow lichen	Rock and deciduous trees in open, semi-arid intermontane habitats.	S1 <sup>1</sup> Sensitive	G3 <sup>2</sup>	DMW, LFH	N/A <sup>5</sup>	--

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<i>Phaeophyscia nigricans</i>	shadow lichen	Base-rich rock in sheltered intermontane habitats at low elevations.	S2 <sup>1</sup> May Be At Risk	--	CMW	N/A <sup>5</sup>	--
<i>Phascum cuspidatum</i>	cuspidate earth moss	Soil, lawns, fields, and banks at low to moderate elevations.	S2 <sup>1</sup>	--	DMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Philonotis capillaris</i>	Philonotis moss	Unknown.	SNR <sup>1</sup>	--	LBH	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Phlyctis argena</i>	whitewash lichen	Bark of deciduous trees (occasionally coniferous) and rocks.	S1? <sup>1</sup>	--	CMW, DMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Physcia biziana</i>	frosted rosette lichen	Bark or calcareous rocks in open, dry habitats.	S1S2 <sup>1</sup> May Be At Risk	--	LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Physcia dimidiata</i>	rosette lichen	Steppe, open forests and rock outcrops in exposed to sheltered microsites from low to moderate elevations.	S1S2 <sup>1</sup> May Be At Risk	--	CMW, DMW	N/A <sup>5</sup>	--
<i>Physcia tenella</i>	fringed rosette lichen	Twigs, bark and rock.	S2 <sup>1</sup> Sensitive	--	CMW, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Physcomitrium hookeri</i>	bladder-cap moss	Wet soil in disturbed places at moderate to high elevations.	S1 <sup>1</sup> Sensitive	G2G4 <sup>2</sup>	CMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Physcomitrium immersum</i>	Physcomitrium moss	Wet soil in disturbed floodplains or mud flats near streams at moderate to high elevations.	SNR <sup>1</sup>	--	CMW	N/A <sup>5</sup>	BL, BC, PL, CR
<i>Physcomitrium pyriforme</i>	urn moss	Wet soil in disturbed areas at moderate to high elevation.	S1 <sup>1</sup>	--	DMW	N/A <sup>5</sup>	BL, BC, AR, OL
<i>Physconia enteroxantha</i>	frost lichen	Bark, wood and occasionally rock.	S1? <sup>1</sup>	G3G5 <sup>2</sup>	CMW, DMW, LBH, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Physconia isidiigera</i>	frost lichen	Bark.	S2 <sup>1</sup> May Be At Risk	G3G4 <sup>2</sup>	DMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Physconia perisidiosa</i>	crescent frost lichen	Bark, occasionally on rock or soil.	S2 <sup>1</sup> Sensitive	G3G5 <sup>2</sup>	LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Placynthiella dasaea</i>	tar-spot lichen	Unknown.	SNR <sup>1</sup>	GNR <sup>2</sup>	CMW	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Placynthiella icmalea</i>	ink lichen	Wood.	S2S4 <sup>1</sup>	GNR <sup>2</sup>	CMW, LBH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL



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<i>Plagiobryum demissum</i>	Plagiobryum moss	Unknown.	S1 <sup>1</sup> May Be At Risk	G3G5 <sup>2</sup>	CMW	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Plagiochila porelloides</i>	Plagiochila liverwort	Unknown.	SNR <sup>1</sup>	--	CMW	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Plagiomnium ciliare</i>	Plagiomnium moss	Wet soil, usually in wooded areas beside streams.	S2 <sup>1</sup>	--	CMW, DMW, LBH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Plagiomnium rostratum</i>	Plagiomnium moss	Soil and soil over rock in forests.	S1 <sup>1</sup> Sensitive	--	CMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Pogonatum dentatum</i>	hair-like pogonatum moss	Dry, insolated habitats, silt, sandy or gravelly soil, rocks, talus slopes and disturbed areas at moderate to high elevations.	S2 <sup>1</sup> Sensitive	G3G5 <sup>2</sup>	UFH, LFH	N/A <sup>5</sup>	--
<i>Pohlia atropurpurea</i>	Pohlia moss	Damp to wet disturbed sandy or clayey soil, roadbanks, ditch banks, margins of lakes, ponds or streams.	S1 <sup>1</sup> Sensitive	--	CMW, DMW	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Pohlia bulbifera</i>	Pohlia moss	Soil at moderate elevations.	S1 <sup>1</sup> Sensitive	--	CMW, DMW, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Pohlia drummondii</i>	Pohlia moss	Unknown.	S2 <sup>1</sup> Sensitive	G3G4 <sup>2</sup>	LBH	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Pohlia filum</i>	Pohlia moss	Unknown.	S1 <sup>1</sup> Sensitive	--	CMW	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Polytrichum longisetum</i>	slender hairy-cap moss	Moist acidic to basic peaty sites, hummocks, meadows and wet tundra from moderate to high elevations.	S1 <sup>1</sup> Sensitive	--	CMW, DMW	N/A <sup>5</sup>	--
<i>Pseudobryum cinclidioides</i>	Pseudobryum moss	Wet humus in depressional microhabitats.	S2 <sup>1</sup>	--	CMW, LBH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Pseudoleskeella sibirica</i>	Pseudoleskeella moss	Rock.	S2 <sup>1</sup>	--	CMW	N/A <sup>5</sup>	--

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<i>Racomitrium microcarpon</i>	Racomitrium moss	Acidic rock, cliffs, soil or gravel in late snow areas, tundra, slopes, granite rock underhangs on talus slopes, exposed, dry to moist sites at low to high elevations (0 m ASL to 1700 m ASL).	S1? <sup>1</sup> Sensitive	GNRQ <sup>2</sup>	CMW	N/A <sup>5</sup>	--
<i>Ramalina calicaris</i>	Ramalina lichen	Unknown.	S1? <sup>1</sup>	GNR <sup>2</sup>	CMW, DMW	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Ramalina farinacea</i>	dotted ramalina	Trees and shrubs, rarely on rock, in regions with a mild, humid climate.	S3 <sup>1</sup> Sensitive	G3G5 <sup>2</sup>	CMW, LFH	N/A <sup>5</sup>	--
<i>Ramalina intermedia</i>	rock ramalina	Rock faces in forests, rarely on bark.	S2 <sup>1</sup> May Be At Risk	--	CMW, LFH	N/A <sup>5</sup>	--
<i>Ramalina obtusata</i>	hooded ramalina	Trees and rocks.	S2 <sup>1</sup>	--	CMW, DMW, LBH, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Ramalina roesleri</i>	frayed ramalina	Twigs and branches of trees and shrubs in open, humid sites, rarely on wood or shaded rock.	S1 <sup>1</sup>	G3G5 <sup>2</sup>	CMW, DMW, LFH	N/A <sup>5</sup>	BL, BC, AR, OL
<i>Rhizomnium andrewsianum</i>	Rhizomnium moss	Wet places in arctic or alpine habitats.	S1 <sup>1</sup> Sensitive	G3G5 <sup>2</sup>	DMW	N/A <sup>5</sup>	--
<i>Rhizomnium magnifolium</i>	Rhizomnium moss	Wet places in woods and often near streams from lowlands to 2000 m ASL.	S2 <sup>1</sup> Sensitive	--	CMW, LBH, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Rhodobryum ontariense</i>	Rhodobryum moss	Unknown.	S2 <sup>1</sup> Sensitive	--	CMW, DMW	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Riccardia latifrons</i>	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 <sup>1</sup>	--	CMW, DMW, LBH, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL

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<i>Riccardia multifida</i>	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, montane gullies and crags, from lowland to alpine elevations.	S2S3 <sup>1</sup>	--	CMW, LBH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Riccardia palmata</i>	Riccardia liverwort	Damp, soft, decorticated logs and stumps, sheltered woodlands, shaded peat and plant debris on and among rocks, from lowland to subalpine elevations.	S1 <sup>1</sup>	--	CMW, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Riccia beyrichiana</i>	Riccia liverwort	Rocks, banks, heaths, tracks, roadsides, waste ground, exposed reservoir margins, cultivated lands, montane slopes, compacted soil, periodically flooded and strongly insolated sites from lowlands to 800 m ASL.	S1 <sup>1</sup>	--	DMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Riccia cavernosa</i>	Riccia liverwort	Insolated, wet or moist, circumneutral to basic, intermittently exposed sand or mud beside lakes, ponds, reservoirs, waterlogged areas in fields, gravel pits and sand dunes.	S1 <sup>1</sup>	--	DMW, LBH	N/A <sup>5</sup>	BL, BC
<i>Riccia fluitans</i>	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 <sup>1</sup>	--	CMW, DMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR
<i>Ricciocarpos natans</i>	Ricciocarpos liverwort	Floating at surface of stagnant or slow moving water, exposed, wet or moist, calcareous clay, humus-rich mud and leaf litter.	S2 <sup>1</sup>	--	CMW, DMW, LBH, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR

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<i>Rinodina albertana</i>	pepper-spore lichen	Unknown.	S2 <sup>1</sup>	GNR <sup>2</sup>	LFH	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Rinodina archaea</i>	brown pepper-spore lichen	Moss, bark and old wood.	S2 <sup>1</sup>	--	DMW, LBH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Rinodina degeliana</i>	pepper-spore lichen	Unknown.	SNR <sup>1</sup>	GNR <sup>2</sup>	CMW, LBH, LFH	--	N/A <sup>5</sup>
<i>Rinodina disjuncta</i>	pepper-spore lichen	Unknown.	S1? <sup>1</sup>	GNR <sup>2</sup>	CMW	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Rinodina exigua</i>	spoke pepper-spore lichen	Unknown.	S1S2 <sup>1</sup>	GNR <sup>2</sup>	LFH	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Rinodina metaboliza</i>	pepper-spore lichen	Unknown.	S2S4 <sup>1</sup>	GNR <sup>2</sup>	CMW, LBH, LFH	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Rinodina orculata</i>	pepper-spore lichen	Unknown.	SNR <sup>1</sup>	GNR <sup>2</sup>	CMW, DMW, LBH	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Rinodina stictica</i>	pepper-spore lichen	Unknown.	SNR <sup>1</sup>	G1G3 <sup>2</sup>	CMW	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Scapania apiculata</i>	Scapania liverwort	Moist, rotting wood and peat.	S1 <sup>1</sup>	--	CMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Scapania curta</i>	Scapania liverwort	Moist, circumneutral clay, loam, fine sand, peaty soil, sandy detritus, sandstone, woodland tracks and pathsides, steep banks in woodlands, pastures, beside streams at low elevations.	S2 <sup>1</sup>	--	CMW, LBH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Scapania cuspiduligera</i>	Scapania liverwort	Limestone and base-rich schist from lowland to subalpine elevations (30 m ASL to 1175 m ASL).	S2 <sup>1</sup>	--	CMW	N/A <sup>5</sup>	--
<i>Scapania glaucocephala</i>	Scapania liverwort	Decaying logs, especially cedar, fir, pine and spruce.	S2 <sup>1</sup>	--	CMW, DMW, LBH, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Scapania paludicola</i>	Scapania liverwort	Bogs, wet Sphagnum-rich grassy heaths, pastures and gently sloping flushes from lowland to subalpine elevations.	S2 <sup>1</sup>	--	CMW, DMW, LBH, LFH	PL	BL, BC, PL, CR, AR, OL



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<i>Scapania paludosa</i>	Scapania liverwort	Partially or fully submerged on rocks in running water, irrigated surfaces of cliffs, wet earthy banks with north to east aspects, and in melt water from late-lying snow at subalpine to alpine elevations.	S2 <sup>1</sup>	--	CMW, DMW, LBH, LFH	N/A <sup>5</sup>	BL, BC, PL, CR
<i>Schistidium agassizii</i>	elf bloom moss	Wet or dry rocks in or beside streams and lakes from low to high elevations (0 m ASL to 3600 m ASL).	S1 <sup>1</sup>	G3G5 <sup>2</sup>	CMW	N/A <sup>5</sup>	BL, BC, PL, CR
<i>Schistostega pennata</i>	luminous moss	Mineral soil on lower part of upturned tree roots, cave ceilings, crevices in soil banks, animal burrows, occasionally on rock, from low to high elevations (0 m ASL to 1700 m ASL).	S1S2 <sup>1</sup> May Be At Risk	G3G4 <sup>2</sup>	LBH, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Scoliciosporum chlorococcum</i>	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 <sup>1</sup>	--	DMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Scoliciosporum umbrinum</i>	umber dot lichen	Rocks and occasionally wood, rarely tree bases.	S2S4 <sup>1</sup>	--	CMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Seligeria calcarea</i>	chalk brittle moss	Calcareous substrates.	S1 <sup>1</sup> Sensitive	--	CMW	N/A <sup>5</sup>	--
<i>Seligeria donniana</i>	Donian beardless moss	Crevices and protected areas of bare calcareous rock.	S2 <sup>1</sup> Sensitive	--	LFH	N/A <sup>5</sup>	--
<i>Solorina spongiosa</i>	fringed chocolate chip lichen	Soil in arctic and alpine tundra, rarely in shaded boreal habitats.	S2 <sup>1</sup> May Be At Risk	--	CMW, LBH, LFH	N/A <sup>5</sup>	--
<i>Sphagnum balticum</i>	peat moss	Hollows and floating mats in raised bogs and poor fens from low to high elevations.	S1 <sup>1</sup>	--	CMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Sphagnum compactum</i>	neat bog moss	Poorly drained sand, siliceous rocks, and peat from low to high elevations.	S2 <sup>1</sup>	--	CMW, DMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL

Scientific Name	Common Name	Habitat	Provincial Designations	Federal/Global Designations	Natural Subregion <sup>3</sup>	Right-of-Way within Known Species Range <sup>4</sup>	Preferred Habitat on Proposed Right-of-Way <sup>4</sup>
<i>Sphagnum contortum</i>	twisted bog moss	Very minetrophic, sometimes found in slightly basic mires, intolerant of shade, from low to high elevations.	S2 <sup>1</sup>	--	CMW, DMW, LBH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Sphagnum fallax</i>	peat moss	Poor fen habitats, often as a pioneer species, ombrotrophic mires at hummock bases, from low to moderate elevations.	S2 <sup>1</sup>	--	CMW, LBH, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Sphagnum fimbriatum</i>	fringed bog moss	Minetrophic, common on mineral soil at bog and poor fen margins, open and forested fens, from low to high elevations.	S2 <sup>1</sup>	--	CMW, DMW, LBH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Sphagnum lindbergii</i>	Lindberg's bog moss	Carpet forming in ombrotrophic to weakly minetrophic boreal mires from low to high elevations.	S2 <sup>1</sup>	--	CMW, LBH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Sphagnum platyphyllum</i>	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 <sup>1</sup>	--	CMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Sphinctrina turbinata</i>	Sphinctrina lichen	Grows on various species of Pertusaria.	S1 <sup>1</sup>	G3G5 <sup>2</sup>	DMW	N/A <sup>5</sup>	BL, BC, AR, OL
<i>Splachnum ampullaceum</i>	flagon-fruited splachnum moss	Soil and decaying animal matter in wet places.	S2 <sup>1</sup>	--	CMW, DMW, LBH, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Splachnum luteum</i>	yellow collar moss	Old moose dung, in muskeg and other boggy woods in northern latitudes.	S3 <sup>1</sup> Sensitive	--	CMW, LBH, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Splachnum rubrum</i>	red collar moss	Old moose dung, in boggy swamps and muskeg.	S3 <sup>1</sup> Sensitive	--	CMW, LBH, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Splachnum sphaericum</i>	globe-fruited splachnum moss	Animal excrement in moist places, sometimes in bogs.	S2 <sup>1</sup>	G3G5 <sup>2</sup>	CMW, LBH, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Splachnum vasculosum</i>	large-fruited splachnum moss	Dung in bogs at high elevations.	S2 <sup>1</sup> Sensitive	G3G5 <sup>2</sup>	CMW	N/A <sup>5</sup>	--
<i>Stenocybe major</i>	Stenocybe lichen	Trunks and branches of balsam fir.	S1 <sup>1</sup>	--	DMW	N/A <sup>5</sup>	BL, BC, PL, AR, OL
<i>Stenocybe pullatula</i>	Stenocybe lichen	Unknown.	S2S4 <sup>1</sup>	GNR <sup>2</sup>	CMW, LBH	N/A <sup>5</sup>	N/A <sup>5</sup>

Scientific Name	Common Name	Habitat	Provincial Designations	Federal/Global Designations	Natural Subregion <sup>3</sup>	Right-of-Way within Known Species Range <sup>4</sup>	Preferred Habitat on Proposed Right-of-Way <sup>4</sup>
<i>Stereocaulon condensatum</i>	foam lichen	Sandy soil, occasionally on gravelly soil.	S1S2 <sup>1</sup> May Be At Risk	--	CMW	N/A <sup>5</sup>	BL, BC, CR, AR, OL
<i>Tayloria lingulata</i>	tongue-leaf small-kettle moss	Wet soil.	S2 <sup>1</sup> Sensitive	G3G5 <sup>2</sup>	LBH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Tayloria serrata</i>	slender splachnum moss	Humus or excrement from lowlands to 2000 m ASL or higher.	S2 <sup>1</sup>	--	CMW, LBH, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Thuidium philibertii</i>	Thuidium moss	Calcareous regions.	S1S2 <sup>1</sup>	--	CMW, DMW	N/A <sup>5</sup>	--
<i>Trapeliopsis flexuosa</i>	mottled-disk lichen	Weathered wood, especially fences and boards in full sun.	S1S3 <sup>1</sup>	--	CMW, DMW	PL	--
<i>Trichodon cylindricus</i>	narrow-fruited fork moss	Sand or clay soil, open, disturbed sites, roadside banks, trails and fields from low to high elevations.	S1 <sup>1</sup> Sensitive	--	DMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Tritomaria exsecta</i>	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 <sup>1</sup>	--	CMW, DMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Tritomaria scitula</i>	Tritomaria liverwort	Unknown.	S2S3 <sup>1</sup>	--	CMW, DMW, LFH	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Tuckermannopsis orbata</i>	variable wrinkle lichen	Branches and twigs of conifers or birch, rarely other hardwoods.	S2? <sup>1</sup>	--	CMW, LBH, UBH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Umbilicaria muehlenbergii</i>	plated rock tripe lichen	Boulders and steep rock walls in forests and in the open.	S2S3 <sup>1</sup>	--	CMW	N/A <sup>5</sup>	--
<i>Usnea ceratina</i>	warty beard lichen	Conifers and shrubs in humid, open forest.	S1 <sup>1</sup> May Be At Risk	--	LFH	N/A <sup>5</sup>	BL, BC, AR, OL
<i>Usnea fulvoreagens</i>	beard lichen	Unknown.	S1S3 <sup>1</sup>	GNR <sup>2</sup>	CMW, LBH, UBH	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Usnea scabiosa</i>	beard lichen	Conifers in forests or open habitats.	S1S2 <sup>1</sup>	GNR <sup>2</sup>	CMW, LBH, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Warnstorfia pseudostraminea</i>	brown moss	Poor fens and pools in wet tundra and near waterfalls.	S1 <sup>1</sup>	G3G4 <sup>2</sup>	CMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL

Scientific Name	Common Name	Habitat	Provincial Designations	Federal/Global Designations	Natural Subregion <sup>3</sup>	Right-of-Way within Known Species Range <sup>4</sup>	Preferred Habitat on Proposed Right-of-Way <sup>4</sup>
<i>Warnstorfia tundrae</i>	brown moss	Subalpine to alpine and arctic habitats.	S2 <sup>1</sup>	GU <sup>2</sup>	CMW, DMW, LBH, LFH	N/A <sup>5</sup>	--
<i>Weissia controversa</i>	green-cushioned weissia moss	Weedy soil, rock, disturbed areas, roadsides, fields, acidic or calcareous substrates.	S2 <sup>1</sup>	--	CMW, DMW, LBH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Xanthomendoza fulva</i>	bare-bottomed sunburst lichen	Bark, wood and rock in semi-open to shaded, drier habitats at low elevations.	S1 <sup>1</sup> May Be At Risk	--	CMW, DMW, LFH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Xanthomendoza hasseana</i>	polar sunburst lichen	Bark (especially poplar, oak and other hardwoods), occasionally wood or rock, in semi-open to open, nutrient rich habitats.	S1S2 <sup>1</sup>	--	CMW, DMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Xanthoparmelia conspersa</i>	rock-shield lichen	Siliceous rock, especially granite, in sunny locations.	S1 <sup>1</sup> May Be At Risk	--	CMW, LBH	N/A <sup>5</sup>	--
<i>Xylographa parallela</i>	black woodscript lichen	Hard, weathered wood.	S2S4 <sup>1</sup>	--	CMW, LBH	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL
<i>Xylographa vitiligo</i>	white-spotted woodscript lichen	Hard, weathered wood.	S2 <sup>1</sup>	--	CMW	PL	BL, BC, PL, CR, AR, OL
<i>Xyloschistes platytropa</i>	lichen	Unknown.	S1? <sup>1</sup>	GNR <sup>2</sup>	CMW	N/A <sup>5</sup>	N/A <sup>5</sup>
<i>Zygodon viridissimus</i>	Zygodon moss	Tree trunks, scattered among other mosses and rocks in northern and montane habitats.	S1 <sup>1</sup> May Be At Risk	--	CMW	N/A <sup>5</sup>	BL, BC, PL, CR, AR, OL

**Sources:** AESRD 2014b,e,f, Argus and Pryer 1990, COSEWIC 2014, Douglas *et al.* 2002, Environment Canada 2014, FNA Editorial Committee 1993+, Kershaw *et al.* 2001, Moss 1983, NatureServe 2014a, Porsild and Cody 1980, Williston 2001

**Notes:**

- Provincial (S) ranks are assigned by the provincial and federal Conservation Data Centre(s) (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); definitions below are adapted from NatureServe (2014b) unless noted otherwise.
  - S1 = Critically Imperilled: due to extreme rarity or due to some factor(s) making it especially vulnerable to extirpation. Typically five or fewer occurrences or very few remaining individuals (<1,000).
  - S2 = Imperilled: due to rarity or due to 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 due to other factors making it vulnerable to extirpation. Typically 21-100 occurrences or between 3,000 and 10,000 individuals.



- S4 = Apparently Secure: uncommon, however, 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.
  - (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 AESRD (2014g)
  - SNR = 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, range ranks (G#G#) which include a G1 to G3 ranking are also included (e.g., G3G4) (NatureServe 2014b).
  3. LBH = Lower Boreal Highlands Natural Subregion; UBH = Upper Boreal Highlands Natural Subregion; DMW = Dry Mixedwood Natural Subregion; CMW = Central Mixedwood Subregion; LFH = Lower Foothills Natural Subregion
  4. BC = Bear Canyon Section, BL = Boundary Lake Section, CR = Christina River Section, PL = Pelican Lake Section, AR = Alces River Compressor Station, OL = Otter Lake Compressor Station
  5. Insufficient information

## APPENDIX B

### POTENTIAL RARE ECOLOGICAL COMMUNITIES IN THE DRY AND CENTRAL MIXEDWOOD, LOWER FOOTHILLS, LOWER AND UPPER BOREAL HIGHLANDS NATURAL SUBREGIONS

Scientific Names	Common Names	Provincial and Global Ranks <sup>1</sup>	Natural Subregion <sup>2</sup>	Right-of-Way within Community Range <sup>3</sup>
<b>Forest/Woodland</b>				
<i>Betula neoalaskana</i> / <i>Ledum groenlandicum</i>	Alaska birch/common Labrador tea	S1S2	CMW, DMW	CR, PL
<i>Betula neoalaskana</i> - <i>Picea glauca</i> / <i>Salix discolor</i> / <i>Equisetum arvense</i> swamp forest community	Alaska birch - white spruce/pussy willow/common horsetail swamp forest community	S1S2	DMW	CR, PL
<i>Betula papyrifera</i> / <i>Lycopodium obscurum</i> - <i>Lycopodium annotinum</i> woodland	white birch/ground-pine - stiff club-moss woodland	S2?	LFH	BC, BL, CR, PL, AR, OL, HL, WH
<i>Larix laricina</i> - <i>Picea mariana</i> / <i>Cornus stolonifera</i> - <i>Rubus idaeus</i>	tamarack - black spruce/red-osier dogwood - wild red raspberry	S1S2	CMW, DMW	BC, BL, CR, PL, AR, OL, HL, WH
<i>Larix laricina</i> / <i>Carex prairea</i>	tamarack/prairie sedge	S1	CMW, DMW	BC, BL, AR
<i>Picea glauca</i> / <i>Alnus incana</i> ssp. <i>tenuifolia</i> - <i>Betula neoalaskana</i> / <i>Equisetum pretense</i> / <i>Hylocomium splendens</i>	white spruce/river alder - Alaska birch/meadow horsetail/stair-step moss	S3	CMW, DMW	CR, PL
<i>Picea glauca</i> / <i>Cetraria islandica</i>	white spruce/lichen	S1?	CMW	N/A <sup>4</sup>
<i>Picea glauca</i> / <i>Equisetum scirpoides</i> forest	white spruce/dwarf scouring-rush forest	SU	CMW, DMW, LBH, UBH	BC, BL, CR, PL, AR, OL, HL, WH
<i>Picea mariana</i> / <i>Cladina stellaris</i>	black spruce/star-tipped reindeer lichen	S1	UBH	N/A <sup>4</sup>
<i>Picea mariana</i> / <i>Cornus stolonifera</i> /feathermoss	black spruce/red-osier dogwood/feathermoss	S1S2	CMW, DMW	BC, BL, CR, PL, AR, OL, HL, WH
<i>Populus balsamifera</i> / <i>Alnus incana</i> ssp. <i>tenuifolia</i> - <i>Cornus stolonifera</i> / <i>Equisetum pratense</i>	balsam poplar/river alder - red-osier dogwood/meadow horsetail	S3	CMW, DMW	BC, BL, CR, PL, AR, OL, HL, WH
<i>Populus balsamifera</i> / <i>Rhamnus alnifolia</i> / <i>Equisetum arvense</i>	balsam poplar/alder-leaved buckthorn/common horsetail	S1	CMW	CR, PL
<i>Populus balsamifera</i> / <i>Viburnum opulus</i> / <i>Matteuccia struthiopteris</i>	balsam poplar/high-bush cranberry/ostrich fern	S1S2	CMW, DMW, LBH	CR, PL
<i>Populus tremuloides</i> / <i>Rosa acicularis</i> / <i>Apocynum androsaemifolium</i>	aspen/prickly rose/spreading dogbane	S1S2	CMW, DMW	BC, BL, CR, PL, AR, OL, HL, WH
<i>Populus tremuloides</i> / <i>Rubus parviflorus</i> / <i>Aralia nudicaulis</i>	aspen/thimbleberry/wild sarsaparilla	S2S3	CMW, LFH	BC, BL, AR
<i>Populus tremuloides</i> / <i>Salix bebbiana</i> - <i>Corylus cornuta</i> / <i>Calamagrostis canadensis</i> - <i>Matteuccia struthiopteris</i>	aspen/beaked willow - beaked hazelnut/bluejoint - ostrich fern	S1	CMW, DMW	BC, BL, CR, PL, AR, OL, HL, WH
<i>Populus tremuloides</i> / <i>Vaccinium myrtilloides</i> woodland	aspen/common blueberry woodland	S2?	CMW, DMW	BC, BL, CR, PL, AR, OL, HL, WH
<b>Shrubland</b>				
<i>Alnus incana</i> ssp. <i>tenuifolia</i> / <i>Matteuccia struthiopteris</i> shrubland	river alder/ostrich fern shrubland	S2?	CMW, DMW, LBH, UBH	BC, BL, CR, PL, AR, OL, HL, WH

Scientific Names	Common Names	Provincial and Global Ranks <sup>1</sup>	Natural Subregion <sup>2</sup>	Right-of-Way within Community Range <sup>3</sup>
<i>Amelanchier alnifolia</i> / <i>Arctostaphylos uva-ursi</i> / <i>Oryzopsis pungens</i>	Saskatoon/common bearberry/northern rice grass	S2S3	CMW, DMW	BC, BL, AR, HL, OL
<i>Andromeda polifolia</i> / <i>Sarracenia purpurea</i> / <i>Sphagnum angustifolium</i>	bog rosemary/pitcher-plant/peat moss	S1S2	CMW	PL
<i>Betula glandulosa</i> / <i>Festuca campestris</i>	bog birch/mountain rough fescue	S2S3	LFH	--
<i>Betula pumila</i> - <i>Ledum groenlandicum</i> / <i>Juncus balticus</i> / <i>Tomenthypnum nitens</i> - <i>Hylocomium splendens</i> slope fen	dwarf birch - common Labrador tea/wire rush/golden moss - stair-step moss slope fen	S1?	LFH	CR, PL, WH
<i>Betula pumila</i> - <i>Salix</i> spp./ <i>Carex</i> spp.	dwarf birch - willow/sedges	S3?	DMW	CR, PL, WH
<i>Chamaedaphne calyculata</i> - <i>Kalmia polifolia</i> / <i>Cladina mitis</i>	leatherleaf - northern laurel/green reindeer lichen	S1S2	CMW	CR, PL
<i>Elaeagnus commutata</i> riparian shrubland	silverberry riparian shrubland	SU, G2Q	LFH	BC, AR
<i>Salix drummondiana</i> / <i>Scirpus microcarpus</i> - <i>Calamagrostis canadensis</i>	Drummond's willow/small-fruited bulrush - bluejoint	S1	CMW, DMW, LFH	BC, BL, CR, PL, AR, OL, HL, WH
<i>Salix pedicellaris</i> / <i>Potentilla palustris</i> rich fen	bog willow/marsh cinquefoil rich fen	S2?	CMW, DMW, LBH, UBH	BC, AR, CR
<i>Symphoricarpos albus</i> - <i>Amelanchier alnifolia</i> slope type	snowberry - saskatoon shrubby slope	S2?	CMW, DMW	BC, BL, CR, PL, AR, OL, HL, WH
<b>Herbaceous</b>				
<i>Atriplex subspicata</i> - <i>Puccinellia nuttalliana</i> - <i>Triglochin palustris</i> string fen	spearscale saltbrush - Nuttall's salt-meadow grass - slender arrow grass	S1S3	CMW	BC, CR, AR, HL
<i>Calamagrostis stricta</i> - <i>Triglochin maritima</i> string fen	narrow reed grass - seaside arrow grass string fen	S1S3	CMW	BC, AR
<i>Carex limosa</i> - <i>Menyanthes trifoliata</i> - <i>Cardamine pratensis</i>	mud sedge - buck-bean - meadow bitter cress	S1S2	CMW	CR, PL
<i>Carex limosa</i> - <i>Scheuchzeria palustris</i> / <i>Sphagnum teres</i> - <i>S. subsecundum</i>	mud sedge - scheuchzeria/peat moss	S1	CMW	CR, PL
<i>Carex limosa</i> / <i>Sphagnum jensenii</i>	mud sedge/pendant branch peat moss	S1	UBH	N/A <sup>4</sup>
<i>Carex oligosperma</i> / <i>Sphagnum subsecundum</i>	few-fruited sedge/twisted bog moss	S1S2	CMW	N/A <sup>4</sup>
<i>Carex pseudocyperus</i> - <i>Calla palustris</i>	cyperus-like sedge - water arum	S2	CMW, DMW	--
<i>Carex retrorsa</i> marsh	turned sedge marsh	S1S2	CMW, DMW	--
<i>Carex rostrata</i> marsh	beaked sedge marsh	S2	CMW, DMW, LBH, UBH	BC, BL, CR, PL, AR, OL, HL, WH
<i>Carex</i> spp. - <i>Stipa curtiseta</i> - <i>Danthonia intermedia</i> grassland	upland sedge - western porcupine grass - intermediate oat grass grassland	S1?	DMW	--
<i>Carex stenophylla</i> - <i>Pascopyrum smithii</i> slope grassland	low sedge - western wheat grass slope grassland	S1	DMW	--
<i>Elymus lanceolatus</i> - <i>Pascopyrum smithii</i>	northern wheat grass - western wheat grass	S2?	DMW	BC, BL, AR, HL
<i>Elymus trachycaulus</i> - <i>Distichlis stricta</i>	slender wheat grass - salt grass	S1	CMW	BC, BL, AR, HL
<i>Elymus trachycaulus</i> - <i>Hierochloa hirta</i> ssp. <i>arctica</i>	slender wheat grass - sweet grass	SU	CMW, DMW	BC, BL, AR
<i>Hudsonia tomentosa</i> sand flats	sand heather sand flats	S2?	CMW	--

Scientific Names	Common Names	Provincial and Global Ranks <sup>1</sup>	Natural Subregion <sup>2</sup>	Right-of-Way within Community Range <sup>3</sup>
<i>Pascopyrum smithii</i> - <i>Artemisia tilesii</i> - <i>Artemisia frigida</i>	western wheat grass - Herriot's sagewort - pasture sagewort	S1	DMW	BC, BL, AR
<i>Stipa curtisetia</i> - <i>Stipa viridula</i> - <i>Carex</i> spp.	western porcupine grass - green needle grass - sedges	S2S3	DMW	BC, BL, AR
<i>Triglochin maritima</i> - <i>Carex praegracilis</i> spring fen	seaside arrow-grass - graceful sedge spring fen	S1S2	CMW, DMW	BC
<b>Sparsely Vegetated</b>				
<i>Hudsonia tomentosa</i> sand flats	sand heather sand flats	S2?	DMW	--
<i>Puccinellia nuttalliana</i> - <i>Suaeda calceoliformis</i> - <i>Spergularia marina</i> barren	Nuttall's salt-meadow grass - western sea-blite - salt-marsh sand spurry barren	S2	CMW	BC
<i>Salicornia rubra</i> emergent marsh	samphire emergent marsh	S2, G2G3	CMW, DMW	--
<b>Aquatic</b>				
<i>Cymbella pusilla</i> - <i>Mastogloia smithii</i> - <i>Nitzschia palea</i>	diatom ponds	S1S3	CMW	N/A <sup>4</sup>
<i>Isoetes echinospora</i> aquatic community	northern quillwort aquatic community	S1	CMW, LBH, UBH	--
<i>Sparganium eurycarpum</i> emergent aquatic vegetation	giant bur-reed emergent aquatic vegetation	S1S2	CMW, DMW, LBH, UBH	BC, CR

**Source:** Allen 2014

- Notes:**
- 1 Provincial (S) and Global (G) ratings range from S1 (five or fewer occurrences or very few remaining hectares) to S5 (demonstrably secure, though it may be quite rare in parts of its range, especially at the periphery). Ranks may be combined (e.g., S1S2). This indicates a larger margin of error than ranks assigned a "?" qualifier. Ratings that are not of concern (4-5) are not included.  
 ? = Element is not yet ranked (i.e., S?), or has an inexact numerical rank (e.g., S1?).  
 U = Unrankable: currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
  - 2 Natural Subregion codes: CMW = Central Mixedwood Natural Subregion, DMW = Dry Mixedwood Natural Subregion, LBH = Lower Boreal Highlands Natural Subregion, UBH = Upper Boreal Highlands Natural Subregion, LFH = Lower Foothills Natural Subregion.
  - 3 BC = Bear Canyon Section, BL = Boundary Lake Section, CL = Christina Lake Section, PL = Pelican Lake Section, AR = Alces River Compressor Station, HL = Hidden Lake North Compressor Station, OL = Otter Lake Compressor Station, WH = Woodenhouse Compressor Station.
  - 4 Insufficient information.



## **APPENDIX C**

### **PHOTOPLATES**



Plate 1

View south of a typical mixedwood forest vegetation community observed along the Boundary Lake Section at SE 7-90-12 W6M (approximate KP 46.8) (August 23, 2014).



Plate 2

View east of a typical deciduous forest vegetation community observed along the Pelican Lake Section at 16-3-84-18 W4M (approximate KP 30.5) (August 25, 2014).





Plate 3

View north of a typical coniferous vegetation community observed along the Boundary Lake Section at SE 30-88-12 W6M (approximate KP 32.7) (August 25, 2014).



Plate 4

View west of a typical fen vegetation community observed along the Boundary Lake Section at NE 6-89-12 W6M (approximate KP 36.8) (August 24, 2014).





Plate 5 View east of typical bog vegetation community observed along the Boundary Lake Section at NE 29-92-12 W6M (approximate KP 73.8) (August 22, 2014).



Plate 6 View northwest of typical treed swamp vegetation community observed along the Pelican Lake Section at NW 18-86-18 W4M (approximate KP 54.1) (August 28, 2014).





Plate 7 View north of a typical riparian vegetation community observed along and old proposed route of the Pelican Lake Section at 12-26-82-17 W4M (approximate KP 12.5 (August 27, 2014).



Plate 8 Close-up view of pinesap located at 15-30-89-12 W6M along the Boundary Lake Section (approximate KP 43.9) (August 22, 2014).

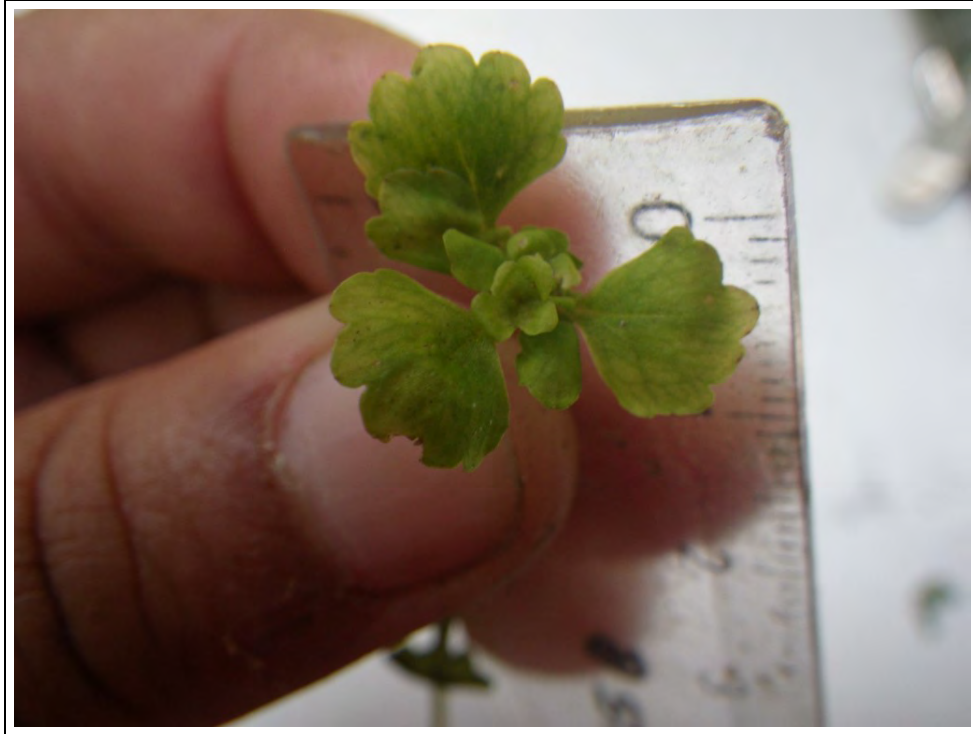


Plate 9

Close-up view of golden saxifrage located at 5-27-82-17 W4M along the Pelican Lake Section (approximate KP 13.3) (August 31, 2014).





Plate 10

Close-up view of leather grape fern located at 10-25-79-6 W4M along the Christina River Section (approximate KP 10.8) (August 23, 2014).



Plate 11

Close-up view of snakeskin liverwort located at 7-26-80-6 W4M along the Christina River Section (approximate KP 1.0) (August 21, 2014).



Plate 12

View east of Canada thistle (creeping thistle) and perennial sow-thistle population observed along the east side of a pond at the Alces River Unit Addition location at 13-85-13 W6M (August 24, 2014).





Plate 13

View north of Canada thistle (creeping thistle) population observed along the east side of a pond at the Alces River Unit Addition location at 13-85-13 W6M (August 24, 2014).



Plate 14

View of scentless chamomile observed at the Otter Lake Unit Addition located at N1/2 8-91-16 W5M (August 25, 2014).



Plate 15

View of MPB pitch tube observed along the Boundary Lake Section at SE 30-89-12 W4M (approximate KP 44.1) (August 23, 2014).

## APPENDIX D

### OBSERVED VEGETATION SPECIES – BY TYPE AND COMMON NAME ALONG THE BOUNDARY LAKE SECTION

Common Name	Scientific Name
<b>TREES</b>	
aspen	<i>Populus tremuloides</i>
balsam fir	<i>Abies balsamea</i>
balsam poplar	<i>Populus balsamifera</i>
black spruce	<i>Picea mariana</i>
jack pine	<i>Pinus banksiana</i>
lodgepole pine	<i>Pinus contorta</i>
tamarack	<i>Larix laricina</i>
white birch	<i>Betula papyrifera</i>
white spruce	<i>Picea glauca</i>
<b>SHRUBS</b>	
bracted honeysuckle	<i>Lonicera involucrata</i>
bristly black currant	<i>Ribes lacustre</i>
Canada buffaloberry	<i>Shepherdia canadensis</i>
common Labrador tea	<i>Ledum groenlandicum</i>
Drummond's willow	<i>Salix drummondiana</i>
dwarf birch	<i>Betula pumila</i>
low-bush cranberry	<i>Viburnum edule</i>
myrtle-leaved willow	<i>Salix myrtillifolia</i>
northern black currant	<i>Ribes hudsonianum</i>
northern gooseberry	<i>Ribes oxycanthoides</i>
prickly rose	<i>Rosa acicularis</i>
river alder	<i>Alnus incana</i>
saskatoon	<i>Amelanchier alnifolia</i>
skunk currant	<i>Ribes glandulosum</i>
snowberry	<i>Symphoricarpos albus</i>
wild red currant	<i>Ribes triste</i>
<b>FORBS, DWARF SHRUBS</b>	
American milk vetch	<i>Astragalus americanus</i>
arrow-leaved coltsfoot	<i>Petasites frigidus var. sagittatus</i>
arum-leaved arrowhead	<i>Sagittaria cuneata</i>
bishop's-cap	<i>Mitella nuda</i>
bitter cress	<i>Cardamine pensylvanica</i>
bog cranberry	<i>Vaccinium vitis-idaea</i>
bog rosemary	<i>Andromeda polifolia</i>
boreal buttercup	<i>Ranunculus hyperboreus</i>
bracted bog orchid	<i>Coeloglossum viride</i>
buck-bean	<i>Menyanthes trifoliata</i>
bunchberry	<i>Cornus canadensis</i>
Canada goldenrod	<i>Solidago canadensis</i>
clasping-leaved twisted-stalk	<i>Streptopus amplexifolius</i>
cloudberry	<i>Rubus chamaemorus</i>
common bearberry	<i>Arctostaphylos uva-ursi</i>
common bladderwort	<i>Utricularia vulgaris</i>
common blueberry	<i>Vaccinium myrtilloides</i>
common duckweed	<i>Lemna minor</i>



Common Name	Scientific Name
common fireweed	<i>Epilobium angustifolium</i>
common horsetail	<i>Equisetum arvense</i>
common mare's-tail	<i>Hippuris vulgaris</i>
common nettle	<i>Urtica dioica</i>
common pink wintergreen	<i>Pyrola asarifolia</i>
common yarrow	<i>Achillea millefolium</i>
coralroot species	<i>Corallorhiza</i> sp.
cow parsnip	<i>Heracleum lanatum</i>
cream-colored vetchling	<i>Lathyrus ochroleucus</i>
crowberry	<i>Empetrum nigrum</i>
dewberry	<i>Rubus pubescens</i>
dwarf bramble	<i>Rubus pedatus</i>
dwarf scouring-rush	<i>Equisetum scirpoides</i>
elephant's-head	<i>Pedicularis groenlandica</i>
felwort	<i>Gentianella amarella</i>
giant bur-reed	<i>Sparganium eurycarpum</i>
greenish-flowered wintergreen	<i>Pyrola chlorantha</i>
ground-pine	<i>Lycopodium obscurum</i>
heart-leaved arnica	<i>Arnica cordifolia</i>
hooded ladies'-tresses	<i>Spiranthes romanzoffiana</i>
kidney-leaved violet	<i>Viola renifolia</i>
Labrador lousewort	<i>Pedicularis labradorica</i>
Lapland buttercup	<i>Ranunculus lapponicus</i>
large-leaved yellow avens	<i>Geum macrophyllum</i>
lesser rattlesnake plantain	<i>Goodyera repens</i>
lesser wintergreen	<i>Pyrola minor</i>
Lindley's aster	<i>Aster ciliolatus</i>
long-leaved chickweed	<i>Stellaria longifolia</i>
marsh skullcap	<i>Scutellaria galericulata</i>
marsh-marigold	<i>Caltha palustris</i>
narrow-leaved hawkweed	<i>Hieracium umbellatum</i>
narrow-leaved willowherb	<i>Epilobium leptophyllum</i>
nodding beggarticks	<i>Bidens cernua</i>
northern bastard toadflax	<i>Geocaulon lividum</i>
northern bedstraw	<i>Galium boreale</i>
northern grass-of-parnassus	<i>Parnassia palustris</i>
northern starflower	<i>Trientalis borealis</i>
northern willowherb	<i>Epilobium ciliatum</i>
one-sided wintergreen	<i>Orthilia secunda</i>
palmate-leaved coltsfoot	<i>Petasites frigidus</i> var. <i>palmatus</i>
piresap	<i>Monotropa hypopithys</i>
rattlesnake plantain	<i>Goodyera oblongifolia</i>
red and white baneberry	<i>Actaea rubra</i>
rough cinquefoil	<i>Potentilla norvegica</i>
round-leaved bog orchid	<i>Platanthera orbiculata</i>
running club-moss	<i>Lycopodium clavatum</i>
showy aster	<i>Eurybia conspicua</i>
small bedstraw	<i>Galium trifidum</i>
small bog cranberry	<i>Oxycoccus microcarpus</i>
spiked water-milfoil	<i>Myriophyllum exalbescens</i>
spurred gentian	<i>Halenia deflexa</i>



Common Name	Scientific Name
stiff club-moss	<i>Lycopodium annotinum</i>
sweet coltsfoot	<i>Petasites frigidus</i>
sweet-scented bedstraw	<i>Galium triflorum</i>
tall Jacob's-ladder	<i>Polemonium acutiflorum</i>
tall lungwort	<i>Mertensia paniculata</i>
thread-leaved pondweed	<i>Potamogeton filiformis</i>
three-leaved Solomon's-seal	<i>Smilacina trifolia</i>
twinflower	<i>Linnaea borealis</i>
twining honeysuckle	<i>Lonicera dioica</i>
veiny meadow rue	<i>Thalictrum venulosum</i>
vernal water-starwort	<i>Callitriche verna</i>
violet species	<i>Viola sp.</i>
water parsnip	<i>Sium suave</i>
water-hemlock	<i>Cicuta maculata</i>
western dock	<i>Rumex occidentalis</i>
wild lily-of-the-valley	<i>Maianthemum canadense</i>
wild strawberry	<i>Fragaria virginiana</i>
woodland horsetail	<i>Equisetum sylvaticum</i>
yellow rattle	<i>Rhinanthus minor</i>
yellow water crowfoot	<i>Ranunculus gmelinii</i>
<b>GRASSES, SEDGES, RUSHES</b>	
Bebb's sedge	<i>Carex bebbii</i>
bluejoint	<i>Calamagrostis canadensis</i>
bog sedge	<i>Carex paupercula</i>
common cattail	<i>Typha latifolia</i>
common tall manna grass	<i>Glyceria grandis</i>
drooping wood-reed	<i>Cinna latifolia</i>
few-flowered sedge	<i>Carex pauciflora</i>
golden sedge	<i>Carex aurea</i>
hairy wild rye	<i>Leymus innovatus</i>
inland sedge	<i>Carex interior</i>
mud sedge	<i>Carex limosa</i>
reed canary grass	<i>Phalaris arundinacea</i>
sheathed cotton grass	<i>Eriophorum vaginatum</i>
short-awned foxtail	<i>Alopecurus aequalis</i>
small bottle sedge	<i>Carex utriculata</i>
small-flowered wood-rush	<i>Luzula parviflora</i>
small-fruited bulrush	<i>Scirpus microcarpus</i>
thin-leaved cotton grass	<i>Eriophorum viridi-carinatum</i>
three-seeded sedge	<i>Carex trisperma</i>
two-seeded sedge	<i>Carex disperma</i>
water sedge	<i>Carex aquatilis</i>
wire rush	<i>Juncus balticus</i>
<b>MOSSES, LICHENS, LIVERWORTS</b>	
Climacium moss	<i>Climacium dendroides</i>
Marchantia liverwort	<i>Marchantia polymorpha</i>
peat moss species	<i>Sphagnum sp.</i>
reindeer lichen	<i>Cladonia rangiferina</i>
rusty peat moss	<i>Sphagnum fuscum</i>
squarrose peat moss	<i>Sphagnum squarrosum</i>
stair-step moss	<i>Hylocomium splendens</i>

Common Name	Scientific Name
<b>WEEDS, AGRONOMICS</b>	
alsike clover	<i>Trifolium hybridum</i>
<b>Canada thistle (creeping thistle)</b>	<b><i>Cirsium arvense</i></b>
cicer milk vetch	<i>Astragalus cicer</i>
clover species	<i>Trifolium sp.</i>
common dandelion	<i>Taraxacum officinale</i>
<b>perennial sow-thistle</b>	<b><i>Sonchus arvensis</i></b>
sainfoin	<i>Onobrychis viciifolia</i>

- Notes:**
- 1 **Bold** font denotes Noxious weed species.
- Where the Alberta *Weed Control Regulation* name for a species differs from the ACIMS list of all elements (AESRD 2014d), the ACIMS name has been provided in brackets alongside the *Weed Control Regulation* name.
  - The status of species as native or not is according to the list of all elements in Alberta (AESRD 2014d).

## APPENDIX E

### OBSERVED VEGETATION SPECIES - BY TYPE AND COMMON NAME ALONG THE BEAR CANYON SECTION

Common Name	Scientific Name
<b>TREES</b>	
aspen	<i>Populus tremuloides</i>
black spruce	<i>Picea mariana</i>
lodgepole pine	<i>Pinus contorta</i>
white birch	<i>Betula papyrifera</i>
white spruce	<i>Picea glauca</i>
<b>SHRUBS</b>	
bracted honeysuckle	<i>Lonicera involucrata</i>
bristly black currant	<i>Ribes lacustre</i>
common Labrador tea	<i>Ledum groenlandicum</i>
Farr's willow	<i>Salix farriae</i>
low-bush cranberry	<i>Viburnum edule</i>
northern gooseberry	<i>Ribes oxycanthoides</i>
prickly rose	<i>Rosa acicularis</i>
red-osier dogwood	<i>Cornus stolonifera</i>
river alder	<i>Alnus incana</i>
saskatoon	<i>Amelanchier alnifolia</i>
Scouler's willow	<i>Salix scouleriana</i>
western mountain-ash	<i>Sorbus scopulina</i>
wild red currant	<i>Ribes triste</i>
wild red raspberry	<i>Rubus idaeus</i>
<b>FORBS, DWARF SHRUBS</b>	
arrow-leaved coltsfoot	<i>Petasites frigidus</i> var. <i>sagittatus</i>
bitter cress	<i>Cardamine pensylvanica</i>
bog cranberry	<i>Vaccinium vitis-idaea</i>
broad-leaved water-plantain	<i>Alisma plantago-aquatica</i>
bunchberry	<i>Cornus canadensis</i>
Canada goldenrod	<i>Solidago canadensis</i>
clasping-leaf pondweed	<i>Potamogeton richardsonii</i>
cloudberry	<i>Rubus chamaemorus</i>
common bladderwort	<i>Utricularia vulgaris</i>
common duckweed	<i>Lemna minor</i>
common fireweed	<i>Epilobium angustifolium</i>
common horsetail	<i>Equisetum arvense</i>
common pink wintergreen	<i>Pyrola asarifolia</i>
common red paintbrush	<i>Castilleja miniata</i>
cream-colored vetchling	<i>Lathyrus ochroleucus</i>
dewberry	<i>Rubus pubescens</i>
elephant's-head	<i>Pedicularis groenlandica</i>
fairybells	<i>Disporum trachycarpum</i>
false Solomon's-seal	<i>Smilacina racemosa</i>
leafy arnica	<i>Arnica chamissonis</i>
Lindley's aster	<i>Aster ciliolatus</i>
lousewort species	<i>Pedicularis</i> sp.
many-flowered yarrow	<i>Achillea sibirica</i>
marsh cinquefoil	<i>Potentilla palustris</i>

Common Name	Scientific Name
marsh hedge-nettle	<i>Stachys palustris</i>
marsh skullcap	<i>Scutellaria galericulata</i>
marsh-marigold	<i>Caltha palustris</i>
narrow-leaved willowherb	<i>Epilobium leptophyllum</i>
nodding beggarticks	<i>Bidens cernua</i>
northern bedstraw	<i>Galium boreale</i>
oak fern	<i>Gymnocarpium dryopteris</i>
palmate-leaved coltsfoot	<i>Petasites frigidus</i> var. <i>palmatus</i>
red and white baneberry	<i>Actaea rubra</i>
showy aster	<i>Eurybia conspicua</i>
small bedstraw	<i>Galium trifidum</i>
small bog cranberry	<i>Oxycoccus microcarpus</i>
spiked water-milfoil	<i>Myriophyllum exalbescens</i>
spreading sweet cicely	<i>Osmorhiza depauperata</i>
spurred gentian	<i>Halenia deflexa</i>
stiff club-moss	<i>Lycopodium annotinum</i>
sweet coltsfoot	<i>Petasites frigidus</i> var. <i>frigidus</i>
tall lungwort	<i>Mertensia paniculata</i>
three-leaved Solomon's-seal	<i>Smilacina trifolia</i>
twinline	<i>Linnaea borealis</i>
violet species	<i>Viola</i> sp.
water parsnip	<i>Sium suave</i>
water smartweed	<i>Polygonum amphibium</i>
water-hemlock	<i>Cicuta maculata</i>
wild lily-of-the-valley	<i>Maianthemum canadense</i>
wild mint	<i>Mentha arvensis</i>
wild sarsaparilla	<i>Aralia nudicaulis</i>
wild vetch	<i>Vicia americana</i>
woodland horsetail	<i>Equisetum sylvaticum</i>
woolly hawkweed	<i>Hieracium cynoglossoides</i>
yellow water crowfoot	<i>Ranunculus gmelinii</i>
<b>GRASSES, SEDGES, RUSHES</b>	
bluejoint	<i>Calamagrostis canadensis</i>
common cattail	<i>Typha latifolia</i>
common tall manna grass	<i>Glyceria grandis</i>
fringed brome	<i>Bromus ciliatus</i>
hairy wild rye	<i>Leymus innovatus</i>
hay sedge	<i>Carex siccata</i>
long-bracted sedge	<i>Carex athrostachya</i>
Raymond's sedge	<i>Carex raymondii</i>
reed canary grass	<i>Phalaris arundinacea</i>
slough grass	<i>Beckmannia syzigachne</i>
small bottle sedge	<i>Carex utriculata</i>
small-fruited bulrush	<i>Scirpus microcarpus</i>
three-seeded sedge	<i>Carex trisperma</i>
water sedge	<i>Carex aquatilis</i>
wire rush	<i>Juncus balticus</i>
<b>MOSSES, LICHENS, LIVERWORTS</b>	
peat moss species	<i>Sphagnum</i> sp.
<b>WEEDS, AGRONOMICS</b>	
alsike clover	<i>Trifolium hybridum</i>



Common Name	Scientific Name
<b>Canada thistle (creeping thistle)</b>	<b><i>Cirsium arvense</i></b>
cicer milk vetch	<i>Astragalus cicer</i>
low cudweed	<i>Gnaphalium uliginosum</i>
orchard grass	<i>Dactylis glomerata</i>

- Notes:**
- 1 **Bold** font denotes Noxious weed species.
- Where the Alberta *Weed Control Regulation* name for a species differs from the ACIMS list of all elements (AESRD 2014d), the ACIMS name has been provided in brackets alongside the *Weed Control Regulation* name.
  - The status of species as native or not is according to the list of all elements in Alberta (AESRD 2014d).

## APPENDIX F

### OBSERVED VEGETATION SPECIES – BY TYPE AND COMMON NAME ALONG THE PELICAN LAKE SECTION

Common Name	Scientific Name
<b>TREES</b>	
Alaska birch	<i>Betula neoalaskana</i>
aspen	<i>Populus tremuloides</i>
balsam fir	<i>Abies balsamea</i>
balsam poplar	<i>Populus balsamifera</i>
black spruce	<i>Picea mariana</i>
tamarack	<i>Larix laricina</i>
white birch	<i>Betula papyrifera</i>
white spruce	<i>Picea glauca</i>
<b>SHRUBS</b>	
balsam willow	<i>Salix pyrifolia</i>
bog willow	<i>Salix pedicellaris</i>
buckbrush	<i>Symphoricarpos occidentalis</i>
Canada buffaloberry	<i>Shepherdia canadensis</i>
common Labrador tea	<i>Ledum groenlandicum</i>
common wild rose	<i>Rosa woodsii</i>
dwarf birch	<i>Betula pumila</i>
flat-leaved willow	<i>Salix planifolia</i>
leatherleaf	<i>Chamaedaphne calyculata</i>
low-bush cranberry	<i>Viburnum edule</i>
narrow-leaved meadowsweet	<i>Spiraea alba</i>
northern gooseberry	<i>Ribes oxycanthoides</i>
northern Labrador tea	<i>Ledum palustre</i>
prickly rose	<i>Rosa acicularis</i>
saskatoon	<i>Amelanchier alnifolia</i>
skunk currant	<i>Ribes glandulosum</i>
smooth willow	<i>Salix glauca</i>
snowberry	<i>Symphoricarpos albus</i>
sweet gale	<i>Myrica gale</i>
thimbleberry	<i>Rubus parviflorus</i>
water birch	<i>Betula occidentalis</i>
wild red raspberry	<i>Rubus idaeus</i>
willow species	<i>Salix</i> sp.
<b>FORBS, DWARF SHRUBS</b>	
alpine bearberry	<i>Arctostaphylos rubra</i>
arrow-leaved coltsfoot	<i>Petasites frigidus</i> var. <i>sagittatus</i>
Bicknell's geranium	<i>Geranium bicknellii</i>
bishop's-cap	<i>Mitella nuda</i>
bitter cress	<i>Cardamine pensylvanica</i>
bog cranberry	<i>Vaccinium vitis-idaea</i>
buck-bean	<i>Menyanthes trifoliata</i>
bulb-bearing water-hemlock	<i>Cicuta bulbifera</i>
bunchberry	<i>Cornus canadensis</i>
Canada goldenrod	<i>Solidago canadensis</i>
celery-leaved buttercup	<i>Ranunculus sceleratus</i>
cloudberry	<i>Rubus chamaemorus</i>

Common Name	Scientific Name
club-moss species	<i>Lycopodium</i> sp.
common bearberry	<i>Arctostaphylos uva-ursi</i>
common fireweed	<i>Epilobium angustifolium</i>
common horsetail	<i>Equisetum arvense</i>
common mare's-tail	<i>Hippuris vulgaris</i>
common pink wintergreen	<i>Pyrola asarifolia</i>
common yarrow	<i>Achillea millefolium</i>
cream-colored vetchling	<i>Lathyrus ochroleucus</i>
crowberry	<i>Empetrum nigrum</i>
dewberry	<i>Rubus pubescens</i>
dwarf bilberry	<i>Vaccinium caespitosum</i>
dwarf scouring-rush	<i>Equisetum scirpoides</i>
fairybells	<i>Disporum trachycarpum</i>
flat-leaved bladderwort	<i>Utricularia intermedia</i>
floating marsh-marigold	<i>Caltha natans</i>
golden saxifrage	<i>Chrysosplenium iowense</i>
ground-pine	<i>Lycopodium obscurum</i>
groundsel species	<i>Senecio</i> sp.
hooded ladies'-tresses	<i>Spiranthes romanzoffiana</i>
Lindley's aster	<i>Aster ciliolatus</i>
Macoun's buttercup	<i>Ranunculus macounii</i>
many-flowered yarrow	<i>Achillea sibirica</i>
marsh cinquefoil	<i>Potentilla palustris</i>
marsh hedge-nettle	<i>Stachys palustris</i>
marsh skullcap	<i>Scutellaria galericulata</i>
marsh yellow cress	<i>Rorippa palustris</i>
meadow horsetail	<i>Equisetum pratense</i>
narrow-leaved hawkweed	<i>Hieracium umbellatum</i>
nodding beggarticks	<i>Bidens cernua</i>
northern bedstraw	<i>Galium boreale</i>
northern grass-of-parnassus	<i>Parnassia palustris</i>
northern green bog orchid	<i>Platanthera hyperborea</i>
northern laurel	<i>Kalmia polifolia</i>
northern starflower	<i>Trientalis borealis</i>
northern willowherb	<i>Epilobium ciliatum</i>
oak fern	<i>Gymnocarpium dryopteris</i>
one-flowered wintergreen	<i>Moneses uniflora</i>
one-sided wintergreen	<i>Orthilia secunda</i>
ostrich fern	<i>Matteuccia struthiopteris</i>
pale coralroot	<i>Corallorhiza trifida</i>
palmate-leaved coltsfoot	<i>Petasites frigidus</i> var. <i>palmatum</i>
purple-stemmed aster	<i>Aster puniceus</i>
round-leaved sundew	<i>Drosera rotundifolia</i>
seaside arrow-grass	<i>Triglochin maritima</i>
showy aster	<i>Eurybia conspicua</i>
small bedstraw	<i>Galium trifidum</i>
small bog cranberry	<i>Oxycoccus microcarpus</i>
small enchanter's nightshade	<i>Circaea alpina</i>
smooth aster	<i>Aster laevis</i>
spiked water-milfoil	<i>Myriophyllum exalbescens</i>
spurred gentian	<i>Halenia deflexa</i>

Common Name	Scientific Name
star-flowered Solomon's-seal	<i>Smilacina stellata</i>
stiff club-moss	<i>Lycopodium annotinum</i>
strawberry blite	<i>Chenopodium capitatum</i>
swamp horsetail	<i>Equisetum fluviatile</i>
sweet-scented bedstraw	<i>Galium triflorum</i>
tall larkspur	<i>Delphinium glaucum</i>
tall lungwort	<i>Mertensia paniculata</i>
three-leaved Solomon's-seal	<i>Smilacina trifolia</i>
tufted loosestrife	<i>Lysimachia thyrsoflora</i>
twinner	<i>Linnaea borealis</i>
twining honeysuckle	<i>Lonicera dioica</i>
veiny meadow rue	<i>Thalictrum venulosum</i>
violet species	<i>Viola</i> sp.
water arum	<i>Calla palustris</i>
water parsnip	<i>Sium suave</i>
water-hemlock	<i>Cicuta maculata</i>
western Canada violet	<i>Viola canadensis</i>
western dock	<i>Rumex occidentalis</i>
wild licorice	<i>Glycyrrhiza lepidota</i>
wild lily-of-the-valley	<i>Maianthemum canadense</i>
wild mint	<i>Mentha arvensis</i>
wild sarsaparilla	<i>Aralia nudicaulis</i>
wild strawberry	<i>Fragaria virginiana</i>
wild vetch	<i>Vicia americana</i>
willowherb species	<i>Epilobium</i> sp.
woodland strawberry	<i>Fragaria vesca</i>
yellow avens	<i>Geum aleppicum</i>
yellow water crowfoot	<i>Ranunculus gmelinii</i>
<b>GRASSES, SEDGES, RUSHES</b>	
Bebb's sedge	<i>Carex bebbii</i>
big-head rush	<i>Juncus vaseyi</i>
bluejoint	<i>Calamagrostis canadensis</i>
bog sedge	<i>Carex paupercula</i>
brownish sedge	<i>Carex brunneascens</i>
common tall manna grass	<i>Glyceria grandis</i>
drooping wood-reed	<i>Cinna latifolia</i>
few-flowered sedge	<i>Carex pauciflora</i>
fowl bluegrass	<i>Poa palustris</i>
foxtail barley	<i>Hordeum jubatum</i>
fringed brome	<i>Bromus ciliatus</i>
hairy wild rye	<i>Leymus innovatus</i>
hoary sedge	<i>Carex canescens</i>
inland sedge	<i>Carex interior</i>
long-bracted sedge	<i>Carex athrostachya</i>
mud sedge	<i>Carex limosa</i>
narrowleaf cotton-grass	<i>Eriophorum angustifolium</i>
needle spike-rush	<i>Eleocharis acicularis</i>
northern bog sedge	<i>Carex gynocrates</i>
purple oat grass	<i>Schizachne purpurascens</i>
reed canary grass	<i>Phalaris arundinacea</i>
rough hair grass	<i>Agrostis scabra</i>



Common Name	Scientific Name
russett cotton grass	<i>Eriophorum chamissonis</i>
Sartwell's sedge	<i>Carex sartwellii</i>
sedge species	<i>Carex</i> sp.
sheathed cotton grass	<i>Eriophorum vaginatum</i>
short-awned foxtail	<i>Alopecurus aequalis</i>
slough grass	<i>Beckmannia syzigachne</i>
small bottle sedge	<i>Carex utriculata</i>
small-fruited bulrush	<i>Scirpus microcarpus</i>
sweet grass	<i>Hierochloe hirta</i> ssp. <i>arctica</i>
three-square rush	<i>Scirpus pungens</i>
water sedge	<i>Carex aquatilis</i>
white-grained mountain rice grass	<i>Oryzopsis asperifolia</i>
yellow rattle	<i>Rhinanthus minor</i>
woolly sedge	<i>Carex pellita</i>
<b>MOSSES, LICHENS, LIVERWORTS</b>	
acute-leaved peat moss	<i>Sphagnum capillifolium</i>
bighorn cladonia	<i>Cladonia cornuta</i>
Blepharostoma liverwort	<i>Blepharostoma trichophyllum</i>
brown moss	<i>Hamatocaulis vernicosus</i>
Calypogeia liverwort	<i>Calypogeia sphagnicola</i>
candy lichen	<i>Icmadophila ericetorum</i>
Cephalozia liverwort	<i>Cephalozia pleniceps</i>
cladonia lichen	<i>Cladonia</i> sp.
common hair-cap	<i>Polytrichum commune</i>
golden moss	<i>Tomentypnum nitens</i>
granular mottled-disk lichen	<i>Trapeliopsis granulosa</i>
greater sulphur-cup	<i>Cladonia sulphurina</i>
Helodium moss	<i>Helodium blandowii</i>
knight's plume moss	<i>Ptilium crista-castrensis</i>
Lophozia liverwort	<i>Lophozia ventricosa</i>
Marchantia liverwort	<i>Marchantia polymorpha</i>
Mylia liverwort	<i>Mylia anomala</i>
organ-pipe lichen	<i>Cladonia crispata</i>
peat moss	<i>Sphagnum angustifolium</i>
reindeer lichen	<i>Cladonia mitis</i>
rusty peat moss	<i>Sphagnum fuscum</i>
Schreber's moss	<i>Pleurozium schreberi</i>
shore-growing peat moss	<i>Sphagnum riparium</i>
slender hair-cap	<i>Polytrichum strictum</i>
squarrose peat moss	<i>Sphagnum squarrosum</i>
stair-step moss	<i>Hylocomium splendens</i>
studded leather lichen	<i>Peltigera aphthosa</i>
toothed Plagiomnium moss	<i>Plagiomnium cuspidatum</i>
tufted moss	<i>Aulacomnium palustre</i>
undulating pelt lichen	<i>Peltigera neopolydactyla</i>
wrinkle lichen	<i>Vulpicida pinastri</i>
<b>WEEDS, AGRONOMICS</b>	
absinthe wormwood	<i>Artemisia absinthium</i>
alfalfa	<i>Medicago sativa</i>
alsike clover	<i>Trifolium hybridum</i>
annual hawk's-beard	<i>Crepis tectorum</i>

Common Name	Scientific Name
awnless brome	<i>Bromus inermis</i>
bird's-foot trefoil	<i>Lotus corniculatus</i>
cicer milk vetch	<i>Astragalus cicer</i>
clover species	<i>Trifolium sp.</i>
common dandelion	<i>Taraxacum officinale</i>
common plantain	<i>Plantago major</i>
hemp-nettle	<i>Galeopsis tetrahit</i>
lamb's-quarters	<i>Chenopodium album</i>
<b>perennial sow-thistle</b>	<b><i>Sonchus arvensis</i></b>
pineappleweed	<i>Matricaria matricarioides</i>
red clover	<i>Trifolium pratense</i>
Timothy	<i>Phleum pratense</i>
water foxtail	<i>Alopecurus geniculatus</i>
white sweet-clover	<i>Melilotus alba</i>
yellow sweet-clover	<i>Melilotus officinalis</i>

- Notes:**
- 1 **Bold** font denotes Noxious weed species.
  - The status of species as native or not is according to the list of all elements in Alberta (AESRD 2014d).

## APPENDIX G

### OBSERVED VEGETATION SPECIES – BY TYPE AND COMMON NAME ALONG THE CHRISTINA RIVER SECTION

Common Name	Scientific Name
<b>TREES</b>	
aspen	<i>Populus tremuloides</i>
balsam poplar	<i>Populus balsamifera</i>
black spruce	<i>Picea mariana</i>
jack pine	<i>Pinus banksiana</i>
tamarack	<i>Larix laricina</i>
white birch	<i>Betula papyrifera</i>
white spruce	<i>Picea glauca</i>
<b>SHRUBS</b>	
bog birch	<i>Betula glandulosa</i>
bracted honeysuckle	<i>Lonicera involucrata</i>
Canada buffaloberry	<i>Shepherdia canadensis</i>
choke cherry	<i>Prunus virginiana</i>
common Labrador tea	<i>Ledum groenlandicum</i>
common wild rose	<i>Rosa woodsii</i>
dwarf birch	<i>Betula pumila</i>
green alder	<i>Alnus viridis</i>
leatherleaf	<i>Chamaedaphne calyculata</i>
low-bush cranberry	<i>Viburnum edule</i>
northern black currant	<i>Ribes hudsonianum</i>
northern gooseberry	<i>Ribes oxycanthoides</i>
prickly rose	<i>Rosa acicularis</i>
red-osier dogwood	<i>Cornus stolonifera</i>
river alder	<i>Alnus incana</i>
sandbar willow	<i>Salix exigua</i>
saskatoon	<i>Amelanchier alnifolia</i>
snowberry	<i>Symphoricarpos albus</i>
southernwood species	<i>Artemisia</i> sp.
wild red raspberry	<i>Rubus idaeus</i>
willow species	<i>Salix</i> sp.
<b>FORBS, DWARF SHRUBS</b>	
alpine bearberry	<i>Arctostaphylos rubra</i>
arrow-leaved coltsfoot	<i>Petasites frigidus</i> var. <i>sagittatus</i>
Bicknell's geranium	<i>Geranium bicknellii</i>
bishop's-cap	<i>Mitella nuda</i>
bitter cress	<i>Cardamine pensylvanica</i>
bitter cress species	<i>Cardamine</i> sp.
blunt-leaved bog orchid	<i>Platanthera obtusata</i>
bog cranberry	<i>Vaccinium vitis-idaea</i>
bog rosemary	<i>Andromeda polifolia</i>
bracted bog orchid	<i>Coeloglossum viride</i>
broad spinulose shield fern	<i>Dryopteris assimilis</i>
broad-leaved water-plantain	<i>Alisma plantago-aquatica</i>
bunchberry	<i>Cornus canadensis</i>
Canada anemone	<i>Anemone canadensis</i>
Canada goldenrod	<i>Solidago canadensis</i>

Common Name	Scientific Name
celery-leaved buttercup	<i>Ranunculus sceleratus</i>
cloudberry	<i>Rubus chamaemorus</i>
club-moss species	<i>Lycopodium</i> sp.
columbine species	<i>Aquilegia</i> sp.
common bearberry	<i>Arctostaphylos uva-ursi</i>
common blueberry	<i>Vaccinium myrtilloides</i>
common duckweed	<i>Lemna minor</i>
common fireweed	<i>Epilobium angustifolium</i>
common horsetail	<i>Equisetum arvense</i>
common nettle	<i>Urtica dioica</i>
common pink wintergreen	<i>Pyrola asarifolia</i>
common yarrow	<i>Achillea millefolium</i>
cream-colored vetchling	<i>Lathyrus ochroleucus</i>
dewberry	<i>Rubus pubescens</i>
fairybells	<i>Disporum trachycarpum</i>
golden saxifrage	<i>Chrysosplenium iowense</i>
green saxifrage	<i>Chrysosplenium tetrandrum</i>
ground-pine	<i>Lycopodium obscurum</i>
harebell	<i>Campanula rotundifolia</i>
horsetail species	<i>Equisetum</i> sp.
large-leaved yellow avens	<i>Geum macrophyllum</i>
leather grape fern	<i>Botrychium multifidum</i> var. <i>intermedium</i>
lousewort species	<i>Pedicularis</i> sp.
Macoun's buttercup	<i>Ranunculus macounii</i>
marsh cinquefoil	<i>Potentilla palustris</i>
marsh hedge-nettle	<i>Stachys palustris</i>
marsh skullcap	<i>Scutellaria galericulata</i>
marsh yellow cress	<i>Rorippa palustris</i>
marsh-marigold	<i>Caltha palustris</i>
moschatel	<i>Adoxa moschatellina</i>
narrow-leaved hawkweed	<i>Hieracium umbellatum</i>
nodding beggarticks	<i>Bidens cernua</i>
northern bedstraw	<i>Galium boreale</i>
northern grass-of-parnassus	<i>Parnassia palustris</i>
northern starflower	<i>Trientalis borealis</i>
northern willowherb	<i>Epilobium ciliatum</i>
ostrich fern	<i>Matteuccia struthiopteris</i>
palmate-leaved coltsfoot	<i>Petasites frigidus</i> var. <i>palmatius</i>
rough cinquefoil	<i>Potentilla norvegica</i>
round-leaved sundew	<i>Drosera rotundifolia</i>
showy aster	<i>Eurybia conspicua</i>
small bog cranberry	<i>Oxycoccus microcarpus</i>
small enchanter's nightshade	<i>Circaea alpina</i>
smooth aster	<i>Aster laevis</i>
spreading dogbane	<i>Apocynum androsaemifolium</i>
star-flowered Solomon's-seal	<i>Smilacina stellata</i>
sweet-scented bedstraw	<i>Galium triflorum</i>
tall lungwort	<i>Mertensia paniculata</i>
touch-me-not species	<i>Impatiens</i> sp.
twinflwer	<i>Linnaea borealis</i>
twining honeysuckle	<i>Lonicera dioica</i>



Common Name	Scientific Name
veiny meadow rue	<i>Thalictrum venulosum</i>
water smartweed	<i>Polygonum amphibium</i>
water-hemlock	<i>Cicuta maculata</i>
western Canada violet	<i>Viola canadensis</i>
western dock	<i>Rumex occidentalis</i>
wild lily-of-the-valley	<i>Maianthemum canadense</i>
wild mint	<i>Mentha arvensis</i>
wild sarsaparilla	<i>Aralia nudicaulis</i>
wild strawberry	<i>Fragaria virginiana</i>
wild vetch	<i>Vicia americana</i>
woodland horsetail	<i>Equisetum sylvaticum</i>
yellow rattle	<i>Rhinanthus minor</i>
<b>GRASSES, SEDGES, RUSHES</b>	
beautiful sedge	<i>Carex concinna</i>
Bebb's sedge	<i>Carex bebbii</i>
bluejoint	<i>Calamagrostis canadensis</i>
common cattail	<i>Typha latifolia</i>
common tall manna grass	<i>Glyceria grandis</i>
drooping wood-reed	<i>Cinna latifolia</i>
foxtail barley	<i>Hordeum jubatum</i>
fringed brome	<i>Bromus ciliatus</i>
Kentucky bluegrass	<i>Poa pratensis</i>
meadow sedge	<i>Carex praticola</i>
purple oat grass	<i>Schizachne purpurascens</i>
rough hair grass	<i>Agrostis scabra</i>
sedge species	<i>Carex</i> sp.
sheathed cotton grass	<i>Eriophorum vaginatum</i>
slough grass	<i>Beckmannia syzigachne</i>
small bottle sedge	<i>Carex utriculata</i>
small-fruited bulrush	<i>Scirpus microcarpus</i>
tufted hair grass	<i>Deschampsia cespitosa</i>
two-seeded sedge	<i>Carex disperma</i>
water sedge	<i>Carex aquatilis</i>
wild-rye species	<i>Elymus</i> sp.
wire rush	<i>Juncus balticus</i>
<b>MOSSES, LICHENS, LIVERWORTS</b>	
hair-cap species	<i>Polytrichum</i> sp.
knight's plume moss	<i>Ptilium crista-castrensis</i>
Marchantia liverwort	<i>Marchantia polymorpha</i>
midway peat moss	<i>Sphagnum magellanicum</i>
peat moss	<i>Sphagnum angustifolium</i>
reindeer lichen	<i>Cladonia mitis</i>
rusty peat moss	<i>Sphagnum fuscum</i>
snakeskin liverwort	<i>Conocephalum salebrosum</i>
squarrose peat moss	<i>Sphagnum squarrosum</i>
stair-step moss	<i>Hylocomium splendens</i>
star-tipped reindeer lichen	<i>Cladonia stellaris</i>
waxyleaf moss	<i>Dicranum polysetum</i>
<b>WEEDS, AGRONOMICS</b>	
alfalfa	<i>Medicago sativa</i>
alsike clover	<i>Trifolium hybridum</i>

Common Name	Scientific Name
annual hawk's-beard	<i>Crepis tectorum</i>
awnless brome	<i>Bromus inermis</i>
bird's-foot trefoil	<i>Lotus corniculatus</i>
cicer milk vetch	<i>Astragalus cicer</i>
common dandelion	<i>Taraxacum officinale</i>
common plantain	<i>Plantago major</i>
hemp-nettle	<i>Galeopsis tetrahit</i>
<b>perennial sow-thistle</b>	<b><i>Sonchus arvensis</i></b>
pineappleweed	<i>Matricaria matricarioides</i>
red clover	<i>Trifolium pratense</i>
sweet-clover species	<i>Melilotus</i> sp.
timothy	<i>Phleum pratense</i>
wild buckwheat	<i>Polygonum convolvulus</i>
yellow sweet-clover	<i>Melilotus officinalis</i>

- Notes:**
- 1 **Bold** font denotes Noxious weed species.
- The status of species as native or not is according to the list of all elements in Alberta (AESRD 2014d).

## APPENDIX H

### OBSERVED VEGETATION SPECIES – BY TYPE AND COMMON NAME ALONG THE ALCES RIVER UNIT ADDITION

Common Name	Scientific Name
<b>TREES</b>	
tamarack	<i>Larix laricina</i>
white birch	<i>Betula papyrifera</i>
<b>SHRUBS</b>	
autumn willow	<i>Salix serissima</i>
dwarf birch	<i>Betula pumila</i>
green alder	<i>Alnus viridis</i> ssp. <i>crispa</i>
skunk currant	<i>Ribes glandulosum</i>
wild red raspberry	<i>Rubus idaeus</i>
willow species	<i>Salix</i> sp.
<b>FORBS, DWARF SHRUBS</b>	
bitter cress	<i>Cardamine pensylvanica</i>
bracted bog orchid	<i>Coeloglossum viride</i>
Canada goldenrod	<i>Solidago canadensis</i>
common bladderwort	<i>Utricularia vulgaris</i>
common fireweed	<i>Epilobium angustifolium</i>
common yarrow	<i>Achillea millefolium</i>
felwort	<i>Gentianella amarella</i>
large-leaved yellow avens	<i>Geum macrophyllum</i>
Lindley's aster	<i>Aster ciliolatus</i>
many-flowered yarrow	<i>Achillea sibirica</i>
marsh cinquefoil	<i>Potentilla palustris</i>
meadow horsetail	<i>Equisetum pratense</i>
northern grass-of-parnassus	<i>Parnassia palustris</i>
purple-stemmed aster	<i>Aster puniceus</i>
small bedstraw	<i>Galium trifidum</i>
small bog cranberry	<i>Oxycoccus microcarpus</i>
sweet coltsfoot	<i>Petasites frigidus</i> var. <i>frigidus</i>
water parsnip	<i>Sium suave</i>
western dock	<i>Rumex occidentalis</i>
wild strawberry	<i>Fragaria virginiana</i>
wild vetch	<i>Vicia americana</i>
yellow rattle	<i>Rhinanthus minor</i>
<b>GRASSES, SEDGES, RUSHES</b>	
bluejoint	<i>Calamagrostis canadensis</i>
bog sedge	<i>Carex paupercula</i>
common cattail	<i>Typha latifolia</i>
fowl bluegrass	<i>Poa palustris</i>
foxtail barley	<i>Hordeum jubatum</i>
reed canary grass	<i>Phalaris arundinacea</i>
rough hair grass	<i>Agrostis scabra</i>
slender rush	<i>Juncus tenuis</i>
slender wheatgrass	<i>Elymus trachycaulus</i> ssp. <i>subsecundus</i>
slough grass	<i>Beckmannia syzigachne</i>
small bottle sedge	<i>Carex utriculata</i>
small-fruited bulrush	<i>Scirpus microcarpus</i>

Common Name	Scientific Name
tufted hair grass	<i>Deschampsia cespitosa</i>
water sedge	<i>Carex aquatilis</i>
<b>MOSSES, LICHENS, LIVERWORTS</b>	
Marchantia liverwort	<i>Marchantia polymorpha</i>
<b>WEEDS, AGRONOMICS</b>	
alsike clover	<i>Trifolium hybridum</i>
annual hawk's-beard	<i>Crepis tectorum</i>
<b>Canada thistle (creeping thistle)</b>	<b><i>Cirsium arvense</i></b>
common dandelion	<i>Taraxacum officinale</i>
common plantain	<i>Plantago major</i>
low cudweed	<i>Gnaphalium uliginosum</i>
<b>perennial sow-thistle</b>	<b><i>Sonchus arvensis</i></b>
summer-cypress	<i>Kochia scoparia</i>
Timothy	<i>Phleum pratense</i>
white sweet-clover	<i>Melilotus alba</i>
yellow sweet-clover	<i>Melilotus officinalis</i>

- Notes:**
- 1 **Bold** font denotes Noxious weed species.
  - Where the Alberta *Weed Control Regulation* name for a species differs from the ACIMS list of all elements (AESRD 2014d), the ACIMS name has been provided in brackets alongside the *Weed Control Regulation* name.
  - The status of species as native or not is according to the list of all elements in Alberta (AESRD 2014d).



## APPENDIX I

### OBSERVED VEGETATION SPECIES – BY TYPE AND COMMON NAME ALONG THE OTTER LAKE UNIT ADDITION

Common Name	Scientific Name
<b>TREES</b>	
aspen	<i>Populus tremuloides</i>
balsam poplar	<i>Populus balsamifera</i>
black spruce	<i>Picea mariana</i>
lodgepole pine	<i>Pinus contorta</i>
tamarack	<i>Larix laricina</i>
white birch	<i>Betula papyrifera</i>
<b>SHRUBS</b>	
Canada buffaloberry	<i>Shepherdia canadensis</i>
common Labrador tea	<i>Ledum groenlandicum</i>
dwarf birch	<i>Betula pumila</i>
low-bush cranberry	<i>Viburnum edule</i>
myrtle-leaved willow	<i>Salix myrtillifolia</i>
northern gooseberry	<i>Ribes oxycanthoides</i>
prickly rose	<i>Rosa acicularis</i>
skunk currant	<i>Ribes glandulosum</i>
willow species	<i>Salix</i> sp.
<b>FORBS, DWARF SHRUBS</b>	
alpine milk vetch	<i>Astragalus alpinus</i>
American milk vetch	<i>Astragalus americanus</i>
arrow-leaved coltsfoot	<i>Petasites frigidus</i> var. <i>sagittatus</i>
bishop's-cap	<i>Mitella nuda</i>
bog cranberry	<i>Vaccinium vitis-idaea</i>
bunchberry	<i>Cornus canadensis</i>
Canada goldenrod	<i>Solidago canadensis</i>
cloudberry	<i>Rubus chamaemorus</i>
common blueberry	<i>Vaccinium myrtilloides</i>
common fireweed	<i>Epilobium angustifolium</i>
common horsetail	<i>Equisetum arvense</i>
common yarrow	<i>Achillea millefolium</i>
cream-colored vetchling	<i>Lathyrus ochroleucus</i>
dewberry	<i>Rubus pubescens</i>
dwarf scouring-rush	<i>Equisetum scirpoides</i>
elephant's-head	<i>Pedicularis groenlandica</i>
felwort	<i>Gentianella amarella</i>
greenish-flowered wintergreen	<i>Pyrola chlorantha</i>
hooded ladies'-tresses	<i>Spiranthes romanzoffiana</i>
Labrador lousewort	<i>Pedicularis labradorica</i>
Lindley's aster	<i>Aster ciliolatus</i>
many-flowered yarrow	<i>Achillea sibirica</i>
northern bastard toadflax	<i>Geocaulon lividum</i>
northern bedstraw	<i>Galium boreale</i>
northern grass-of-parnassus	<i>Parnassia palustris</i>
one-sided wintergreen	<i>Orthilia secunda</i>
palmate-leaved coltsfoot	<i>Petasites frigidus</i> var. <i>palmatus</i>
reflexed locoweed	<i>Oxytropis deflexa</i>

Common Name	Scientific Name
small bog cranberry	<i>Oxycoccus microcarpus</i>
sweet coltsfoot	<i>Petasites frigidus</i> var. <i>frigidus</i>
tall lungwort	<i>Mertensia paniculata</i>
three-leaved Solomon's-seal	<i>Smilacina trifolia</i>
twinflower	<i>Linnaea borealis</i>
twining honeysuckle	<i>Lonicera dioica</i>
white prairie-clover	<i>Petalostemon candidum</i>
wild vetch	<i>Vicia americana</i>
woodland horsetail	<i>Equisetum sylvaticum</i>
yellow rattle	<i>Rhinanthus minor</i>
<b>GRASSES, SEDGES, RUSHES</b>	
bluejoint	<i>Calamagrostis canadensis</i>
foxtail barley	<i>Hordeum jubatum</i>
golden sedge	<i>Carex aurea</i>
hairy wild rye	<i>Leymus innovatus</i>
northern bog sedge	<i>Carex gynocrates</i>
rough hair grass	<i>Agrostis scabra</i>
sedge species	<i>Carex</i> sp.
sheathed sedge	<i>Carex vaginata</i>
slender wheatgrass	<i>Elymus trachycaulus</i>
toad rush	<i>Juncus bufonius</i>
water sedge	<i>Carex aquatilis</i>
wire rush	<i>Juncus balticus</i>
<b>MOSSES, LICHENS, LIVERWORTS</b>	
candy lichen	<i>Imadophila ericetorum</i>
Climacium moss	<i>Climacium dendroides</i>
peat moss species	<i>Sphagnum</i> sp.
reindeer lichen	<i>Cladonia rangiferina</i>
studded leather lichen	<i>Peltigera aphthosa</i>
wrinkle lichen	<i>Vulpicida pinastri</i>
<b>WEEDS, AGRONOMICS</b>	
alsike clover	<i>Trifolium hybridum</i>
annual hawk's-beard	<i>Crepis tectorum</i>
common dandelion	<i>Taraxacum officinale</i>
<b>scentless chamomile</b>	<b><i>Matricaria perforata</i></b>
Timothy	<i>Phleum pratense</i>
white sweet-clover	<i>Melilotus alba</i>
yellow sweet-clover	<i>Melilotus officinalis</i>

- Notes:**
- 1 **Bold** font denotes Noxious weed species.
  - The status of species as native or not is according to the list of all elements in Alberta (AESRD 2014d).

## APPENDIX J

### OBSERVED WEED SPECIES AND LAND COVER BY LEGAL LOCATION

Legal Description	Land Cover	Weeds Species <sup>1</sup>	Density <sup>2</sup>	Comments
Boundary Lake Section				
SE 12-86-13 W6M	drainage	cicer milk vetch perennial sow-thistle	3 3	--
SE 6-87-12 W6M	drainage	clover species	4	--
	mixedwood forest	alsike clover Canada thistle (creeping thistle)	3 2	--
SE 18-89-12 W6M	drainage	alsike clover	3	--
SE 19-89-12 W6M	mixedwood regeneration	alsike clover	3	--
SE 30-89-12 W6M	drainage	alsike clover	4	--
SE 31-89-12 W6M	drainage	alsike clover	2	--
NE 31-90-12 W6M	mixedwood forest	clover species	5	--
NE 17-93-12 W6M	mixedwood forest	alsike clover	7	--
		common dandelion	2	
		sainfoin	1	
Bear Canyon Section				
SE 5-79-9 W6M	drainage	cicer milk vetch	7	--
NW 23-79-10 W6M	shrubby swamp	Canada thistle (creeping thistle)	3	UTM NAD 83 Zone 11 V 346159 E 6194213 N
SE 8-80-10 W6M	drainage	alsike clover	3	--
	existing right-of-way	Canada thistle (creeping thistle)	3	UTM NAD 83 Zone 11 V 342481 E 6199661 N 343685 E 6197998 N 343750 E 6197903 N 343856 E 6197763 N
SW 17-80-10 W6M	existing right-of-way	cicer milk vetch orchard grass	3 3	--
SW 19-80-10 W6M	mixedwood forest	Canada thistle (creeping thistle) low cudweed	3 2	UTM NAD 83 Zone 11 V 340125 E 6202864 N
Pelican Lake Section				
SE 11-82-17-W4M	mixedwood forest	alsike clover red clover water foxtail	2 5 3	--
NW 11-82-17 W4M	mixedwood forest	bird's-foot trefoil	2	--
		cicer milk vetch	3	
		clover species	5	
		common dandelion	5	
SE 27-82-17 W4M	deciduous forest	alsike clover common plantain	2 3	--
	existing right-of-way	absinthe wormwood	2	--

Legal Description	Land Cover	Weeds Species <sup>1</sup>	Density <sup>2</sup>	Comments
SW 25-83-18 W4M	existing right-of-way	pineappleweed	3	--
	mixedwood forest	alsike clover	3	--
		annual hawk's-beard	3	
		cicer milk vetch	3	
	coniferous forest	alfalfa	3	--
		bird's-foot trefoil	3	
hemp-nettle		3		
NW 2-84-18 W4M	riparian	lamb's-quarters	1	--
SE 30-85-18 W4M	regenerating burned bog	alsike clover	3	--
		awnless brome	3	
		<b>perennial sow-thistle</b>	<b>2</b>	
		Timothy	3	
	white sweet-clover	3		
existing right-of-way	alsike clover	9	--	
	riparian	alsike clover	3	--
		yellow sweet-clover	3	
SE 30-85-18 W4M	existing right-of-way	alsike clover	6	--
		common dandelion	5	
SW 32-85-18 W4M	existing right-of-way	clover species	3	--
		Timothy	3	
Christina River Section				
NW 26-80-6 W4M	disturbed	alsike clover	7	--
		annual hawk's-beard	2	
		common plantain	2	
		hemp-nettle	3	
		pineappleweed	1	
		red clover	7	
		sweet-clover species	3	
		wild buckwheat	4	
	deciduous forest	cicer milk vetch	5	--
		Timothy	2	
	existing right-of-way	common dandelion	6	UTM NAD 83 Zone 12 U Perennial sow-thistle population is located at 510514 E 620495 N
	<b>perennial sow-thistle</b>	<b>3</b>		
SE 26-80-6 W4M	deciduous forest	common dandelion	2	--
NE 23-80-6 W4M	deciduous forest	cicer milk vetch	2	--
		red clover	2	
SE 23-80-6 W4M	cutblock	annual hawk's-beard	1	--
		common dandelion	2	
		<b>perennial sow-thistle</b>	<b>2</b>	
		yellow sweet-clover	2	
	deciduous regeneration	alfalfa	3	--
	common dandelion	5		
SE 2-80-6 W4M	mixedwood forest	common plantain	2	--
NE 11-80-6 W4M	wetland	alsike clover	3	--
		cicer milk vetch	2	
		common plantain	3	














Legal Description	Land Cover	Weeds Species <sup>1</sup>	Density <sup>2</sup>	Comments
SE 36-79-6 W4M	deciduous forest	alsike clover awnless brome common dandelion common plantain pineappleweed yellow sweet-clover	3 3 3 3 3 3	--
NW 25-79-6 W4M	riparian	annual hawk's-beard common plantain	2 2	--
NE 25-79-6 W4M	coniferous forest	alsike clover	3	--
	ditch	alsike clover common dandelion common plantain sweet-clover species	3 2 2 3	--
	riparian	common plantain	2	--
<b>Alces River Unit Addition</b>				
W1/2 13-85-13 W6M	disturbed area	alsike clover annual hawk's-beard <b>Canada thistle (creeping thistle)</b> common dandelion common plantain low cudweed <b>perennial sow-thistle</b> summer-cypress Timothy white sweet-clover yellow sweet-clover	3 1 <b>5</b> 2 1 2 <b>2</b> 1 2 1 2	UTM NAD 83 Zone 11 V Canada thistle (creeping thistle) and perennial sow-thistle are located at 319533 E 6251059 N and Canada thistle (creeping thistle) is located on its own at 319596 E 6251217 N
<b>Otter Lake Unit Addition</b>				
N1/2 8-91-16 W5M	disturbed area	alsike clover annual hawk's-beard common dandelion <b>scentless chamomile</b> Timothy white sweet-clover yellow sweet-clover	3 4 3 <b>1</b> 1 3 3	--

- Notes:**
- 1** Bold font denotes Noxious weed species.
  - 2** Density code definitions are provided in Appendix K.
  - 3** Where Alberta *Weed Control Act* nomenclature differs from the ACIMS list of all elements (AESRD 2014d), the ACIMS name for the species has been provided in brackets following the *Weed Control Act* name.



## APPENDIX K

### ALBERTA WEED DENSITY DISTRIBUTION CLASSES

Class	Description of Abundance In Polygon	Distribution
0	None	
1	Rare	
2	A few sporadically occurring individual plants	
3	A single patch	
4	A single patch plus a few sporadically occurring plants	
5	Several sporadically occurring plants	
6	A single patch plus several sporadically occurring plants	
7	A few patches	
8	A few patches plus several sporadically occurring plants	
9	Several well-spaced patches	
10	Continuous uniform occurrences of well-spaced plants	
11	Continuous occurrence of plants with a few gaps in the distribution	
12	Continuous dense occurrence of plants	
13	Continuous occurrence of plants with a distinct linear edge in the polygon	

**Source:** Adams *et al.* 2009