

IDENTIFICATION AND MANAGEMENT OF SPECIES AND PLANT COMMUNITIES AT RISK IN NORTHEASTERN BRITISH COLUMBIA

Prepared for:



Prepared by:

Dan Bernier, RPBio

and

Gilbert Proulx, RPBio

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1.0 INTRODUCTION

BC Timber Sales (BCTS) was founded in 2003 with a mandate to provide the cost and price benchmarks for timber harvested from public land in British Columbia. Central to its mandate is sound forest management, which includes achieving and maintaining certification of an Environmental Management System in all Business Areas under the International Organization for Standardization (ISO 14001) and achieving Sustainable Forest Management (SFM) certification in its operating areas.

BCTS Peace-Liard Business Area (PLBA) conducts forestry operations in northeastern B.C. in the areas encompassed by the Fort Nelson and Peace Forest Districts. Operations include forest planning, timber cruising, layout and engineering, road construction and maintenance, bridge installation, and silviculture activities such as tree planting, surveys and stand treatments.

A fundamental component of SFM is the conservation of species and plant communities at risk. Rare and endangered species, their habitats, and plant communities need to be addressed and managed with a particular level of urgency, due to their sensitivity to forestry practices. In the past 15 years, Canadian Legislation around the management of species at risk has been produced steadily in response to an increasingly concerned public. In British Columbia, the loss of species or communities at risk is generally considered unacceptable by the public. Forest stewardship plans, sustainable forest management plans, higher level plans and other strategic planning documents almost always list species and plant communities at risk as one of the critical values of our forests.

The conservation of species at risk (a general term that refers to all rare and endangered flora and fauna, their habitats, as well as rare and endangered plant communities) is a fundamental component of SFM plans. It is important for forestry personnel to be capable of recognizing and understanding at-risk species and plant communities in the field. To complement the species at risk identification accounts, this report provides best management practices related to each species or group of species to assist forestry personnel.

Managing species and plant communities at risk is a challenge for everyone; there are very few ‘absolutes’ to guide resource managers. Each stand, watershed, disturbance unit and planning area has unique problems that require creative solutions. It should be understood that the information in this report has been provided to assist with the conservation of species and plant communities at risk, and should always be interpreted with conservation as the main objective. Future generations will evaluate our success as forest managers by our ability to maintain all species and plant communities through time. In the PLBA, there are still many opportunities to make landscape and stand level decisions that will ensure biological diversity is conserved. Furthermore, because of site-specific situations and multiple species at risk, several of the presented best management practices may be applicable in any given stand or watershed. The most appropriate best management practices must be carefully selected to develop sound conservation plans.

1.1 Objectives

In January, 2011, BCTS requested that Dan Bernier and Gilbert Proulx update the 2009 edition of the BCTS document titled “Identification and Management of Species and Plant Communities at Risk in Northeastern BC” (Bernier and Proulx, 2009). The 2011 edition updates the lists of species and plant communities at risk current to February, 2011.

Dan Bernier (Ecora Resource Group) and Gilbert Proulx (Alpha Wildlife) have developed numerous species at risk field guides and account documents throughout B.C., including the original version of this document, the species at risk field guide for the Fort Nelson Forest District (Proulx et al, 2006), and general SAR management guidelines for the Dawson Creek TSA (Bernier et al, 2008). The two biologists have a long history of collaborating on projects to ensure SAR projects are completed with the highest quality and most up-to-date information. The identification descriptions and management strategies described build upon previous field guides and management documents for similar areas. Information is consistent with similar past documents provided to forest licensees in the operating area to ensure our resource managers, regardless of company or agency, have consistent guidelines to manage our most sensitive species and their habitats.

1.2 PLBA Commitments to SAR

BCTS has several strategic documents that directly or indirectly refer to the management of species at risk. The following excerpts from BCTS documents are typical of policies developed by most forestry companies and agencies in British Columbia concerning species at risk management.

1. BCTS’ vision is to be an effective timber marketer generating wealth through sustainable forest management.
2. The BC Timber Sales sustainable resource management policy states “BC Timber Sales is committed to managing and administering forest management activities on our operations through effective measures that ensure *sustainable resource management*.”
3. In the BCTS Environmental Management System, the environmental policy states the following:

It is the policy of the BCTS to:

- comply with all relevant environmental legislation and regulations;
- strive for excellence in forest management by continually improving the performance of resource management activities and practices;
- maintain a framework that sets and reviews environmental objectives and targets, and promotes the prevention of pollution associated with BCTS forestry activities;
- monitor and evaluate key BCTS forestry operations; and

- communicate BCTS business activities and policies to all staff and make them available to the public.

1.3 Conservation Agencies and Pertinent Legislation

There are a number of agencies and specific legislation dedicated to the protection of species at risk: the British Columbia Conservation Data Centre (CDC), the Identified Wildlife Management Strategies (IWMS), NatureServe, Species at Risk Act (SARA), and the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).

1.3.1 CDC

The BC Conservation Data Centre (CDC) was established in 1991 as the British Columbia government authority on species at risk. CDC ecologists collect and distribute information on rare and endangered plants, animals, and plant associations in British Columbia. Staff specialists at the CDC, in cooperation with scientists and experts throughout the province, have identified BC's most vulnerable vertebrate animals, vascular plants, and natural plant communities. Each of these rare and endangered species and plant communities is assigned a global and provincial conservation status rank according to a set of criteria established by the US Nature Conservancy. They are also placed on the BC Ministry of Environment's "red" and "blue" lists, according to their degree of rarity. The CDC can be accessed at <http://www.env.gov.bc.ca/cdc/>.

1.3.2 IWMS

In British Columbia, the Identified Wildlife Management Strategies (IWMS) was initiated in the late 1990s by the Ministry of Environment in partnership with the Ministry of Forests, and in consultation with other resource ministries, stakeholders and the public. Statutory authority is provided for the Ministry of Water, Land and Air Protection to carry out this strategy under provisions and regulations of the *Forest Practices Code of British Columbia Act* and the new *Forest and Range Practices Act*.

The IWMS provides direction, policy, procedures and guidelines for managing Identified Wildlife, including all flora, fauna and plant communities. The goals of the Strategy are to minimize the effects of forest and range practices on Identified Wildlife situated on Crown land, and to maintain their limiting habitats throughout their current ranges and, where appropriate, their historic ranges. Identified Wildlife is managed through the establishment of wildlife habitat areas (WHAs), the implementation of general wildlife measures (GWMs), or through other management practices specified in strategic or landscape level plans. IWMS can be accessed at <http://www.env.gov.bc.ca/wld/frpa/iwms/>.

1.3.3 NatureServe

NatureServe is a global non-profit conservation organization that provides scientific information and tools needed to help guide effective conservation action. NatureServe and its

network of natural heritage programs are the leading source for information about rare and endangered species and threatened ecosystems. They represent an international network of biological inventories—known as natural heritage programs or conservation data centers—operating in the United States, Canada, Latin America and the Caribbean. NatureServe can be accessed at <http://www.natureserve.org>.

1.3.4 SARA

The Species at Risk Act (SARA) was proclaimed in June 2003, and is one third of a three-part Government of Canada strategy for the protection of wildlife species at risk. This national strategy also includes commitments under the *Accord for the Protection of Species at Risk* and activities under the *Habitat Stewardship Program for Species at Risk*. The purposes of the Act are to 1) prevent Canadian indigenous species, subspecies, and distinct populations from becoming extirpated or extinct, 2) provide for the recovery of endangered or threatened species, and 3) encourage the management of other species to prevent them from becoming at risk. SARA documents can be accessed at <http://www.sararegistry.gc.ca>. The initial list of SARA's wildlife species at risk corresponds to Schedule 1.

1.3.5 COSEWIC

COSEWIC is a national conservation organization that was created in 1977 following the Conference of Federal-Provincial-Territorial Wildlife Directors held in 1976 in Fredericton, New Brunswick. It arose from the need for a single, official, scientifically sound, national classification of wildlife species at risk. COSEWIC's role is to determine the national status of wild Canadian species, subspecies, varieties or other units that are suspected of being at risk of extinction or extirpation. All native mammals, birds, reptiles, amphibians, fish, arthropods, molluscs, vascular plants, mosses, and lichens are included in COSEWIC's current mandate, however plant communities are not. COSEWIC can be accessed at <http://www.cosewic.gc.ca>.

1.4 Ranking Species at Risk

The inclusion of species and plant communities in this document was based on the ranking or status given to them by the following organizations as of February 21, 2011:

- IWMS; listed species selected by the Technical Advisory Committee;
- CDC; red- listed species and plant communities

The ranking of all wildlife, including plant communities, is based on factors such as rarity; the size, quality, conditions, and viability of the populations; and actual or potential threats facing the species or its habitats. In general, each species or plant community type is assigned a single global (G) *rank* on a scale of 1 to 5:

- G1 – Critically Imperiled;
- G2 – Imperiled;

- G3 – Vulnerable;
- G4 – Apparently Secure; and
- G5 – Secure.

They are also assigned a national Canada-wide (N) rank; and a subnational (S) rank using the same 1-5 scale that reflects its provincial conservation status.

The CDC separates species into three lists according to conservation risks:

- Red List – species that have been designated as *endangered* or *threatened* and may or may not be legally designated under the *British Columbia Wildlife Act*. These species have S ranks of 1, 2, 1-2, 1-3, H or X;
- Blue List – species not immediately threatened, but of concern because of characteristics that make them particularly sensitive to human activities or natural events. These are species with S ranks of 2-3, 3, or 3-4 (animals only); and
- Yellow List – all species not included in the Red or Blue lists. These species have S ranks of 4, 5, 4-5, or 3-4 (plants only).

1.5 PLBA Operating Areas

The BCTS PLBA includes operating areas in the Peace and Fort Nelson Forest Districts and TFL 48. The management guidelines developed could be used outside of BCTS by other resource managers as the accounts and best management practices are designed to be somewhat generic in application.

1.6 PLBA SAR List

Table 1 provides a complete list of all species and plant communities at risk in the PLBA, current to February 2011. The Plains Bison is a red-listed species but is considered a special case since it is an introduced species to the Peace Area; its account is described in Appendix 1. As of February 2011, the peregrine falcon, emerald shiner and rivergrass are no longer on the at-risk list in the PLBA; therefore, these accounts have also been moved to the appendix. The Canada Warbler account has also been moved to the appendix as it is not provincially identified wildlife and is not on the red-list.

There are a total of 108 species and 5 plant communities at risk in the PLBA, excluding the species listed in the appendix and including the numerous non-vascular plants not described individually in this report.

Table 1 Species and Plant Communities at Risk in the PLBA

English Name	Scientific Name	COSEWIC	BC List	Identified Wildlife	Page
INVERTEBRATE ANIMAL - GASTROPODS					
Hotwater Physa	<i>Physella wrighti</i>	E (Mar 2008)	Red		13
INVERTEBRATE ANIMAL - INSECTS					
Alberta Arctic	<i>Oeneis alberta</i>		Red		16
Assiniboine Skipper	<i>Hesperia assiniboia</i>		Red		20
Coral Hairstreak, <i>titus</i> subspecies	<i>Satyrrium titus titus</i>		Red		23
Eastern Pine Elfin	<i>Callophrys niphon</i>		Red		26
Great Spangled Fritillary, <i>pseudocarpenteri</i> subspecies	<i>Speyeria cybele pseudocarpenteri</i>		Red		29
Mormon Fritillary, <i>eurynome</i> subspecies	<i>Speyeria mormonia eurynome</i>		Red		33
Mt. McKinley Alpine	<i>Erebia mackinleyensis</i>		Red		36
Old World Swallowtail, <i>hudsonianus</i> subspecies	<i>Papilio machaon hudsonianus</i>		Red		39
Philip's Arctic	<i>Oeneis philipi</i>		Red		42
Plains Forktail	<i>Ischnura damula</i>		Red		45
Striped Hairstreak	<i>Satyrrium liparops</i>		Red		48
Yellow-dotted Alpine	<i>Erebia pawloskii</i>		Red		51
VERTEBRATE ANIMAL - BIRDS					
Bay-breasted Warbler	<i>Dendroica castanea</i>		Red	Y (Jun 2006)	54
Black-throated Green Warbler	<i>Dendroica virens</i>		Blue	Y (Jun 2006)	58
Cape May Warbler	<i>Dendroica tigrina</i>		Red	Y (Jun 2006)	61
Connecticut Warbler	<i>Oporornis agilis</i>		Red	Y (Jun 2006)	65
Lark Sparrow	<i>Chondestes grammacus</i>		Red		68
Nelson's Sharp-tailed Sparrow	<i>Ammodramus nelsoni</i>	NAR (May 1998)	Red	Y (Jun 2006)	71
Sandhill Crane	<i>Grus canadensis</i>	NAR (May 1979)	Yellow	Y (Jun 2006)	75
Short-eared Owl	<i>Asio flammeus</i>	SC (Mar 2008)	Blue	Y (May 2004)	78
Swainson's Hawk	<i>Buteo swainsoni</i>		Red		81
Upland Sandpiper	<i>Bartramia longicauda</i>		Red		84
Yellow Rail	<i>Coturnicops noveboracensis</i>	SC (Nov 2009)	Red		87
VERTEBRATE ANIMAL - MAMMALS					
Bighorn Sheep	<i>Ovis canadensis</i>		Blue	Y (Jun 2006)	91

English Name	Scientific Name	COSEWIC	BC List	Identified Wildlife	Page
Caribou (boreal population)	<i>Rangifer tarandus</i> pop. 14	T (May 2002)	Red	Y (May 2004)	95
Caribou (northern mountain population)	<i>Rangifer tarandus</i> pop. 15	T/SC (May 2002)	Blue	Y (May 2004)	98
Caribou (southern mountain population)	<i>Rangifer tarandus</i> pop. 1	T (May 2000)	Red	Y (May 2004)	102
Fisher	<i>Martes pennanti</i>		Blue	Y (Jun 2006)	106
Grizzly Bear	<i>Ursus arctos</i>	SC (May 2002)	Blue	Y (May 2004)	110
Plains Bison	<i>Bos bison bison</i>	T (May 2004)	Red		App.1
Wolverine, <i>luscus</i> subspecies	<i>Gulo gulo luscus</i>	SC (May 2003)	Blue	Y (May 2004)	114
Wood Bison	<i>Bos bison athabasca</i>	T (May 2000)	Red		118
VERTEBRATE ANIMAL - RAY-FINNED FISHES					
Arctic Cisco	<i>Coregonus autumnalis</i>		Red		121
Bull Trout	<i>Salvelinus confluentus</i>		Blue	Y (Jun 2006)	124
Cisco	<i>Coregonus artedii</i>		Red		128
Ninespine Stickleback	<i>Pungitius pungitius</i>		Red		131
Spottail Shiner	<i>Notropis hudsonius</i>		Red		134
VASCULAR PLANTS - DICOTS					
Drummond's thistle	<i>Cirsium drummondii</i>		Red		137
fennel-leaved desert-parsley	<i>Lomatium foeniculaceum</i> var. <i>foeniculaceum</i>		Red		141
gaping goosefoot	<i>Chenopodium hians</i>		Red		145
Gardner's sagebrush	<i>Atriplex gardneri</i> var. <i>gardneri</i>		Red		148
hawkweed-leaved saxifrage	<i>Saxifraga hieraciifolia</i> var. <i>hieraciifolia</i>		Red		152
heart-leaved buttercup	<i>Ranunculus cardiophyllus</i>		Red		156
long-leaved mugwort	<i>Artemisia longifolia</i>		Red		160
marsh fleabane	<i>Tephrosia palustris</i>		Red		164
northern swamp willowherb	<i>Epilobium davuricum</i>		Red		168
Nuttall's sunflower	<i>Helianthus nuttallii</i> ssp. <i>rydbergii</i>		Red		172
pink campion	<i>Silene repens</i>		Red		176
prairie buttercup	<i>Ranunculus rhomboideus</i>		Red		180
purple rattlesnake-root	<i>Prenanthes racemosa</i>		Red		184
Raup's willow	<i>Salix raupii</i>		Red		188
riverbank anemone	<i>Anemone virginiana</i> var. <i>cylindroidea</i>		Red		192
Seneca-snakeroot	<i>Polygala senega</i>		Red		196
sickle-pod rockcress	<i>Arabis sparsiflora</i>		Red		200

English Name	Scientific Name	COSEWIC	BC List	Identified Wildlife	Page
slender penstemon	<i>Penstemon gracilis</i>		Red		204
three-lobed daisy	<i>Erigeron trifidus</i>		Red		208
yellow marsh saxifrage	<i>Saxifraga hirculus</i> ssp. <i>hirculus</i>		Red		212
VASCULAR PLANTS - FERNS					
Siberian polypody	<i>Polypodium sibiricum</i>		Red		216
VASCULAR PLANTS - MONOCOTS					
alpine meadow-foxtail	<i>Alopecurus alpinus</i>		Red		220
Canada Ryegrass	<i>Piptatherum canadense</i>		Red		224
dry-land sedge	<i>Carex xerantica</i>		Red		227
porcupinegrass	<i>Hesperostipa spartea</i>		Red		231
VASCULAR PLANTS - QUILLWORTS					
rock selaginella	<i>Selaginella rupestris</i>		Red		235
VASCULAR PLANTS - MOONWORTS					
spoon-shaped moonwort	<i>Botrychium spathulatum</i>		Red		239
upswept moonwort	<i>Botrychium ascendens</i>		Red		243
NON-VASCULAR PLANTS					
Porsild's bryum	<i>Haplodontium macrocarpum</i>	T (Nov 2003)	Red		247
	<i>Andraeobryum macrosporum</i>		Red		250
	<i>Anoetangium sendtnerianum</i>		Red		
	<i>Aulacomnium acuminatum</i>		Red		
	<i>Bryum arcticum</i>		Red		
	<i>Bryum uliginosum</i>		Red		
	<i>Cinclidium arcticum</i>		Red		
	<i>Cirriphyllum piliferum</i>		Red		
	<i>Cnestrum glaucescens</i>		Red		
	<i>Cnestrum schisti</i>		Red		
	<i>Desmatodon leucostoma</i>		Red		
	<i>Dicranum angustum</i>		Red		
	<i>Didymodon asperifolius</i>		Red		
	<i>Didymodon johansenii</i>		Red		
	<i>Didymodon rigidulus</i>		Red		
	<i>Drepanocladus tundrae</i>		Red		
	<i>Entodon concinnus</i>		Red		
	<i>Grimmia teretineris</i>		Red		
	<i>Grimmia unicolor</i>		Red		
	<i>Hygrohypnum alpestre</i>		Red		
	<i>Hygrohypnum polare</i>		Red		
	<i>Hypnum holmenii</i>		Red		
	<i>Myurella sibirica</i>		Red		

English Name	Scientific Name	COSEWIC	BC List	Identified Wildlife	Page
	<i>Oreas martiana</i>		Red		250
	<i>Plagiobryum demissum</i>		Red		
	<i>Plagiomnium ciliare</i>		Red		
	<i>Pohlia bulbifera</i>		Red		
	<i>Pylaisiella intricata</i>		Red		
	<i>Rhizomnium punctatum</i>		Red		
	<i>Schistidium atrichum</i>		Red		
	<i>Schistidium pulchrum</i>		Red		
	<i>Seligeria subimmersa</i>		Red		
	<i>Sphagnum annulatum</i>		Red		
	<i>Sphagnum nitidum</i>		Red		
	<i>Sphagnum platyphyllum</i>		Red		
	<i>Splachnum rubrum</i>		Red		
	<i>Splachnum vasculosum</i>		Red		
	<i>Stegonia latifolia</i> var. <i>pilifera</i>		Red		
	<i>Timmia sibirica</i>		Red		
	<i>Tortella arctica</i>		Red		
	<i>Trichostomum arcticum</i>		Red		
	<i>Trichostomum crispulum</i>		Red		
PLANT COMMUNITIES					
(balsam poplar, black cottonwood) - spruces / red-osier dogwood	<i>Populus balsamifera</i> (ssp. <i>balsamifera</i> , ssp. <i>trichocarpa</i>) - <i>Picea</i> spp. / <i>Cornus stolonifera</i>		Red		253
arctic rush - Nuttall's alkaligrass - seablite	<i>Juncus arcticus</i> - <i>Puccinellia nuttalliana</i> - <i>Suaeda calceoliformis</i>		Red		257
mat muhly - arctic rush - Nevada bluegrass	<i>Muhlenbergia richardsonis</i> - <i>Juncus arcticus</i> - <i>Poa secunda</i> ssp. <i>juncifolia</i>		Red		259
narrow-leaf willow Shrubland	<i>Salix exigua</i> Shrubland		Red		261
Pacific willow / red-osier dogwood / horsetails	<i>Salix lucida</i> ssp. <i>lasiandra</i> / <i>Cornus stolonifera</i> / <i>Equisetum</i> spp.		Red		264

2.0 ANIMAL IDENTIFICATION

2.1 Invertebrate Animals

2.1.1 Gastropods

Hotwater Physa

Physella wrighti

Kingdom	Phylum	Class	Order	Family
Animalia	Mollusca	Gastropoda	Basommatophora	Physidae

Description

General: The hotwater physa is a freshwater snail with elongate-ovate, high-spired, sinistrally coiled shell. The opening in the shell is ear-shaped, with an outer lip callus and a curved perimeter. The Hotwater Physa is an oviparous hermaphrodite. It breeds only once. The adults reproduce in the spring and die after laying crescent-shaped gelatinous egg masses (6 – 18 eggs). Hatching occurs after approximately 9 days.

Size: 3.25 to 9.1 mm long shell.

Status:

Global: G1Q

Canada: E

Provincial: S1 – Red

Distribution

BEC Units: BWBS

Forest Districts: Fort Nelson District

Known Locations: In BC it has only been recorded in the Alpha Stream, lower Alpha Pool and Beta Pool within the Liard River Hot Springs Provincial Park

Habitat

General: The Hotwater Physa lives within mats of the green alga *Chara* on the surface of soft sediments and on birch (*Betula* spp.) leaves that have fallen in the stream. The Alpha Stream section provides the Hotwater Physa with food and security.

Food

This mollusk is a detritivore and/or a bacterial feeder.

Biological notes

The Hotwater Physa prefers water temperatures up to and higher than 36°C.

Threats

Due to its very limited distribution and the precise (though not fully known) habitat requirements that restrict it to a particular, small area, the Hotwater Physa is at risk. The population is so localized that a single calamity could result in the loss of this species forever. The species is vulnerable to changes to its habitat, such as the inadvertent addition of polluting substances to the Alpha Pool, or a sudden stop in flow of the stream from blockage or the outlet of the pool.

Best Management Practices

- Avoid alteration of hydrological characteristics within and adjacent to the core area.
- Avoid the introduction of exotic species
- Maintain the integrity of the aquatic system.
- Do not apply herbicide in or near occupied aquatic ecosystems that would result in the destruction or alteration of existing wetland vegetation, and may encourage the growth of invasive exotic plants.

Information Gaps

- Investigate the possibility of extending the species range through translocation in similar environments.

Further Information and Links:

BC Conservation Data Centre. 2009. B.C. Conservation Data Centre. 2011. Species Summary: *Physella wrighti*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Heron, J. 2007. Recovery Strategy for the Hotwater Physa (*Physella wrighti*) in Canada. *Species at Risk Act* Recovery Strategy Series. Fisheries and Oceans Canada, Vancouver, vii + 27 pp.

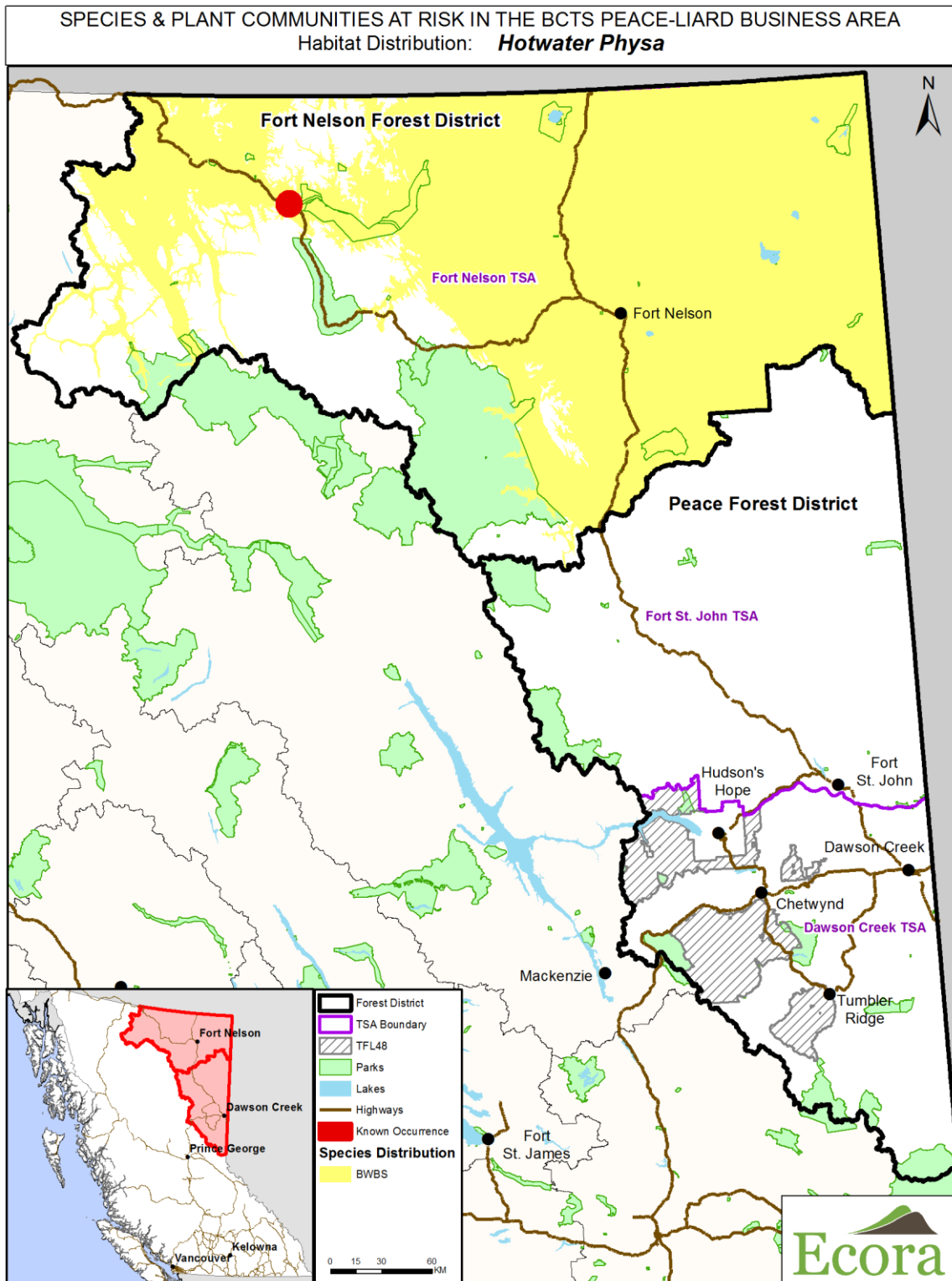
Lee, J.S., and J. Ackerman. 1998. COSEWIC status report on the hotwater physa, *Physella wrighti*. Committee on the Status of Endangered Wildlife in Canada. 28 pp.

Lee, J.S., and J. Ackerman. 1999. Freshwater mollusks at risk in British Columbia: three examples of risk. Pp. 67-73 in L.M. Darling, ed. At risk. Vol. Proc. Conference Biology and Management of Species and Habitats at Risk, BC Mini. Environment, Lands and Parks, Victoria, BC.

Lee, J.S. 1981. The distribution and ecology of the freshwater mollusks of northern British Columbia, MSc Thesis, Simon Fraser University, Burnaby, BC.

Lee, J.S. 2000. Freshwater mollusks. BC Ministry Environment, Lands and Parks, Victoria, BC.

Fisheries and Oceans Canada. 2005. Hotwater Physa. Available at: <http://www.dfo-mpo.gc.ca/species-especies/species-especies/hotwaterphysa-physedeauchaude-eng.htm>



2.1.2 Insects

Alberta Arctic

Oeneis alberta

Kingdom	Phylum	Class	Order	Family
<i>Animalia</i>	<i>Mandibulata</i>	<i>Insecta</i>	<i>Lepidoptera</i>	<i>Nymphalidae</i>

Description

General: Adults are grey brown or light brown. The forewing could have an absence of, or up to four eye spots, sometimes with pupils. These spots are repeated on the underside. There is a thin dark line that sharply angles outward between the second and third eyespot. Larvae are dark brown, with green lateral stripes and a black dorsal stripe. The head has six broad dark stripes and is brownish green.

Size: 34-43 mm.



Field Signs: Flight period is from May to mid June.

Taxonomy: There are four subspecies in total, but the Alberta Arctic is the only one found in Canada.

Status:

Global: G4

Canada:

Provincial: S2 – Red

Distribution

BEC Units: BWBS

Forest Districts: Peace District

Known Locations: Known only in the grasslands of the Peace region and restricted to the Dawson Creek, Fort St. John and Clayhurst areas in British Columbia.

Habitat

General: Grasslands, meadows, prairies, openings, and undisturbed sandy hills and prairie ridges.

Special Habitat Features: In BC their preference is dry bunchgrass hillsides

Food

Caterpillars feed on the genus *Festuca*.

Biological notes

The Alberta Arctic flies when the Prairie Crocus is in bloom. Males favor the higher ground and the females are generally further down the slopes.

Threats

Habitat loss and/or alteration caused by overgrazing, ranching practices, land development, ATV use and the introduction of invasive species.

Best Management Practices

- Ensure grasslands are preserved in present state.
- Limit off-road vehicle traffic where populations are known to occur.

Information Gaps

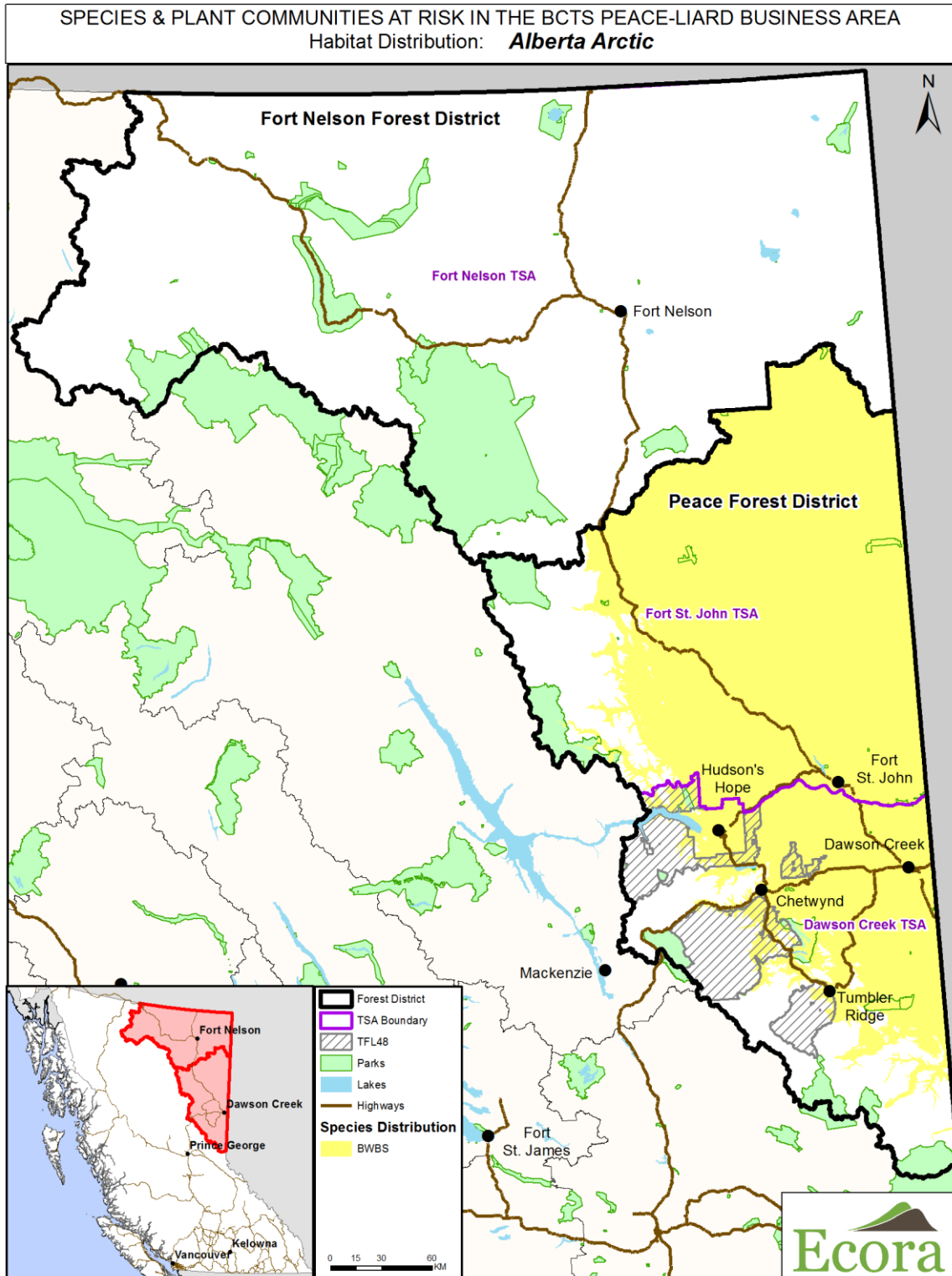
- Research is needed into life history and specific habitat requirements, such as food plant density and patch size.

Further Information and Links:

B.C. Conservation Data Centre. 2011. Species Summary: *Oeneis alberta*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>.

Canadian Biodiversity Information Facility. 2009. Species Bank. Government of Canada. Available at: http://www.cbif.gc.ca/spp_pages/butterflies/species/AlbertaArctic_e.php

Guppy, C.S. and Shepard, J.H. 2001. Butterflies of British Columbia. UBC Press with Royal British Columbia Museum, Vancouver & Victoria, BC. 414 p.



Assiniboine Skipper

Hesperia assiniboia

Kingdom	Phylum	Class	Order	Family
Animalia	Mandibulata	Insecta	Lepidoptera	Hesperiidae

Description

General: The Assiniboine Skipper is pale green or greenish-grey on the underside of the hindwing. It has a band of white or pale yellow spots which is usually broken into several separated groups. Spots are usually small and sometimes almost absent. Females are usually larger and darker than males.

Size: 21-30 mm.

Field Signs: Flight period is from mid-July to early September.

Similar Species: The Common Branded Skipper (*Hesperia comma*) does not have a reduced spot band or pale green color underneath the hindwing. Typically the Assiniboine Skipper is distinguished by the almost complete lack of a contrasting medial area and lightly coloured ventral hindwing.

Status:

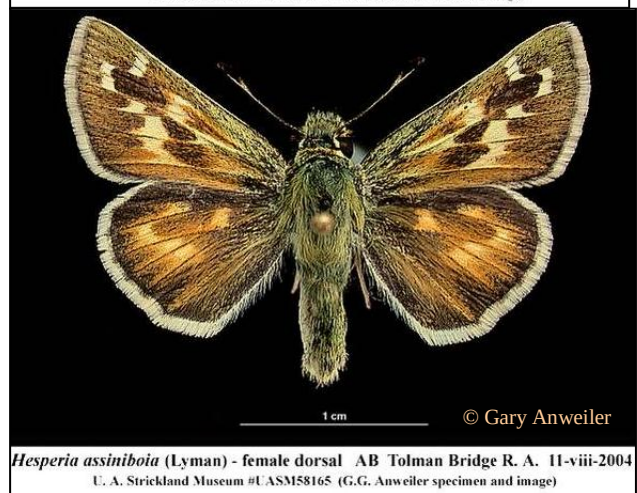
Global: G5

Canada:

Provincial: S2 – Red



Hesperia assiniboia (Lyman) male dorsal AB Tolman Bridge R. A. 11-viii-2004
U. A. Strickland Museum #UASM58166 (G. G. Anweiler image)



Hesperia assiniboia (Lyman) - female dorsal AB Tolman Bridge R. A. 11-viii-2004
U. A. Strickland Museum #UASM58165 (G.G. Anweiler specimen and image)

Distribution

BEC Units: BWBS

Forest Districts: Peace District, TFL 48

Known Locations: There are four current known locations in British Columbia. One is 5 km east of Kiskatinaw Provincial Park; a second is 3 km southeast of Boudreau Lake; a

third is at the Clayhurst Bridge area on the Peace River; and the fourth and final is in the Beatton River area north of Fort St. John.

Habitat

General: Generally associated with short grass prairies but also common in aspen stands.

Special Habitat Features: Native prairie.

Food

Caterpillars feed on needlegrass (*Stipa* spp.), June Grass (*Koeleria cristata*), Blue Grama (*Bouteloua gracilis*), *Festuca* spp. and *Carex* spp.

Threats

Habitat loss and/or alteration caused by development or logging and loss of food plants from off-road vehicle use and grazing livestock.

Best Management Practices

- Ensure native prairie grasslands as well as younger aspen stands are maintained near population occurrences.
- Limit off-road vehicle traffic where populations are known to occur.
- Avoid using herbicides and/or pesticides near suitable habitat.

Information Gaps

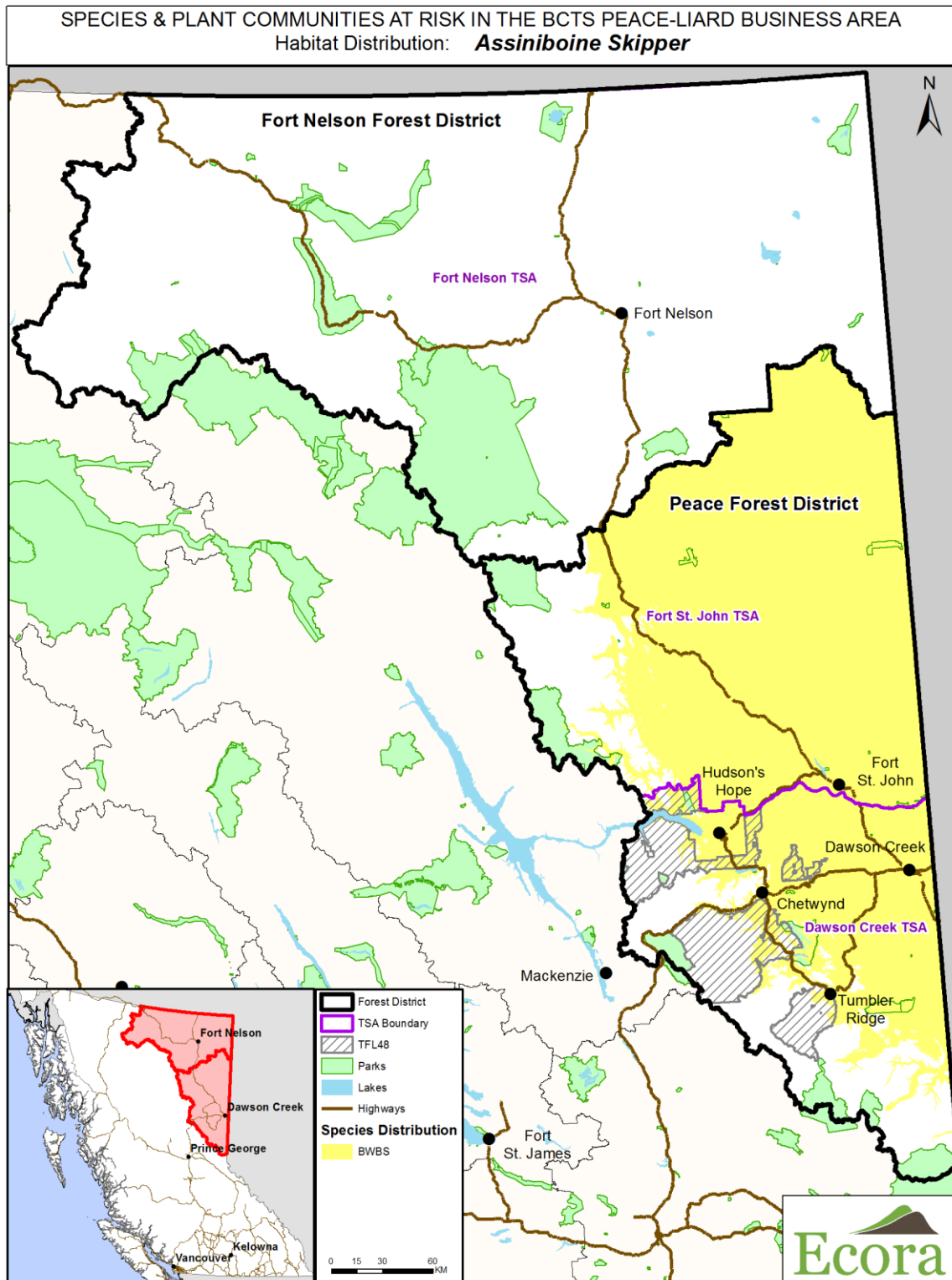
- Research is needed into life history, specific habitat requirements and to better understand current threats.

Further Information and Links:

B.C. Conservation Data Centre. 2011. Species Summary: *Hesperia assiniboia*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Canadian Biodiversity Information Facility. 2009. Species Bank. Government of Canada. Available at: http://www.cbif.gc.ca/spp_pages/butterflies/species/PlainsSkipper_e.php

Guppy, C.S. and Shepard, J.H. 2001. Butterflies of British Columbia. UBC Press with Royal British Columbia Museum, Vancouver & Victoria, BC. 414 p.



Coral Hairstreak, *titus* subspecies

Satyrium titus titus

Kingdom	Phylum	Class	Order	Family
Animalia	Mandibulata	Insecta	Lepidoptera	Lycaenidae

Description

General: Its upperside is dark brown and most of the females have an orange row of spots near the hindwing's outer margin. It is light brown underneath with a row of coral-red spots along the margin of the hindwing. Above the red spots is a row of white-circled black dots. Females have a more rounded forewing than males. Larvae are dull green in color with a dark green stripe and a shiny black head. Pupae are pale brown and covered with short, brown hairs.



© Jeremy Gatten

Size: 23-33 mm.

Field Signs: Flight period from late June to early August.

Taxonomy: Subspecies *immaculosus* has reduced black spots on the underside.

Status:

Global: G4G5T4T5

Canada:

Provincial: S2 – Red

Distribution

BEC Units: BWBS, ESSF

Forest Districts: Peace District, TFL 48

Known Locations: The Peace Canyon area from below Hudson's Hope to the Alberta border.

Habitat

General: This species is typically found in riparian areas and on the banks of large rivers.

Special Habitat Features: Areas with flowers (ex. milkweed) and/or wild fruit-producing shrubs such as chokecherry (*Prunus virginiana*).

Food

Caterpillars feed on the developing fruits of wild plums, cherries and Saskatoon berries.

Biological notes

This species flies very rapidly before alighting.

Threats

None listed.

Best Management Practices

- Maintain the integrity of wetlands and aquatic habitats during forest activities.
- Create buffers around areas known to be used by the species.
- Avoid the use of pesticide and herbicide applications.

Information Gaps

- Research is needed into life history and specific habitat requirements, such as food plant density and patch size.

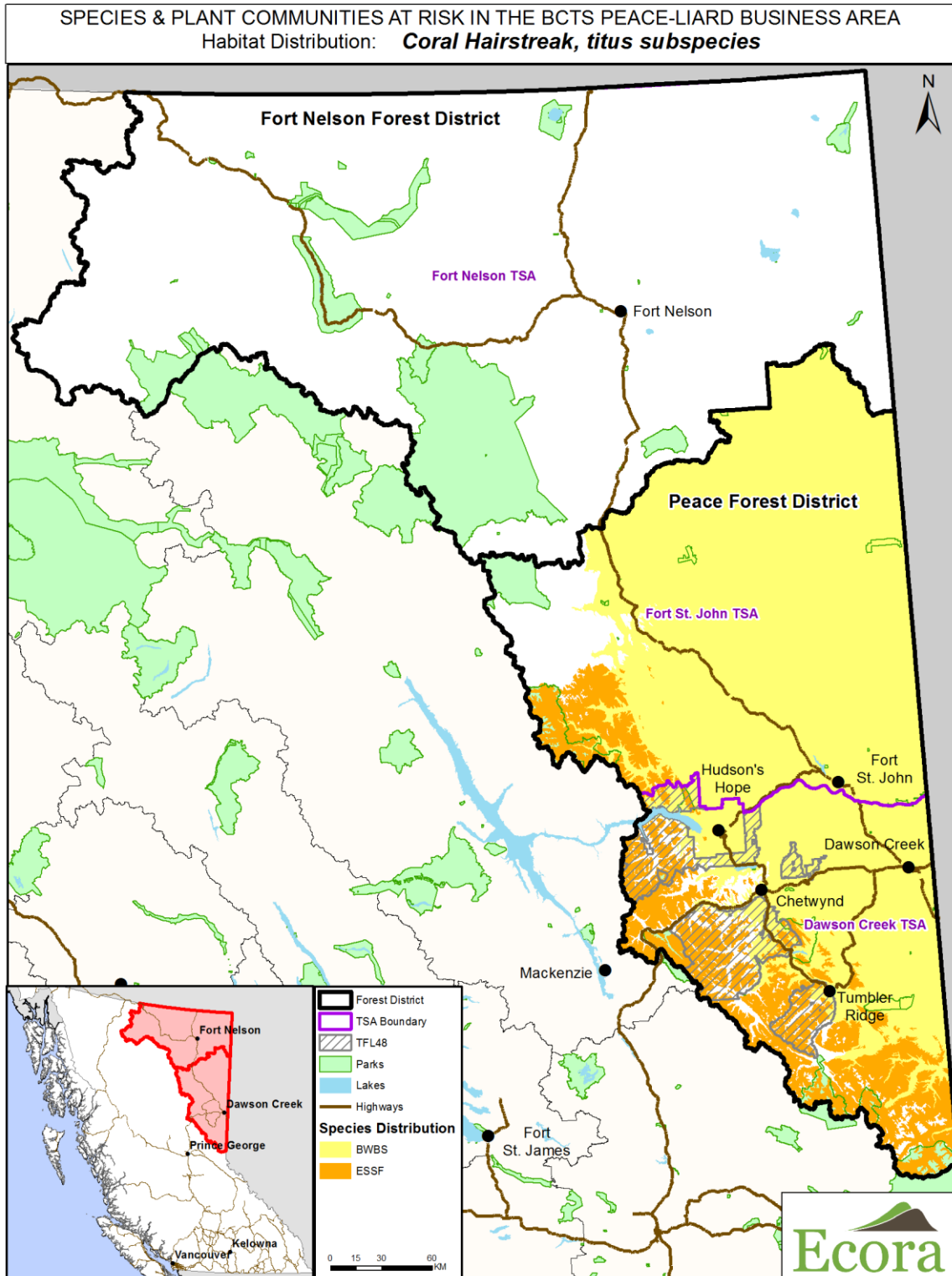
Further Information and Links:

B.C. Conservation Data Centre. 2011. Species Summary: *Satyrium titus titus*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Canadian Biodiversity Information Facility. 2009. Species Bank. Government of Canada. Available at: http://www.cbif.gc.ca/spp_pages/butterflies/species/CoralHairstreak_e.php

Guppy, C.S. and Shepard, J.H. 2001. Butterflies of British Columbia. UBC Press with Royal British Columbia Museum, Vancouver & Victoria, BC. 414 pp.

Timberline NRG. 2008. Management strategy recommendations for species and plant communities at risk in the Dawson Creek Timber Supply Area. Report Prepared for Tembec Enterprise Inc., Chetwynd, BC. 32 pp.



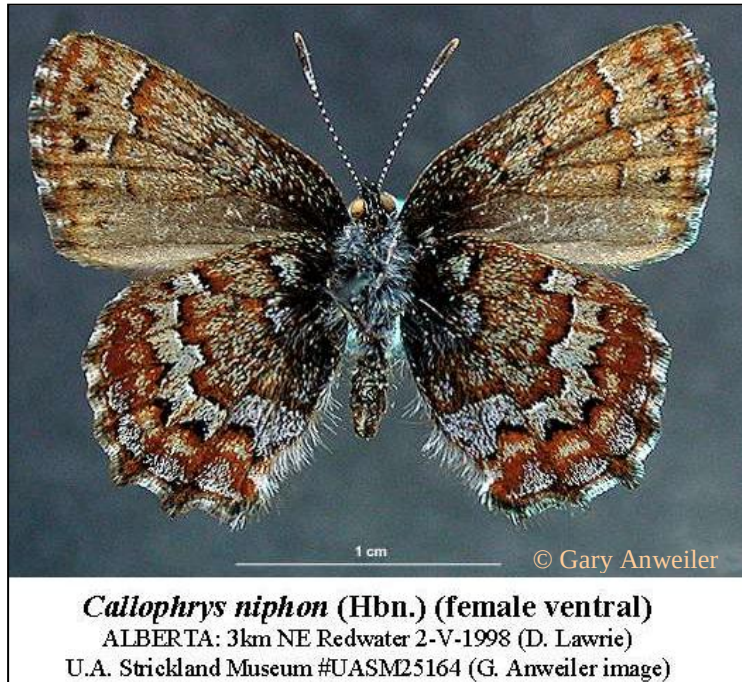
Eastern Pine Elfin

Callophrys niphon (synonym: *Incisalia niphon clarki*)

Kingdom	Phylum	Class	Order	Family
Animalia	Mandibulata	Insecta	Lepidoptera	Lycaenidae

Description

General: Adults are small, brown above, and mottled gray and brown below. They also have white-scalloped wing margins. On the underside, there are two dark brown bars across the forewing. While females have the same general coloration as the males, the females brown color fades to a rusty orange color towards the wing margins. Caterpillars are green with whitish lines along the body. Brownish-black pupae are tinged with yellow. Larvae are green and have whitish lines along the body, sometimes tinged with orange.



Size: 19-32 mm.

Field Signs: Flight is in early May – early June.

Taxonomy: *Callophrys niphon* is synonymous with *Incisalia niphon*.

Status:

Global: G5

Canada:

Provincial: S1S3 - Red

Distribution

BEC Units: BWBS

Forest Districts: Fort Nelson District

Known Locations: The only known location for this species in British Columbia is at the Nelson River, along the Liard Highway.

Habitat

General: Pine-rich forest and plantations, where females perch and larvae feed on young needles. Males are often seen basking along roadways, and patches of sand. Also found along roadsides and old fields where pine is nearby.

Special Habitat Features: This species was observed in BC in a jack pine stand.

Food

The species is known to feed on jack pine in BC.

Biological notes

Males are often seen basking along roadways and patches of sand. Females rarely fly unless they are disturbed.

Threats

Use of pesticides in pine plantations and since the species was observed at the roadside, it is possible that herbicide or vegetation removal could impact food plants.

Best Management Practices

- Keep residual jack pine stands.
- Do not use pesticides in openings that are adjacent to jack pine stands that may be inhabited by the Eastern Pine Elfin.

Information Gaps

- Inventories are required to better determine the species' life history and specific habitat needs.

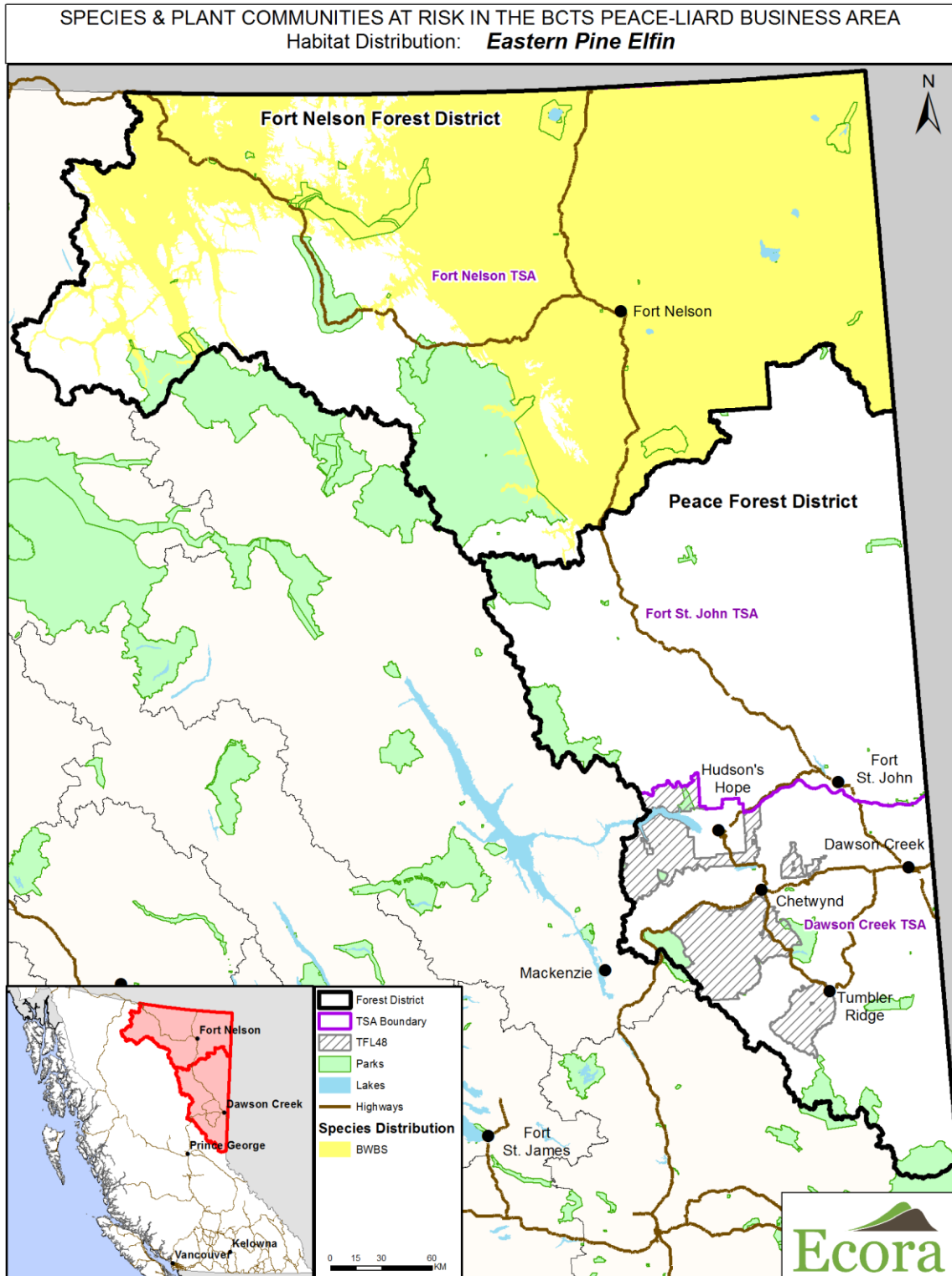
Further Information and Links:

B.C. Conservation Data Centre. 2011. Species Summary: *Callophrys niphon*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Canadian Biodiversity Information Facility. 2009. Species Bank. Government of Canada. Available at: http://www.cbif.gc.ca/spp_pages/butterflies/species/EasternPineElfin_e.php

Guppy, C.S. and Shepard, J.H. 2001. Butterflies of British Columbia. UBC Press with Royal British Columbia Museum, Vancouver & Victoria, BC. 414 pp.

Proulx, G., D. Bernier, and K. Green. 2006. Accounts for Species and Plant Communities at Risk in the Fort Nelson Forest District. Unpublished report. Alpha Wildlife Research & Management Ltd., Sherwood Park, Alta., And Timberline Natural Resource Group Ltd., Dawson Creek, BC



Great Spangled Fritillary, *pseudocarpenteri* subspecies

Speyeria cybele pseudocarpenteri

Kingdom	Phylum	Class	Order	Family
Animalia	Mandibulata	Insecta	Lepidoptera	Nymphalidae

Description

General: Adult males are orange in color with distinct black veining on the upper surface. Females are yellow brown and slightly darker at the wing bases. The underside of the hindwing is silver and a light, wide submarginal band is present. The larvae have brown sides but are mostly velvety black. They also have rows of black spines with red bases. Subspecies



© Ian Lane

pseudocarpenteri is smaller and paler than some southern species but larger than the other *Speyeria* species in northeastern BC.

Size: 62-88 mm.

Field Signs: Flight is in July in the Peace River Region.

Taxonomy: There are 5 subspecies in Canada. *S. c. Leto*, *S. c. krautwurmi*, *S. c. cybele*, *S. c. novascotiae*, and *S. c. pseudocarpenteri*. The latter is the subspecies found in the areas covered by this project.

Status:

Global: G5T5

Canada:

Provincial: S2 - Red

Distribution

BEC Units: BWBS

Forest Districts: Peace District

Known Locations: Subspecies *pseudocarpenteri* can be found in the Peace River lowlands of British Columbia. The Great Spangled Fritillary can be observed in the southern interior of BC also.

Habitat

General: Often seen in open grasslands and along roadsides.

Special Habitat Features: Within the Peace region, this species is found at the edges of and within open, mature aspen forests.

Food

The species is known to feed on a wide variety of flowers especially those of thistles and milkweeds as an adult and violet during the larval stages.

Biological notes

The Great Spangled Fritillary is a very fast and active flyer. It is also very common in the heavily populated areas of southern Canada, causing it to be the best known of the Fritillaries.

Threats

Habitat loss is the main threat to this species. The main causes of habitat loss could be through vegetation control, development and agricultural practices.

Best Management Practices

- Create buffers around areas known to be used by this species.
- Avoid the use of pesticide and herbicide applications.

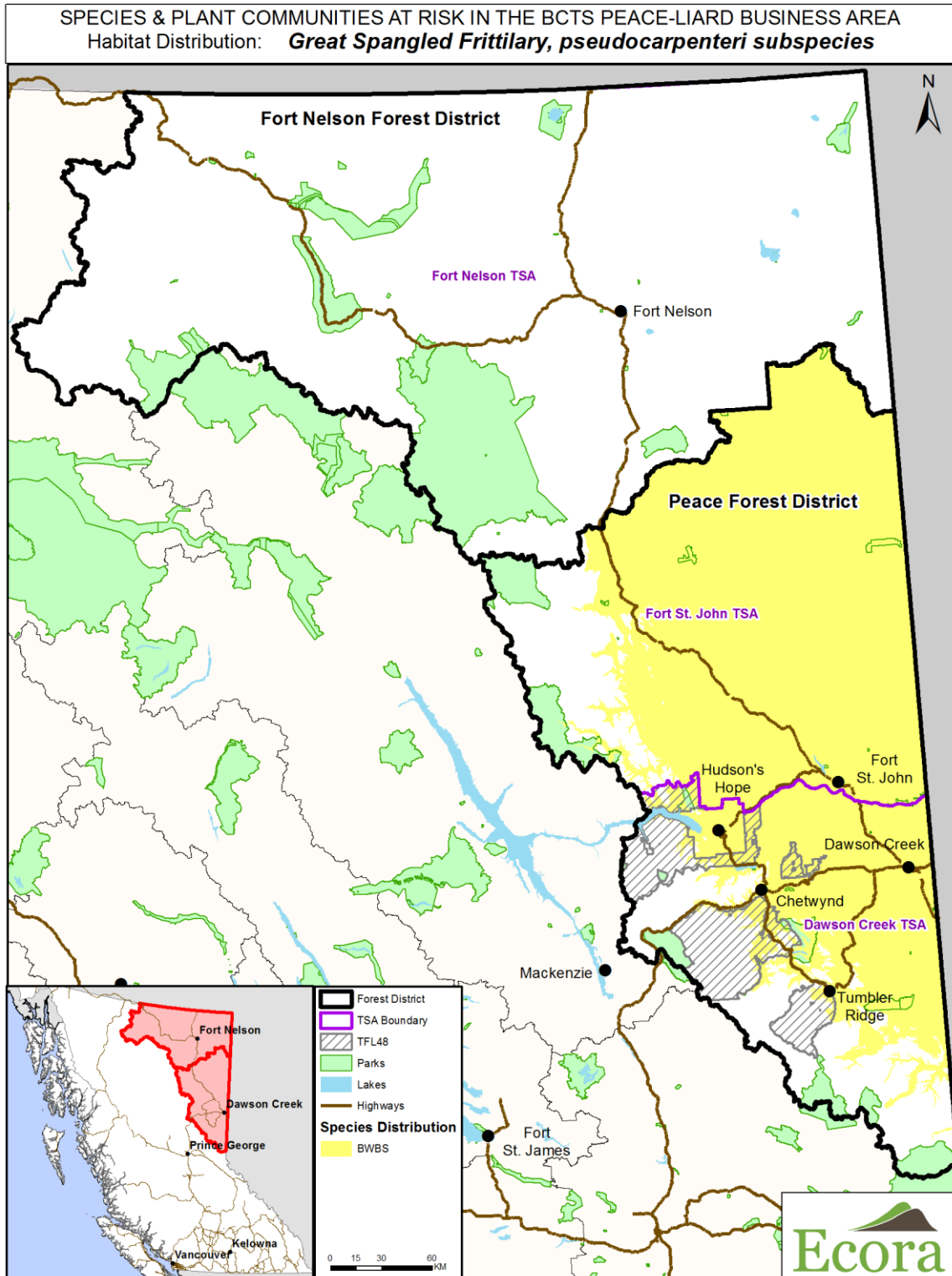
Further Information and Links:

B.C. Conservation Data Centre. 2011. Species Summary: *Speyeria cybele pseudocarpenteri*.
B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Canadian Biodiversity Information Facility. 2009. Species Bank. Government of Canada.
Available at:
http://www.cbif.gc.ca/spp_pages/butterflies/species/GreatSpangledFritillary_e.php

Guppy, C.S. and Shepard, J.H. 2001. Butterflies of British Columbia. UBC Press with Royal
British Columbia Museum, Vancouver & Victoria, BC. 414 pp.

Timberline NRG. 2008. Management strategy recommendations for species and plant communities at
risk in the Dawson Creek Timber Supply Area. Report Prepared for Tembec Enterprise Inc.,
Chetwynd, BC. 32 pp.



Mormon Fritillary

Speyeria mormonia eurynome

Kingdom	Phylum	Class	Order	Family
Animalia	Mandibulata	Insecta	Lepidoptera	Nymphalidae

Description

General: Adults: This is a relatively small butterfly with highly variable colour intensity. It is orange-brown above, with a complex pattern of black spots, bars and stripes, and a black border that is wider in females. The forewing underside is orange with narrow black markings, and the hindwing underside is lighter with greenish or silvery. The Mormon Fritillary is smaller than other *Speyeria*, and has a noticeably large body in relationship to its wing size (Acorn and Sheldon 2006). Tan *eggs* are laid near violets. *Larvae*: almost black with a broad, pale, mid-dorsal spine.

Size: 40-50 mm.

Field Signs: One brood per year. Flies mainly in July-August. Butterflies fly close to the ground with frequent stops.

Taxonomy: There are three subspecies: *bischoffi* (yellow-listed), *erinna* (red-listed), and *eurynome* (red-listed). The latter is of interest for the areas reviewed in this document.

Status:

Global: G5TNR
Canada: NNR
Provincial: S1S3 – Red

Distribution

In BC, found typically in mountains, where it occurs in dry grassy meadows at high elevations, and in prairie valleys.

Biogeoclimatic Zones: ESSF

Forest Districts: Peace District

Known Locations: little information available, there are some records near the BC border in Alberta

Habitat

General: *S. m. euryome* is associated with the boreal and the Rocky Mountain regions. Habitats include prairie grassland, mixed forests, forest openings, riparian sites, and alpine meadows.

Structural stage: mainly early-seral stages.

Elevations: from sea level to mountain tops.

Food

Larvae feed on violets. Adults feed on diverse wildflowers.

Biological notes

Smaller than other fritillaries.

Threats

Habitat loss is the main threat to this species. The main causes of habitat loss could be through vegetation control, development and agricultural practices.

Best Management Practices

- Create buffers around areas known to be used by this species.
- Avoid the use of herbicides and pesticides in inhabited areas.

Information gaps

Population distribution and dynamics in various habitats; the impacts of anthropogenic changes.

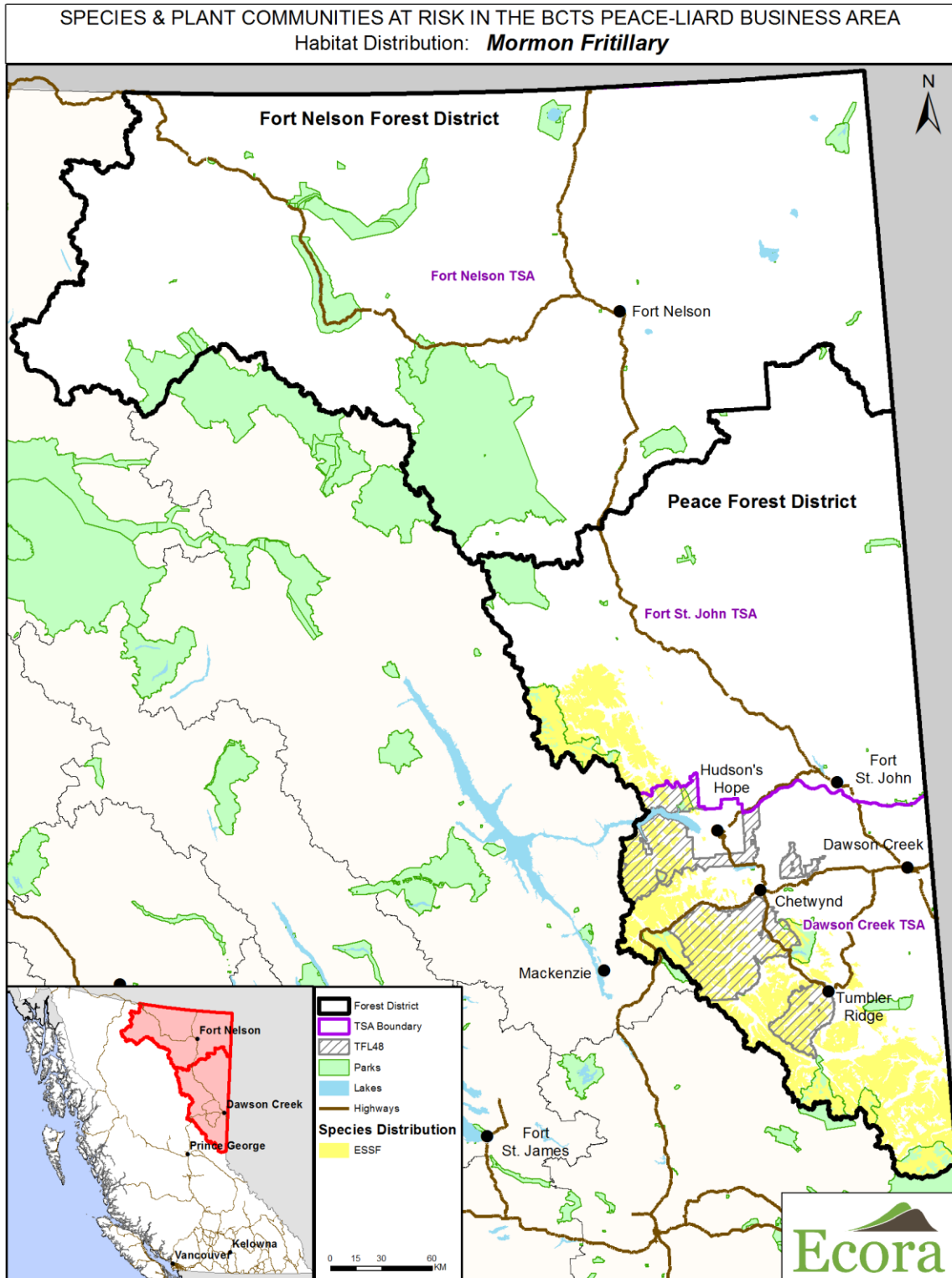
Further information and links:

Acorn, J., and I. Sheldon. 2006. Butterflies of British Columbia. Lone Pine Publishing, Edmonton, Alta,

Bird, C. D., G. I. Hilchie, N. G. konda, E. M. Pike, and F. A. H. Sperling. 1995. Alberta butterflies. The Provincial Museum of Alberta, Edmonton, Alta.

Layberry, R. A., P. W. Hall, and J. D. Lafontaine. 1998. The butterflies of Canada. University of Toronto Press, Toronto, Ont.

Pyle, R. M. 1998. National Audubon Society field guide to North American butterflies. Alfred A. Knopf, New York, New York.



Mt. McKinley Alpine

Erebia mackinleyensis

Kingdom	Phylum	Class	Order	Family
Animalia	Mandibulata	Insecta	Lepidoptera	Nymphalidae

Description

General: Adults have wings that are black in color with a trace of a red flush on both sides of the forewing. The female has a larger patch than the male. The underside of the hindwing has a pale medial band. The larvae are green mottled with black. They are also covered with short hairs, and have a dark brown head.

Size: 41-53 mm.



Field Signs: Flight is in June and July.

Similar Species: *Erebia magdalenadoes* does not have the characteristic red flush on the forewing and is larger.

Status:

Global: G5

Canada:

Provincial: S1S3 - red

Distribution

BEC Units: BAFA, BWBS, SWB

Forest Districts: Fort Nelson District

Known Locations: In British Columbia it was recorded near Summit Lake in Stone Mountain Provincial Park. There are some records near the BC border in the Yukon.

Habitat

General: High - elevation scree slopes and boulder fields.

Food

The species is known to feed on moss campion as an adult. During the larval stages, they eat grasses, sedges and rushes.

Biological notes

Adults can be commonly found resting on large rocks covered with black lichens.

Threats

Based on habitat locations threats to this species are considered minimal but there is a potential threat due to mining and blasting and quarrying for rock extraction.

Best Management Practices

- This species should be incorporated into mining and exploration strategies in areas where the species are known to occur and/or areas which provide suitable habitat.

Information Gaps

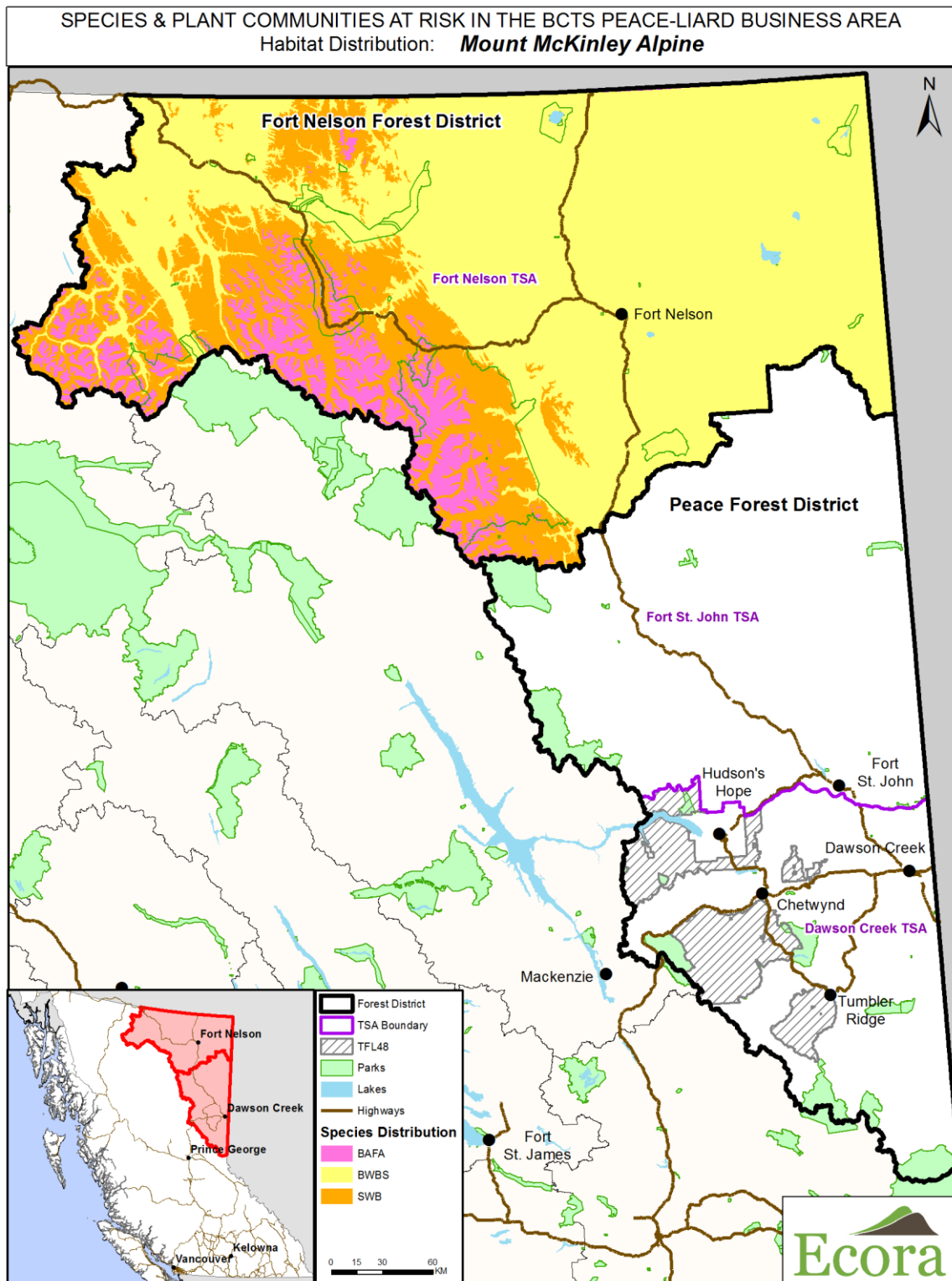
- Research is needed to more accurately quantify habitat requirements, potential threats and to further understand life history.

Further Information and Links:

B.C. Conservation Data Centre. 2011. Species Summary: *Erebia mackinleyensis*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Canadian Biodiversity Information Facility. 2009. Species Bank. Government of Canada. Available at:
http://www.cbif.gc.ca/spp_pages/butterflies/species/MtMcKinleyAlpine_e.php

Guppy, C.S. and Shepard, J.H. 2001. Butterflies of British Columbia. UBC Press with Royal British Columbia Museum, Vancouver & Victoria, BC. 414 pp.



Old World Swallowtail, *hudsonianus* subspecies

Papilio machaon hudsonianus

Kingdom	Phylum	Class	Order	Family
Animalia	Mandibulata	Insecta	Lepidoptera	Papilionidae

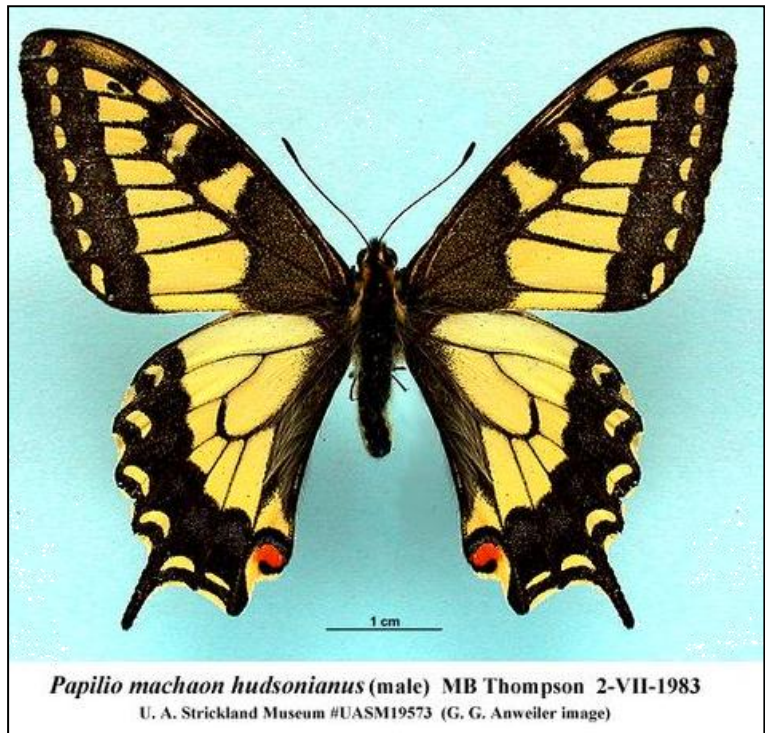
Description

General: The adult Old World Swallowtail is mainly yellow in color. The main identification feature is the eye-spot located on the upperside of the hindwing where the black pupil touches the abdominal wing margin. The green larva has black bands dotted with orange or yellow spots on each segment.

Size: 51-95 mm.

Field Signs: Flight is from June to July.

Taxonomy: In Canada there are six subspecies: *aliaska*, *oregonius*, *dodi*, *bairdii*, *pikei*, and *hudsonianus*. The latter is of interest for this report.



Status:

Global: G5T4

Canada:

Provincial: S1S3 - Red

Distribution

BEC Units: ESSF

Forest Districts: Peace District

Known Locations: In British Columbia it has been recorded in two areas, both near the Pink Mountain area. One was 9 km north of Pink Mountain on the Alaska Highway and the second is on the ridge below the southern summit of Pink Mountain.

Habitat

General: Various habitats but typically found inhabiting openings in the northern boreal forests, northern subalpine willow-shrub habitats and alpine tundra.

Food

During the larval stages, they have been observed eating mountain sagewort (*Artemisia norvegica*) and coltsfoot (*Petasites frigidus* var. *palmatus*) has been reported outside of BC.

Biological notes

Males patrol exposed cliff and hilltops to establish dominance while waiting for mates to come up from lower elevations. It is common to see many males competing for the same space.

Threats

Wildfire and invasive weed species may change ecosystems (and therefore habitat) over time. Livestock management practices such as overgrazing, rutting and trail forming may also lead to erosion problems which would also affect habitat.

Best Management Practices

- Protected area planning documents need to entail species management provisions.
- Guidelines for best management practices need to be created for private landowners.

Information Gaps

- A monitoring program would be very beneficial for management purposes at its known location.
- Further research into specific habitat requirements, potential threats, life history and population viability is required.

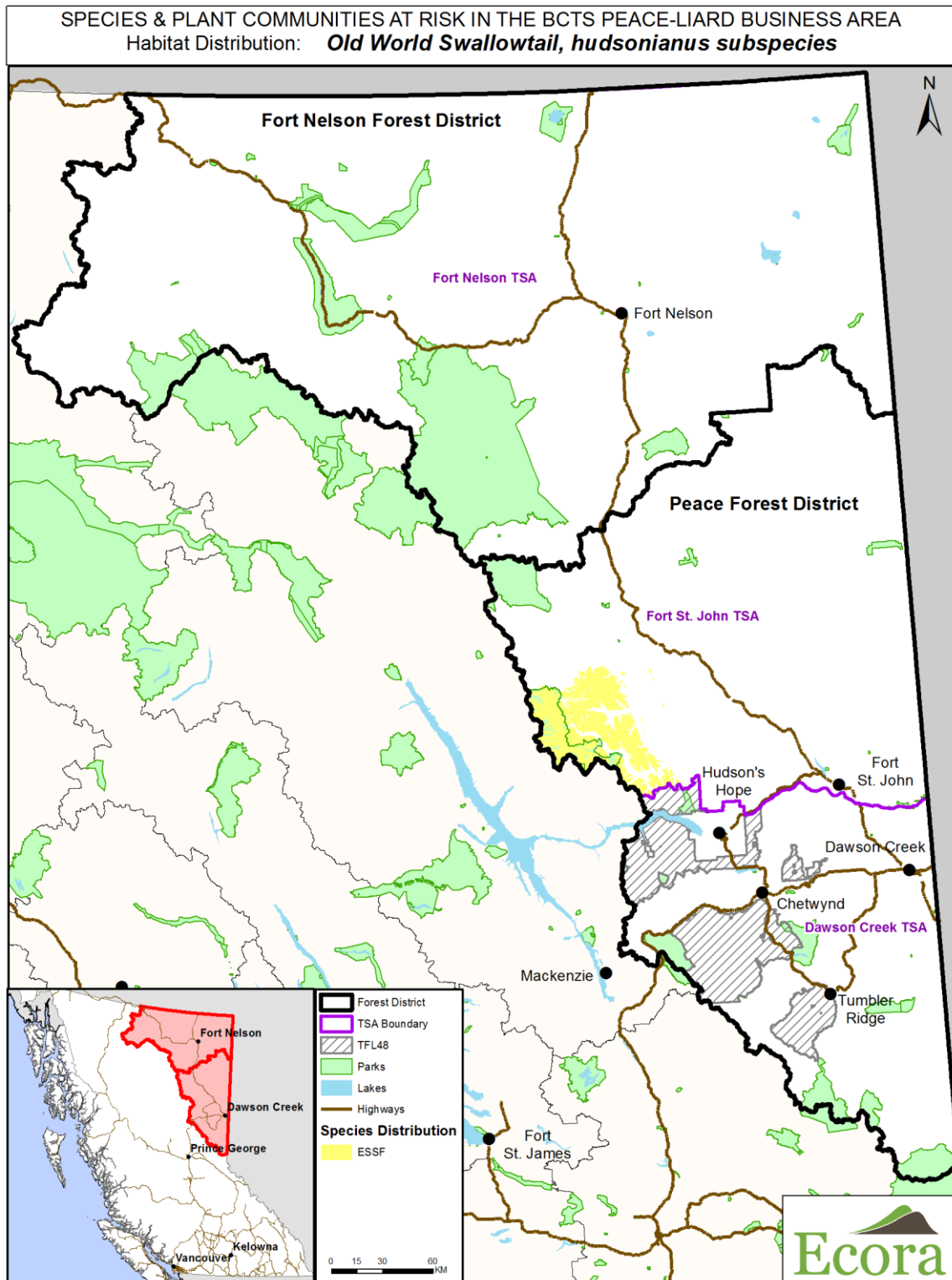
Further Information and Links:

B.C. Conservation Data Centre. 2011. Species Summary: *Papilio machaon hudsonianus*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Canadian Biodiversity Information Facility. 2009. Species Bank. Government of Canada. Available at: http://www.cbif.gc.ca/spp_pages/butterflies/species/OldWorldSwallowtail_e.php

Entomology Collection. 2009. University of Alberta. Available at: http://www.entomology.ualberta.ca/searching_species_details.php?c=8&rnd=25014308&s=2511

Guppy, C.S. and Shepard, J.H. 2001. Butterflies of British Columbia. UBC Press with Royal British Columbia Museum, Vancouver & Victoria, BC. 414 pp.



Philip's Arctic (Rosov's Arctic)

Oeneis rosovi philipi

Kingdom	Phylum	Class	Order	Family
Animalia	Mandibulata	Insecta	Lepidoptera	Nymphalidae

Description

General: The adult butterfly has a dark grey-brown upperside, usually with orange patches close to the wing margin. There is a faint eye-spot on the underside of the forewing and sometimes a trace of this spot on the upperside as well. The underside of the hindwing has a dark grey-brown band with contrasting grey shading on either side of it. The wing's marginal quarter is pale grey brown with darker brown markings.

Size: 42-52 mm.

Field Signs: Flight is from mid-June to mid-July.

Similar Species: Very similar to Polixenes Arctic (*Oeneis polixenes*). Species are differentiated on habitat (Polixenes Arctic is found on dry, grassy steppe-like tundra and Philip's Arctic in open spruce bogs).

Status:

Global: G3G5

Canada:

Provincial: S1S3 - Red

Distribution

BEC Units: BWBS, SWB

Forest Districts: Fort Nelson District

Known Locations: In British Columbia it has been recorded in one area, which is Stone Mountain Provincial Park. It may also be present at Pink Mountain and near Muncho Lake although these accounts are unconfirmed.

Habitat

General: Open spruce bogs, open spruce forests, and alpine tundra just above tree line.

Food

During the larval stages, they have been observed eating Cotton-grass. Adults are thought to feed on flower nectar.

Biological notes

Philip's Arctic often lands on tree trunks, flying high into the crowns when alarmed. It has a similar behavior to the Jutta Arctic (*Oeneis jutta*).

Threats

No specific threats listed, as habitat locations may be unfavorable for urban and industrial development.

Best Management Practices

- Create specific provisions in the Stone Mountain Provincial Park Master Plan to help protect the species.
- Allow for listing in the Identified Wildlife Management Strategy (under the Forest and Range Practices Act).

Information Gaps

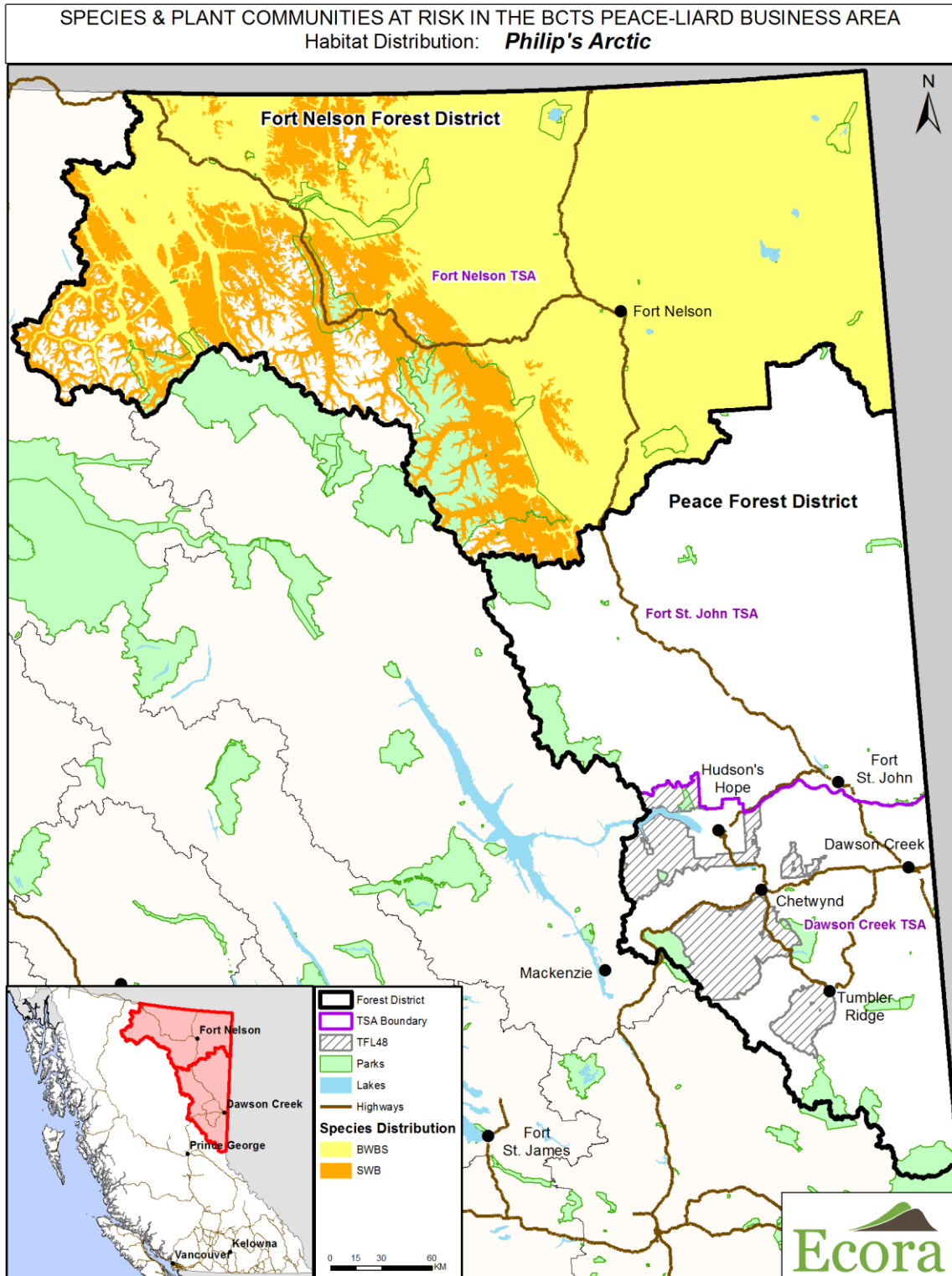
- A monitoring program would be very beneficial for management purposes in subalpine and alpine areas of the north central part of BC.
- Further research into specific habitat requirements, potential threats and life history is required.

Further Information and Links:

B.C. Conservation Data Centre. 2011. Species Summary: *Oeneis philipi*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Canadian Biodiversity Information Facility. 2009. Species Bank. Government of Canada. Available at: http://www.cbif.gc.ca/spp_pages/butterflies/species/Philip%27sArctic_e.php

Guppy, C.S. and Shepard, J.H. 2001. Butterflies of British Columbia. UBC Press with Royal British Columbia Museum, Vancouver & Victoria, BC. 414 pp.



Plains Forktail

Ischnura damula

Kingdom	Phylum	Class	Order	Family
Animalia	Mandibulata	Insecta	Odonata	Coenagrionidae

Description

General: This damselfly is black on the top of its thorax with two pairs of pale dots, and blue sides. The female is similar but it has pale spots on the top joined into stripes. It may also be tan to pink. The abdomen's tip is blue.

Size: ~ 28 mm.

Field Signs: Active in flight from mid-May to August.

Status:

Global: G5

Canada:

Provincial: S1 - Red



Distribution

BEC Units: BWBS

Forest Districts: Fort Nelson District

Known Locations: The only known location for this species in British Columbia is at the Liard River Hot springs.

Habitat

General: Around hot springs.

Special Habitat Features: Warm water environments.

Food

The species is known to eat various flying insects.

Threats

Elimination or alteration of the Hotsprings.

Best Management Practices

- Maintain the integrity of the aquatic system.
- Do not apply herbicide in or near occupied aquatic ecosystems that would result in the destruction or alteration of existing wetland vegetation.

Information Gaps

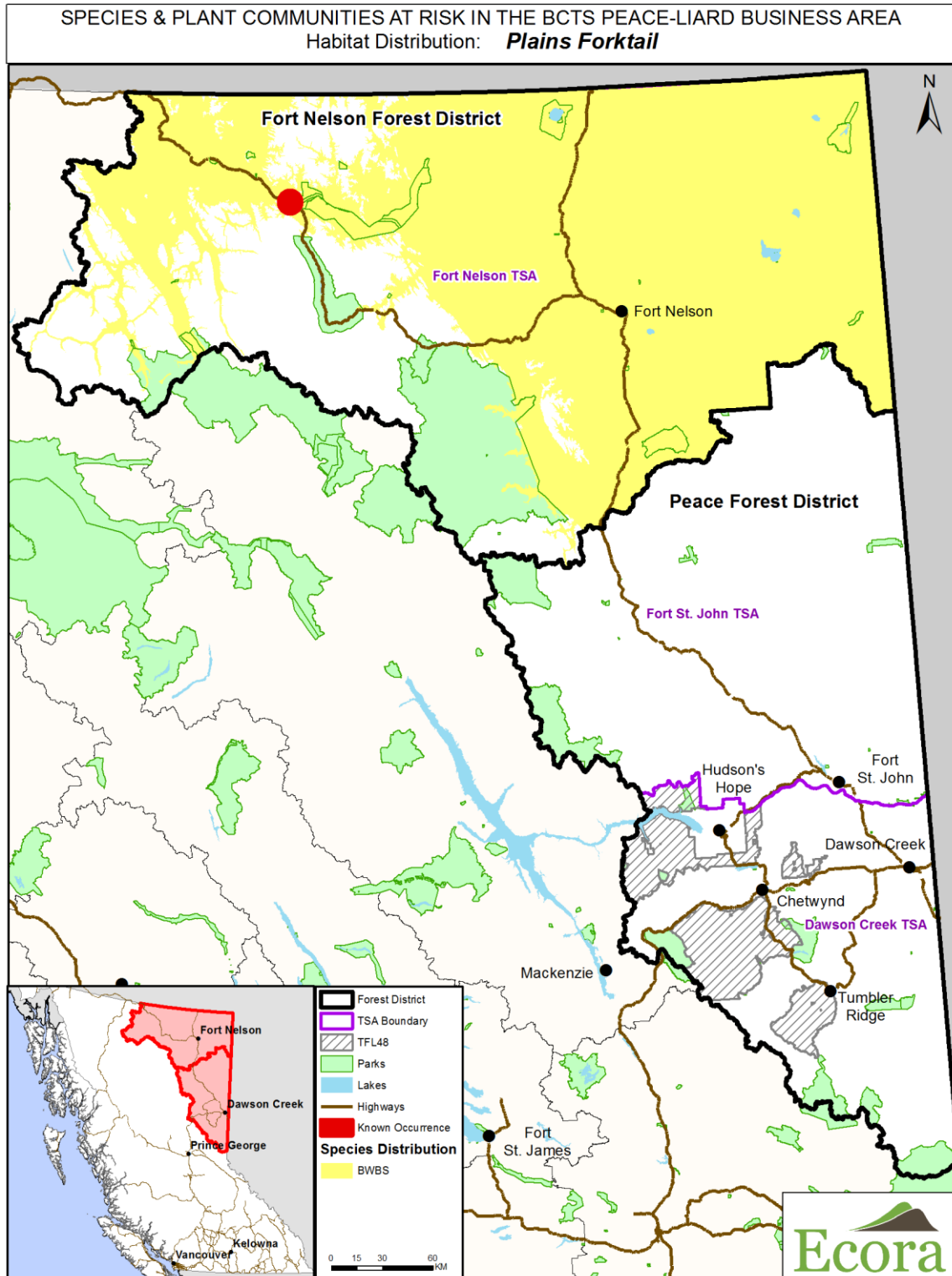
- Research is required on species' distribution.

Further Information and Links:

B.C. Conservation Data Centre. 2011. Species Summary: *Ischnura damula*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Cannings, R. 2002. Rare Dragonflies of British Columbia, B.C. Minist. Sustainable Resour. Manage. and B.C. Minist. Water, Land and Air Prot. 6pp.

Proulx, G., D. Bernier, and K. Green. 2006. Accounts for Species and Plant Communities at Risk in the Fort Nelson Forest District. Unpublished report. Alpha Wildlife Research & Management Ltd., Sherwood Park, Alta., And Timberline Natural Resource Group Ltd., Dawson Creek, BC.



Striped Hairstreak

Satyrium liparops

Kingdom	Phylum	Class	Order	Family
Animalia	Mandibulata	Insecta	Lepidoptera	Lycaenidae

Description

General: The relatively small adult is dark brown on the upperside of the wings with a large tawny (orangy) flush on the dorsal forewing. The wing undersides have similar colouration to the upperside but with slightly darker areas outlined by white lines on the lateral sides. The mature larvae are usually green with a darker green dorsal stripe.

Size: 21-28 mm.

Field Signs: Flight is from late June to late July.



Similar Species: Very similar to the Banded Hairstreak (*S. calanus*), the Hickory Hairstreak (*S. caryaevorum*) and Edwards' Hairstreak (*S. edwardsii*). However, none of these have the orange crescent above the blue spot on the hindwing.

Status:

Global: G5

Canada:

Provincial: S2 - Red

Distribution

BEC Units: BWBS

Forest Districts: Peace District, TFL 48

Known Locations: In British Columbia it has been recorded from the Clayhurst, Taylor and Fort St. John areas, as well as in the Beaton River area, Kiskatinaw Provincial Park and on the north banks of the Peace River Canyon and some of its tributaries.

Habitat

General: Around thick shrubbery on the edge of wooded areas.

Food

As adults, this species will feed on various types of flowering plants. In larval stages, they eat predominately plum, cherry and hawthorns. This species has been observed perching on branches of Saskatoon (*Amelanchier alnifolia*), and presumed to be a larval foodplant.

Biological notes

This species is sometimes seen feeding with the more common Banded Hairstreak. The Striped Hairstreak itself is rarely seen in abundance.

Threats

Vegetation management practices along roadways and in parks could reduce suitable habitat. Agricultural practices and modern development may also have an impact.

Best Management Practices

- Specific provisions intended to protect the species should be incorporated into the Clayhurst Ecological Reserve management plan.
- Should be listed in the Identified Wildlife Management Strategy under the Forest and Range Practices Act.

Information Gaps

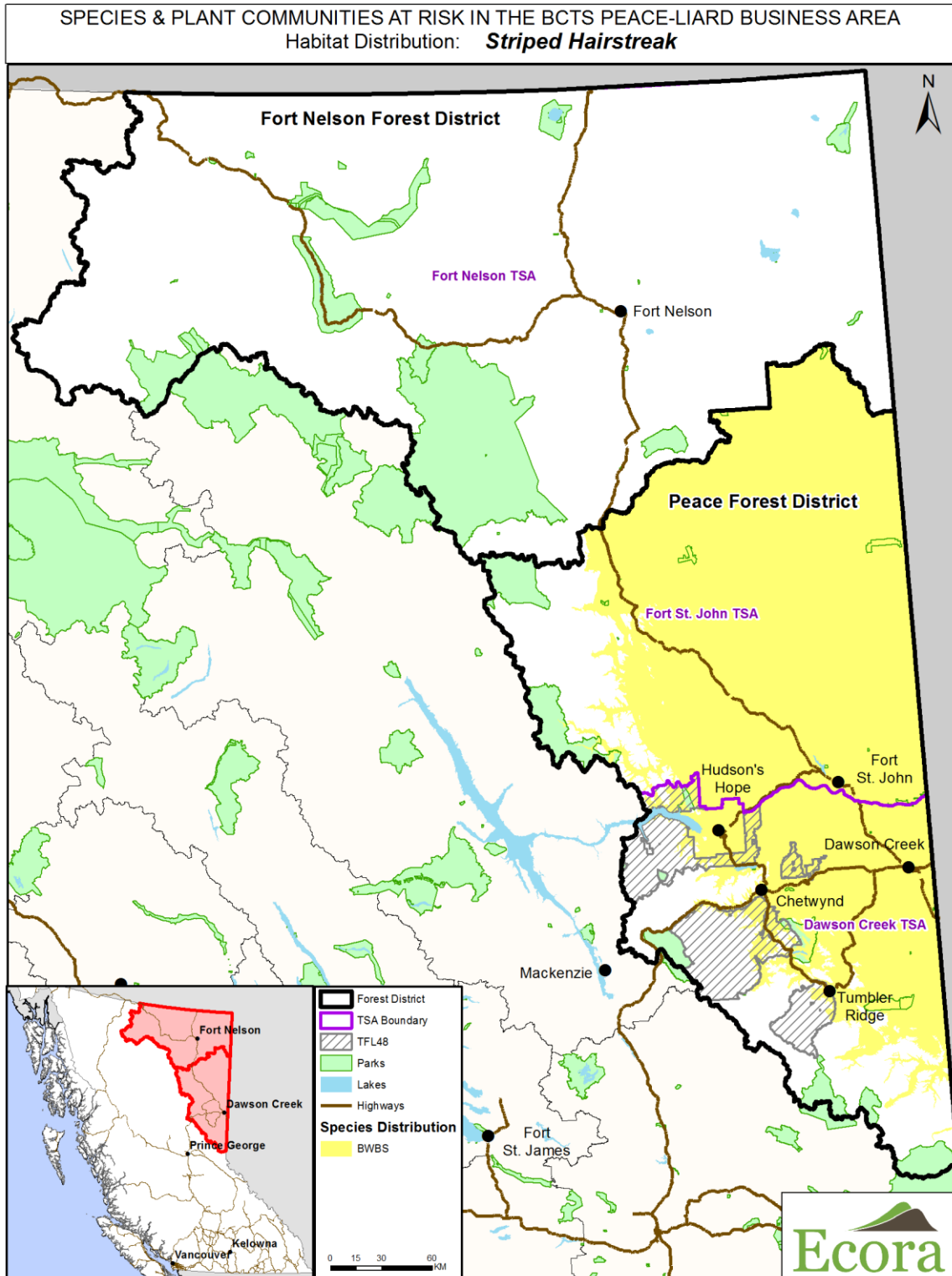
- Research needed into life history, food plant identification, threats and specific habitat requirements.
- Inventories on butterflies focusing on woodlands and riparian areas would be beneficial.

Further Information and Links:

B.C. Conservation Data Centre. 2011. Species Summary: *Satyrium liparops*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Canadian Biodiversity Information Facility. 2009. Species Bank. Government of Canada. Available at: http://www.cbif.gc.ca/spp_pages/butterflies/species/StripedHairstreak_e.php

Guppy, C.S. and Shepard, J.H. 2001. Butterflies of British Columbia. UBC Press with Royal British Columbia Museum, Vancouver & Victoria, BC. 414 pp.



Yellow-Dotted Alpine (Mountain Alpine)

Erebia pawlowskii

Kingdom	Phylum	Class	Order	Family
Animalia	Mandibulata	Insecta	Lepidoptera	Nymphalidae

Description

General: The adult Yellow-Dotted Alpine has a series of orange bars on the upperside of both wings and is dark brown in color. The forewing underside has a reddish flush in the centre and the orange bars are repeated. These markings are pale cream color on the underside of the hindwing. Larvae have dark brown lateral and dorsal stripes and are tan in color. Thick hairs cover the head and body.

Size: 29-38 mm.

Field Signs: Flight is from early July to mid-August.

Taxonomy: Two subspecies occur in Canada. Subspecies *canadensis* is found only around Churchill, Manitoba and subspecies *alaskensis* exists in northern BC, the Yukon and Alaska.

Status:

Global: G5

Canada:

Provincial: S1S3 - Red

Distribution

BEC Units: BWBS, SWB

Forest Districts: Fort Nelson District

Known Locations: In British Columbia it has been recorded only within Stone Mountain Provincial Park.

Habitat

General: This species typically inhabits subalpine bogs and wet grassy meadows.

Food

As adults, this species will feed on various types of flowering plants. In larval stages, they eat primarily grasses, sedges or rushes.

Biological notes

Females often lay eggs on willow. Males are more active than females, but both spend most of the time perched on long grass. The Yellow-dotted Alpine has a weak, slow flight, and when alarmed they drop to the ground.

Threats

No significant threats are listed.

Best Management Practices

- Specific provisions intended to protect the species should be updated in the Stone Mountain Provincial Park Master Plan.

Information Gaps

- Research into life history, food plant identification, threats and specific habitat requirements is needed.
- Inventories on butterflies focusing on population and distribution in subalpine and alpine areas of northern BC would be beneficial.

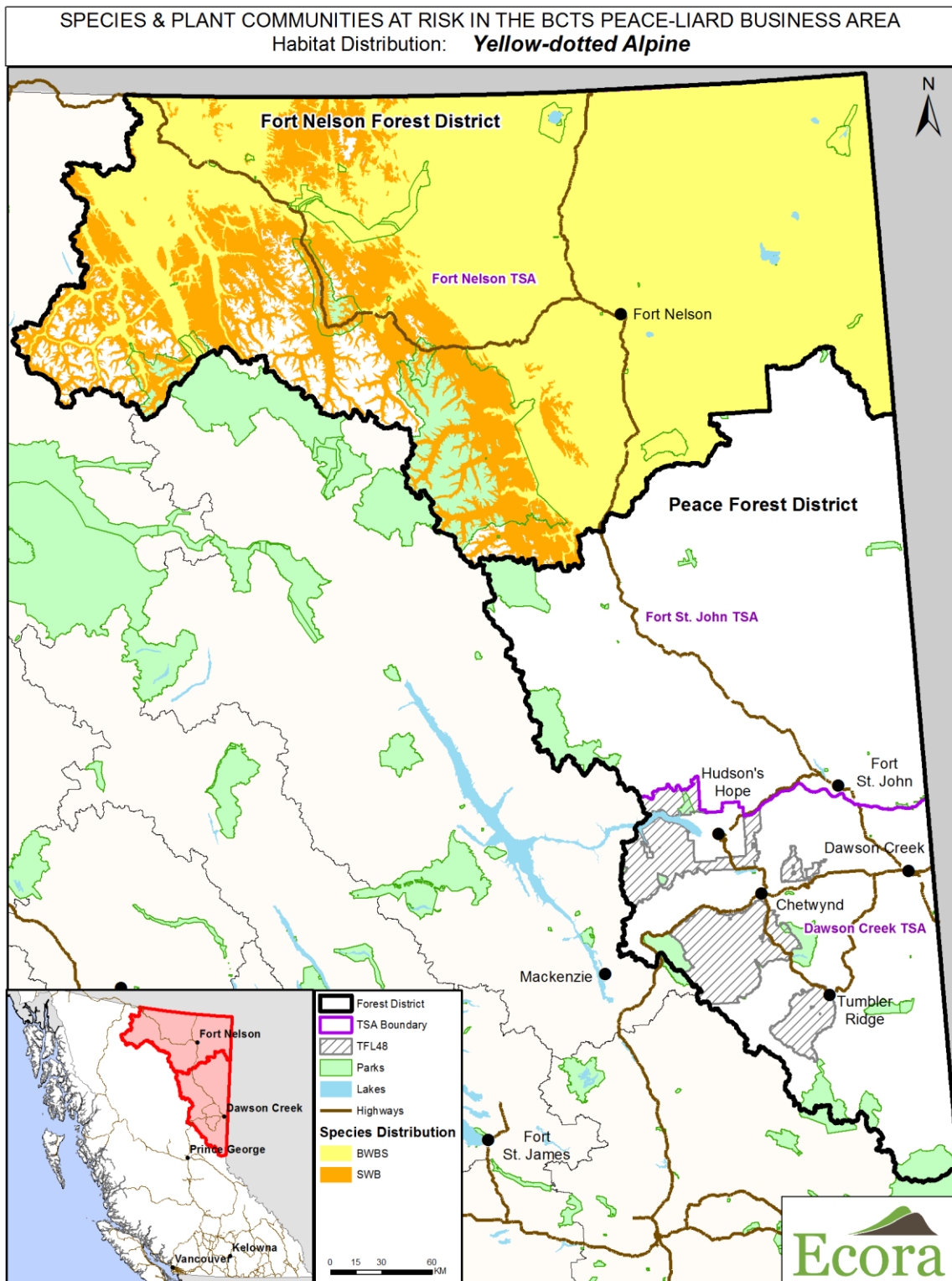
Further Information and Links:

B.C. Conservation Data Centre. 2011. Species Summary: *Erebia pawloskii*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Canadian Biodiversity Information Facility. 2009. Species Bank. Government of Canada. Available at: http://www.cbif.gc.ca/spp_pages/butterflies/species/Yellow-dottedAlpine_e.php

Guppy, C.S. and Shepard, J.H. 2001. Butterflies of British Columbia. UBC Press with Royal British Columbia Museum, Vancouver & Victoria, BC. 414 pp.

Opler, P.A., H. Pavulaan, R. E. Stanford, M. Pogue, coordinators. 2006. Butterflies and Moths of North America. Bozeman, MT: Big Sky Institute. Butterflies and Moths of North America. 2009. Species detail. Available at: <http://www.butterfliesandmoths.org/species?l=1869>



2.2 Vertebrate Animals

2.2.1 Birds

Bay-breasted Warbler

Dendroica castanea

Kingdom	Phylum	Class	Order	Family	Genus	Species
Animalia	Craniata	Aves	Passeriformes	Parulidae	Dendroica	castanea

Description

General: Males (length: 14 cm) have a black face with a cream-coloured patch on the sides of the neck. They have a chestnut crown, throat and sides, and two white wing bars. The plumage of the female in spring is similar, but fainter. The plumage of the Bay-breasted Warbler becomes drab in the fall.

Status:

Global: G5

Canada:

Provincial: S2B – Red;
IWMS listed



Distribution

BEC Units: BWBS

Forest Districts: Fort Nelson District, Peace District, TFL 48

Known Locations: The Bay-breasted Warbler is rare, but may be widely and sparsely distributed in northern spruce forests of the Taiga and Boreal Plains.

Habitat

The Bay-breasted Warbler is found almost exclusively in mature white spruce forest, either in pure stands or mixed with clumps of aspen and balsam poplar. This species also uses riparian coniferous or mixedwood corridors with multi-layered canopy and frequent openings. Some common characteristics of nesting habitat include a high proportion of old

spruce with dead lower branches, a sparse but patchy sub-canopy, and an understory dominated by tall shrub layer possibly composed of highbush-cranberry, paper birch, dogwood, or alder.

Threats and Concerns

The primary threat to Bay-breasted Warblers is the harvesting of mature and old-growth white spruce stands within its restricted range. However, the species has been observed in stands that had been logged selectively for very large spruce with substantial amounts of moderate-sized spruce remaining; this finding suggests that a certain amount of selective logging may be compatible with this warbler. Habitat is also lost or fragmented by other activities such as clearing for agriculture, road building, transmission lines, and oil and gas exploration. Large scale spraying of insecticides to control spruce budworm outbreaks in coniferous forests inevitably reduces insect prey base.

Best Management Practices

- Maintain suitable nesting habitat by maintaining old spruce forests in BWBS.
- Incorporate old spruce into old-growth management areas, wildlife tree patches, and riparian management areas. Wildlife tree patches should be ≥ 5 ha.
- Conservation areas should include spruce forests with evidence of declining health for their potential for future spruce budworm outbreaks. These areas should have old black and white spruce, a relatively closed upper canopy, open patches in mid-canopy, and an understory dominated by tall shrubs such as highbush-cranberry, paper birch, dogwood or alder.
- Minimize edge habitat, maximize forest interior conditions, and establish corridors between favorable habitat patches.
- Do not construct roads, trails, or other access routes near nest sites.
- When a nest is found, special measures should be taken to protect it and its surroundings. Establish WHAs at known breeding sites or sites with high suitability nesting habitat.
- Do not apply pesticides or herbicides in or near occupied ecosystems.
- Avoid prime habitat when planning seismic explorations, transmission lines, and other access routes.

Further Information and Links:

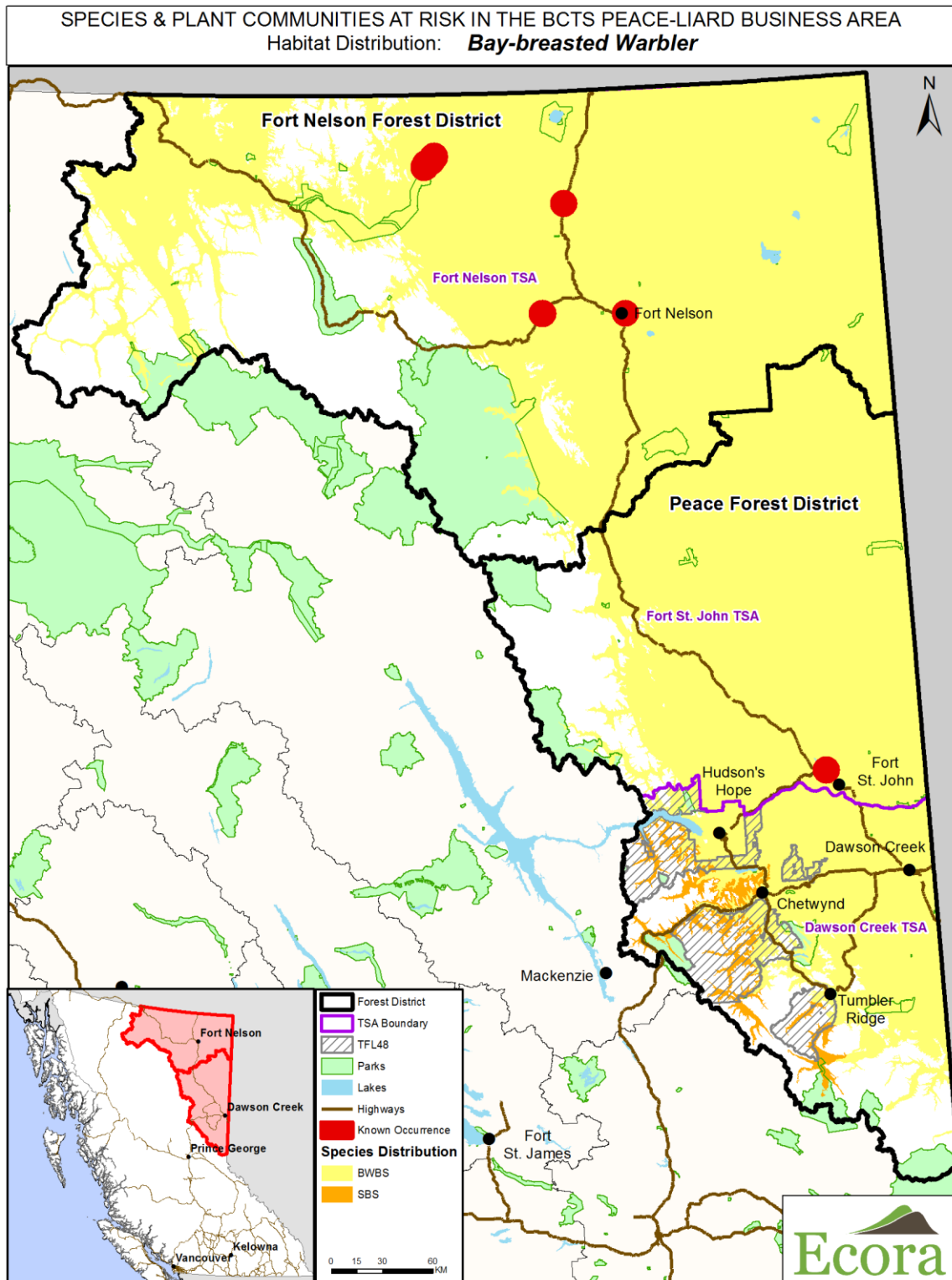
B.C. Conservation Data Centre. 2011. Species Summary: *Dendroica castanea*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Campbell, R. W., N. K. Dawe. I. McTaggart-Cowan, J. M. Cooper, G. W. Kaiser, A. C. Stewart, and M. C. E. McNall. 1990. The birds of British Columbia. Volume 4. Wood-warblers through old world sparrows. UBC Press, Vancouver, BC.

Cooper, J. M., K. A. Enns, and M. G. Shepard. 1997. Status of the Bay-breasted Warbler in British Columbia. BC Min. Enviro., Wildl. Work. Rep. WR-79, Victoria, BC.

Enns, K. A., and C. Siddle. 1992. The distribution, abundance and habitat requirements of selected passerine birds on the Taiga and Boreal Plains. Report prepared for BC Environ., Lands and Parks, Victoria, BC.

Proulx, G., K. Green, and D. Bernier. 2006. Accounts for species and plant communities at risk in the Fort Nelson Forest District. Alpha Wildlife Research & Management Ltd. and Timberline Forest Inventory Consultants report submitted to CANFOR, Fort Nelson, BC. 121 pages.



Black-throated Green Warbler

Dendroica virens

Kingdom	Phylum	Class	Order	Family	Genus	Species
Animalia	Craniata	Aves	Passeriformes	Parulidae	Dendroica	virens

Description

General: The Black-throated Green Warbler is a small (length: 13 cm), olive-green warbler with black throat, upper breast and wings. It has a yellow face, a dusky line through the eye, and an olive ear patch surrounded by yellow. Sexes are similar but the female has less black.

Status:

Global: G5

Canada:

Provincial: S3B – Blue; IWMS listed

Distribution

BEC Units: BWBS

Forest Districts: Fort Nelson District, Peace District, TFL 48

Known Locations: The black-throated green warbler occurs mainly in the Boreal Plains. Recent records from the Tuchodi River extend its known range significantly northward into the Taiga Plains. No nests have been found in BC.

Habitat

In northeastern BC, Black-throated Green Warblers are mainly found in mature white spruce – trembling aspen (or balsam poplar) mixedwood forest. They also frequent riparian spruce and mixedwood forests, and less often, mature pine-aspen forest. Habitat consists of tall, mixed, white spruce and poplar stands in the BWBS. Structure is variable. Stands tend to be mesic, with rose, twinberry, cranberry, bunchberry, coltsfoot, grass and fireweed the most common plant species found in the understorey.

Threats and Concerns

In northeastern BC, clearcutting of mature and old-growth white spruce and mixedwood forest removes suitable nesting habitat for the Black-throated Green Warbler. Selective (40-75% of stand) and strip cuts have a negative effect in the short- and medium- term. The trend in northern BC toward intensive silviculture for short rotations of mixedwood prevents regeneration of good quality nesting habitat after it has been lost to harvesting. Habitat is also lost or fragmented by other activities such as clearing for agriculture, road building, transmission lines, oil and gas exploration and hydro reservoirs.

Best Management Practices

- Maintain suitable nesting habitat by maintaining late-successional white spruce or mixedwood stands in BWBS.
- Incorporate old spruce into old-growth management areas, wildlife tree patches, and riparian management areas. Wildlife tree patches should be ≥ 5 ha.
- Minimize edge habitat, maximize forest interior conditions, and establish corridors between favorable habitat patches.
- Do not construct roads, trails, or other access routes near nest sites.
- When a nest is found, special measures should be taken to protect it and its surroundings. Establish WHAs at known breeding sites or sites with high suitability nesting habitat.
- Do not apply pesticides or herbicides in or near occupied ecosystems.
- Avoid prime habitat when planning access roads, seismic explorations, transmission lines, and other access routes.

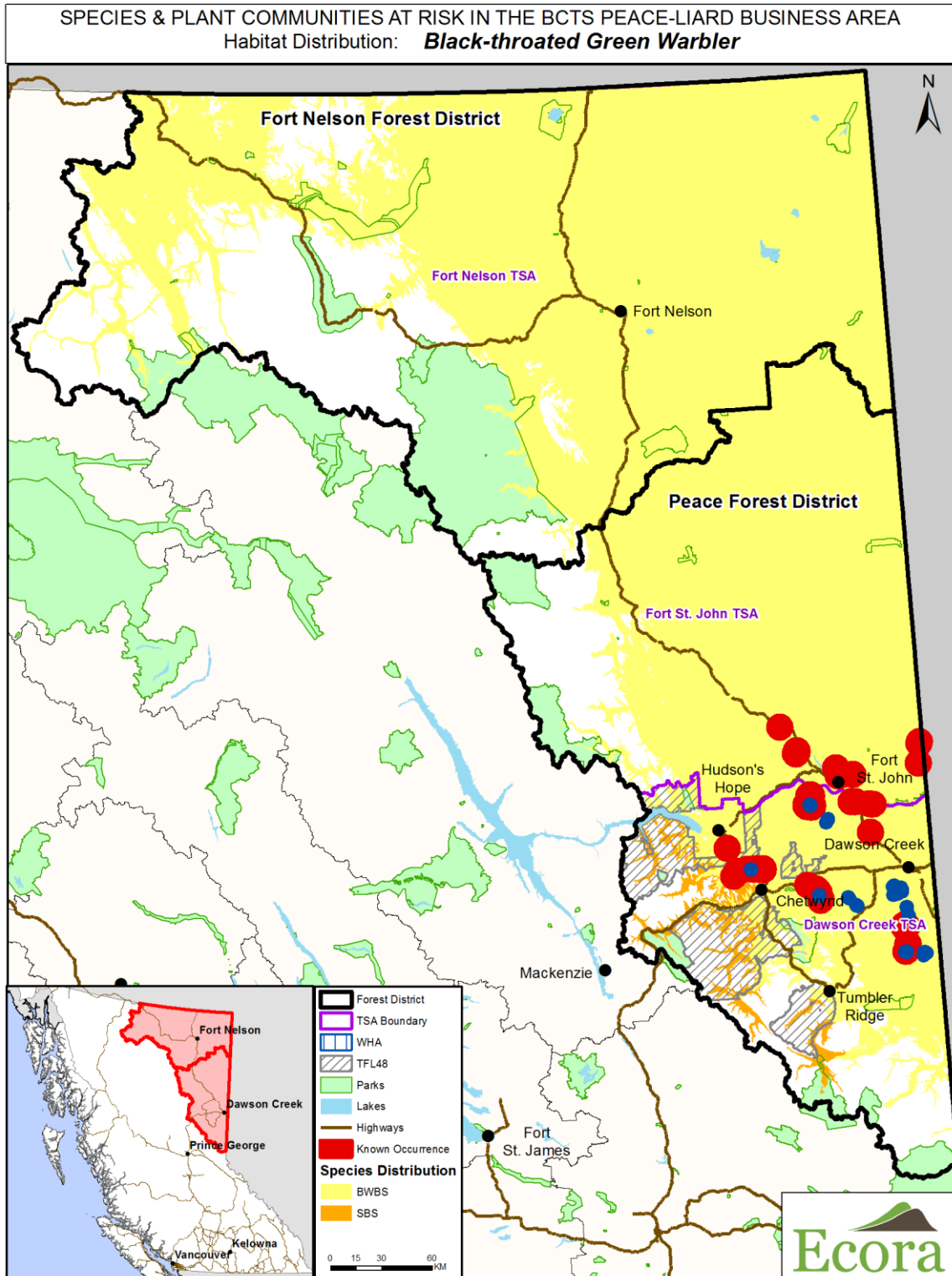
Further Information and Links:

B.C. Conservation Data Centre. 2011. Species Summary: *Dendroica virens*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Beaudry, L., and G. Proulx. 2006. Management strategies for riparian sensitive species. P. Beaudry and Associates Ltd. and Alpha Wildlife Research & Management Ltd. report prepared for CANFOR, Vanderhoof Division, BC.

Campbell, R. W., N. K. Dawe, I. McTaggart-Cowan, J. M. Cooper, G. W. Kaiser, A. C. Stewart, and M. C. E. McNall. 1990. The birds of British Columbia. Volume 4. Wood-warblers through old world sparrows. UBC Press, Vancouver, BC.

Proulx, G., K. Green, and D. Bernier. 2006. Accounts for species and plant communities at risk in the Fort Nelson Forest District. Alpha Wildlife Research & Management Ltd. and Timberline Forest Inventory Consultants report submitted to CANFOR, Fort Nelson, BC. 121 pages.



Cape May Warbler

Dendroica tigrina

Kingdom	Phylum	Class	Order	Family	Genus	Species
Animalia	Craniata	Aves	Passeriformes	Parulidae	Dendroica	tigrina

Description

General: The Cape May Warbler is a small (length: 13 cm) songbird with white wing patches, a yellow or olive-yellow rump, and streaks below. In the breeding season, males have a chestnut ear patch surrounded by yellow, and an olive crown and nape, heavily streaked with black. Females have a yellow patch on the neck, just below an olive ear patch, and narrower white wing bars. Juvenile males do not have the chestnut ear patch. Female juveniles are very drab, often lacking yellow.



Status:

Global: G5

Canada:

Provincial: S2B – Red; IWMS listed

Distribution

BEC Units: BWBS

Forest Districts: Fort Nelson District, Peace District, TFL 48

Known Locations: The Cape May Warbler occurs almost exclusively in the Taiga and Boreal Plains.

Habitat

In northeastern BC, Cape May Warblers are found almost exclusively in mature or old white spruce, either in pure stands or mixed with black spruce, balsam poplar, aspen, birch, willow, alder, and lodgepole pine. Stands have tall trees and are fairly dense, with frequent openings. Relatively tall conifers extending above the main canopy are used by males as singing perches. Sites are usually on flat ground with open, mossy ground cover and understorey including highbush cranberry, horsetail, bunchberry, palmate coltsfoot, twinflower, and willow.

Threats and Concerns

The primary threat to Cape May Warblers is the harvesting of mature and old-growth white spruce stands within its restricted range. However, the species may tolerate some thinning of forests. Habitat is also lost or fragmented by other activities such as clearing for agriculture, road building, transmission lines, and oil and gas exploration. Large scale spraying of insecticides to control spruce budworm outbreaks in coniferous forests inevitably reduces insect prey base.

Best Management Practices

- Maintain suitable nesting habitat by maintaining old stands of large-stem spruce in BWBS.
- Incorporate old spruce into old-growth management areas, wildlife tree patches, and riparian management areas. Wildlife tree patches should be ≥ 5 ha.
- Conservation areas should include spruce forests with evidence of declining health for their potential for future spruce budworm outbreaks. These areas should have old black and white spruce > 140 years, a relatively closed upper canopy, open patches in mid-canopy, and an understorey dominated by highbush cranberry, paper birch, dogwood and Sitka alder.
- Minimize edge habitat, maximize forest interior conditions, and establish corridors between favorable habitat patches.
- Do not construct roads, trails, or other access routes near nest sites.
- When a nest is found, special measures should be taken to protect it and its surroundings. Establish WHAs at known breeding sites or sites with high suitability nesting habitat. No visits should occur from April to August except to confirm occupancy.
- Do not apply pesticides or herbicides in or near occupied ecosystems.
- Avoid prime habitat when planning seismic explorations, transmission lines, and other access routes.

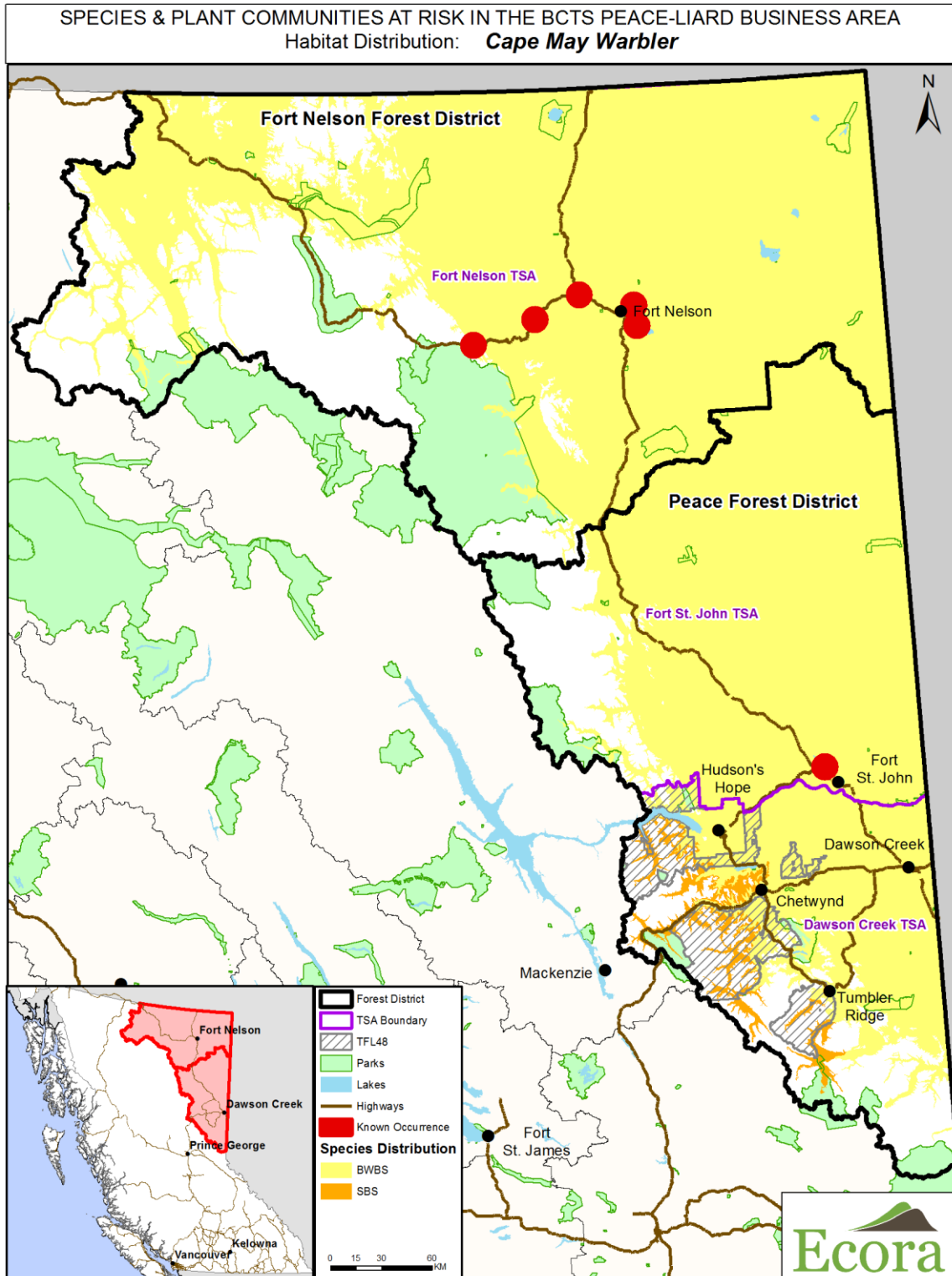
Further Information and Links:

B.C. Conservation Data Centre. 2011. Species Summary: *Dendroica tigrina*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Campbell, R. W., N. K. Dawe. I. McTaggart-Cowan, J. M. Cooper, G. W. Kaiser, A. C. Stewart, and M. C. E. McNall. 1990. The birds of British Columbia. Volume 4. Wood-warblers through old world sparrows. UBC Press, Vancouver, BC.

Enns, K. A., and C. Siddle. 1992. The distribution, abundance and habitat requirements of selected passerine birds on the Taiga and Boreal Plains. Report prepared for BC Environ., Lands and Parks, Victoria, BC.

Proulx, G., K. Green, and D. Bernier. 2006. Accounts for species and plant communities at risk in the Fort Nelson Forest District. Alpha Wildlife Research & Management Ltd. and Timberline Forest Inventory Consultants report submitted to CANFOR, Fort Nelson, BC. 121 pages.



Connecticut Warbler

Oporornis agilis

Kingdom	Phylum	Class	Order	Family	Genus	Species
Animalia	Craniata	Aves	Passeriformes	Parulidae	Oporornis	agilis

Description

General: The Connecticut Warbler is a small (length: 13-15 cm) songbird with long legs and a stout body. The species is easily distinguished from other species by the presence of a complete bold white or withish eye-ring, which is present in both sexes, all age classes, and at all times of year. In breeding plumage, the male has a gray hood extending to the lower throat. Its upperparts are olive or olive-brown, and un-streaked. Its underparts are yellowish. Females and juveniles (with a brownish hood) are similar but duller.

Status:

Global: G4

Canada:

Provincial: S2B – Red; IWMS listed

Distribution

BEC Units: BWBS

Forest Districts: Fort Nelson District, Peace District, TFL 48

Known Locations: The Connecticut Warbler is at the northwestern limit of its breeding range in northeastern BC. It occurs mainly in the Boreal Plains and has been recorded from the Fort Nelson and Fort St. John areas. Cooper et al. (1997c) report sightings northeast of Chetwynd and south of Dawson Creek.

Habitat

The breeding habitat of this species is extremely variable across its range, but in British Columbia it usually inhabits aspen stands 40-120 years old with a fairly sparse shrub layer and a well-developed herbaceous understorey. Occupied sites usually have grasses and creamy peavine in the herb layer. Small amounts of rose and soopolallie are common, but alder is generally avoided.

Threats and Concerns

The primary threat to Connecticut Warblers is the harvesting of late-successional aspen stands. Repeated over-grazing by cattle can negatively affect the herbaceous understorey required by this species. Habitat is also lost or fragmented by other activities such as clearing for agriculture, road building, transmission lines, and oil and gas exploration.

Best Management Practices

- Maintain suitable nesting habitat by maintaining late-successional aspen stands in BWBS.
- Incorporate stands of pure trembling aspen into old-growth management areas, wildlife tree patches, and riparian management areas. Wildlife tree patches should be ≥ 5 ha.
- Minimize edge habitat, maximize forest interior conditions, and establish corridors between favorable habitat patches.
- Do not construct roads, trails, or other access routes near nest sites.
- When a nest is found, special measures should be taken to protect it and its surroundings. Establish WHAs at known breeding sites or sites with high suitability nesting habitat. No visits should occur from April to August except to confirm occupancy.
- Do not apply pesticides or herbicides in or near occupied ecosystems.
- Avoid prime habitat when planning seismic explorations, transmission lines, and other access routes.

Further Information and Links:

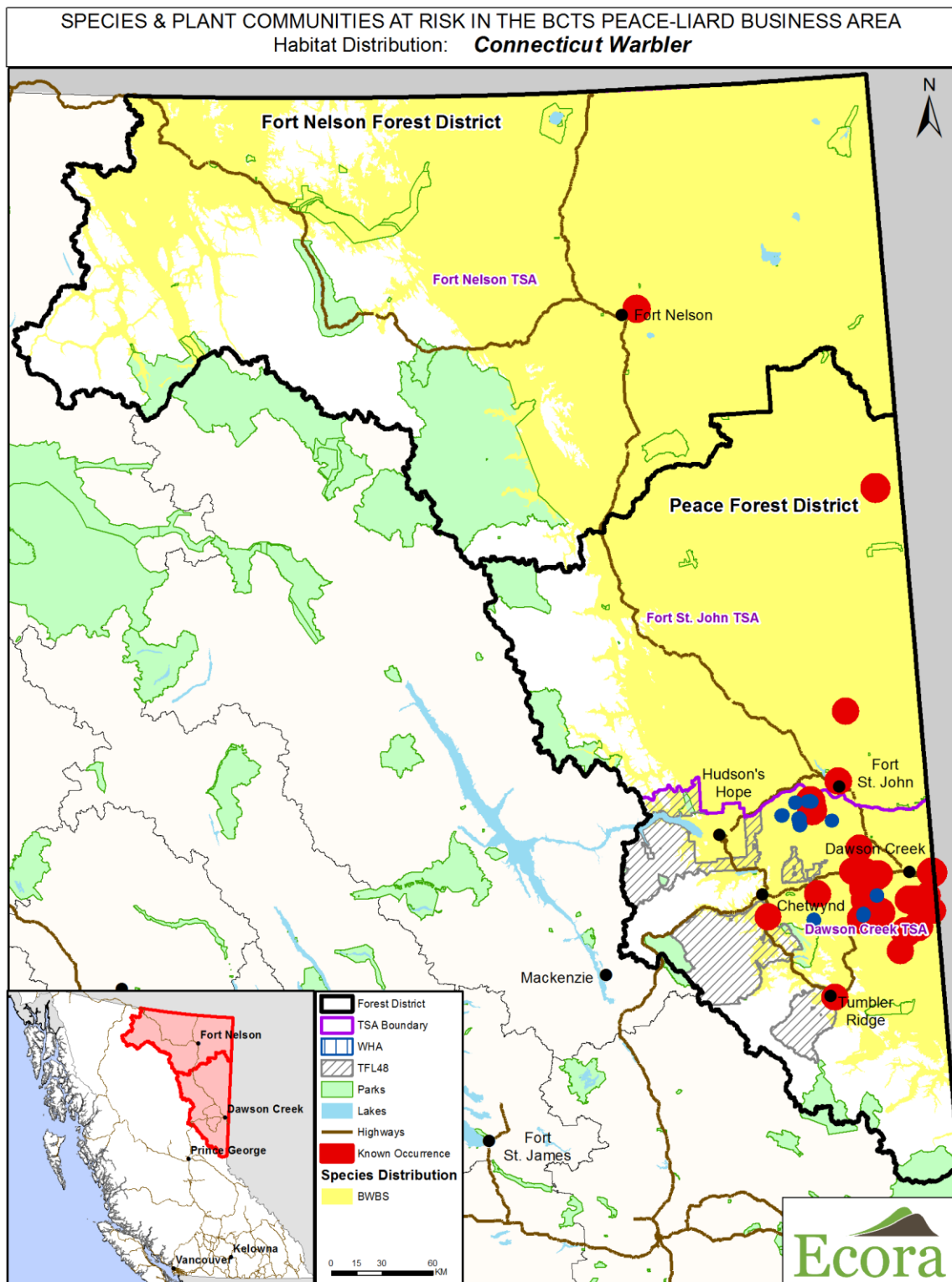
Bennett, S., P. Sherrington, P. Johnstone, and B. Harrison. 2000. Habitat use and distribution of neotropical migrant songbirds in northeastern British Columbia. Pages 79-88 in L. M. Darling, editor. Proc. Conf. on the Biology and Management of Species and Habitats at Risk. BC min. Environ, Lands and Parks, Victoria, and Univ. College Cariboo, Kamloops, BC.

B.C. Conservation Data Centre. 2011. Species Summary: *Oporornis agilis*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

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Lark Sparrow

Chondestes grammacus

Kingdom	Phylum	Class	Order	Family	Genus	Species
Animalia	Craniata	Aves	Passeriformes	Emberizidae	Chondestes	grammacus

Description:

The lark sparrow is a long-necked, medium-sized sparrow with a grayish conical bill, black, white and chestnut-brown stripes on the head, chestnut cheeks, white eye ring and black eyeline. It has whitish underparts with a single central breast dark spot, a long rounded tail with white corners, and pink legs. Both sexes are similar and juveniles have streaked breasts, sides and crown.

Size: Length: 145-17 cm; wingspan: 28 cm; weight: 25 g.

Field signs: Melodious song, often heard at night. Nest is a thick-walled cup of grass and twigs on ground, or in a shrub or small tree. Smooth and glossy eggs (4-5) dark-marked white eggs.

Taxonomy:

Status:

Global : G5
Canada: Secure
Provincial: S2B – Red

Distribution:

BEC Units: BWBS
Forest Districts: Peace River, TFL48

Known locations: The lark sparrow is an occasional seasonal resident and is a confirmed breeder in the Peace District. Nesting of the lark sparrow has been reported as far as 590 km north of its usual range (Okanagan), such as at Lynx Creek outside of Hudson Hope.

Habitat: Mixture of brush, grass and bare earth found in open woods, grasslands, river valleys with scattered trees, roadsides.

Food: Omnivore during the breeding season, but granivore during the non-breeding season.

Biological notes: During reproduction, mid-air combats between males are frequent.

Threats: Habitat change due to expanding urban and agricultural development, pesticides, grazing by cattle, and recreational vehicles on breeding grounds.

Best management practices:

- When a nest is found, special measures should be taken to protect it and its surroundings, and avoid disturbance from April to July.
- Minimize disturbance from humans and livestock during critical times throughout the breeding season.
- Do not construct roads and limit use of existing roads over breeding areas.
- Where nests are known to occur on a yearly basis, minimize habitat alteration and fragmentation.
- Do not apply herbicides and pesticides in or near areas inhabited by the lark sparrow..

Information gaps: Breeding surveys are needed to determine the general distribution of the species across landscapes.

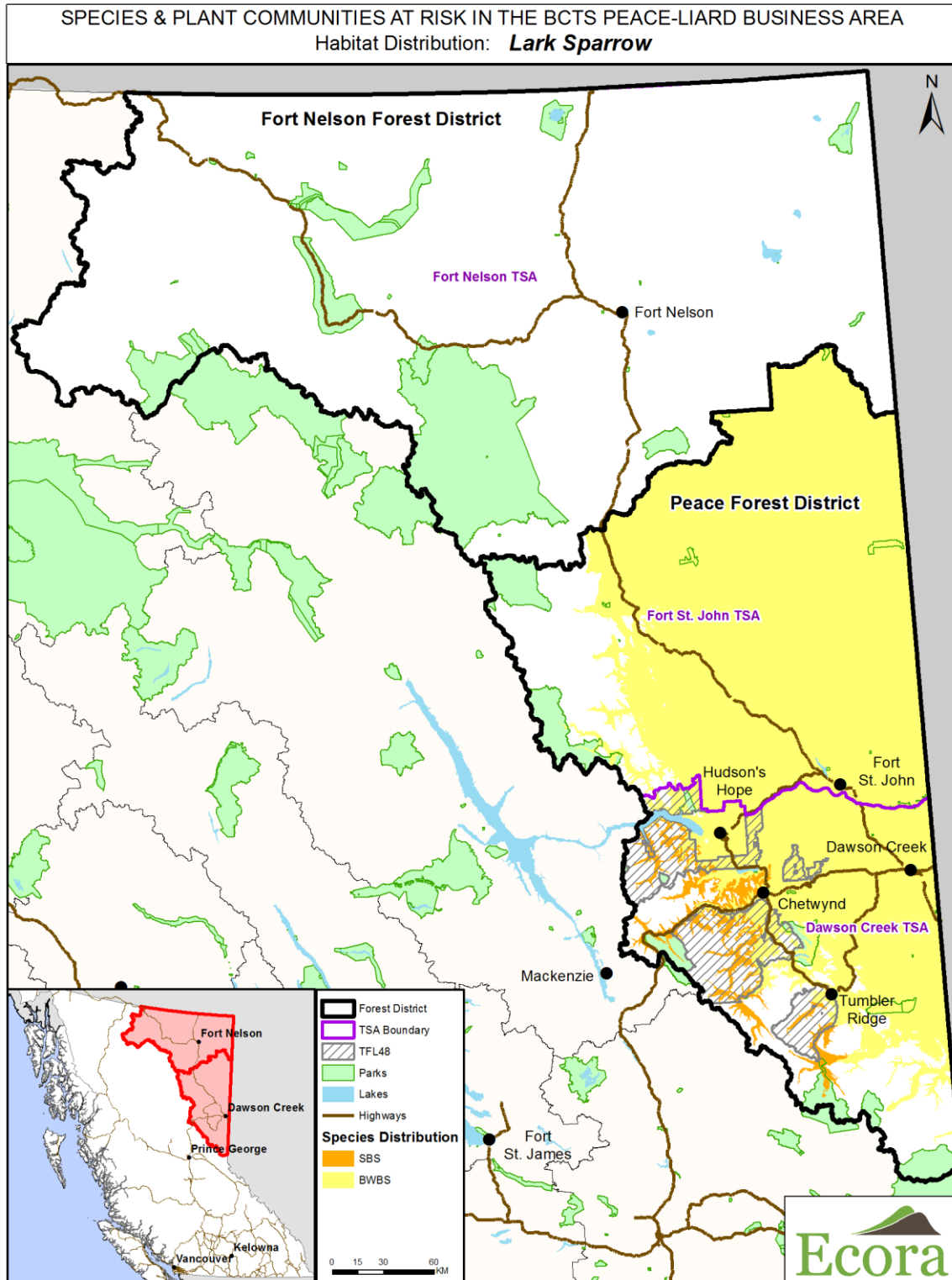
Further Information and Links:

B.C. Conservation Data Centre. 2011. Species Summary: *Chondestes grammacus*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

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Nelson's Sharp-tailed Sparrow

Ammodramus nelsoni

Kingdom	Phylum	Class	Order	Family	Genus	Species
Animalia	Craniata	Aves	Passeriformes	Emberizidae	Ammodramus	nelsoni

Description

General: The Nelson's Sharp-tailed Sparrow is a small (length: 11-13 cm; wingspan: 20 cm) bright buffy sparrow with a gray ear patch, and a dark crown with a gray central stripe merging with a plain gray nape. It has a dark back with white stripes, dark brown wings, a lightly streaked buffy breast, and a white abdomen. It is slightly darker and has a longer bill than Le Conte's Sparrow (*Ammodramus leconteii*). It has a short pointed tail. The juveniles show more orange on the breast and face.



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Status:

Global: G5

Canada: NAR

Provincial: S2B – Red; IWMS listed

Distribution

BEC Units: BWBS

Forest Districts: Peace District, TFL 48

Known Locations: Small numbers occur regularly at Swan Lake south of Pouce Coupe, and Boundary Lake east of Fort St. John. The breeding distribution of the Nelson's Sharp-tailed Sparrow is restricted to the Peace lowland and Kiskatinaw Plateau of the Boreal Plains. The Nelson's Sharp-tailed Sparrow is at the western limit of its breeding range. It is an uncommon summer visitant in the Peace lowland of the Boreal Plains Ecoprovince.

Habitat

In northeastern British Columbia, the Nelson's Sharp-tailed Sparrow prefers sedge meadows along the edge of freshwater marshes, fens, and shores of woodland lakes. Scattered willows (live or dead) are usually present along with dense, emergent vegetation (sedges & grasses). It nests in small loose colonies on ground in matted bed of rushes or under mat of grasses, in dense grass or sedges, or several centimeters above wet ground in dense clump of grass. In migration, the species frequents wet fields and marshes. The Nelson's Sharp-tailed Sparrow requires structural stages 2 (herb).

Threats and Concerns

The Nelson's Sharp-tailed Sparrow has one of the most restricted breeding distributions of any passerine in the province. Loss or alterations of wetlands, flooding and droughts have an effect on the quality of habitats. Logging activities adjacent to breeding wetlands, and pesticides and herbicides, could impact on habitat quality. Trampling of grasses and aquatic emergent vegetation by people, pets or livestock can be detrimental to the species.

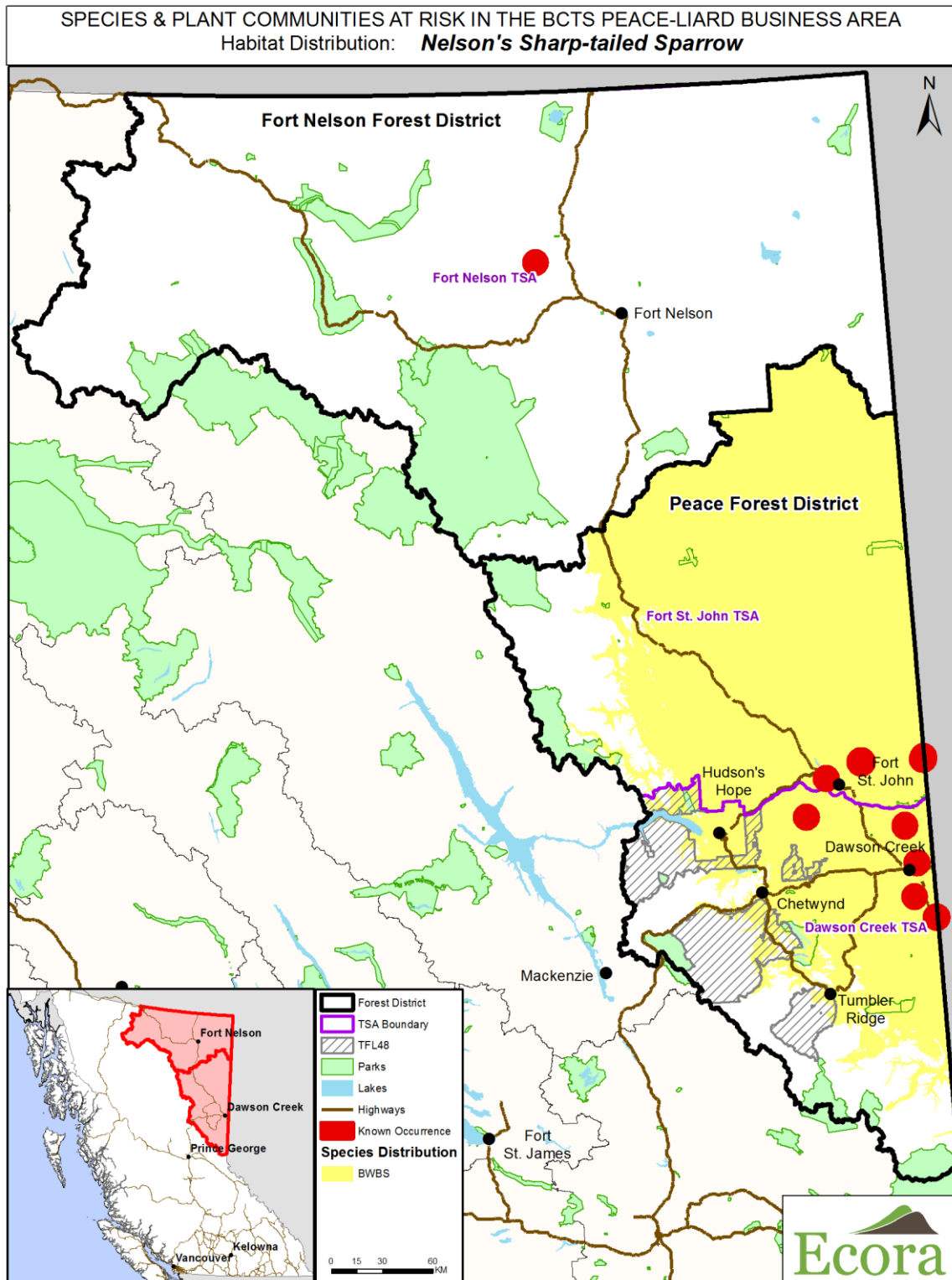
Best Management Practices

The future of the Nelson's Sharp-tailed Sparrow depends upon the protection of habitat. Because the species is associated with aquatic ecosystems, forestry activities should follow The Forest and Range Practices Act's guidelines for aquatic systems.

- Do not destroy/alter the species' habitat (e.g., discharge of fill material, draining, ditching, tilling, etc.).
- Establish a 10 m-wide riparian reserve and a 20 m-wide riparian management zone around 1-5 ha wetlands. The riparian management zone should be increased to 40 m for wetlands > 5 ha. Protect shrubs and advanced generation surrounding wetlands < 1 ha.
- Seismic explorations which cross wetlands suitable for, or known to be used by, Nelson's Sharp-tailed Sparrow, should be planned in such a way that damage to vegetation structure is minimized, and during times that will not disturb the species.
- When a nest is found, special measures should be taken to protect it and its surroundings. Establish WHAs at known breeding sites or sites with high suitability nesting habitat. No visits should occur from April to August.
- Do not apply pesticides or herbicides in or near occupied ecosystems.

Further Information and Links:

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Sandhill Crane

Grus Canadensis

Kingdom	Phylum	Class	Order	Family	Genus	Species
Animalia	Craniata	Aves	Gruiiformes	Gruidae	Grus	canadensis

Description

General: Sandhill Cranes are generally 120 cm, long-necked, gray birds with a bare red forehead, and a black bill. Some of their back and wing feathers may be rusty-stained. Wingspan is approximately 2m. The wings are black-tipped. Sandhill Cranes have a characteristic feather tuft over the tail.

Status:

Global: G5

Canada: NAR

Provincial: S4B – Yellow;
IWMS listed

Distribution

BEC Units: BWBS, ESSF, SBS

Forest Districts: Fort Nelson District, Peace District, TFL 48

Known Locations: Migratory cranes pass through northeastern British Columbia in large numbers

(150,000 – 200,000) each spring and fall as they travel between wintering areas in the southern United States and nesting grounds Yukon, Alaska and Siberia. Some Sandhill Cranes nest locally in the lowlands around Fort Nelson and the Peace River.



Habitat

The Sandhill Crane inhabits isolated and undisturbed wetlands (> 1 ha) with abundant emergent vegetation, surrounded by forest cover for escape. Emergent vegetation such as sedges, cattail, bulrush, hardback, willows, and Labrador tea are important for nesting and brood rearing. Birds exhibit high fidelity to breeding territories. During migration, cranes

roost at night along river channels, on islands, or wetlands. Stopover sites used by cranes migrating through the province include swampy fields, the edges of wetlands, dry rangelands, grain fields, and estuarine meadows. The species is found at < 1510 m elevations when it is breeding. Sandhill Cranes use young structural stages for nesting, and mature to old structural stages for escape.

Threats and Concerns

Loss or alteration of wetlands, and droughts impact on the quality of habitats for Sandhill Cranes.

Best Management Practices

Because the species is associated with aquatic ecosystems, forestry activities should follow The Forest and Range Practices Act's guidelines for aquatic systems.

- Do not destroy/alter the species' habitat (e.g., discharge of fill material, draining, ditching, tilling, etc.).
- Establish a 40 m-wide riparian reserve and a 100 m-wide riparian management zone around wetlands where nesting cranes have been observed.
- Seismic explorations which cross wetlands suitable for, or known to be used by, Sandhill Cranes, should be planned in such a way that damage to vegetation structure is minimized, and during times that will not disturb the species.
- When a nest is found, special measures should be taken to protect it and its surroundings. No visits should occur from April to August.
- Do not apply pesticides or herbicides in or near occupied ecosystems.

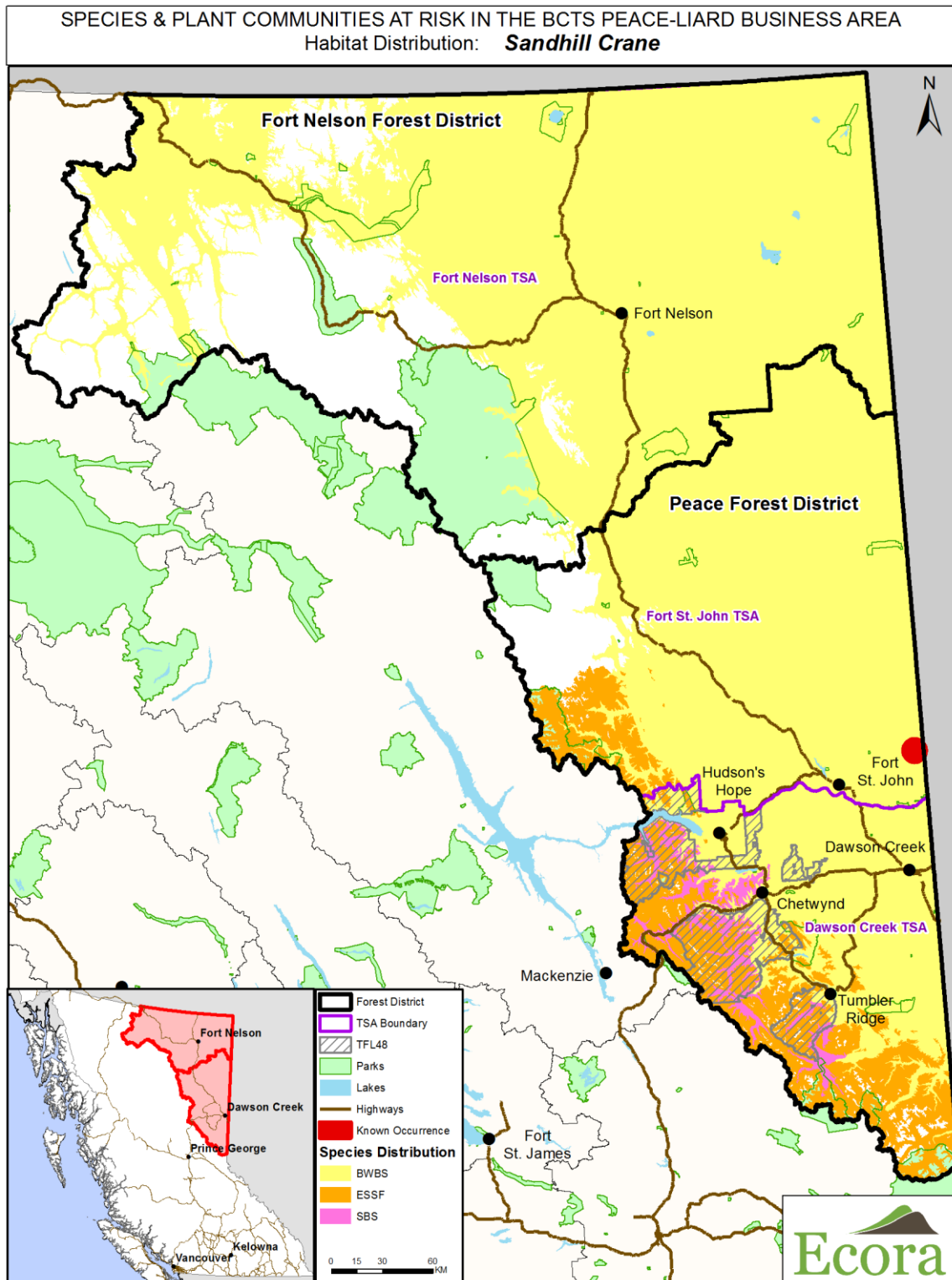
Further Information and Links:

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Short-eared Owl

Asio flammeus

Kingdom	Phylum	Class	Order	Family	Genus	Species
Animalia	Craniata	Aves	Strigiformes	Strigidae	Asio	flammeus

Description

General: The Short-eared Owl is a crow-size (30 cm long) tawny-brown owl with a distinctive dark triangle around each yellow eye. It has a very round facial disc, and inconspicuous ear tufts. It has a boldly streaked chest and a light belly without horizontal barring. The short-eared owl has a noticeable black patch near the bend (wrist) on underwings. The juveniles are darker overall and a darker facial disc.

Status:

Global: G5

Canada: SC

Provincial: S3BS2N – Blue; IWMS listed

Distribution

BEC Units: BWBS, SBS, SWB

Forest Districts: Peace District; TFL48; Possible Fort Nelson

Known Locations: The short-eared owl breeds in, and migrates through northeastern BC.

Habitat

Short-eared owls prefer fields, grasslands and bushy meadows, marshlands, sloughs, and cut blocks. They select broad expanses of open land with low vegetation for nesting and foraging.

Threats and Concerns

The short-eared owl is threatened by the conversion of open habitats to agriculture, grazing, recreation, and urban development.

Best Management Practices

The following recommendations should be followed:

- When a nest is found, special measures should be taken to protect it and its surroundings, and avoid disturbance from April to September.
- Minimize disturbance from humans and livestock from April to September.
- Do not construct roads and limit use of existing roads over breeding areas.
- Where nests are known to occur on a yearly basis, control forest encroachment.
- Do not apply pesticides or herbicides in or near occupied habitats.

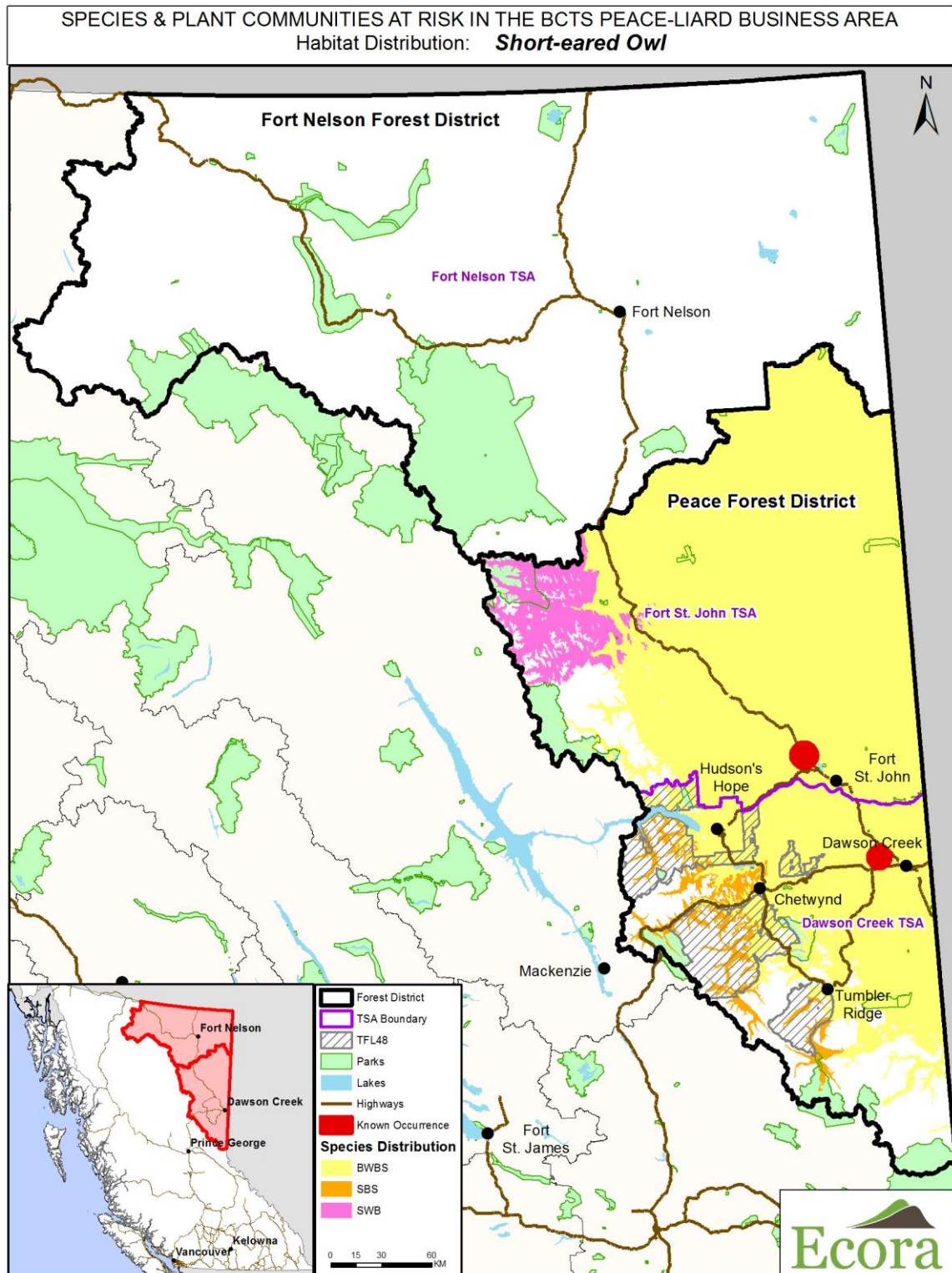
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Cadman, M. D. 1994. Status report of the short-eared owl, *Asio flammeus*, in Canada. COSEWIC report, Ottawa, Ontario. 53 pages.

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Swainson's Hawk

Buteo swainsoni

Kingdom	Phylum	Class	Order	Family	Genus	Species
Animalia	Craniata	Aves	Falconiformes	Accipitridae	Buteo	swainsoni

Description

General: The Swainson's hawk is a relatively large (height: 45 cm; wingspan: 1.3 m) hawk with a pale body and a dark brown bib and a noticeable white throat patch. It has a short, dark, hooked beak. It has a gray-brown tail with about 6 narrow bands, and one wider subterminal band. When perched, the wings extend to the tip of the tail and beyond. In flight, long, slim, pointed wings are held in a shallow "V". When viewed from below, the flight feathers are dark and underwing coverts are light. Dark morphs have a light patch under the tail. The juveniles are dark brown above, and streaked below.



Status:

Global: G5

Canada:

Provincial: S2B – Red

Distribution

BEC Units: BWBS, SBS

Forest Districts: Peace District; TFL48

Known Locations: The Swainson's Hawk is a very rare migrant and summer visitant to the Peace River parklands.

Habitat

Swainson's hawks inhabit open woodlands with mixed forests and groves adjacent to grasslands, farmlands, and wetlands, at 335-975 m elevations. They require young structural stages such as herbaceous and shrubby.

Threats and Concerns

Losses of grasslands, either due to agricultural development or forest encroachment, are major threats. Forestry activities have little impact on Swainson's hawk habitat.

Best Management Practices

- Maintain large tracts of open grasslands and rangelands.
- If a nest is found, special measures should be taken to protect it and its surroundings, and avoid disturbance from April to September.
- Tree bluffs or shelter belts along grasslands should not be destroyed.
- Do not apply pesticides or herbicides in or near occupied ecosystems.

Further Information and Links:

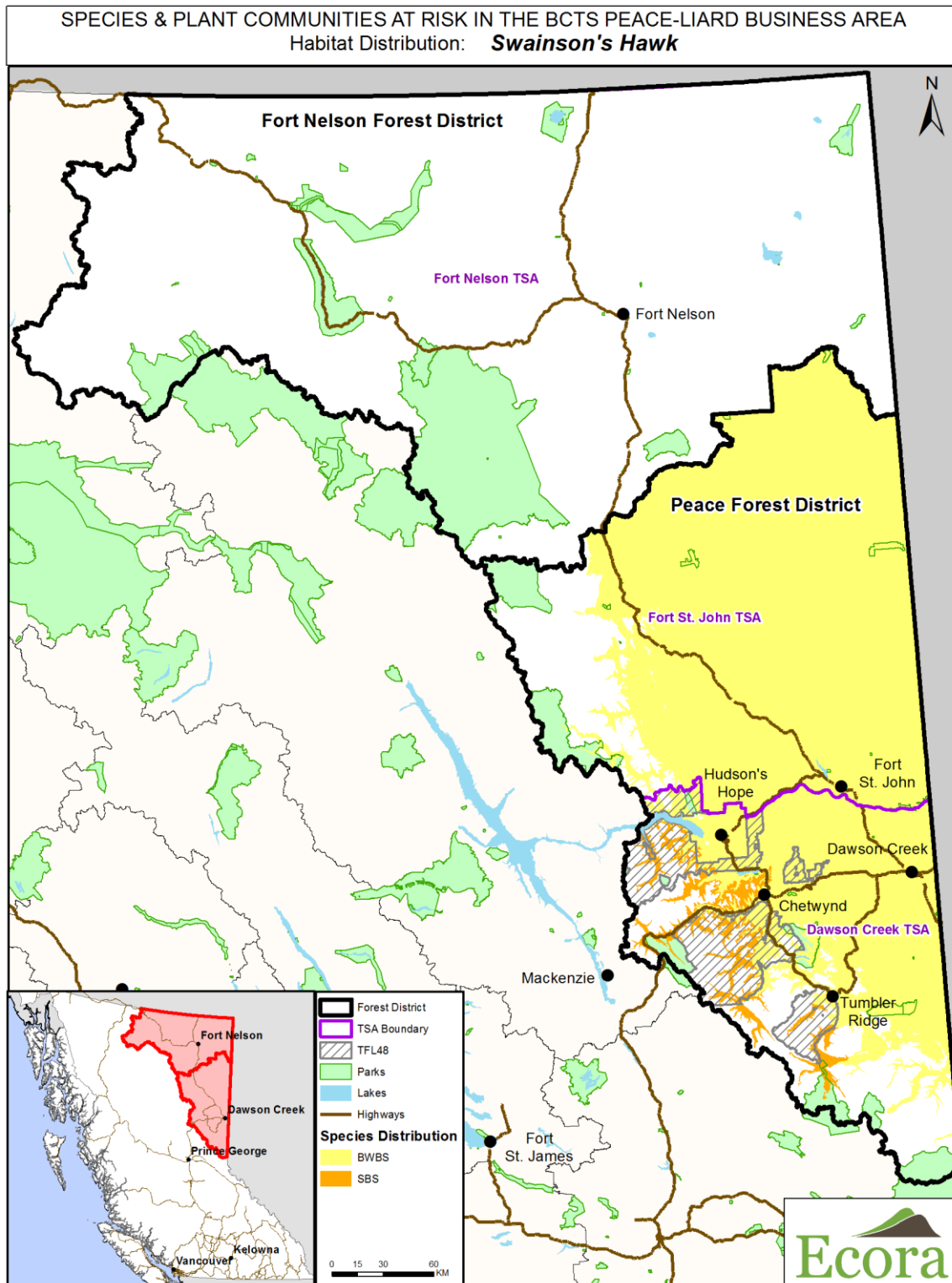
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Upland Sandpiper

Bartramia longicauda

Kingdom	Phylum	Class	Order	Family	Genus	Species
Animalia	Craniata	Aves	Charadriiformes	Scolopacidae	Batramia	longicauda

Description

General: The Upland Sandpiper is recognized by its small head with large dark eyes and a yellowish bill, thin neck, yellow legs, and long tail extending well beyond wingtips. In flight, its dark primaries are conspicuous.

Status:

Global: G5

Canada:

Provincial: S1S2B – Red

Distribution

BEC Units: BWBS

Forest Districts: Fort Nelson District, Peace District, TFL 48

Known Locations: The species is a regular migrant in open areas across northeastern BC, but is known to breed only in the Fort Nelson and Peace River areas.

Habitat

The Upland Sandpiper frequent open, grassy habitats (vegetation generally <20 cm tall). It is found in grassy uplands, hay fields, pastures, wet meadows, and permanently open areas of the boreal forest, at < 1830 m elevation. During migration, the species can occasionally be found in recent cutblocks.

Threats and Concerns

Most occupied habitats are associated with agricultural activities (pasture, hay, grain crops). Timing of harvest, cultivation, and treatment can have a significant impact on nest success. Forestry activities have very little impact on Upland Sandpiper habitat.

Best Management Practices

- When a nest is found, special measures should be taken to protect it and its surroundings, and avoid disturbance from April to September.
- Minimize disturbance from humans and livestock from April to September.
- Do not construct roads and limit use of existing roads over breeding areas.
- Seismic explorations which cross grasslands suitable for, or known to be used by, Upland Sandpiper, should be planned in such a way that damage to vegetation structure is minimized, and during times that will not disturb the species.
- Where nests are known to occur on a yearly basis, control forest encroachment.
- Do not apply pesticides or herbicides in or near occupied habitats.

Further Information and Links:

B.C. Conservation Data Centre. 2011. Species Summary: *Bartramia longicauda*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

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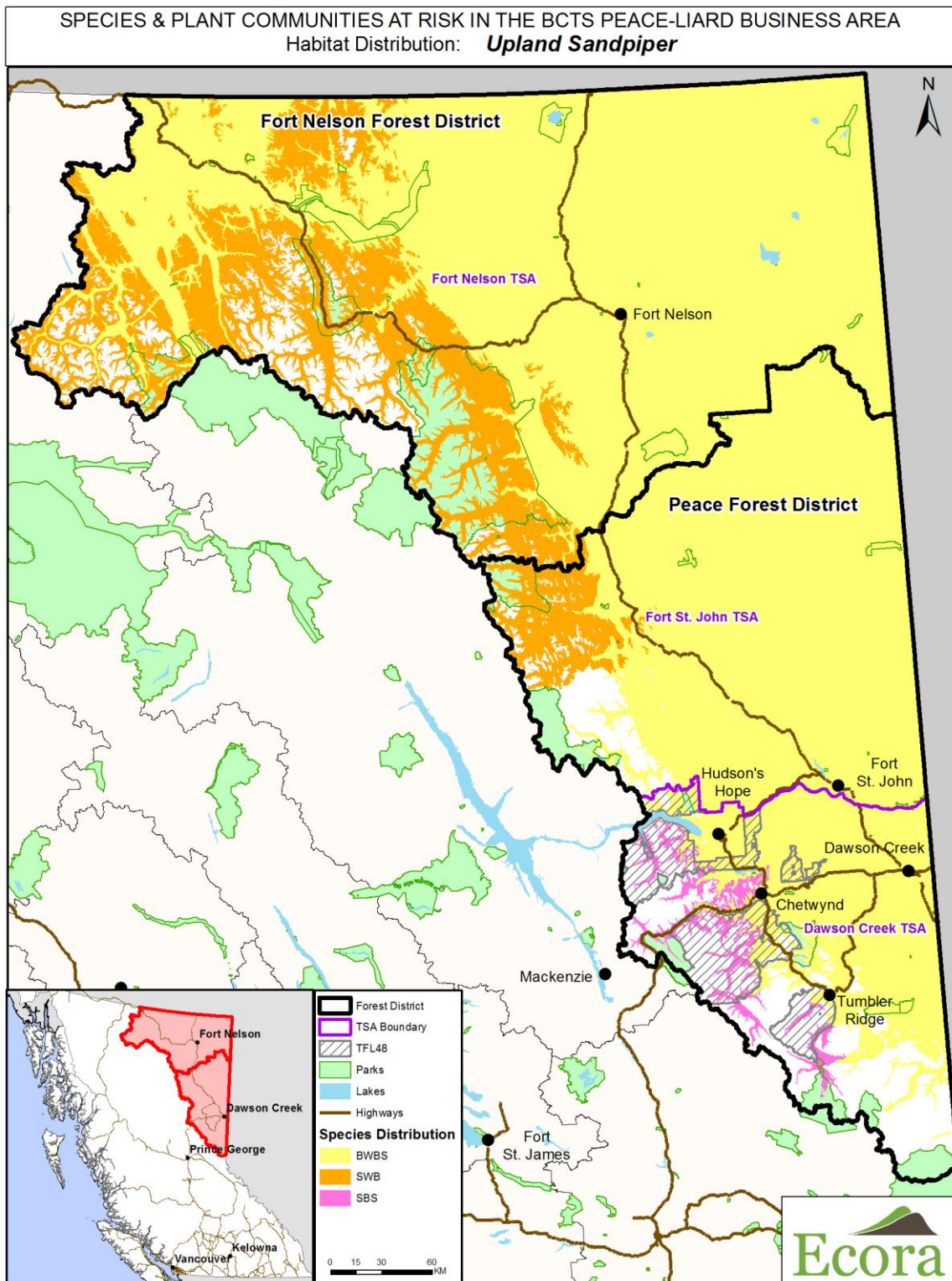
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Yellow Rail

Coturnicops noveboracensis

Kingdom	Phylum	Class	Order	Family	Genus	Species
Animalia	Craniata	Aves	Gruiformes	Rallidae	Coturnicops	noveboracensis

Description

General: The Yellow Rail is a rare and secretive, sparrow-sized (length: 15-19 cm; wingspan: 25-33 cm) bird characterized by a white wing patch in flight, and a yellowish bill shorter than that of other rails. It is yellowish with black striping on the back. Chicks are black. Juveniles are darker than adults and have white barred breast areas and distinctive spots on the head.



Status:

Global: G4

Canada: SC

Provincial: S1B – Red

Distribution

BEC Units: BWBS

Forest Districts: Peace District

Habitat

The Yellow Rail inhabits wet meadows and dense grass-sedge marshes with little (5-15 cm) or no standing water.

Threats and Concerns

The Yellow Rail is believed to be declining due to habitat loss and pesticides. Invasion by shrubs, such as willow or birch, reduces habitat suitability of marshes. Vegetation trampling by livestock can affect habitat, as can fluctuating water levels due to road construction. Suitable wetlands are sometimes drained and converted to farmland, or flooded for waterfowl habitat.

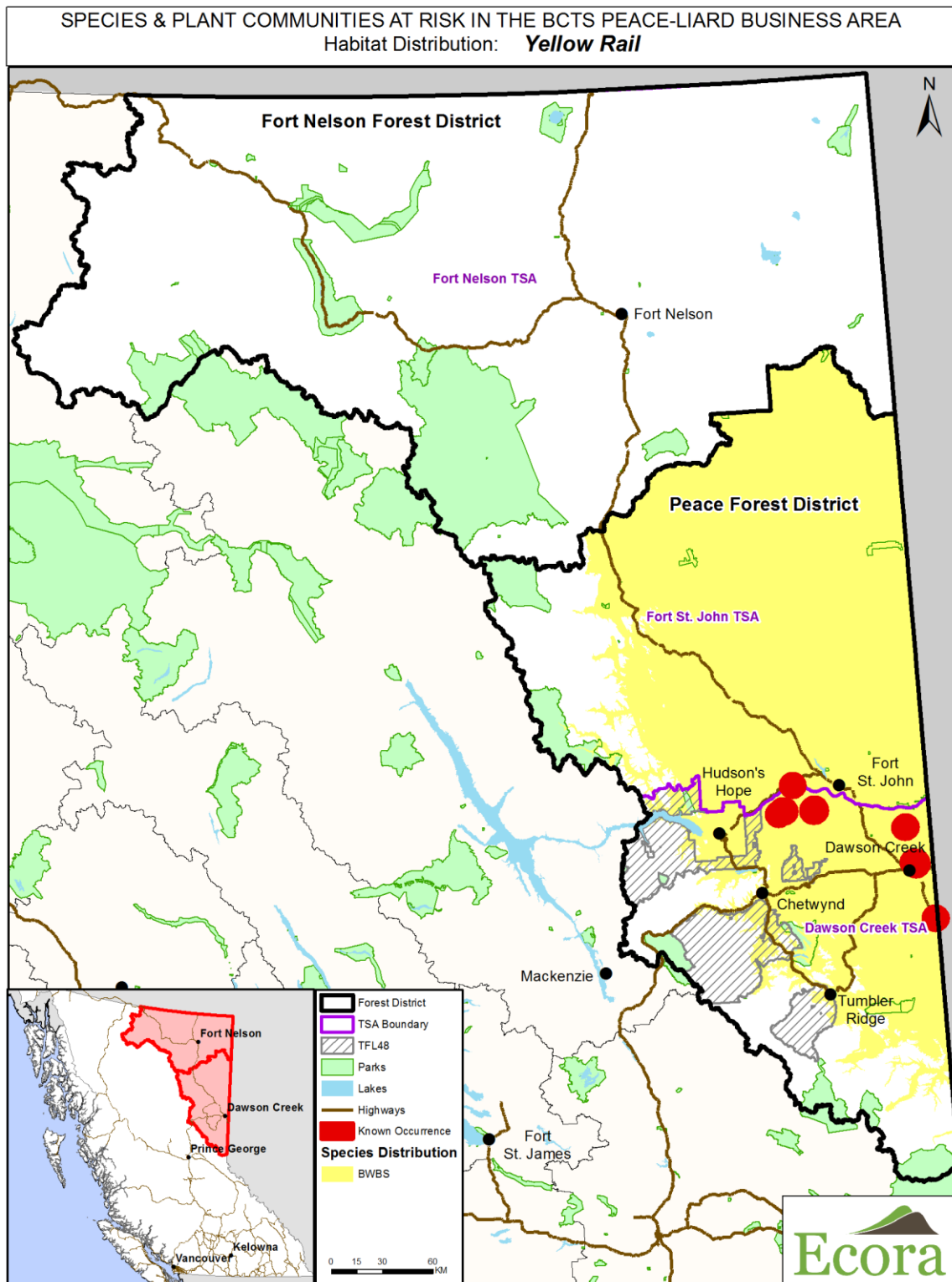
Best Management Practices

Because the species is associated with aquatic ecosystems, forestry activities should follow The Forest and Range Practices Act's guidelines for aquatic systems.

- Maintain natural/ambient water quality and riparian habitat attributes.
- Minimize the effect of road-related surface flow in ditch lines and non-vegetated areas adjacent to watercourses, and of crossing structures causing erosion and sedimentation to adjacent watercourses.
- In wetlands that provide suitable habitat, establish a 10 m-wide riparian reserve and a 20 m-wide riparian management zone around small wetlands. The riparian management zone should be increased to 40 m for wetlands > 5 ha. Protect vegetation surrounding wetlands < 1 ha.
- Seismic explorations which cross wetlands suitable for, or known to be used by, Yellow Rails, should be planned in such a way that damage to vegetation structure is minimized, and during times that will not disturb the species.
- When a nest is found, special measures should be taken to protect it and its surroundings. No visits should occur from April to August, except to confirm occupancy.
- Do not apply pesticides or herbicides in or near occupied ecosystems.

Further Information and Links:

- B.C. Conservation Data Centre. 2011. Species Summary: *Coturnicops noveboracensis*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>
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2.2.2 Mammals

Bighorn Sheep

Ovis canadensis

Kingdom	Phylum	Class	Order	Family	Genus	Species
Animalia	Craniata	Mammalia	Artiodactyla	Bovidae	Ovis	canadensis

Description

General: The Bighorn Sheep is brownish to grayish-brown, with ivory white muzzle, rump patch and edgings down the rear of the legs. A dark stripe runs up from tail and across the rump patch. Mature rams (75-156 kg) have massive coiled horns. Ewes (54-91 kg) have small, almost straight horns that never turn down. The age of Bighorn Sheep can be fairly accurately determined by counting the distinct rings or annuli on the horns.



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Status:

Global: G4

Canada:

Provincial: S3 – Blue; IWMS listed

Distribution

BEC Units: BAFA, ESSF

Forest Districts: Peace District, TFL 48

Known Locations: In the Dawson Creek Forest District, Bighorn Sheep are at the northeast extremity of their range. They are found in the Kalkwa Provincial Park.

Habitat

Bighorn Sheep inhabit mountain ecosystems, river canyons, and high plateaus. They prefer areas with relatively low precipitation, especially low snowfall, and with

grasslands. In summer, they forage on alpine/sub-alpine meadows, grassy mountain slopes, and high ridges (2000-2500 m). They over-winter on low elevations (600-1800 m), on south- and west- facing slopes. Habitat utilization is related to distance from treeline, habitat visibility, and grass and shrub cover. Undisturbed climax grasslands are particularly important in winter. The use of deciduous and coniferous forests by Bighorn Sheep is limited due to reduced visibility impairing predator detection. Open mature coniferous forests can provide bighorn with important habitats for forage and thermal cover, particularly during periods of weather extremes. Bighorn Sheep prefer areas with nearby water sources, rock outcrops, cliffs, steep talus, and mineral licks. They use structural stages 2-3 and 6-7 for forage, 4-7 for security and thermal protection, 1-3 for lambing, and 1-3 and 6-7 for rutting.

Threats and Concerns

Habitat loss (and particularly winter range deterioration) is the major threat to the species. Forest encroachment (due largely to fire suppression) and an increased density of trees may reduce Bighorn Sheep range through reduced visibility and increased predation. Increased access and human disturbance may impact on the behavior and fitness of Bighorn Sheep. Livestock grazing and loss of connectivity may have an effect on Bighorn Sheep habitat. Predation may have an impact, although it is difficult to quantify.

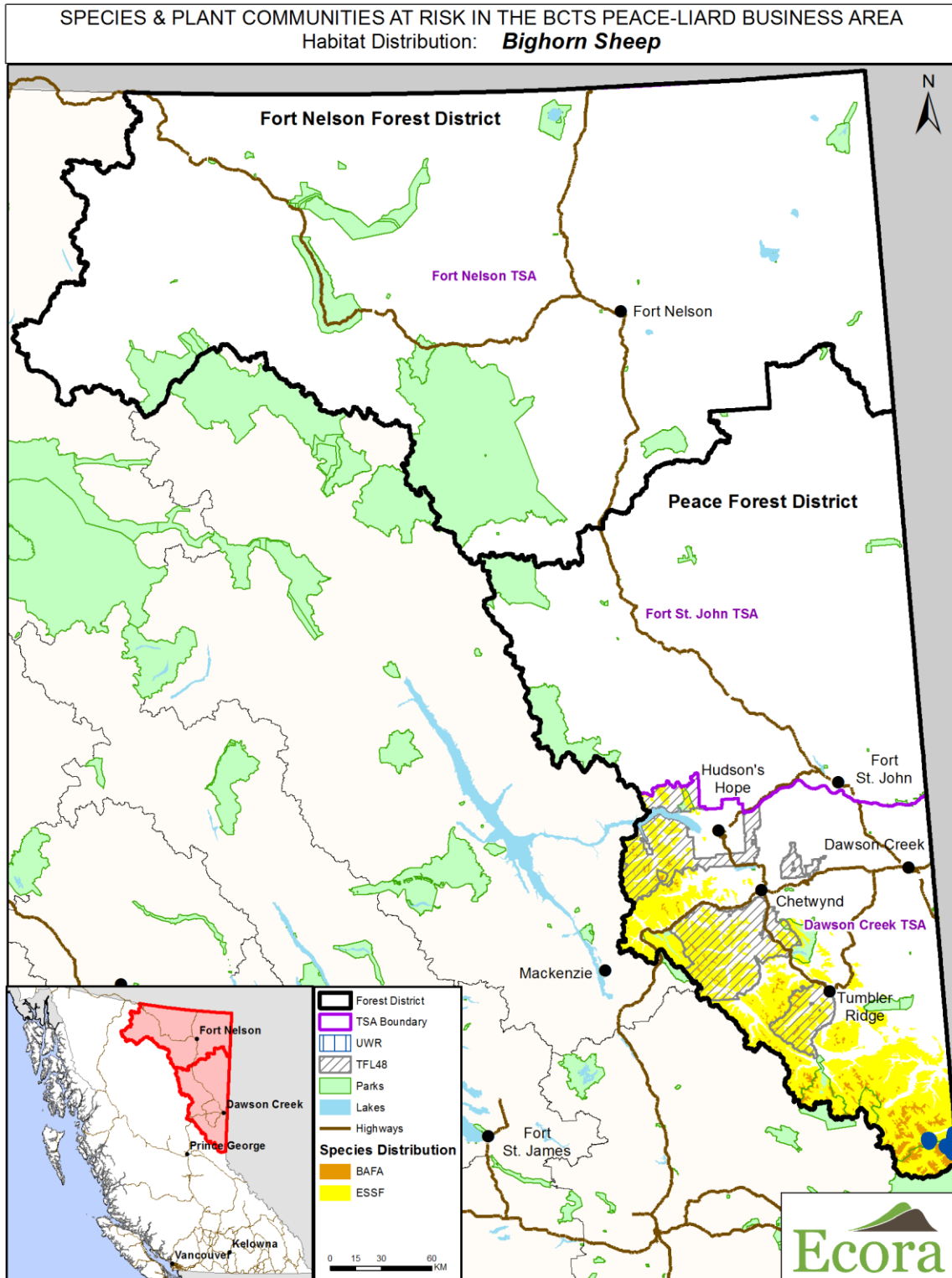
Best Management Practices

Since Bighorn Sheep habitats are often associated with grasslands in proximity to rugged terrain, forestry activities may not impact directly on sheep habitat. Forestry activities in the vicinity of sheep habitat may provide access to winter ranges or lambing grounds. For this reason, the following prescriptions must be considered:

- Avoid the construction of roads near winter ranges and lambing grounds. If roads must be built, their access should be strictly controlled, and they should be deactivated immediately after use.
- Exclude domestic sheep from cut blocks located near Bighorn Sheep range (disease issue).
- Do not harvest in proximity to sheep range during critical times, i.e., winter, and lambing from April to mid-July. Do not use helicopters to remove timber during these critical times.
- Maintain cover near grasslands used by sheep, and throughout movement corridors.
- In areas that have been logged, reforest at reduced stocking rates that promote understorey development (herb, grasses, and shrubs).
- Establish Wildlife Habitat Areas in critical ranges such as lambing areas, transitional ranges, and certain alpine forage and escape habitat. Such areas will generally be < 50 ha.
- Maintain, enhance or restore appropriate forage species.
- Prevent the introduction and the spread of invasive species on sheep range.

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Caribou (boreal populations)

Rangifer tarandus

Kingdom	Phylum	Class	Order	Family	Genus	Species
Animalia	Craniata	Mammalia	Artiodactyla	Cervidae	Rangifer	tarandus

Description

General: The Caribou is a medium-sized (1.6-3.0 m) ungulate with relatively long legs, large and wide hooves, and a broad, blunt muzzle. Body color varies from chocolate-brown in summer to light grey in winter; neck, rump and underside of short tail are light colored. There is a thin band of white hairs above the hooves. Both males and females have antlers. The



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antlers of males have a long C-shaped main beam, with vertically oriented and palmated brow tines. The end of the main beam is usually moderately palmated, with points along the upper edge. The antlers of females and young Caribou are smaller and simpler. Male Caribou shed their antlers soon after the rut, from late September, to mid-October. By November, only young males, calves and females usually have antlers and may keep them as late as May. The presence of small canines is useful to identify the skull. Males (112-275 kg) are larger than females (67-158 kg).

Status:

Global: G5TNR

Canada: T

Provincial: S2 – Red; IWMS listed

Distribution

BEC Units: BWBS

Forest Districts: Fort Nelson District, Peace District

Known Locations: Caribou of the Boreal populations are found in approximately 15% of the northeastern corner of the province. The overall distribution is based on the extent of boreal forest in BC and is defined as the Etsho Plateau, Maxhamish Upland, Petitot Plain and Fort Nelson Lowland Ecoregions of the Taiga Plains Ecoregion and the Clear Hills Ecoregion of the Boreal Plains Ecoregion. This area includes landscapes east of the Rocky Mountain foothills from the Yukon border east of the Liard River as far south as the Doig River Drainage, upstream from its junction with the Beatton River. The western boundary generally follows the Liard River from the Yukon/Northwest Territories boundaries upstream to the junction with the Dunedin River, and runs approximately southeast to Fort St. John.

Habitat

Caribou of Boreal populations are typically associated with large peatlands where animals can find an adequate supply of terrestrial and/or arboreal lichens in tracts of older forests, and avoid predators.

Threats and Concerns

The primary threat appears to be predation and linear corridor development. Associated with linear corridors are higher predation rates, increased human access, and associated disturbance, habitat change and potential reductions in winter food supply. Seismic exploration and oil and gas well development are the most significant disturbance factors creating linear corridors. Because the extent of commercial forest land in boreal Woodland Caribou ranges is limited, forest harvesting poses a lower risk than seismic exploration and oil and gas well development.

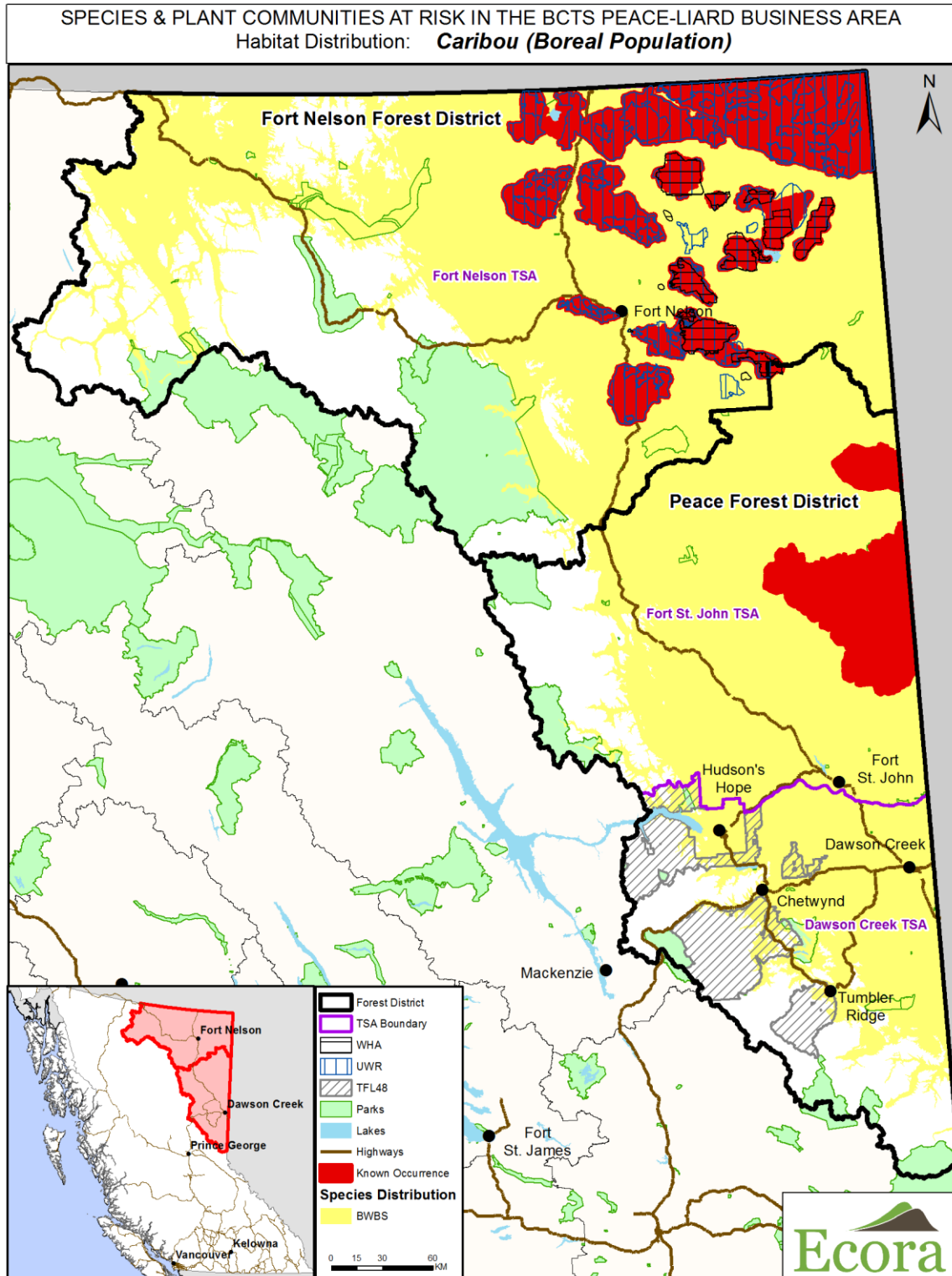
Best Management Practices

Develop a management strategy plan where critical habitat for Caribou is considered “high priority”, and timber harvest is kept to a minimum or eliminated. Landscape segments that interconnect high-priority areas, i.e., movement corridors, should be considered medium-priority areas where industrial activities should be carried out with caution to not interfere with caribou movements and safety. Low-priority areas are forests that are not being used by caribou. There needs to be a reduction in access and road building into Caribou habitat some cooperation between forest sector and oil/gas industry would help maintain caribou habitat and populations.

Further Information and Links:

Bernier, D., and G. Proulx. 2008. Identification and management of species and plant communities at risk: BC Timber Sales – Prince George Business Area – 2008. Alpha Wildlife Publications, Sherwood Park, Alberta.

B.C. Conservation Data Centre. 2011. Species Summary: *Rangifer tarandus* pop. 14. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>



Caribou (northern mountain populations)

Rangifer tarandus

Kingdom	Phylum	Class	Order	Family	Genus	Species
Animalia	Craniata	Mammalia	Artiodactyla	Cervidae	Rangifer	tarandus

Description

General: The Caribou is a medium-sized (1.6-3.0 m) ungulate with relatively long legs, large and wide hooves, and a broad, blunt muzzle. Body color varies from chocolate-brown in summer to light grey in winter; neck, rump and underside of short tail are light colored. There is a thin band of white hairs above the hooves. Both males and females



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have antlers. The antlers of males have a long C-shaped main beam, with vertically oriented and palmated brow tines. The end of the main beam is usually moderately palmated, with points along the upper edge. The antlers of females and young Caribou are smaller and simpler. Male Caribou shed their antlers soon after the rut, from late September, to mid-October. By November, only young males, calves and females usually have antlers and may keep them as late as May. The presence of small canines is useful to identify the skull. Males (112-275 kg) are larger than females (67-158 kg).

Status:

Global: G5T4Q

Canada: T/SC

Provincial: S3 – Blue; IWMS listed

Distribution

BEC Units: BAFA, BWBS, ESSF, SBS

Forest Districts: Fort Nelson District, Peace District, TFL 48

Known Locations: Northern Mountain Caribou are somewhat contiguous in distribution from the Williston lake areas north to the Yukon border, northwest to Atlin, and southeast along the east side of the Rocky Mountains to the Alberta border near Kakwa provincial Park, but excluding the extensive lowland forest north of the Peace River along the Alberta border.

Habitat

In mid- and late winter, Caribou of the northern mountain populations inhabit either low-elevation forested winter ranges, or high-elevation alpine/subalpine winter ranges to feed on terrestrial lichens. In summer, they are found at high elevations. In spring, Caribou frequent forage-rich areas located between winter and summer ranges. The Caribou's seasonal movements involve both horizontal distance and elevational shifts. Old forests, pine stands with terrestrial lichen, and mineral licks are important habitat features.

Threats and Concerns

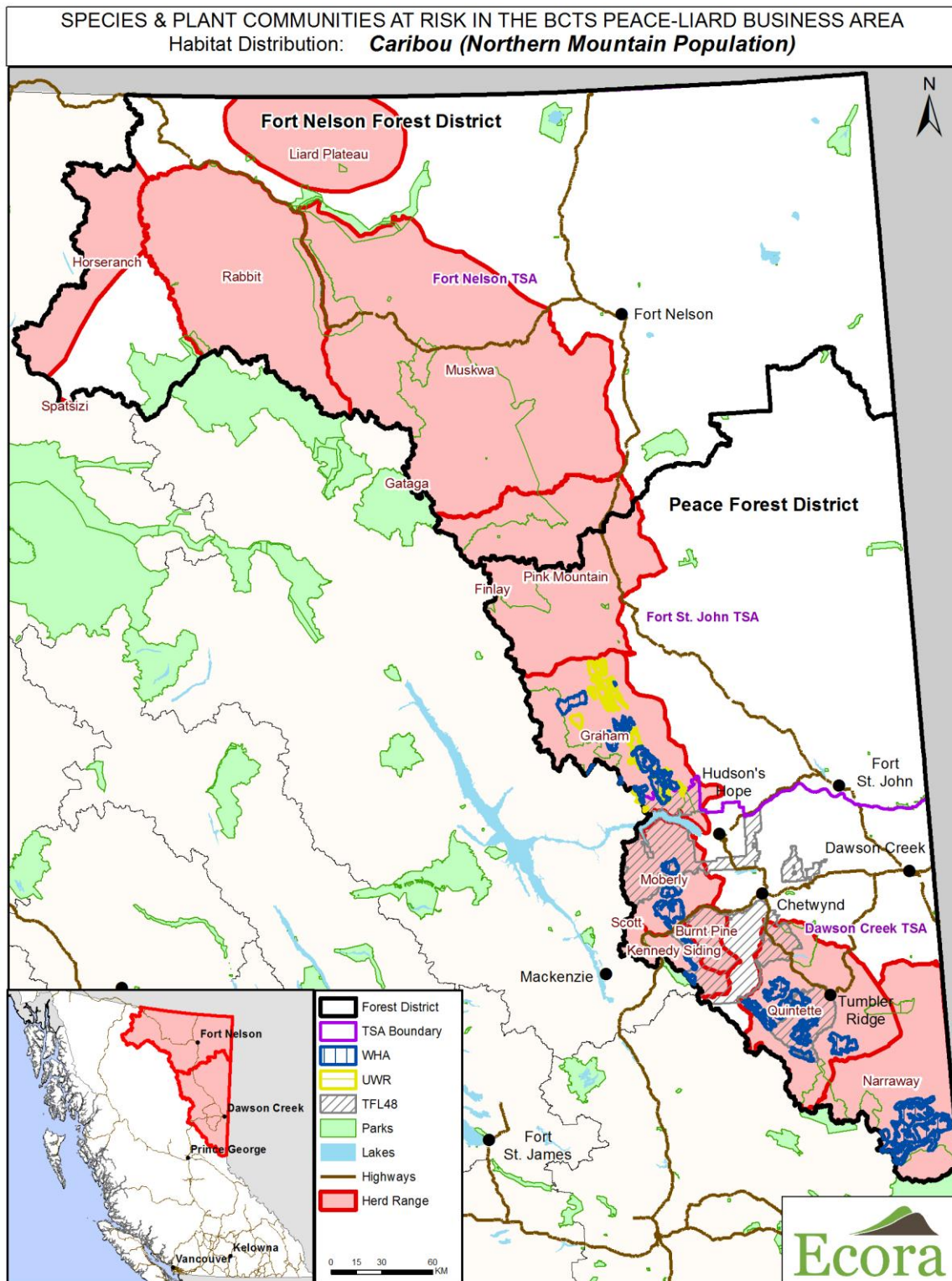
The major threats are predation, access (resulting in disturbance and mortality, and increased predator efficiency), industrial development (reduction and fragmentation of contiguous old-growth forest) which results in a loss of cover and winter food supply, and creation of early seral stages which may increase the abundance of other ungulates and their predators, and natural disturbances (fire, insect epidemics). Development may also isolate and fragment small herds, which then become more susceptible to extirpation.

Best Management Practices

- Develop a management strategy plan where critical habitat for Caribou is considered “high priority”, and timber harvest is kept to a minimum or eliminated. Landscape segments that interconnect high-priority areas, i.e., movement corridors, should be considered medium-priority areas where industrial activities should be carried out with caution to not interfere with caribou movements and safety. Low-priority areas are forests that are not being used by caribou.
- Verify the location of Caribou Wildlife Habitat Areas and Ungulate Winter Ranges as cited in the General Wildlife Measures document.

Further Information and Links:

- Bernier, D., and G. Proulx. 2008. Identification and management of species and plant communities at risk: BC Timber Sales – Prince George Business Area – 2008. Alpha Wildlife Publications, Sherwood Park, Alberta.
- B.C. Conservation Data Centre. 2011. Species Summary: *Rangifer tarandus* pop. 15. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>
- Proulx, G., D. Bernier, and F. P. Caffrey. 2004. A field guide to species at risk in Canfor's Planning Areas in Central Interior British Columbia – 2004. Alpha Wildlife Publications, Sherwood Park, Alberta.
- Cichowski, D., T. Kinley, and B. Churchill. 2003. Caribou, *Rangifer tarandus*. In K. Paige, editor, Standards for managing Identified Wildlife. Version 2003. Min. For., and Min. water, Land and Air Protection, Victoria, BC.



Caribou (southern populations)

Rangifer tarandus

Kingdom	Phylum	Class	Order	Family	Genus	Species
Animalia	Craniata	Mammalia	Artiodactyla	Cervidae	Rangifer	tarandus

Description

General: The Caribou is a medium-sized (1.6-3.0 m) ungulate with relatively long legs, large and wide hooves, and a broad, blunt muzzle. Body color varies from chocolate-brown in summer to light grey in winter; neck, rump and underside of short tail are light colored. There is a thin band of white hairs above the hooves. Both males and females



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have antlers. The antlers of males have a long C-shaped main beam, with vertically oriented and palmated brow tines. The end of the main beam is usually moderately palmated, with points along the upper edge. The antlers of females and young Caribou are smaller and simpler. Male Caribou shed their antlers soon after the rut, from late September, to mid-October. By November, only young males, calves and females usually have antlers and may keep them as late as May. The presence of small canines is useful to identify the skull. Males (112-275 kg) are larger than females (67-158 kg).

Status:

Global: G5T2Q

Canada: T

Provincial: S1 – Red; IWMS listed

Distribution

BEC Units: BAFA, ESSF

Forest Districts: Peace District; TFL 48

Known Locations: The Caribou of southern populations are closely associated with the western continental divide of the Rocky Mountains. Provincially, the populations found in the Peace District are called the northern mountain populations, while nationally they are called the southern mountain populations.

Habitat

During late winter (mid-January to April) Caribou of southern populations (also known as Mountain Caribou) aggregate in open stands in or near ESSF parkland, feeding on arboreal lichens. Snow conditions allow Caribou to travel on top of the snowpack in subalpine areas, and to access arboreal lichens. In spring (mid-April to late May) Caribou move to either exposed sites in the upper ESSF or BAFA or snow-free elevations in the ICH or lower ESSF. In summer (June to late October), they are back in the upper ESSF and BAFA. As snow builds up in early winter (late October to mid-January), they shift down slope into mid-ESSF, where snow depths are reduced due to lower elevation and greater canopy closure. The seasonal movements of the Caribou involve little horizontal distance but strong elevational shifts. Caribou are seldom found on slopes $\geq 60\%$, which are more prone to avalanches than more gentle terrain. Mature and old stands on slopes $< 45\%$ are most heavily used by Caribou.

Threats and Concerns

Habitat loss and fragmentation due to logging of old-growth forests, hunting, poaching, disturbance by recreational activities, namely snowmobiling, and predation by wolves (*Canis lupus*) and cougars (*Felis concolor*) have contributed to the reduction of the Caribou in their current range.

Best Management Practices

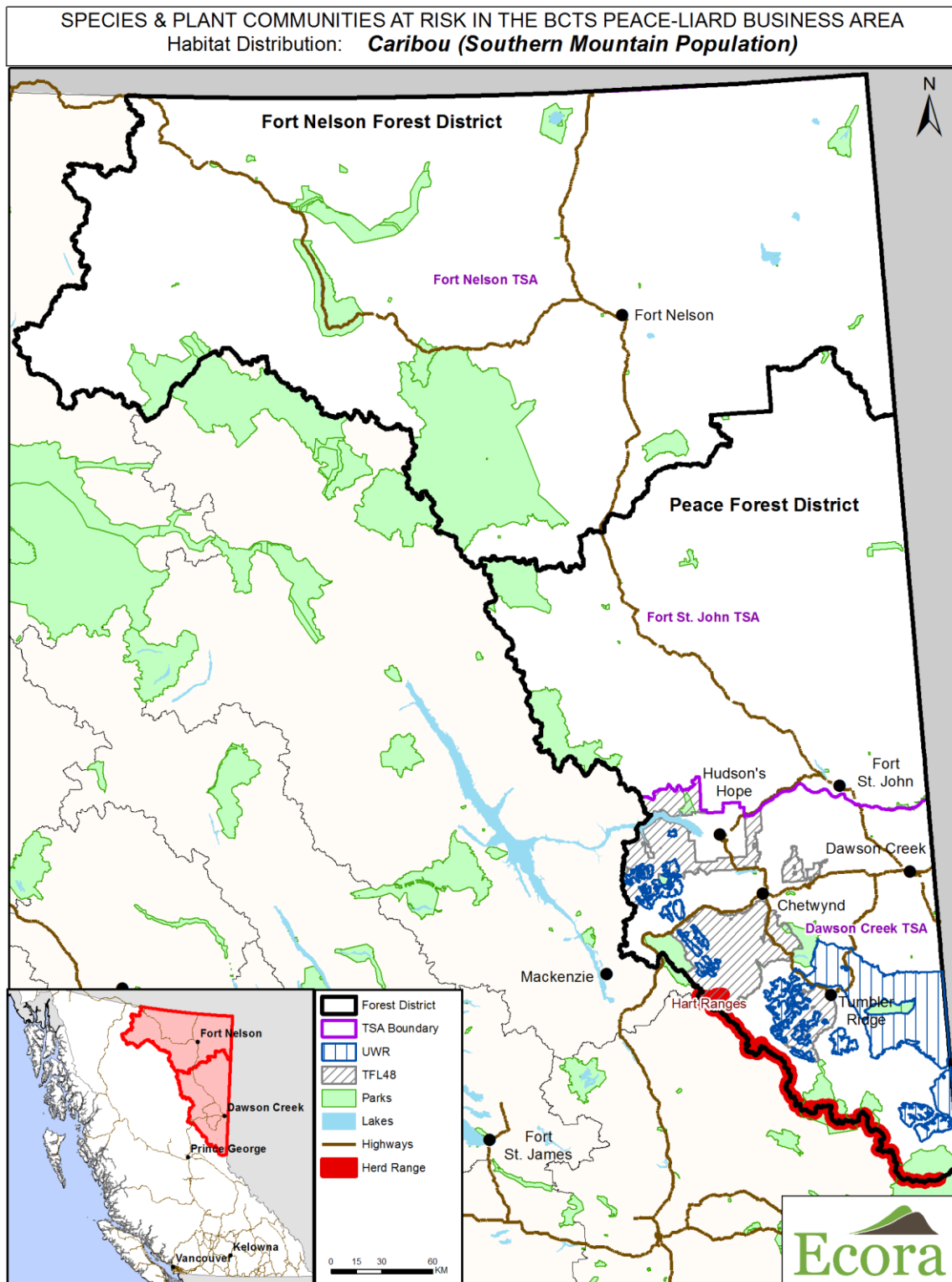
A spatial-temporal management program must be implemented, and based on inventory data. It is recommended that forest management be based on the strategy for recovery that is still being developed and updated by the Mountain Caribou Technical Advisory Committee.

The current approach to protect Mountain Caribou habitat at the regional level is to maintain networks of:

- “Core areas” or areas of no timber harvest to maintain arboreal lichens and limit access; this category corresponds to High Priority Zones where no-harvest, road rehabilitation and deactivation, and the establishment of Wildlife Habitat Areas occur.
- “Buffer zones” around core areas, including areas of selection logging and extended rotations. These buffer zones correspond to Medium Priority Zones where 30% of the volume could be removed every 80-years (240-yr rotation), and constraints on road access and backcountry recreation are recommended.
- “Linkages” or movement corridors between core areas.

Further Information and Links:

- Bernier, D., and G. Proulx. 2008. Identification and management of species and plant communities at risk: BC Timber Sales – Prince George Business Area – 2008. Alpha Wildlife Publications, Sherwood Park, Alberta.
- B.C. Conservation Data Centre. 2011. Species Summary: *Rangifer tarandus* pop. 1. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>
- Proulx, G., D. Bernier, and F. P. Caffrey. 2004. A field guide to species at risk in Canfor's Planning Areas in Central Interior British Columbia – 2004. Alpha Wildlife Publications, Sherwood Park, Alberta.
- Stevenson, S. K., H. M. Armleder, M. J. Jull, D. G. king, B. N. McLellan, and D. S. Coxon. 2001. Mountain caribou in managed forests: recommendations for managers. 2nd. Ed., BC Min. Environ. Lands and Parks, Wildl. Rep. N. 23, Victoria, BC.
- The Mountain Caribou Technical Advisory Committee. 2002. A strategy for the recovery of mountain caribou in British Columbia. BC Min. Water, Land and Air Protection, Victoria, BC.



Fisher

Martes pennanti

Kingdom	Phylum	Class	Order	Family	Genus	Species
Animalia	Craniata	Mammalia	Carnivora	Mustelidae	Martes	pennanti

Description

General: The Fisher is a long (head and tail: 84-101 cm; males 2.7-5.4 kg; females 1.4-3.2 kg) and slender mammal of the weasel family, with strong short legs. It has a dense, dark brown to black fur coat with bushy tail. The face is pointed, with round ears.

Status:

Global: G5

Canada:

Provincial: S2S3 – Blue;
IWMS listed



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Distribution

BEC Units: BWBS, SBPS, SBS

Forest Districts: Fort Nelson District, Peace District, TFL 48

Known Locations: Fishers are found in the Boreal Plains, Sub-Boreal Interior, Central Interior, and Taiga Plains Ecoprovinces.

Habitat

Fishers inhabit landscapes with mosaics of interconnected, young and mature forests that are interspersed with early successional stages. In winter, Fishers select habitats based on overhead cover, foraging, and snow interception at stand and patch levels. They are usually found in coniferous and mixed coniferous-deciduous stands, habitats that may intercept snow. However, in parkland and boreal forests, fishers also frequent deciduous forests where a dense understory may compensate for a lack of snow-intercepting cover. In all these forests, Fishers prefer late-successional (≥ 80 years old) stands with an advanced structural stage (≥ 5), a 30-60% canopy closure in coniferous and mixedwood forests, $\geq 20 \text{ m}^2/\text{ha}$ basal area in trees with $>21 \text{ cm dbh}$, and presence of shrubs. During other seasons, Fishers use all successional stages. Important habitat features include large

coarse woody debris (≥ 28 cm in diameter), witches' brooms (resting) and ≥ 40 -cm-dbh snags, balsam poplars and aspen trees (resting and denning) and decrepit large (≥ 80 cm dbh for denning) cottonwoods. Fishers are usually found at elevations < 1200 m.

Threats and Concerns

Fishers are threatened by loss of late-successional forests, overharvesting, and the compound effect of habitat loss and trapping.

Best Management Practices

A spatial-temporal management program must be implemented, and based on data from modeling and monitoring Fisher distribution at landscape level.

Landscape level

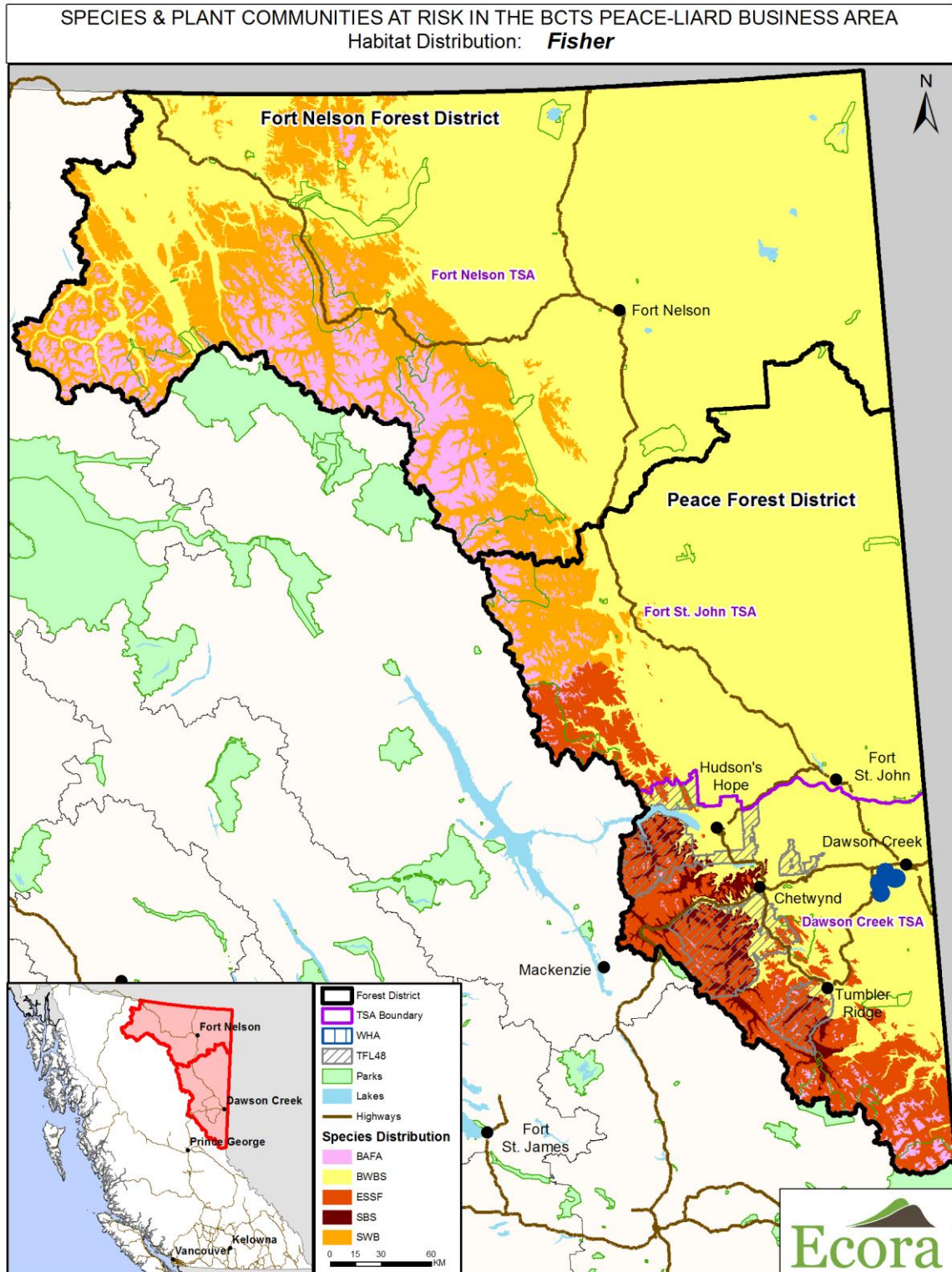
- At least 50% of the managed landscape should be in late-successional forests.
- Loss of suitable forest cover should not exceed 70% of the Fisher habitat area.
- An 80-year cycle should be implemented to ensure habitat sustainability but some patches of older forest should be maintained across the landscape.
- A network of connectivity corridors within large clearcuts (20-50 m-wide) and between forest patches (≥ 250 m wide) should be maintained to allow Fisher movements within and between harvested uncut forests.
- Connectivity corridors should be maintained between riparian and upland forests.
- Establish and interconnect Wildlife Habitat Areas encompassing denning sites located within late-successional forests.

Stand level

- Do not harvest in riparian reserves and management zones.
- Maintain stands and wildlife tree patches (≥ 2 ha, < 100 m from contiguous forest cover) with young, mature and old stands.
- Coniferous and mixed coniferous-deciduous stands should have $\geq 30\%$ canopy closure. Late-successional deciduous stands should have a developed understorey. All stands should have ≥ 20 m²/ha basal area in mature trees, presence of declining deciduous (e.g., > 40 cm dbh poplars, ≥ 88 cm dbh decrepit cottonwoods) and coniferous (≥ 60 cm dbh) trees, and large coarse woody debris.
- Maintain spruce trees with witches' brooms.
- Protect tree dens from harvesting.
- Avoid brushing and herbicides in cut blocks that are adjacent to inhabited late-successional forests.
- Protect clusters of large fire-scarred deciduous trees in wildlife tree patches.
- Maintain large piles of waste wood / coarse woody debris in cutblocks after harvest.

Further Information and Links:

- Badry, M. J., G. Proulx, and P. M. Woodard. 1997. Habitat use by fishers in the aspen parkland of Alberta. Pages 233-251 in G. Proulx, H. N. Bryant, and P. M. Woodard, editors, *Martes: taxonomy, ecology, techniques and management*. Proceedings of the Second International Martes Symposium, Provincial Museum of Alberta, Edmonton, Alberta.
- B.C. Conservation Data Centre. 2011. Species Summary: *Martes pennanti*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>
- Proulx, G. 2006. Using forest inventory data to predict winter habitat use by fisher *Martes pennanti* in British Columbia, Canada. *Acta Theriologica* 51: 275-282.
- Weir, R. d. 2003. Status of the fisher in British Columbia. BC Min. Water, Land and Air Protection, Biodiversity Branch, and Min. Sust. Resour. Manage., Wildlife Bulletin No. B-105, Victoria, BC.
- Weir, R. D. 2008. Fisher ecology in the Kiskatinaw Plateau Ecosection. Artemis Wildlife Consultants report submitted to Louisiana-Pacific Canada Ltd., and BC Min. Environ., BC.
- Weir, R. D., and A. S. Harestad. 2003. Scale-dependent habitat selectivity by fishers in south-central British Columbia. *Journal of Wildlife Management* 67: 73-82.



Grizzly Bear

Ursus arctos

Kingdom	Phylum	Class	Order	Family	Genus	Species
Animalia	Craniata	Mammalia	Carnivora	Ursidae	Ursus	arctos

Description

General: The Grizzly Bear (1.8-2.1 m) is a sturdy bear with a prominent shoulder hump, and a massive head with upturned muzzle (dish face profile) and short round ears. It has a shaggy, yellowish brown to dark brown, almost black coat, and a slight ruff around the back portion. The silvery white tips on hairs give a frosted or grizzly effect. The Grizzly Bear has very long claws (front paw: 3.5-10 cm; back paw: 1.5-4.5 cm). Males (250-350 kg) are, on average, 1.8 times as heavy as females (100-175 kg).



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Status:

Global: G4

Canada: SC

Provincial: S3 – Blue; IWMS listed

Distribution

BEC Units: BAFA, BWBS, ESSF, SBS, SWB

Forest Districts: Fort Nelson District, Peace District, TFL 48

Known Locations: Grizzly Bears may be encountered in all biogeoclimatic units and forest districts.

Habitat

Grizzly Bears inhabit mosaics of non-forested sites interspersed with immature, young and late-successional stands. Bears are attracted to avalanche chutes, salmon streams,

riparian sites rich in succulent vegetation, and berry crops. Grizzly Bears make great use of alpine habitat and old forests in the ESSF Biogeoclimatic Unit. Dens may be a limiting factor affecting Grizzly Bear survival in some areas. They are often located at high elevations on steep, northerly facing slopes, with dry and stable soils. Grizzly Bears also use caves and large coarse woody debris accumulations. They feed in non-forested sites or within open forests with tree gaps such as old forests. Grizzly Bears use early successional stands for food, and older structural stages for food and cover.

Threats and Concerns

Hunting and access to remote areas are important threats to Grizzly Bears. Logging may impact bear habitats. Current reforestation techniques also tend to reduce berry crops and vegetation by converting cleared land to young forests very quickly. The restriction of natural fires, the reduction in controlled burning, and the use of herbicides have eliminated the natural succession or maintenance of large areas of potential berry crops and brush cover used by bears for foraging.

Best Management Practices

Landscape level

- Maintain a mosaic of habitats where cut blocks of various sizes are interspersed with stands of various ages and structural stages, vegetation composition, and topography.
- Maintain connectivity between lowland and upland forested habitats, avalanche chutes and between riparian management zones.
- Minimize density of active roads in areas of high quality habitat. Limit the amount of open roads to vehicles to 0.6 km/km² within highly valuable watersheds.

Stand level

- Cut blocks should encompass > 2 ha wildlife tree patches.
- Maintain large coarse woody debris, particularly along draws and within wildlife tree patches.
- Maintain large coarse woody debris piles near forest cover to maximize feeding opportunities on arthropods, provide some cover, and break up long sighting distances in openings.
- Keep a 50-m wide forest buffer along main roads, wet meadows, marshes and bogs of all sizes, and other riparian areas for visual screening.
- Protect riparian management zones along streams well used by bears.
- When controlling regeneration within cut blocks, use ground-based applications instead of aerial broadcasts in order to protect berry producers.
- Vary or clump stocking rates within plantations.

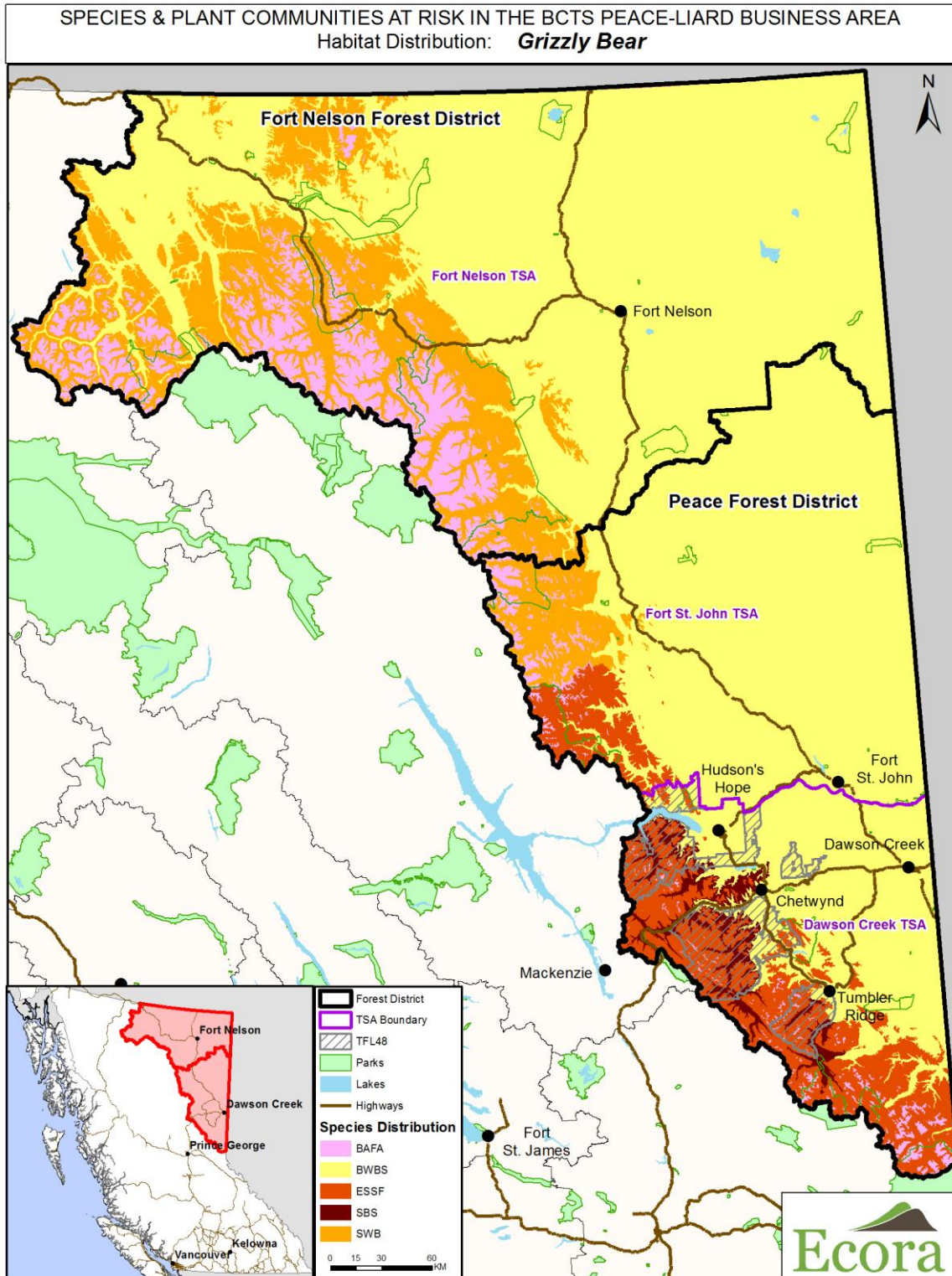
Further Information and Links:

Bernier, D., and G. Proulx. 2008. Identification and management of species and plant communities at risk: BC Timber Sales – Prince George Business Area – 2008. Alpha Wildlife Publications, Sherwood Park, Alberta.

B.C. Conservation Data Centre. 2011. Species Summary: *Ursus arctos*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Gyug, L., T. Hamilton, and M. Austin. 2003. Grizzly bear, *Ursus arctos*. In K. Paige, editor. Standards for managing Identified Wildlife. Min. For., and Min. Environ., Victoria, BC.

Ross, I. 2002. Update COSEWIC status report on the grizzly bear *Ursus arctos* in Canada. In COSEWIC assessment and update status report on the grizzly bear *Ursus arctos* in Canada. Committee on the Status of Endangered Wildlife in Canada. 91 pages.



Wolverine, *luscus* subspecies

Gulo gulo luscus

Kingdom	Phylum	Class	Order	Family	Genus	Species
Animalia	Craniata	Mammalia	Carnivora	Mustelidae	Gulo	gulo

Description

General: The Wolverine is a bear-like (11-16 kg) mustelid with a broad head, short neck, short legs, large feet, and bushy tail (17-6 cm). It has a dark brown-back pelage with a lighter facial mask and throat patch, and two yellowish stripes extending from the shoulders to the rump and merging into the tail. The fur is short on the head, but longer posteriorly.



© Matthias Kabel

Status:

Global: G4T4

Canada: SC

Provincial: S3 – Blue; IWMS listed

Distribution

BEC Units: BAFA, BWBS, ESSF, SBS, SWB

Forest Districts: Fort Nelson District, Peace District, TFL 48

Known Locations: Wolverines may be encountered in all biogeoclimatic units and forest districts.

Habitat

Wolverine habitat is best defined in terms of adequate year-round food supplies in large, sparsely inhabited wilderness areas, and cover for protection. There is a large individual variation in the use of forest cover types, aspect, slopes, and elevations. Females tend to inhabit higher elevations with early- (alpine-type) and late-successional coniferous forests from late-May to mid-December. Females in winter and males all year-round tend to use lower elevations with late-successional stands. With increased fragmentation, Wolverines use forested corridors to move across the landscape. Dens are found under boulders and tree roots, and in coarse woody debris accumulations. They may be located at higher elevations (e.g., > 1500 m) and above treeline. Most consist of relatively long, complex snow tunnel, often associated with fallen trees or large rocks. Wolverines use young successional stages for food, old structural stages for food, thermal cover, and security, from valley bottoms to alpine meadows.

Threats and Concerns

Fur harvest may impact on wolverine populations, particularly in managed forests with a well established road network. Timber harvest activities that influence prey populations, disturb denning, and replace important late-successional stands by large early-successional ones, place considerable pressure on Wolverine populations. Human access on snowmobiles or all-terrain vehicles in winter and early spring can cause behavioral disturbance.

Best Management Practices

A spatial-temporal management program must be implemented, and based on data from modeling and monitoring wolverine distribution at landscape level.

Landscape level

- Maintain a mosaic of cross-altitudinal habitats within large landscape segments ($\geq 100 \text{ km}^2$) encompassing interconnected habitats used by main prey such as caribou and moose.
- Maintain connectivity between lowland and upland forested habitats, avalanche chutes and between riparian management zones.
- Landscape segments should encompass habitats providing Wolverines with abundant snow (e.g., > 1 m in spring).
- Minimize density of active roads in areas of high quality habitat. Limit the amount of open roads to vehicles to 0.6 km/km^2 within highly valuable watersheds.

Stand level

- Maintain early-successional stages for denning; mid-successional stands for connectivity; and late-successional stands for foraging and security.
- In areas inhabited by wolverine, cut blocks should encompass > 2 ha wildlife tree patches in old-growth stands. Keep a 50-m buffer along main road for visual screening. Deactivate and rehabilitate cut block roads.

- Minimize disturbance of suitable denning sites, near avalanche chutes or late-winter areas for caribou.
- Wildlife habitat Areas may be considered to secure critical habitat features from disturbance when other regulatory means are not feasible. In most cases, areas of less than 10 ha will be sufficient to protect habitat features such as den sites.

Further Information and Links:

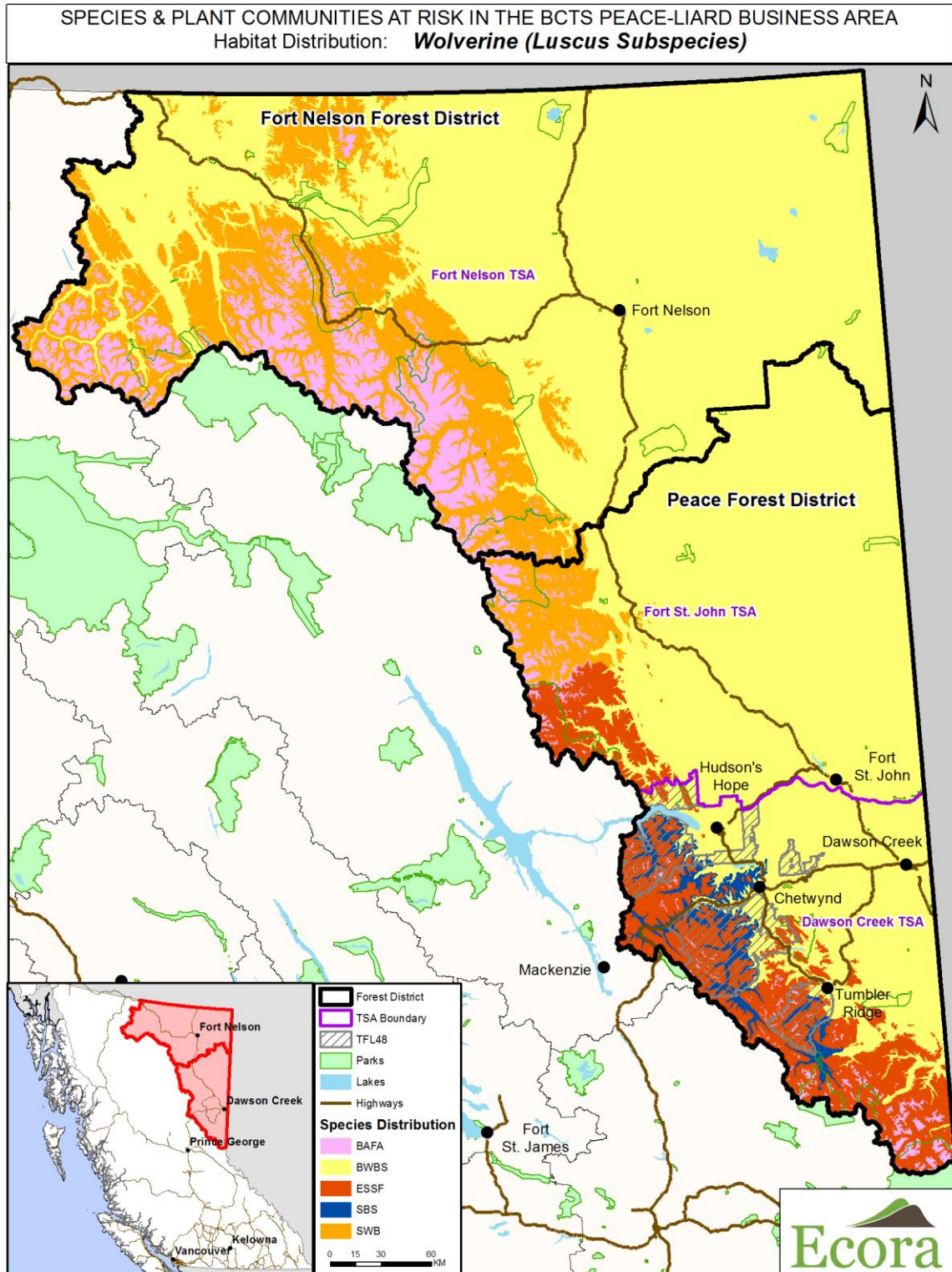
Banci, V., and G. Proulx. 1999. Resiliency of furbearers to trapping in Canada. Pages 175-203 in G. Proulx, editor, Mammal trapping, Alpha Wildlife Research & Management Ltd., Sherwood Park, Alberta.

Bernier, D., and G. Proulx. 2008. Identification and management of species and plant communities at risk: BC Timber Sales – Prince George Business Area – 2008. Alpha Wildlife Publications, Sherwood Park, Alberta.

B.C. Conservation Data Centre. 2011. Species Summary: *Gulo gulo luscus*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Lofroth, E. C. 2001. Wolverine ecology in Plateau and Foothills landscapes 1996-2001. British Columbia Wildlife Branch, Forest Renewal Activity # 712260.

Proulx, G. 2005. Integrating the habitat needs of fine- and coarse- filter species in landscape planning. In T. D. Hooper, editor. Proceedings of the Species at Risk 2004 Pathways to Recovery Conference, Victoria, BC.



Wood Bison

Bos bison athabasca

Kingdom	Phylum	Class	Order	Family	Genus	Species
Animalia	Craniata	Mammalia	Artiodactyla	Bovidae	Bos	bison

Description

General: The Wood Bison is the largest (length: 3-3.8 m; shoulder height: 167 – 182 cm; weight: 350 – 1000 kg) land mammal of Canada. It is a dark brown ungulate with a large, heavy head with a short, broad nasal area, and a mop of black hair. The short and black horns curve inward on the males, but are straight on the females. It has massive forequarters



©Roy Mumby

covered by a reddish-brown cape of long hair, and small hindquarters with short, lighter hair. There is a marked sexual dimorphism. Calves are reddish-brown.

Status:

Global: G4T2Q

Canada: T

Provincial: S1 – Red

Distribution

BEC Units: BWBS

Forest Districts: Fort Nelson District, Peace District

Known Locations: Reintroduction has reestablished three small herds in northeastern BC. Wood Bison reintroduced at Nahanni Butte in the Northwest Territories expanded their range along the Liard River as far south as the mouth of the Beaver River in BC. Further west along the Liard River, another group was reintroduced near Aline Lake on Nordquist

Flats. Wood Bison were also reintroduced further south near Etthithum Lake, close to the Alberta border.

Habitat

The Wood Bison inhabits open trembling aspen or coniferous forests, and shrub lands with extensive wet and dry meadows. Bison are primarily grazers, feeding on sedges, grasses, rushes, and forbs, but they also eat some browse species. Grassland/sedge habitat represents 5-20% of the land area in most bison ranges, and is usually interspersed with tracts of coniferous and aspen forest, bogs, fens, and shrubs.

Threats and Concerns

Habitat loss through urban, agriculture, and petroleum resource development are the main threats faced by Wood Bison in northeastern BC.

Best Management Practices

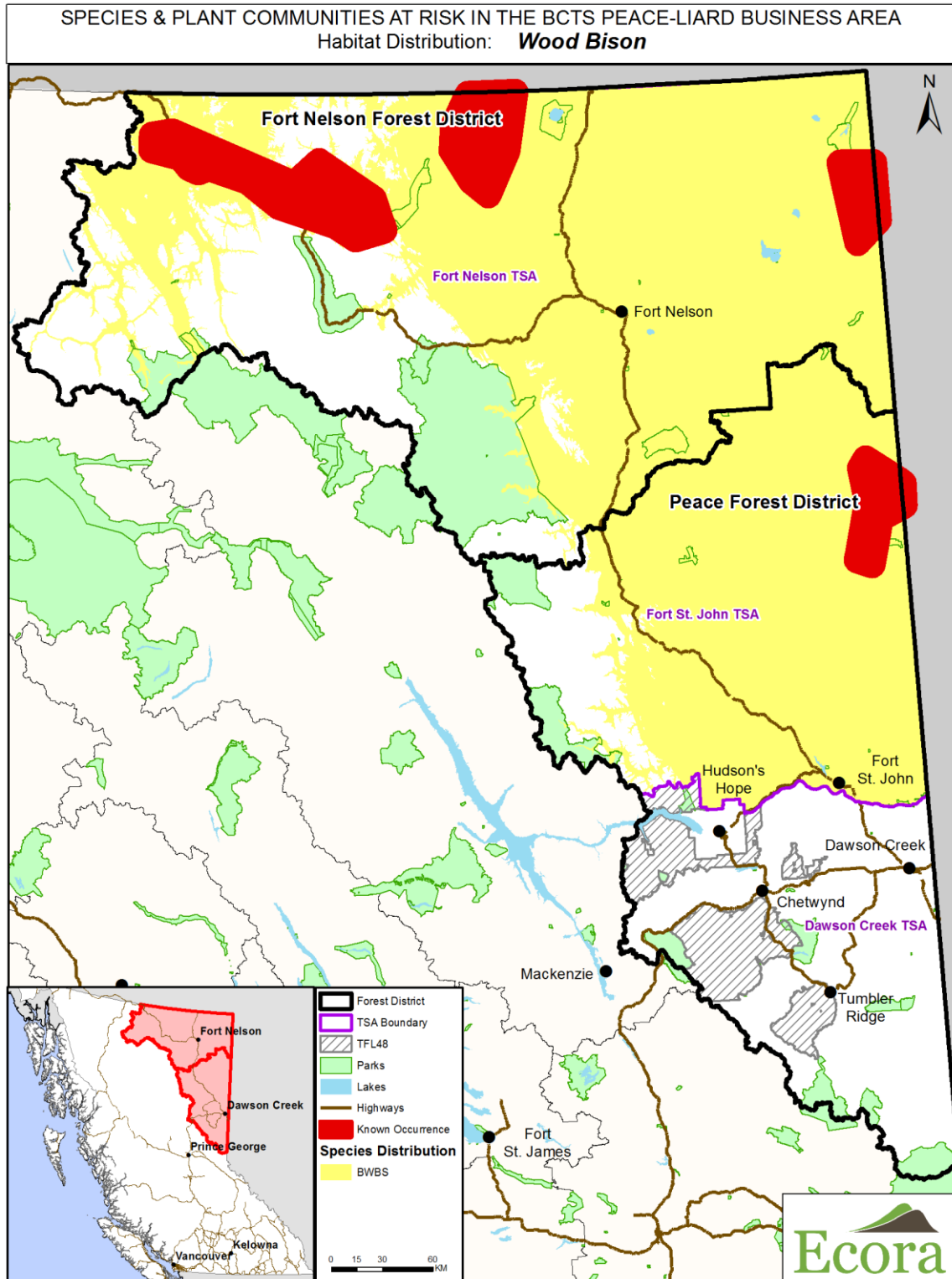
Wood Bison use a variety of successional stages during fall when crude protein is most widely available. Intensive forestry and petroleum development are an opportunity to integrate bison habitat management with the objective of the industries. Land clearing and seeding associated with expanding forestry and petroleum resource development have increased the amount of grasslands. Wood Bison are well adapted to a variety of meadow habitats and could benefit from some types of habitat alteration associated with resource development.

Further Information and Links:

B.C. Conservation Data Centre. 2011. Species Summary: *Bos bison athabasca*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

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2.2.3 Ray-Finned Fishes

Arctic Cisco

Coregonus autumnalis

Kingdom	Phylum	Class	Order	Family	Genus	Species
Animalia	Craniata	Actinopterygii	Salmoniformes	Salmonidae	Coregonus	autumnalis

Description

General: The Arctic Cisco is a 30-35-cm-long slender fish with a brownish-green back and silvery sides. There is an adipose fin.

Status:

Global: G5

Canada:

Provincial: S1S2 – Red

Distribution

BEC Units: BWBS

Forest Districts: Fort Nelson District

Known Locations: In the Fort Nelson Forest District, the Arctic Cisco is found at the southern extent of its distribution, in the Liard River drainage.

Habitat

The Cisco is found in deep lakes, pools and large rivers. It is known as an anadromous species, (i.e., it migrates from the sea up a river to spawn), but the population inhabiting the Liard River may be nonanadromous. The Arctic Cisco spawns in the fall over gravel in fairly swift water where the eggs are broadcasted and abandoned.

Threats

Habitat alteration is the main threat.

Best Management Practices

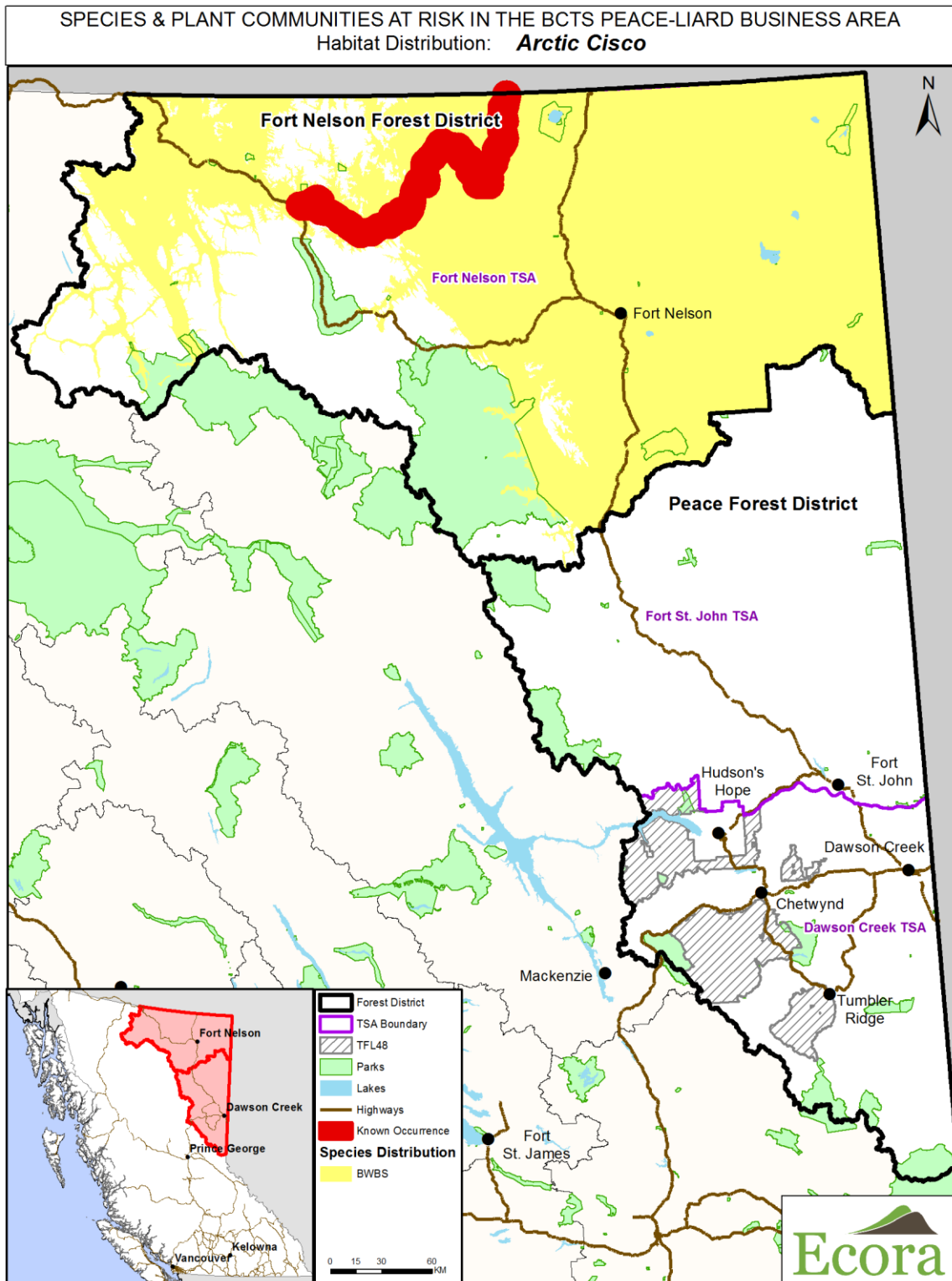
Forestry activities should follow The Forest and Range Practices Act's guidelines for aquatic systems.

- Do not alter the species' habitat (i.e., discharge of fill material, draining, etc.).
- Do not apply pesticides near aquatic ecosystems.

Further Information and Links:

B.C. Conservation Data Centre. 2011. Species Summary: *Coregonus autumnalis*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Proulx, G., K. Green, and D. Bernier. 2006. Accounts for species and plant communities at risk in the Fort Nelson Forest District. Alpha Wildlife Research & Management Ltd. and Timberline Forest Inventory Consultants report submitted to CANFOR, Fort Nelson, BC. 121 pages.



Bull Trout

Salvelinus confluentus

Kingdom	Phylum	Class	Order	Family	Genus	Species
Animalia	Craniata	Actinopterygii	Salmoniformes	Salmonidae	Salvelinus	confluentus

Description

General: The Bull Trout has a long (20-40 cm) and slim body with large head and jaws. It is olive-green to bluish-grey black, a white belly, and silvery sides with orange, red or pink spots. The lower fins have white



leading edges. The upper jaw is long, extending past the eye. Spawning adult males may have shades of red on the belly. In many populations, spawning males develop a hooked lower jaw. The fry are dark-coloured; as they grow, their colour lightens and develops light lateral spots.

Status:

Global: G3

Canada:

Provincial: S3 – Blue; IWMS listed

Distribution

BEC Units: BWBS, ESSF, SWB

Forest Districts: Fort Nelson District, Peace District, TFL 48

Known Locations: Bull Trout are found throughout Peace – Liard area. They are rare or absent from most flat, plateau or lowland areas away from mountains.

Habitat

Bull Trout are cold-water (water temperatures usually $< 15^{\circ}\text{C}$) specialists. They are found in cool, clear mountain streams, typically with an abundance of cobbles, stones and coarse woody debris. High elevation lakes are also utilized throughout the year. Bull Trout require large, deep pools in streams or lakes for over-wintering. For spawning (September-October), they use smaller, slow moving streams or rivers with a proximity to cover (cutbanks, log jams, pools, overhanging bush, etc.) and small gravel ($< 20\text{ mm}$) and cobbles where temperatures rarely exceeds 9°C . Redds (nest sites chosen for spawning) are 1.5 m^2 in size; gravel, bank cover, and 30-60 cm water depths characterize these sites. Fry prefer shallow, low bottom velocity areas with an abundance of cobbles and boulders that provide instream overhead cover. Bull Trout habitat is found at elevations ranging from 0 to 1500 m. Mature to old forest structural stages are important for Bull Trout because they provide more large woody debris, and more habitat structure for many arthropods, than younger successional stages.

Threats and Concerns

The species is very sensitive to 1) habitat degradations, particularly in spawning areas, 2) disruption of migration patterns, and 3) overfishing.

Best Management Practices

Forestry activities should follow the Forest and Range Practices Act's guidelines for aquatic systems.

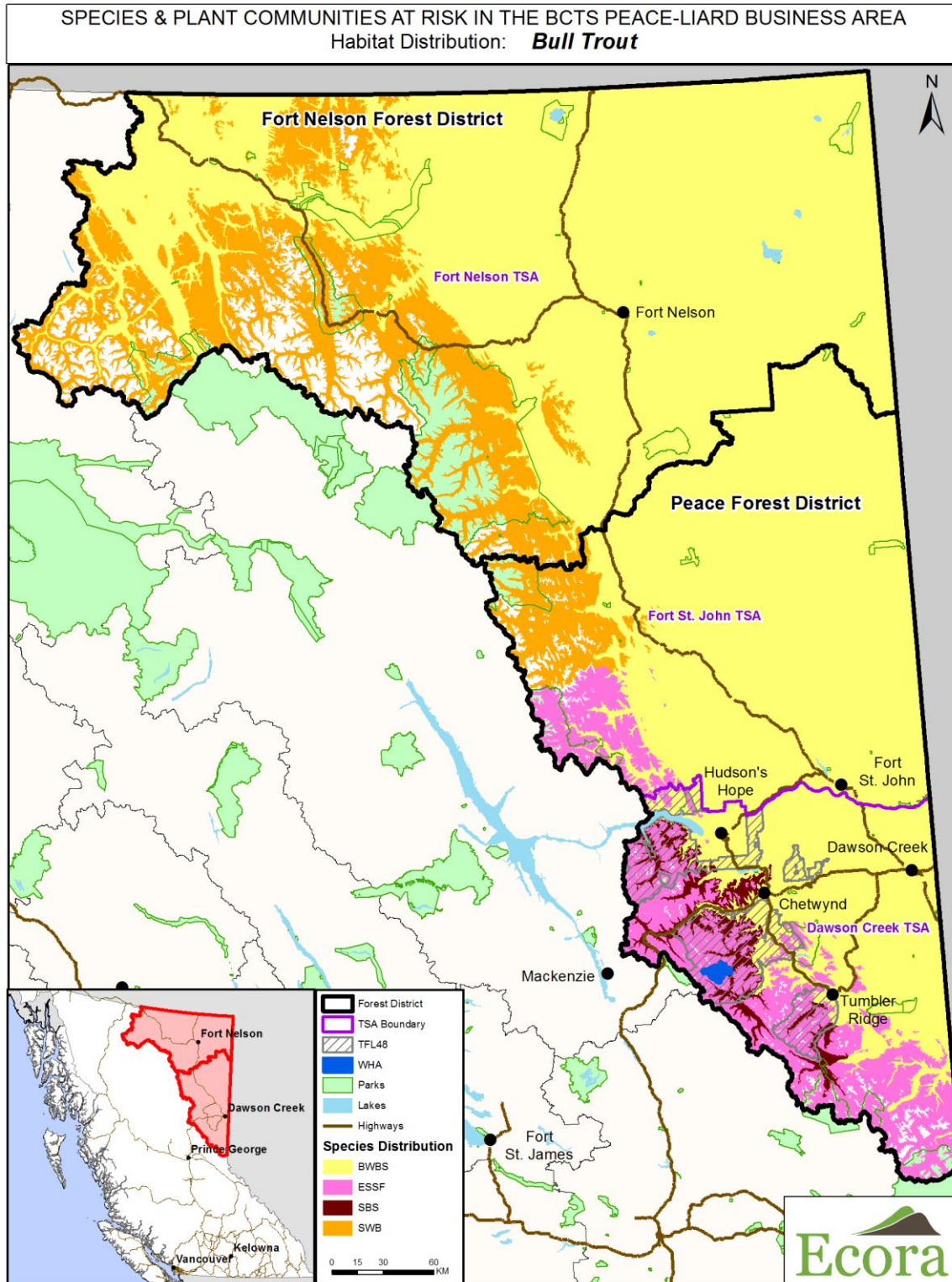
- Because the health of watersheds depends largely on the integrity and quality of small streams, the riparian habitats of all stream that are connected to water bodies inhabited by Bull Trout should be protected. This should involve the protection of riparian reserves and riparian management zones along S1-S3 streams, and the maintenance of wildlife tree patches and shrub communities (with a minimum 5-m-wide machine-free zone) along smaller streams. The maintenance of proper riparian habitats will help considerably to the maintenance of clear and cool waters.
- Minimize the number of stream crossings, use bridges or other open-bottomed structures where practical.
- Maintain roads and right-of-ways in good condition to minimize impact on channel integrity, water quality, groundwater flow, substrate composition, cover, and natural temperature regimes.
- Minimize access to Bull Trout congregations.
- Maintain natural connectivity routes between streams of all sizes and lakes.
- Public education is necessary to stop overfishing and poaching activities.

Further Information and Links:

B.C. Conservation Data Centre. 2011. Species Summary: *Salvelinus confluentus*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

McPhail, J. D., and J. S. Baxter. 1996. A review of bull trout (*Salvelinus confluentus*) life-history and habitat use in relation to compensation and improvement opportunities. Fisheries Management Report No. 104, 35 pages.

Proulx, G., K. Green, and D. Bernier. 2006. Accounts for species and plant communities at risk in the Fort Nelson Forest District. Alpha Wildlife Research & Management Ltd. and Timberline Forest Inventory Consultants report submitted to CANFOR, Fort Nelson, BC. 121 pages.



Cisco

Coregonus artedii

Kingdom	Phylum	Class	Order	Family	Genus	Species
Animalia	Craniata	Actinopterygii	Salmoniformes	Salmonidae	Coregonus	artedii

Description

General: The Cisco is a small (27-38 cm), slender fish with a small head and a protruding jaw. The back is dark blue, and the sides are silvery with pink to purple iridescence. There is an adipose fin.

Status:

Global: G5

Canada:

Provincial: S2 – Red

Distribution

BEC Units: BWBS

Forest Districts: Fort Nelson District

Known Locations: It is known only from Maxhamish lake in the Liard River drainage, 125 km north of Fort Nelson, and 12 km off the Liard Highway.

Habitat

The Cisco is commonly found in deep lakes and large rivers. However, Maxamish Lake in the Fort Nelson District is a large but shallow lake inhabited by this species. In summer, the Cisco moves to deeper waters, just below the thermocline. Fall spawning usually takes place in shallow waters (1-3 m) over gravel or stony substrate, but the species may also spawn pelagically in midwater. Eggs are usually deposited at the bottom.

Threats and Concerns

Habitat alteration is the main threat.

Best Management Practices

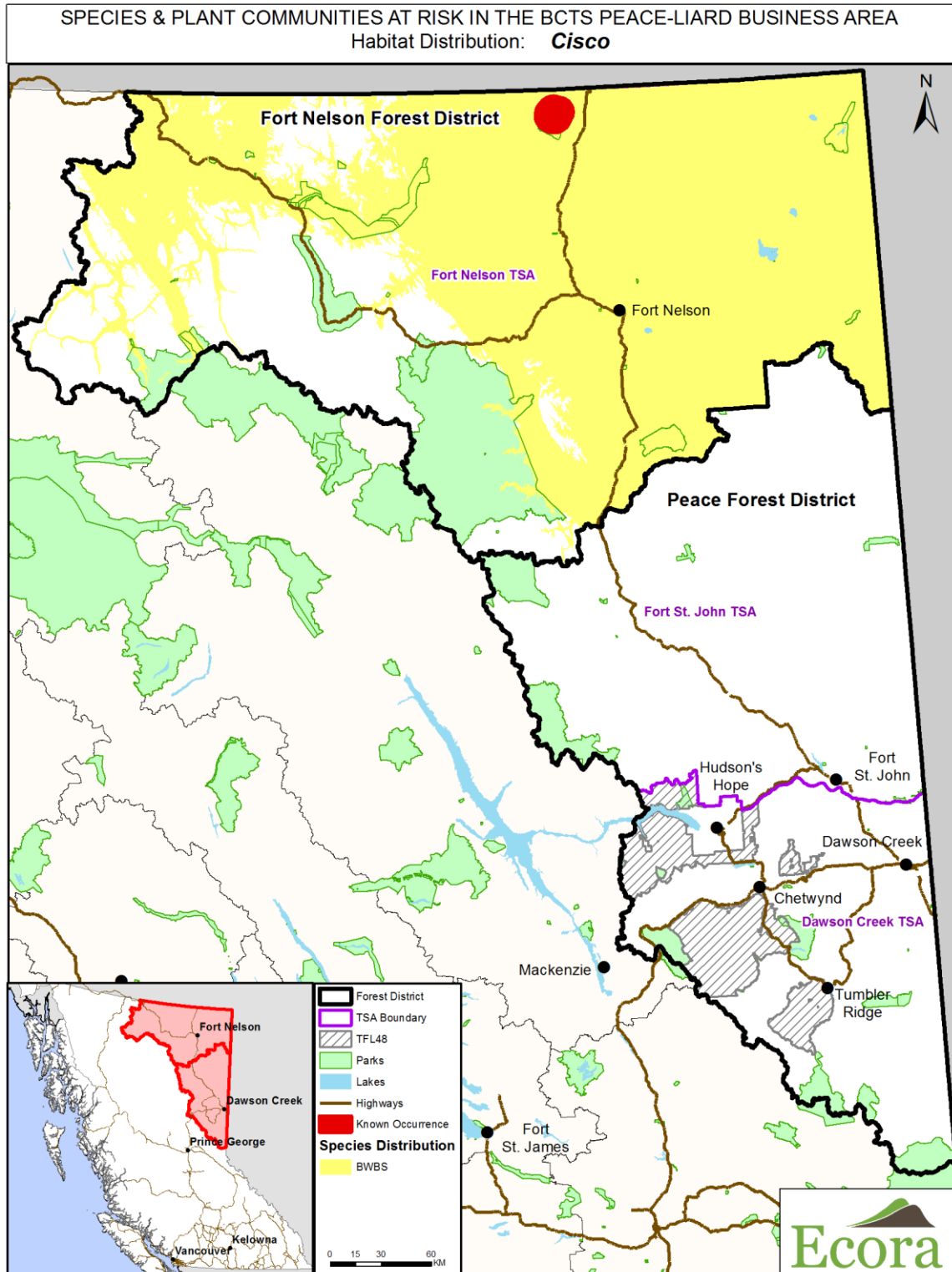
Forestry activities should follow The Forest and Range Practices Act's guidelines for aquatic systems.

- Do not alter the species' habitat (i.e., discharge of fill material, draining, etc.).
- Do not apply pesticides near aquatic ecosystems.

Further Information and Links:

B.C. Conservation Data Centre. 2011. Species Summary: *Coregonus artedii*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Proulx, G., K. Green, and D. Bernier. 2006. Accounts for species and plant communities at risk in the Fort Nelson Forest District. Alpha Wildlife Research & Management Ltd. and Timberline Forest Inventory Consultants report submitted to CANFOR, Fort Nelson, BC. 121 pages.



Ninespine Stickleback

Pungitius pungitius

Kingdom	Phylum	Class	Order	Family	Genus	Species
Animalia	Craniata	Actinopterygii	Gsterosteiformes	Gasterosteidae	Pungitius	pungitius

Description

General: The Ninespine Stickleback is a slender, little (5-6 cm long) fish that is dull-olive brown above, and silver below. It is black over the thoracic and pubic regions. During the breeding season, reddish tints appear under the head, the belly turns greenish, and black dots develop here and there over the entire body. The Ninespine Stickleback is 5-6 times as long (not counting the caudal fin) as it is deep, with a very slim caudal peduncle. The latter usually has a low, well-developed longitudinal keel. Bony plates are present only along the bases of the anal and dorsal fins and on the caudal keels. There are no true scales. There are 9 (range of 7-12) characteristic spines curved rearward on the midline of the back in a continuous row. Each ventral fin is represented by a stout curved spine thicker and longer than the dorsal spines. The tail fin is weakly rounded.

Status:

Global: G5

Canada:

Provincial: S1 – Red

Distribution

BEC Units: BWBS

Forest Districts: Fort Nelson District

Known Locations: It is known from only from Fort Nelson River near Fort Nelson.

Habitat

The Ninespine Stickleback inhabits cool, quiet waters of lakes, estuaries, and streams. In lakes, it may occupy deep water in winter, and shallows in summer. It spawns in spring and summer in freshwater.

Threats and Concerns

The degradation of streamside vegetation and bank integrity is the main threat.

Best Management Practices

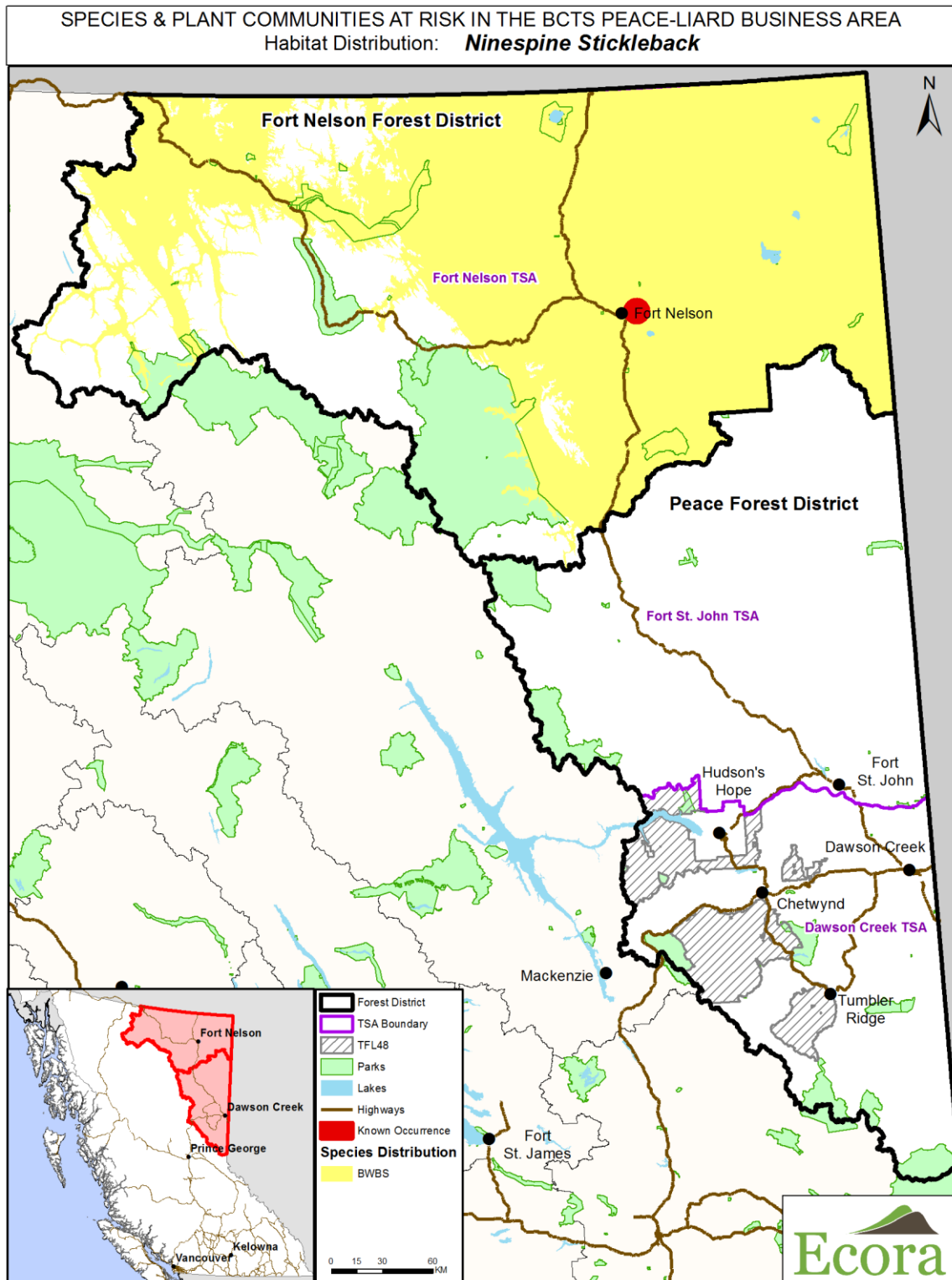
Forestry activities should follow The Forest and Range Practices Act's guidelines for aquatic systems.

- Do not alter the species' habitat (i.e., discharge of fill material, draining, etc.).
- Minimize the number of stream crossings.
- Maintain roads and right-of-ways in good condition to minimize impact on channel integrity, water quality, groundwater flow, substrate composition, cover, and natural temperature regimes.
- Do not apply pesticides near aquatic ecosystems.
- Avoid the introduction of predatory, exotic fish.

Further Information and Links:

B.C. Conservation Data Centre. 2011. Species Summary: *Pungitius pungitius*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Proulx, G., K. Green, and D. Bernier. 2006. Accounts for species and plant communities at risk in the Fort Nelson Forest District. Alpha Wildlife Research & Management Ltd. and Timberline Forest Inventory Consultants report submitted to CANFOR, Fort Nelson, BC. 121 pages.



Spottail Shiner

Notropis hudsonius

Kingdom	Phylum	Class	Order	Family	Genus	Species
Animalia	Craniata	Actinopterygii	Cypriniformes	Cyprinidae	Notropis	hudsonius

Description

General: The Spottail Shiner is a medium-sized (7-9 cm long), robust minnow with a very pale olive back and silvery sides and belly. There is a large prominent spot at the base of the tail.

Status:

Global: G5

Canada:

Provincial: S1S2 – Red

Distribution

BEC Units: BWBS

Forest Districts: Fort Nelson District

Known Locations: It is found in Maxhamish Lake, but it may be present in other water bodies.

Habitat

The Spottail Shiner inhabits large rivers and lakes, usually with sandy or rocky shallows and scant vegetation. In Maxhamish Lake, Spottail Shiners were collected along the south shore of the lake and at the mouth of a stream. Spottail Shiners spawn in spring and early summer in aggregations over areas of gravelly riffles near mouths of brooks, or along sandy shoals of lakeshores.

Threats and Concerns

The degradation of streamside vegetation and bank integrity is the main threat.

Best Management Practices

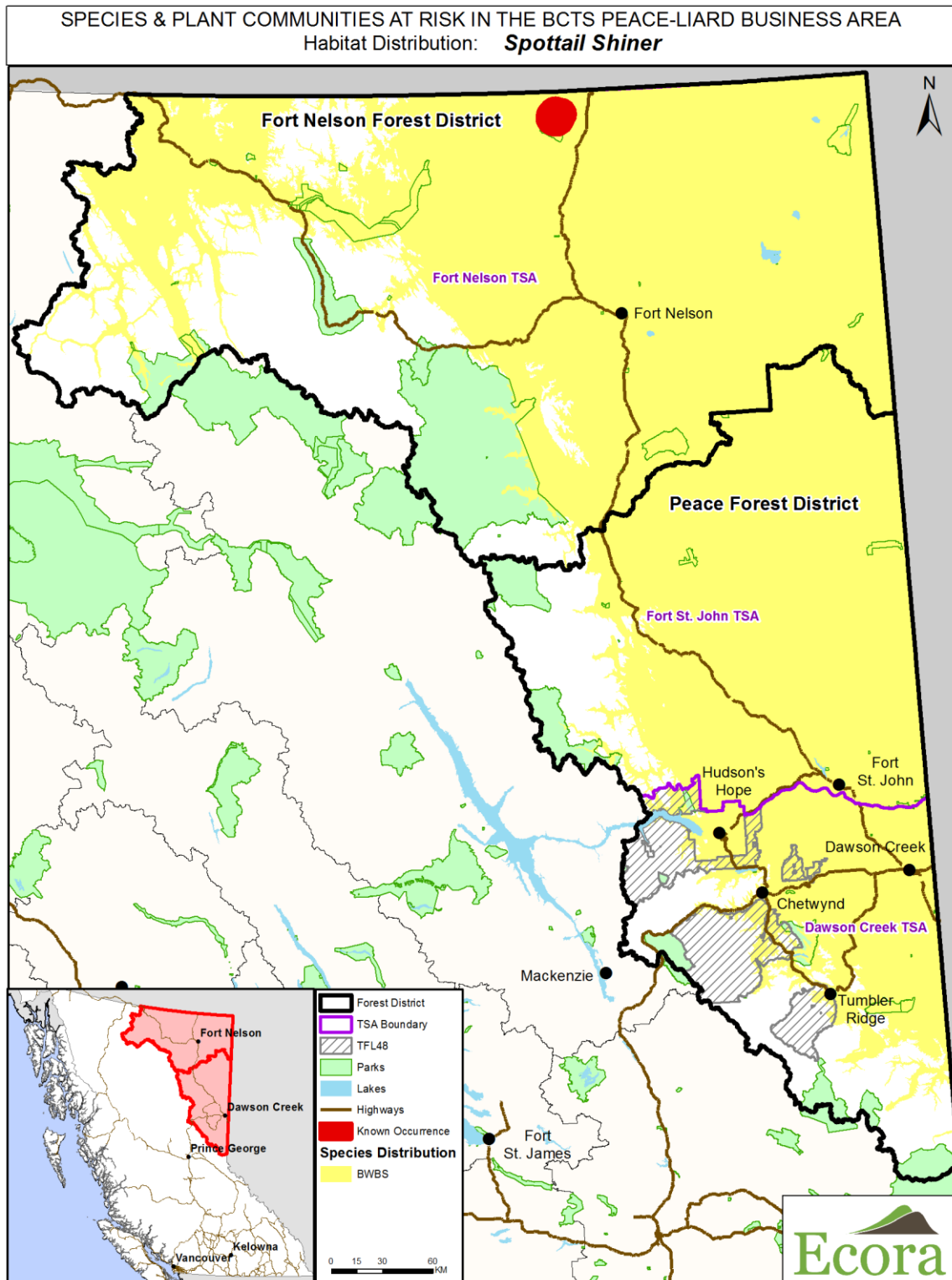
Forestry activities should follow The Forest and Range Practices Act's guidelines for aquatic systems.

- Do not alter the species' habitat (i.e., discharge of fill material, draining, etc.).
- Minimize the number of stream crossings.
- Maintain roads and right-of-ways in good condition to minimize impact on channel integrity, water quality, groundwater flow, substrate composition, cover, and natural temperature regimes.
- Do not apply pesticides near aquatic ecosystems.
- Avoid the introduction of predatory, exotic fish.

Further Information and Links:

B.C. Conservation Data Centre. 2011. Species Summary: *Notropis hudsonius*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Proulx, G., K. Green, and D. Bernier. 2006. Accounts for species and plant communities at risk in the Fort Nelson Forest District. Alpha Wildlife Research & Management Ltd. and Timberline Forest Inventory Consultants report submitted to CANFOR, Fort Nelson, BC. 121 pages.



3.0 PLANT IDENTIFICATION

3.1 Vascular Plants - Dicots

Drummond's Thistle

Cirsium drummondii

Kingdom	Phylum	Class	Order	Family	Genus	Species
Plantae	Anthophyta	Dicotyledoneae	Asterales	Asteraceae	Cirsium	drummondii

Description

General: Drummond's thistle is a biennial herb with a simple, woolly-hairy, erect stem, reaching 1.2-3.0 m in height. Leaves are lance shaped with a rounded apex and tapering base. Segment margins have 3-5 slender spines. The upper surface is smooth to softly-hairy. The uppermost leaves are ascending and narrower than the lower leaves. They extend past the group of large, compact flower heads. Flower heads are disk-shaped and in a cluster of 1-9. Flowers are purplish-red in color and 3-4 cm long. Dry fruits are 4-6 mm long and straw colored.

Status:

Global: G5

Canada:

Provincial: S1 – Red

Distribution

BEC Units: BWBSmw

Forest District: Peace District, TFL 48



Known Locations: In the northern portion it's only known along the roadside approximately four miles west of Dawson Creek and approximately two miles north-northeast of Tupper. However it is frequently found in the southeast and south-central part of the province.

Habitat

Mesic to dry forest openings, meadows and roadsides in the steppe and lower montane zones.

Threats and Concerns

The main threats to this species are oil and gas exploration and development, mining, forest harvesting, and road construction, which may occur in or adjacent to preferred habitat.

Best Management Practices

Current management guidelines for plant species at risk are focused at the stand level. If a potential plant species at risk is located, it is recommended that the area have ribbon placed around it, photos taken and field cards filled out with the exact location recorded. This information should then be passed on to the designated species at risk coordinator.

This is essentially a fine filter approach to managing the identified species, where an individual species and/or habitat is managed singularly and at a small scale (i.e. at the stand level). This approach should be used in association with a coarse filter approach which involves management for a variety of species/habitats simultaneously, mainly through the use of broad scale provisions at the landscape level such as protected areas and parks.

Both the plant species at risk and habitat they occur in should be protected. The current management strategies for plant species at risk are based on the Identified Wildlife Management Strategy (IWMS) wildlife and wildlife habitat provisions/measures set out by the BC Government. The best management practices are as follows:

- establish a core area around a known element occurrence with a 30-50 m wide buffer
- establish a management zone around the core area that is 150-200 m wide around the buffer
- do not harvest within the core area, unless harvesting is aimed specifically at improving the habitat for the particular rare plant species
- keep the identified area (core area + buffer) free from herbicide use
- deactivate temporary roads after use, do not allow road or trail construction upslope or within the element occurrence
- restrict access to high elevation areas with the use of gates and trenches

- where roads already exist or are necessary, ensure road is not changing the hydrology of element occurrence habitat ensure road maintenance activities do not alter, damage, or destroy the element occurrence
- if seeding occurs, use native species (prevent spread of exotic plant species)

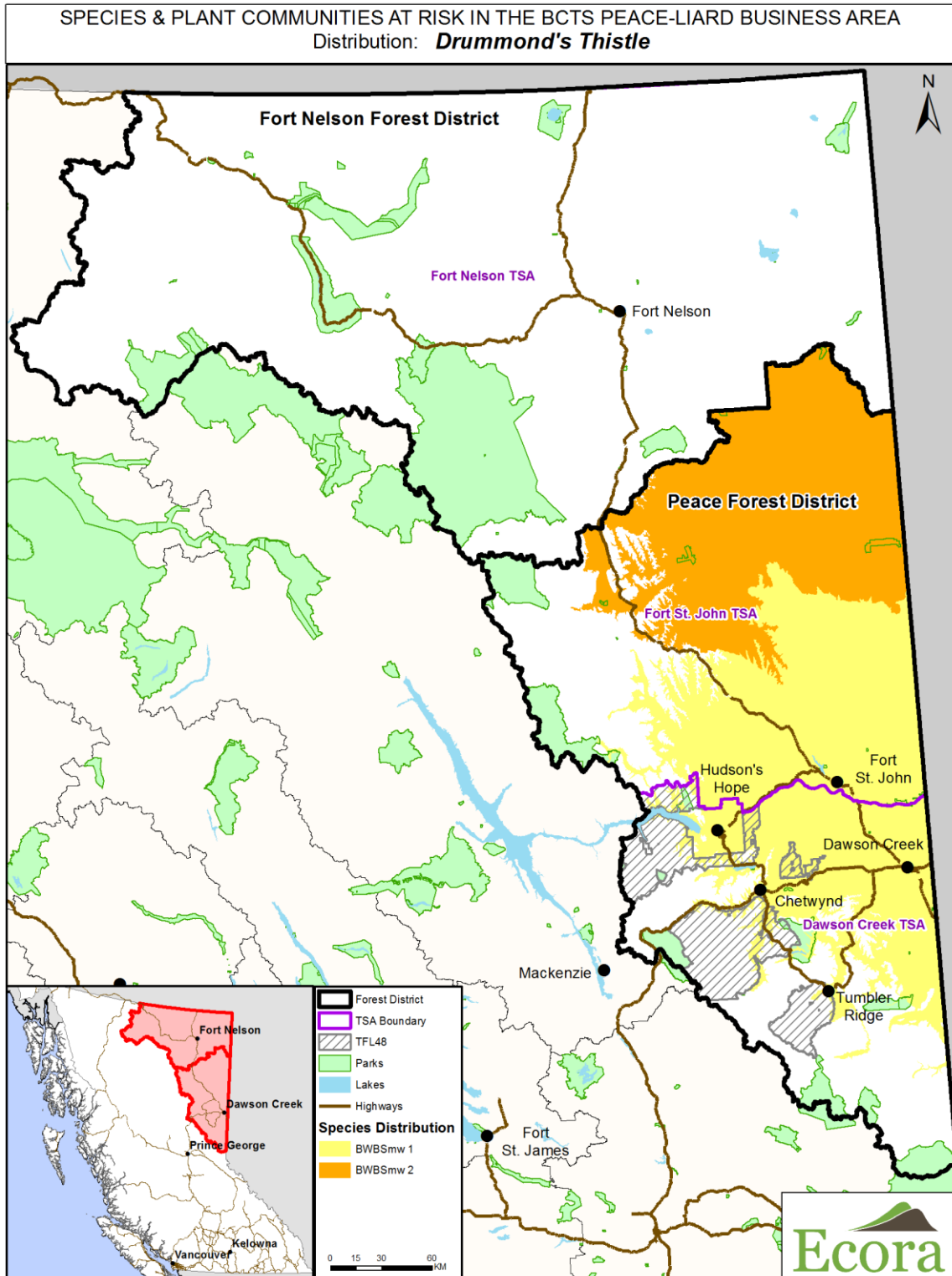
Further Information and Links:

B.C. Conservation Data Centre. 2011. Species Summary: *Cirsium drummondii*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Douglas, G.W., D. Meidinger, and J. Penny. 2002. Rare Native Vascular Plants of British Columbia, 2nd ed. B.C. Conserv. Data Centre, Terrestrial Inf. Branch, Victoria.

Douglas, G.W., D. Meidinger, and J. Pojar, eds. 2001b. Illustrated Flora of British Columbia, Vol. 1, Monocotyledons (Orchidaceae through Zosteraceae). B.C. Minist. Sustainable Resour. Manage., and B.C. Minist. For. Victoria, BC.

E-Flora BC: Electronic Atlas of the Plants of British Columbia:
<http://linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Cirsium+drummondii>



Fennel-Leaved Desert-Parsley

Lomatium foeniculaceum var. *foeniculaceum*

Kingdom	Phylum	Class	Order	Family	Genus	Species
Plantae	Anthophyta	Dicotyledoneae	Apiales	Apiaceae	Lomatium	foeniculaceum

Description

General: Fennel-leaved desert-parsley is a perennial herb ranging from 20 to 90 cm tall. Stems can be solitary or in groups of a few and covered in short hair. The mostly basal leaves have short hairs and can be short stalked or unstalked. The basal leaves are 1-3 times divided and are short. Flowers are clustered and yellow in color. Bracts are spear to egg-shaped and finely hairy. Fruits have thin wings and are elliptic-oblong in shape. When young, fruits are short-hairy.



Status:

Global: G5T5

Canada:

Provincial: S1 – Red

Distribution

BEC Units: BWBSmw

Forest District: Peace District, TFL 48

Know Locations: In British Columbia it is found only in the Peace River area of the province (Golata Creek and Kiskatinaw River).

Habitat

Dry grassy slopes in the montane zone.

Threats and Concerns

The main threats to this species are oil and gas exploration and development, mining, forest harvesting, and road construction, which may occur in or adjacent to preferred habitat.

Best Management Practices

Current management guidelines for plant species at risk are focused at the stand level. If a potential plant species at risk is located, it is recommended that the area have ribbon placed around it, photos taken and field cards filled out with the exact location recorded. This information should then be passed on to the designated species at risk coordinator.

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Both the plant species at risk and habitat they occur in should be protected. The current management strategies for plant species at risk are based on the Identified Wildlife Management Strategy (IWMS) wildlife and wildlife habitat provisions/measures set out by the BC Government. The best management practices are as follows:

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- keep the identified area (core area + buffer) free from herbicide use
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- restrict access to high elevation areas with the use of gates and trenches
- where roads already exist or are necessary, ensure road is not changing the hydrology of element occurrence habitat ensure road maintenance activities do not alter, damage, or destroy the element occurrence
- if seeding occurs, use native species (prevent spread of exotic plant species)

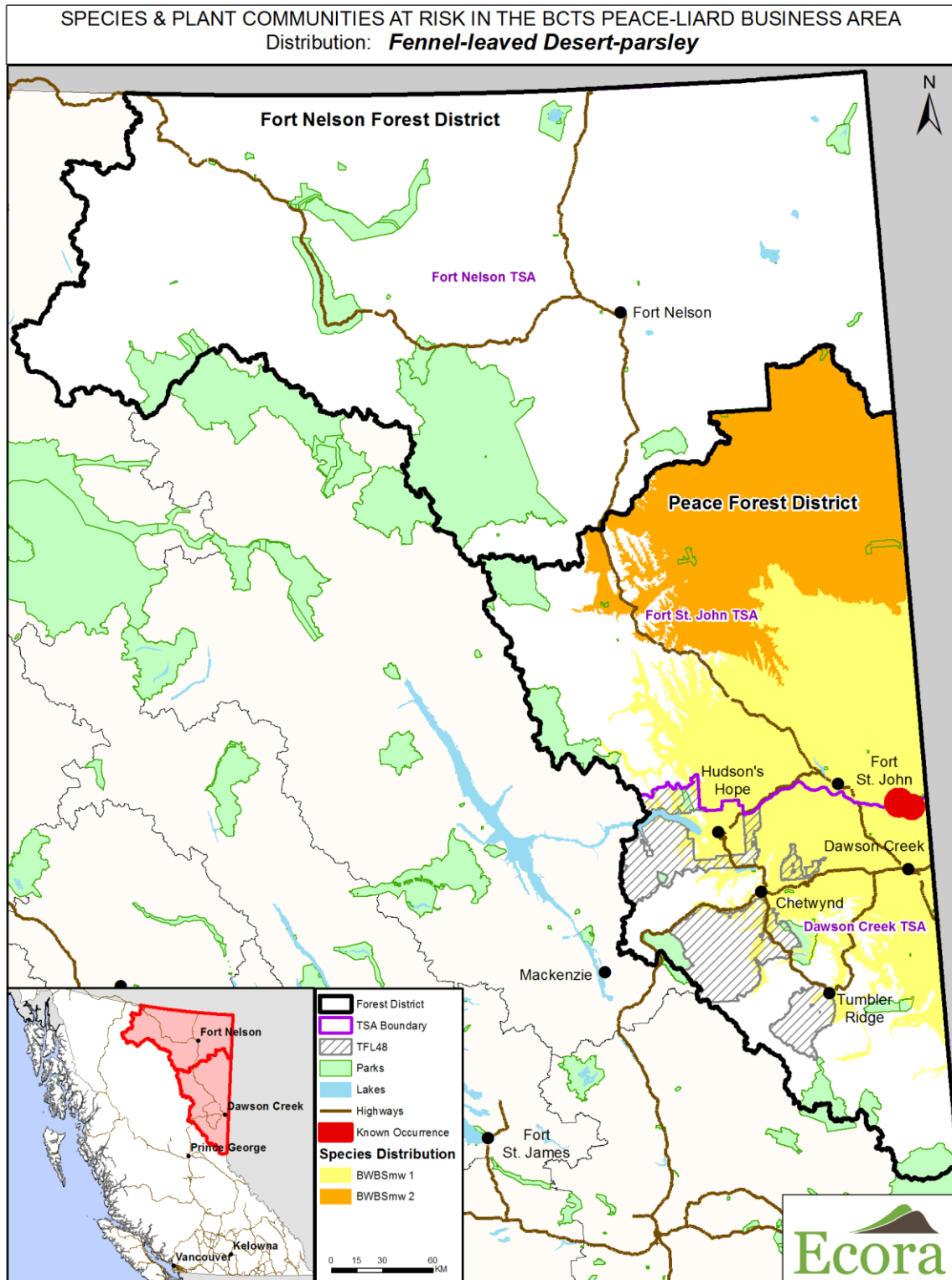
Further Information and Links:

B.C. Conservation Data Centre. 2011. Species Summary: *Lomatium foeniculaceum* var. *foeniculaceum*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Douglas, G.W., D. Meidinger, and J. Penny. 2002. Rare Native Vascular Plants of British Columbia, 2nd ed. B.C. Conserv. Data Centre, Terrestrial Inf. Branch, Victoria.

Douglas, G.W., D. Meidinger, and J. Pojar, eds. 2001b. Illustrated Flora of British Columbia, Vol. 1, Monocotyledons (Orchidaceae through Zosteraceae). B.C. Minist. Sustainable Resour. Manage., and B.C. Minist. For. Victoria, BC.

E-Flora BC: Electronic Atlas of the Plants of British Columbia:
<http://linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Lomatium+foeniculaceum%20var.%20foeniculaceum>



Gaping Goosefoot

Chenopodium hians

Kingdom	Phylum	Class	Order	Family	Genus	Species
Plantae	Anthophyta	Dicotyledoneae	Caryophyllales	Chenopodiaceae	Chenopodium	hians

Description

General: Stems are erect, branched and covered in a powder-like substance. Leaves have elliptic-oblong or narrowly lance-shaped blades. Leaves have entire margins, 3 veins and are covered in a dense powder. Clusters of flowers exist in lateral spikes, are densely spaced and have leaf-like bracts. Flowers are in bloom in April and May and have elliptic, oblong, or ovate lobes with a rounded apex and are covered in a powder-like substance. When mature, flowers expose the oval-shaped fruit.

Status:

Global: G5

Canada:

Provincial: S2 – Red

Distribution

BEC Units: BWBSmw

Forest District: Peace District, TFL 48

Known Locations: There is one known location existing on a south-facing slope in the Peace River area. In British Columbia it is sporadic in distribution.

Habitat

Moist or dry open areas such as pastures, prairies, roadsides, sand hills and lakeshores.

Threats and Concerns

The main threats to this species are oil and gas exploration and development, mining, forest harvesting and road construction, which may occur in or adjacent to preferred habitat.

Best Management Practices:

Current management guidelines for plant species at risk are focused at the stand level. If a potential plant species at risk is located, it is recommended that the area have ribbon placed around it, photos taken and field cards filled out with the exact location recorded. This information should then be passed on to the designated species at risk coordinator.

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Both the plant species at risk and habitat they occur in should be protected. The current management strategies for plant species at risk are based on the Identified Wildlife Management Strategy (IWMS) wildlife and wildlife habitat provisions/measures set out by the BC Government. The best management practices are as follows:

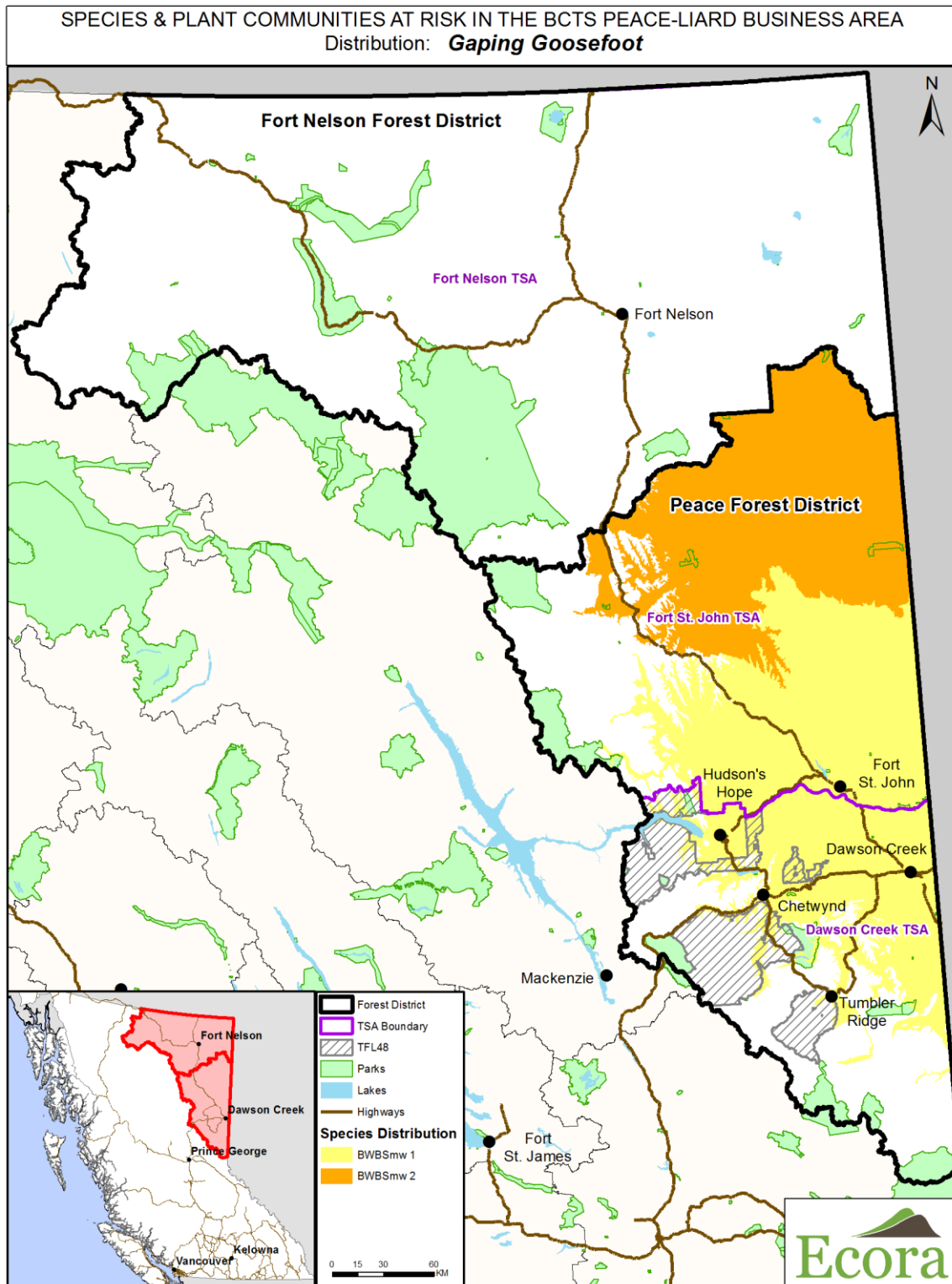
- establish a core area around a known element occurrence with a 30-50 m wide buffer
- establish a management zone around the core area that is 150-200 m wide around the buffer
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- keep the identified area (core area + buffer) free from herbicide use
- deactivate temporary roads after use, do not allow road or trail construction upslope or within the element occurrence
- restrict access to high elevation areas with the use of gates and trenches
- where roads already exist or are necessary, ensure road is not changing the hydrology of element occurrence habitat ensure road maintenance activities do not alter, damage, or destroy the element occurrence
- if seeding occurs, use native species (prevent spread of exotic plant species)

Further Information and Links:

B.C. Conservation Data Centre. 2011. Species Summary: *Chenopodium hians*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

USDA – Natural Resources Conservation Service Plants Database:
<http://plants.usda.gov/java/nameSearch?mode=Scientific+Name&keywordquery=Chenopodium+hians>

Zip Code Zoo: http://zipcodezoo.com/Plants/C/Chenopodium_hians/



Gardner's Sagebrush

Atriplex gardneri var *gardneri*

Kingdom	Phylum	Class	Order	Family	Genus	Species
Plantae	Anthophyta	Dicotyledoneae	Caryophyllales	Chenopodiaceae	Atriplex	gardneri

Description

General: Gardner's sagebrush (formerly known as Nuttall's Orache) is a perennial semi-shrub. It has a woody base with erect or spreading, freely branched stems growing to 10-60 cm in height. Alternate leaves are oblong to spoon-shaped and 2-5 cm long with smooth margins. Flowers are leafless spikes grouped in clusters found axillary or at the terminal end of the stem. Bracteoles are irregularly toothed, smooth to pimply and rounded or lance to elliptic shaped.

Status:

Global: G5T5

Canada:

Provincial: S1 - Red

Distribution

BEC Units: BWBSmw

Forest District: Peace District, TFL 48

Known Locations: In British Columbia it is found only near the Clayhurst Crossing of the Peace River.



© Adolf Ceska

Habitat

This species is found on dry grassy slopes in the montane zone.

Threats and Concerns

The main threats to this species are oil and gas exploration and development, mining, forest harvesting, and road construction, which may occur in or adjacent to preferred habitat. It's only known location in British Columbia is of significant importance. Because it is located on the banks of the Peace River, major changes in hydrological processes (ex. Proposed Site "C" dam) will have drastic impacts on the species in this area.

Best Management Practices

Current management guidelines for plant species at risk are focused at the stand level. If a potential plant species at risk is located, it is recommended that the area have ribbon placed around it, photos taken and field cards filled out with the exact location recorded. This information should then be passed on to the designated species at risk coordinator.

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Both the plant species at risk and habitat they occur in should be protected. The current management strategies for plant species at risk are based on the Identified Wildlife Management Strategy (IWMS) wildlife and wildlife habitat provisions/measures set out by the BC Government. The best management practices are as follows:

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- if seeding occurs, use native species (prevent spread of exotic plant species)

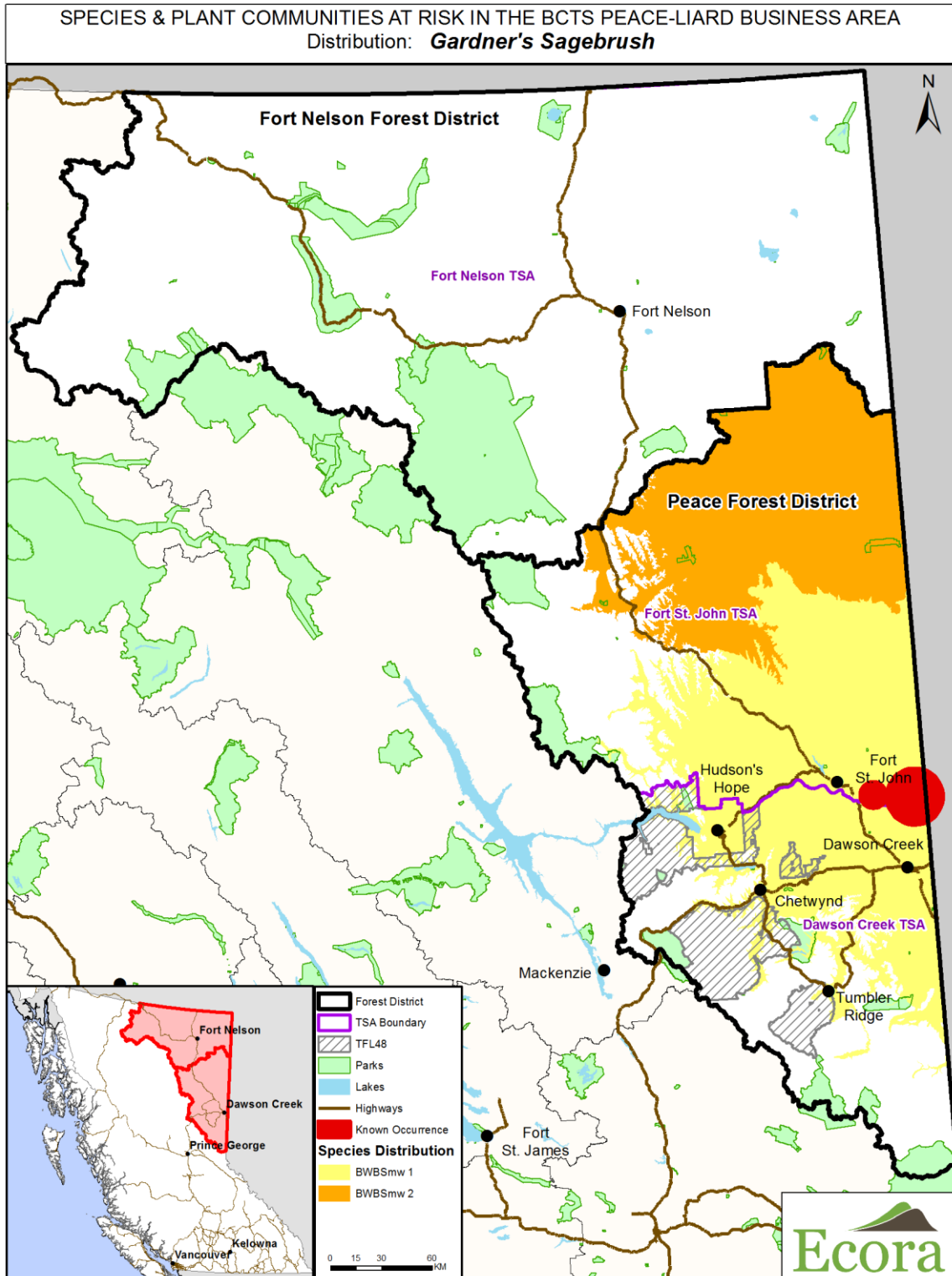
Further Information and Links:

British Columbia Conservation Data Centre:

<http://a100.gov.bc.ca/pub/eswp/speciesSummary.do?id=14345>

Douglas, G.W., D. Meidinger, and J. Penny. 2002. Rare Native Vascular Plants of British Columbia, 2nd ed. B.C. Conserv. Data Centre, Terrestrial Inf. Branch, Victoria.

Douglas, G.W., D. Meidinger, and J. Pojar, eds. 2001b. Illustrated Flora of British Columbia, Vol. 2, Monocotyledons (Orchidaceae through Zosteraceae). B.C. Minist. Sustainable Resour. Manage., and B.C. Minist. For. Victoria, BC.



Hawkweed-Leaved Saxifrage

Saxifraga hieraciifolia var. *hieraciifolia*

Kingdom	Phylum	Class	Order	Family	Genus	Species
Plantae	Anthophyta	Dicotyledoneae	Rosales	Saxifragaceae	Saxifraga	hieraciifolia

Description

General: Hawkweed-leaved saxifrage is an herb ranging from 10 to 50 cm in height. Stems are single, thick and stout and covered in glands. There are no stem leaves. Basal leaves exist in a rosette and are thick, remotely toothed, and oblanceolate to elliptic in shape, with a wedge-shaped base. Small inconspicuous flowers with greenish to purplish petals are produced in dense clusters. Petals are oblanceolate to elliptical shaped. Fruits are purple-black capsules.

Status:

Global: G4TNR

Canada:

Provincial: S1S3 – Red

Distribution

BEC Units: BAFA

Forest District: Fort Nelson District

Known Locations: In British Columbia it is found only around Mt. Mansfield and Liard Plateau areas.

Habitat

Moist to wet meadows and solifluction slopes in the alpine zone.



© Jamie Fenneman

Threats and Concerns

The main threats to this species are oil and gas exploration and development, mining, forest harvesting, and road construction, which may occur in or adjacent to preferred habitat. CDC conservation status reports states that due to the remote locations threats to this species due to human activity are probably low.

Best Management Practices

Current management guidelines for plant species at risk are focused at the stand level. If a potential plant species at risk is located, it is recommended that the area have ribbon placed around it, photos taken and field cards filled out with the exact location recorded. This information should then be passed on to the designated species at risk coordinator.

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Both the plant species at risk and habitat they occur in should be protected. The current management strategies for plant species at risk are based on the Identified Wildlife Management Strategy (IWMS) wildlife and wildlife habitat provisions/measures set out by the BC Government. The best management practices are as follows:

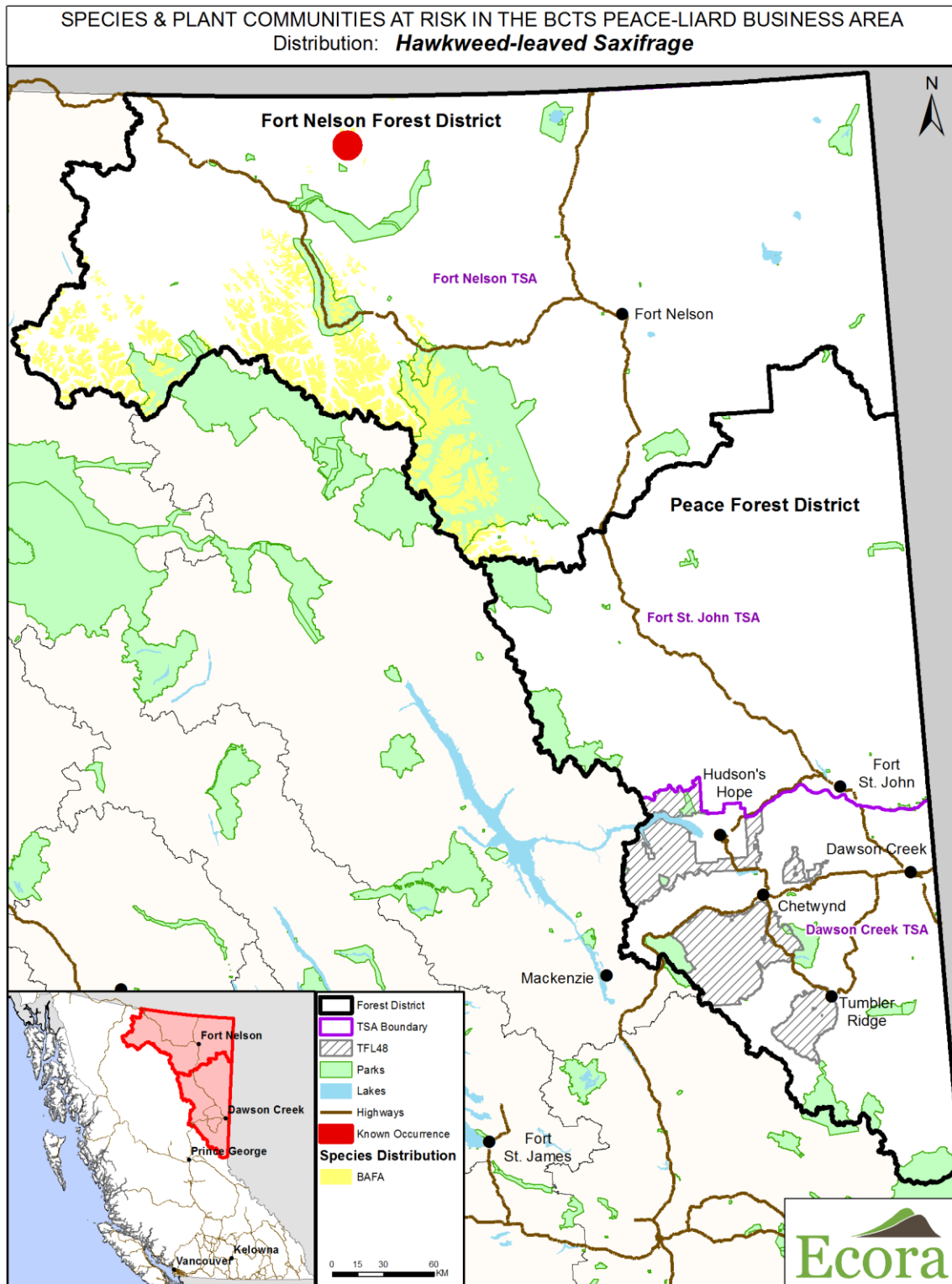
- establish a core area around a known element occurrence with a 30-50 m wide buffer
- establish a management zone around the core area that is 150-200 m wide around the buffer
- do not harvest within the core area, unless harvesting is aimed specifically at improving the habitat for the particular rare plant species
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- deactivate temporary roads after use, do not allow road or trail construction upslope or within the element occurrence
- restrict access to high elevation areas with the use of gates and trenches
- where roads already exist or are necessary, ensure road is not changing the hydrology of element occurrence habitat ensure road maintenance activities do not alter, damage, or destroy the element occurrence
- if seeding occurs, use native species (prevent spread of exotic plant species)

Further Information and Links:

B.C. Conservation Data Centre. 2011. Species Summary: *Saxifraga hieraciifolia* var. *hieraciifolia*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Douglas, G.W., D. Meidinger, and J. Penny. 2002. Rare Native Vascular Plants of British Columbia, 2nd ed. B.C. Conserv. Data Centre, Terrestrial Inf. Branch, Victoria.

Douglas, G.W., D. Meidinger, and J. Pojar, eds. 2001b. Illustrated Flora of British Columbia, Vol. 5, Monocotyledons (Orchidaceae through Zosteraceae). B.C. Minist. Sustainable Resour. Manage., and B.C. Minist. For. Victoria, BC.



Heart-Leaved Buttercup

Ranunculus cardiophyllus

Kingdom	Phylum	Class	Order	Family	Genus	Species
Plantae	Anthophyta	Dicotyledoneae	Ranunculales	Ranunculaceae	Ranunculus	cardiophyllus

Description

General: Heart-leaved buttercup is a perennial herb standing 15 to 40 cm tall. Stems are erect, hollow and soft-hairy, but also possibly smooth. Basal leaves are undivided, heart-shaped, deeply toothed to shallowly lobed and finely toothed with rounded to pointed tips. Stem leaves are more deeply lobed and alternate. Flowers have 5-10 yellow petals and exist in a flat-topped inflorescence of 1-5 flowers. The receptacle is covered in dense, short hairs. The one-seeded, dry fruit are egg-shaped, with fine, dense hairs and are somewhat flattened.

Status:

Global: G4G5

Canada:

Provincial: S1 – Red

Distribution

BEC Units: BWBSmw

Forest District: Peace District,
TFL 48

Known Locations: In British Columbia it is found only around Dawson Creek and Crows Nest Past areas.

Habitat

Moist to mesic meadows, grasslands and forest openings in the montane zone.



© Amelie Rousseau

Threats and Concerns

The main threats to this species are oil and gas exploration and development, mining, forest harvesting, and road construction, which may occur in or adjacent to preferred habitat.

Best Management Practices

Current management guidelines for plant species at risk are focused at the stand level. If a potential plant species at risk is located, it is recommended that the area have ribbon placed around it, photos taken and field cards filled out with the exact location recorded. This information should then be passed on to the designated species at risk coordinator.

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- if seeding occurs, use native species (prevent spread of exotic plant species)

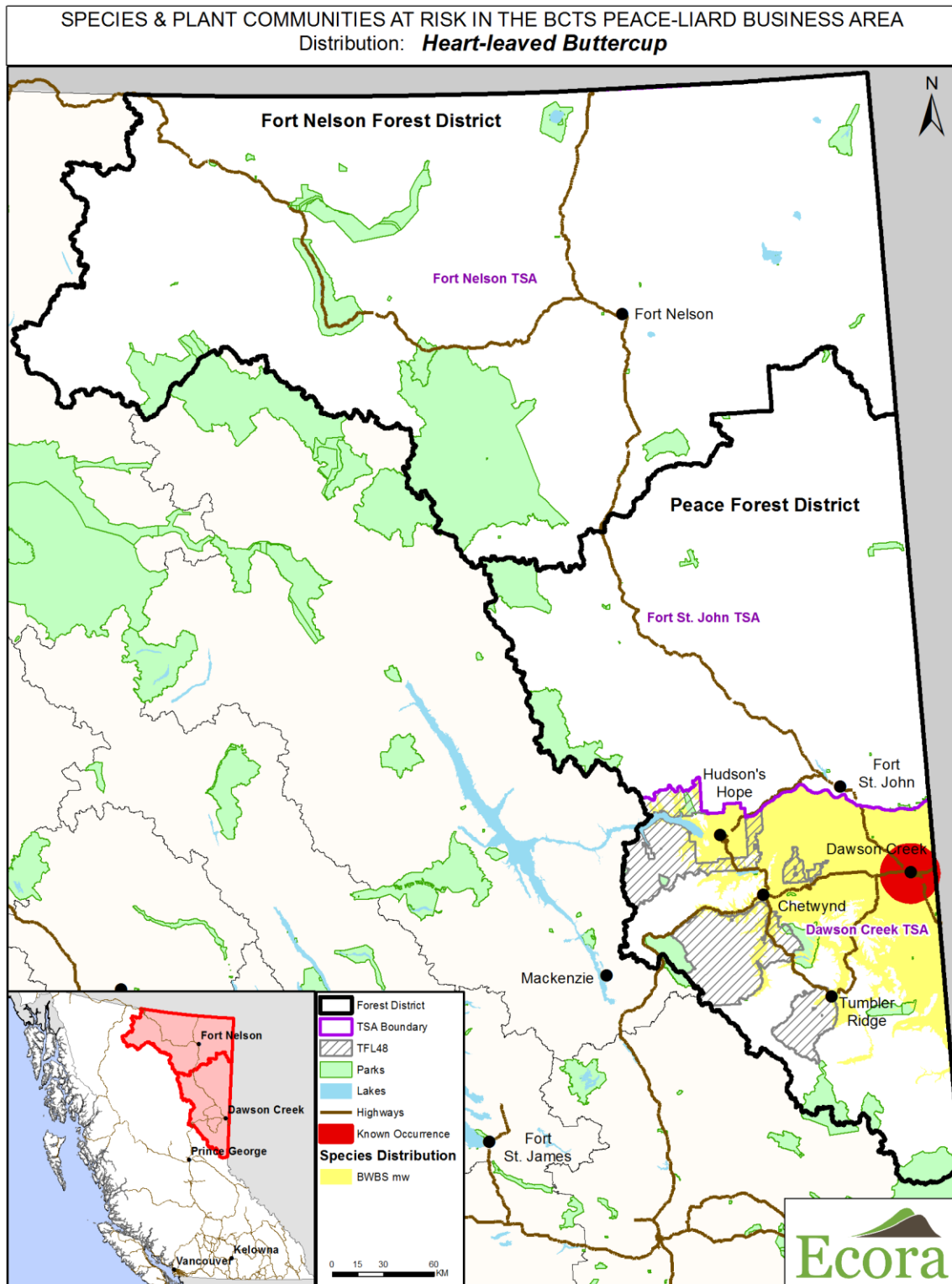
Further Information and Links:

B.C. Conservation Data Centre. 2011. Species Summary: *Ranunculus cardiophyllus*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Douglas, G.W., D. Meidinger, and J. Penny. 2002. Rare Native Vascular Plants of British Columbia, 2nd ed. B.C. Conserv. Data Centre, Terrestrial Inf. Branch, Victoria.

Douglas, G.W., D. Meidinger, and J. Pojar, eds. 2001b. Illustrated Flora of British Columbia, Vol. 4, Monocotyledons (Orchidaceae through Zosteraceae). B.C. Minist. Sustainable Resour. Manage., and B.C. Minist. For. Victoria, BC.

E-Flora BC: Electronic Atlas of the Plants of British Columbia:
<http://linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Ranunculus+cardiophyllus>



Long-Leaved Mugwort

Artemisia longifolia

Kingdom	Phylum	Class	Order	Family	Genus	Species
Plantae	Anthophyta	Dicotyledoneae	Asterales	Asteraceae	Artemisia	longifolia

Description

General: The long-leaved mugwort is a perennial herb growing from 20-80 cm in height. Stems are clustered and erect, coming from a woody base. Leaves (mainly on stem) are entire and covered with dense white hairs on the underside but are usually smooth on top. Sometimes lower leaves may be lobed or toothed at the base. Groups of many small (4-5 mm tall) flowers are present in branched clusters. Bracts are lance to egg-shaped with very fine hairs.



Status:

Global: G5

Canada:

Provincial: S2 – Red

Distribution

BEC Units: BWBSmw

Forest District: Peace District, TFL 48

Known Locations: In British Columbia it is found in the Peace River drainage near the Alberta border as well as along the Kiskatinaw River and near the Old Alaska highway bridge.

Habitat

Mesic streambanks and terraces are suitable locations for the establishment of the long-leaved mugwort.

Threats and Concerns

The main threats to this species are oil and gas exploration and development, mining, forest harvesting, and road construction, which may occur in or adjacent to preferred habitat. As this species also occurs along streambanks, this may help to reduce the likelihood of it being affected by commercial activities. However, the flooding of watercourses could also cause a loss or alteration of habitat in these areas.

Best Management Practices

Current management guidelines for plant species at risk are focused at the stand level. If a potential plant species at risk is located, it is recommended that the area have ribbon placed around it, photos taken and field cards filled out with the exact location recorded. This information should then be passed on to the designated species at risk coordinator.

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- if seeding occurs, use native species (prevent spread of exotic plant species)

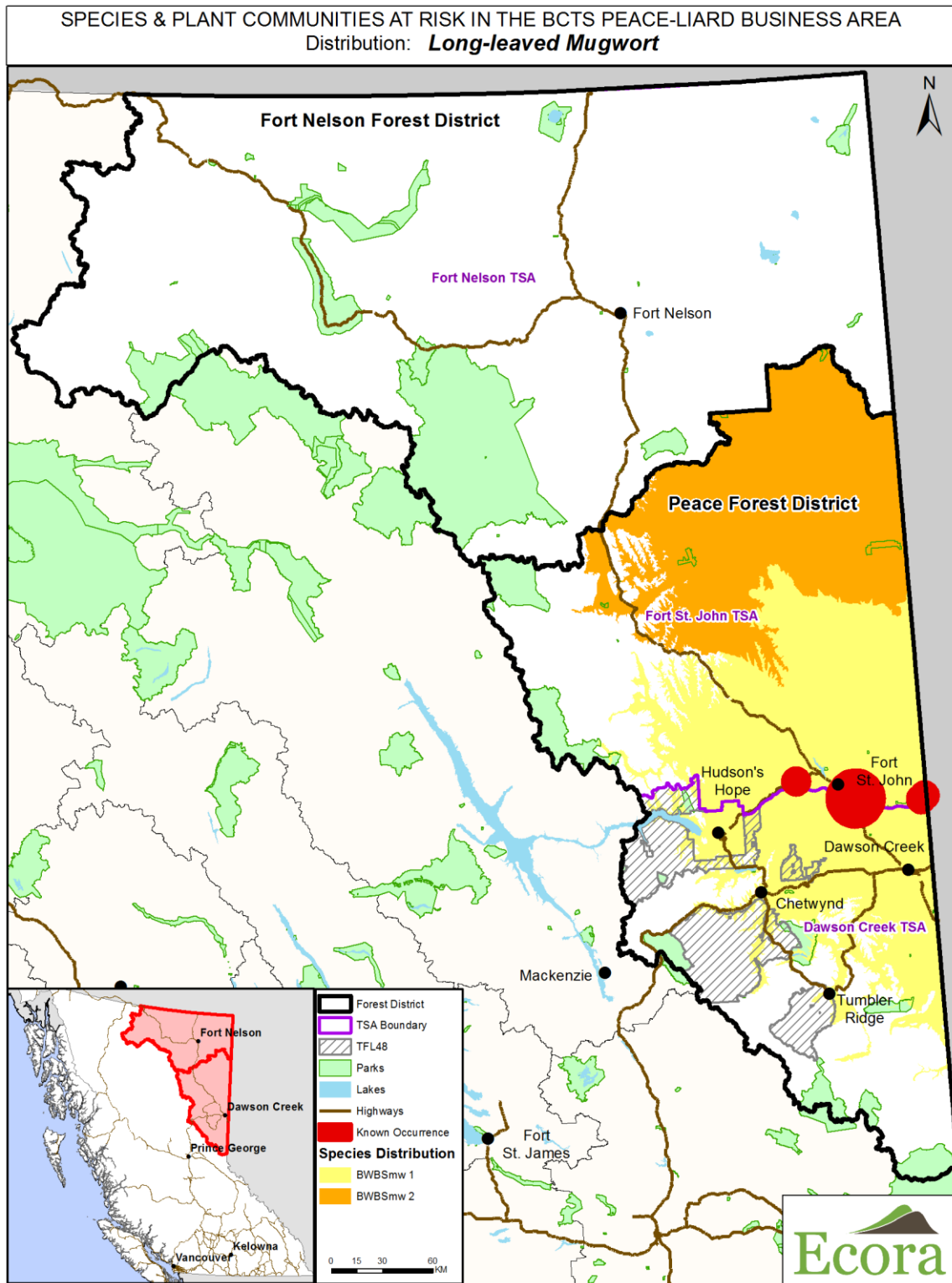
Further Information and Links:

B.C. Conservation Data Centre. 2011. Species Summary: *Artemisia longifolia*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Douglas, G.W., D. Meidinger, and J. Penny. 2002. Rare Native Vascular Plants of British Columbia, 2nd ed. B.C. Conserv. Data Centre, Terrestrial Inf. Branch, Victoria.

Douglas, G.W., D. Meidinger, and J. Pojar, eds. 2001b. Illustrated Flora of British Columbia, Vol. 1, Monocotyledons (Orchidaceae through Zosteraceae). B.C. Minist. Sustainable Resour. Manage., and B.C. Minist. For. Victoria, BC.

E-Flora BC: Electronic Atlas of the Plants of British Columbia:
<http://linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Artemisia+longifolia>



Marsh Fleabane

Senecio congestus

Kingdom	Phylum	Class	Order	Family	Genus	Species
Plantae	Anthophyta	Dicotyledoneae	Asterales	Asteraceae	Senecio	congestus

Description

General: Marsh fleabane is an annual or biennial herb growing up to 1.2 m tall. Stems are solitary and erect with long yellowish (sometimes whitish) hairs. Basal leaves are nearly entire to pinnately toothed or lobed and are narrowly oblanceolate or oblong to elliptic shaped. Stem leaves are pinnately lobed to irregularly toothed and oblong to lanceolate in shape. Yellow ray and disk flowers exist in a rounded cluster. Bracts are green to yellow in color and are smooth or have long or woolly yellow hairs.

Status:

Global: G5

Canada:

Provincial: S1S3 – Red

Distribution

BEC Units: BWBSdk, BWBSmw

Forest District: Fort Nelson District, Peace District, TFL 48

Known Locations: In British Columbia it is found only in Warm Bay, at Mile 581 of the Alaska Highway and one occurrence in the Peace River area near the Alberta border.



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Habitat

Moist to wet lakeshores, marshes, ponds and streambanks in the montane zone.

Threats and Concerns

The main threats to this species are changes to watercourses or hydrological processes caused by development but due to the remote location of these plants threats by human activity are probably low.

Best Management Practices

Current management guidelines for plant species at risk are focused at the stand level. If a potential plant species at risk is located, it is recommended that the area have ribbon placed around it, photos taken and field cards filled out with the exact location recorded. This information should then be passed on to the designated species at risk coordinator.

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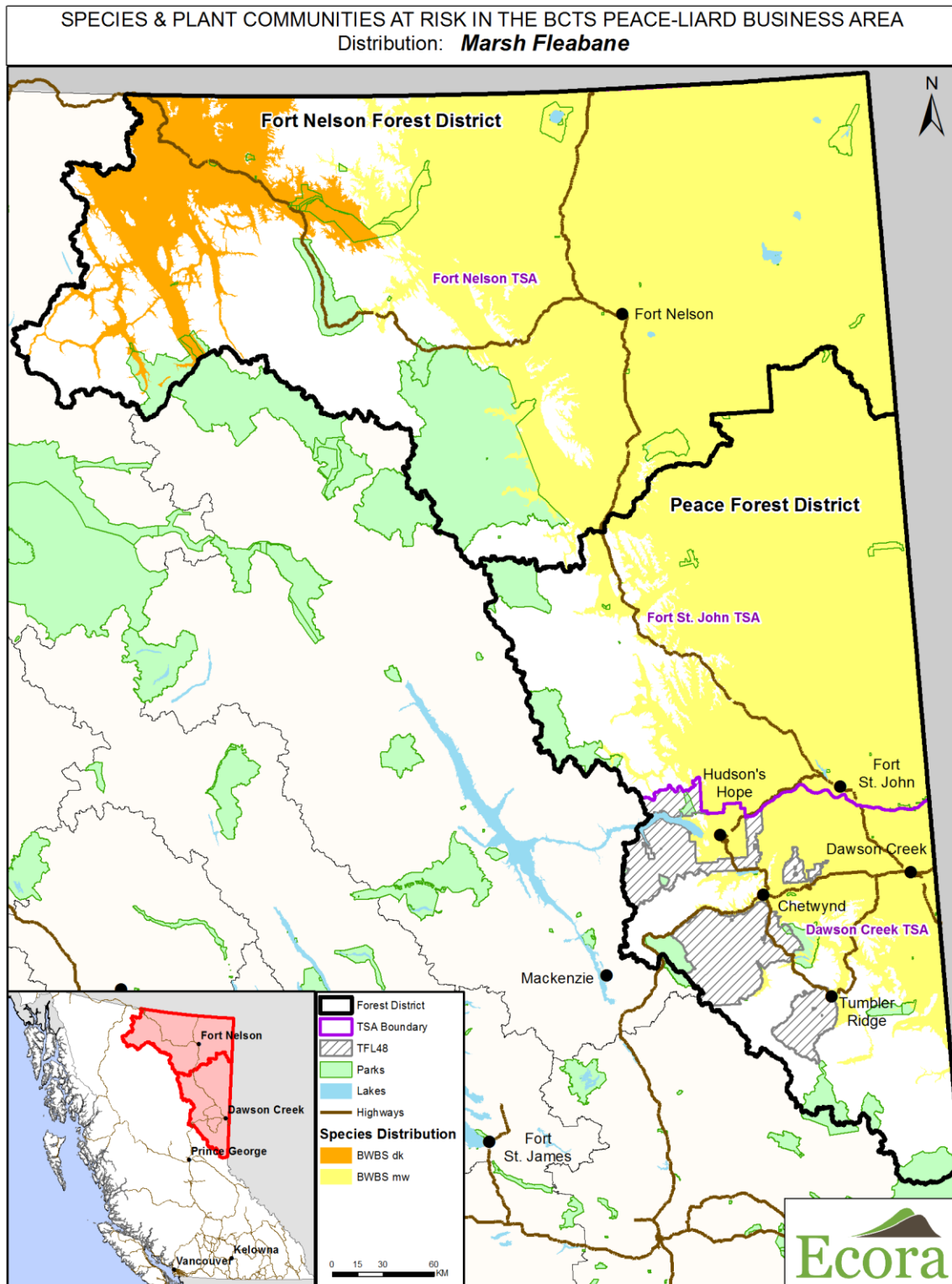
Further Information and Links:

B.C. Conservation Data Centre. 2011. Species Summary: *Tephroseris palustris*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Douglas, G.W., D. Meidinger, and J. Penny. 2002. Rare Native Vascular Plants of British Columbia, 2nd ed. B.C. Conserv. Data Centre, Terrestrial Inf. Branch, Victoria.

Douglas, G.W., D. Meidinger, and J. Pojar, eds. 2001b. Illustrated Flora of British Columbia, Vol. 1, Monocotyledons (Orchidaceae through Zosteraceae). B.C. Minist. Sustainable Resour. Manage., and B.C. Minist. For. Victoria, BC.

E-Flora BC: Electronic Atlas of the Plants of British Columbia:
<http://linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Senecio+congestus>



Northern Swamp Willowherb

Epilobium davuricum

Kingdom	Phylum	Class	Order	Family	Genus	Species
Plantae	Anthophyta	Dicotyledoneae	Myrtales	Onagraceae	Epilobium	davuricum

Description

General: Northern swamp willowherb is a perennial herb reaching 20 cm in height. Its erect stem originates from a short rhizome. Stems are simple, single or few and green or reddish in color. Basal leaves are blunt, oblong to elliptical shaped and arranged in a compact rosette. Stem leaves are linear, flat, blunt, opposite below and alternate above, with margins fringed with hairs. Leaves are often sharply toothed. Clusters of flowers are drooping when young. Flowers have whitish petals that are 4-5 mm long.

Status:

Global: G5

Canada:

Provincial: S1S3 – Red

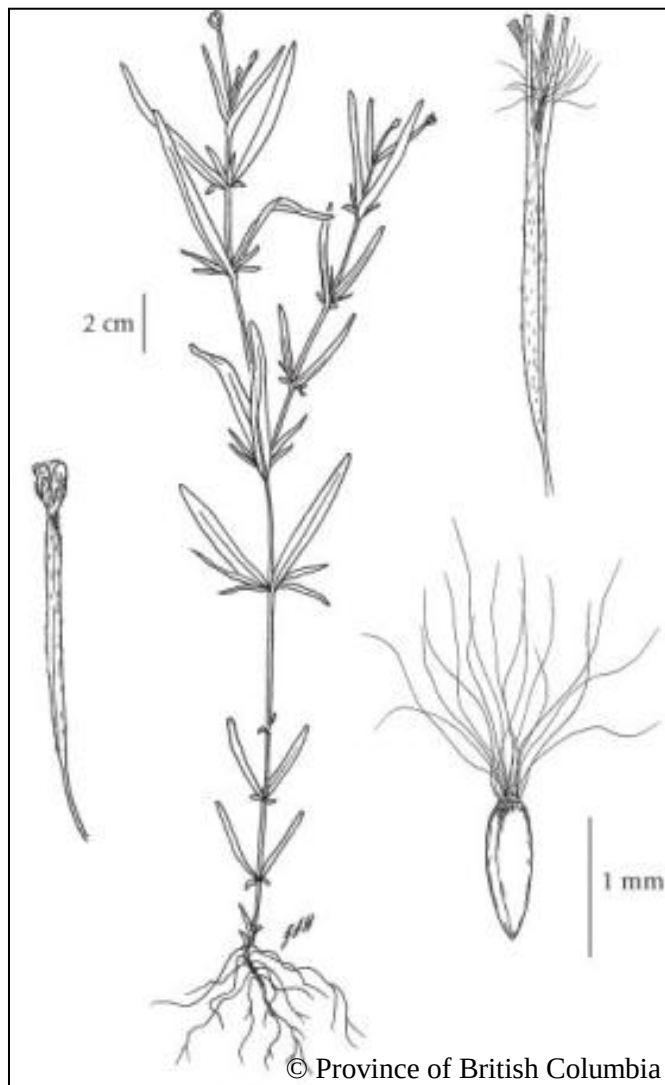
Distribution

BEC Units: BAFA, SWB

Forest District: Fort Nelson District

Known Locations: In British Columbia it is rare in the north and southeast portions of the province.

Found in the Selkirk Mountains and the Spatsizi Plateau of northern BC.



Habitat

Bogs and wet meadows in the montane and subalpine zones.

Threats and Concerns

The main threats to this species are oil and gas exploration and development, mining, which may occur in or adjacent to preferred habitat. But due to the remote location of this species threats due to human activity could be considered low.

Best Management Practices

Current management guidelines for plant species at risk are focused at the stand level. If a potential plant species at risk is located, it is recommended that the area have ribbon placed around it, photos taken and field cards filled out with the exact location recorded. This information should then be passed on to the designated species at risk coordinator.

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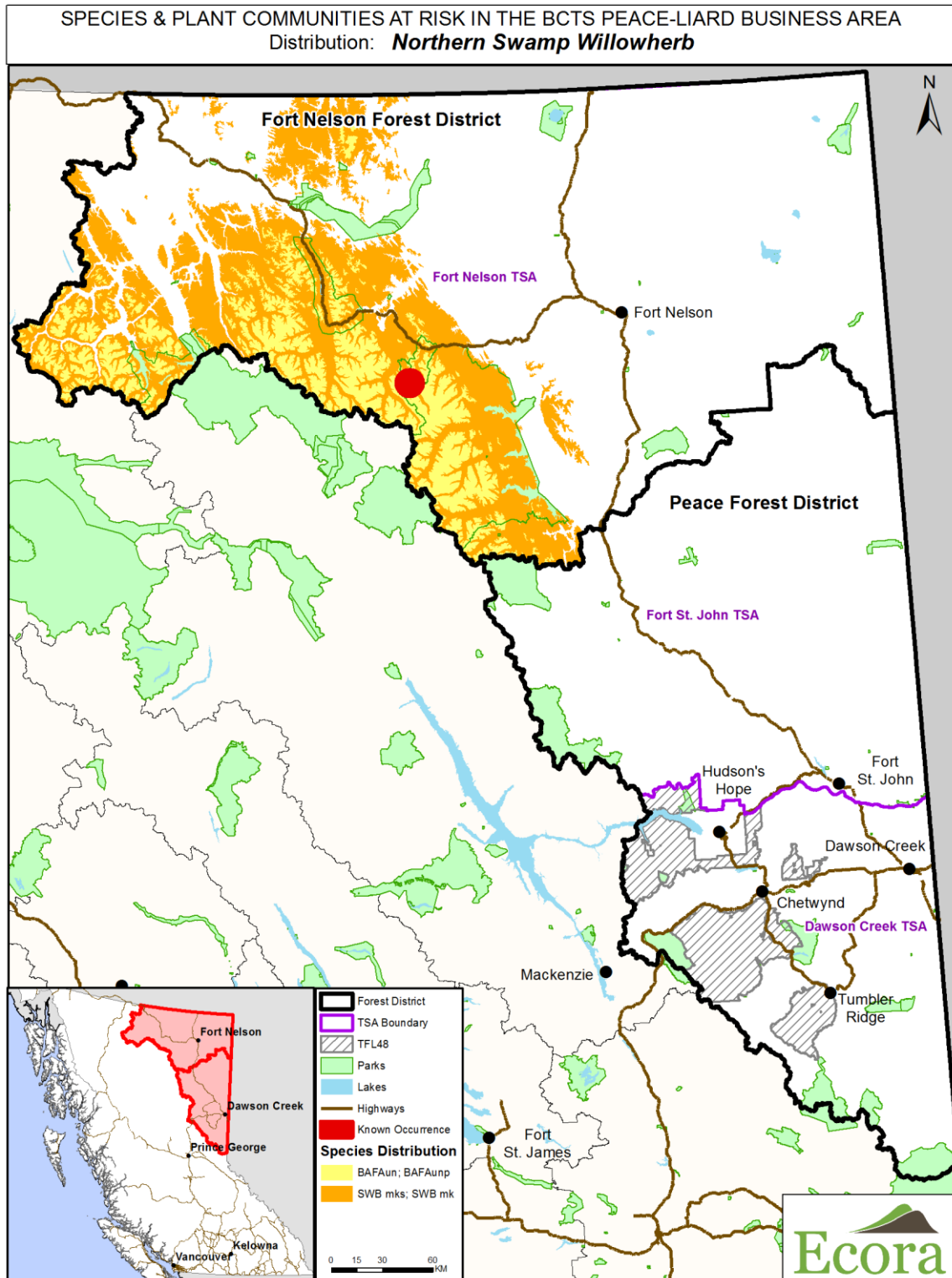
Further Information and Links:

B.C. Conservation Data Centre. 2011. Species Summary: *Epilobium davuricum*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Douglas, G.W., D. Meidinger, and J. Penny. 2002. Rare Native Vascular Plants of British Columbia, 2nd ed. B.C. Conserv. Data Centre, Terrestrial Inf. Branch, Victoria.

Douglas, G.W., D. Meidinger, and J. Pojar, eds. 2001b. Illustrated Flora of British Columbia, Vol. 3, Monocotyledons (Orchidaceae through Zosteraceae). B.C. Minist. Sustainable Resour. Manage., and B.C. Minist. For. Victoria, BC.

E-Flora BC: Electronic Atlas of the Plants of British Columbia:
<http://linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Epilobium+davuricum>



Nuttall's Sunflower

Helianthus nuttallii var. *nuttallii*

Kingdom	Phylum	Class	Order	Family	Genus	Species
Plantae	Anthophyta	Dicotyledoneae	Asterales	Asteraceae	Helianthus	nuttallii

Description

General: Nuttall's sunflower is a perennial herb that ranges from 0.6 m to 2 m tall. Stems are simple or few, erect, hairless or with few hairs below the flower cluster. Basal leaves are absent. Upper leaves are alternate and lower leaves are opposite. Leaves are lance to linear shaped with a short stalk. There is an absence of basal leaves. Flowers are solitary to few at the terminal end of the stem and are composed of ray and disk flowers. Disk flowers are yellow with a convex to low-conic receptacle. Flower bracts are loose with fine hairs on the margins. The dry fruits are without hairs and are moderately compressed.

Status:

Global: G5T5

Canada:

Provincial: S1 – Red

Distribution

BEC Units: BWBSmw, SBSwk

Forest District: Peace District, TFL 48

Known Locations: In the Peace District, it is found near the Peace River close to the Alberta border. In British Columbia it is found naturally in several widely scattered locations in the eastern portion of the province.



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Habitat

Moist to wet meadows and fields in the steppe and lowland zones.

Threats and Concerns

The main threats to this species are oil and gas exploration and development, mining, forest harvesting, and road construction, which may occur in or adjacent to preferred habitat.

Best Management Practice

Current management guidelines for plant species at risk are focused at the stand level. If a potential plant species at risk is located, it is recommended that the area have ribbon placed around it, photos taken and field cards filled out with the exact location recorded. This information should then be passed on to the designated species at risk coordinator.

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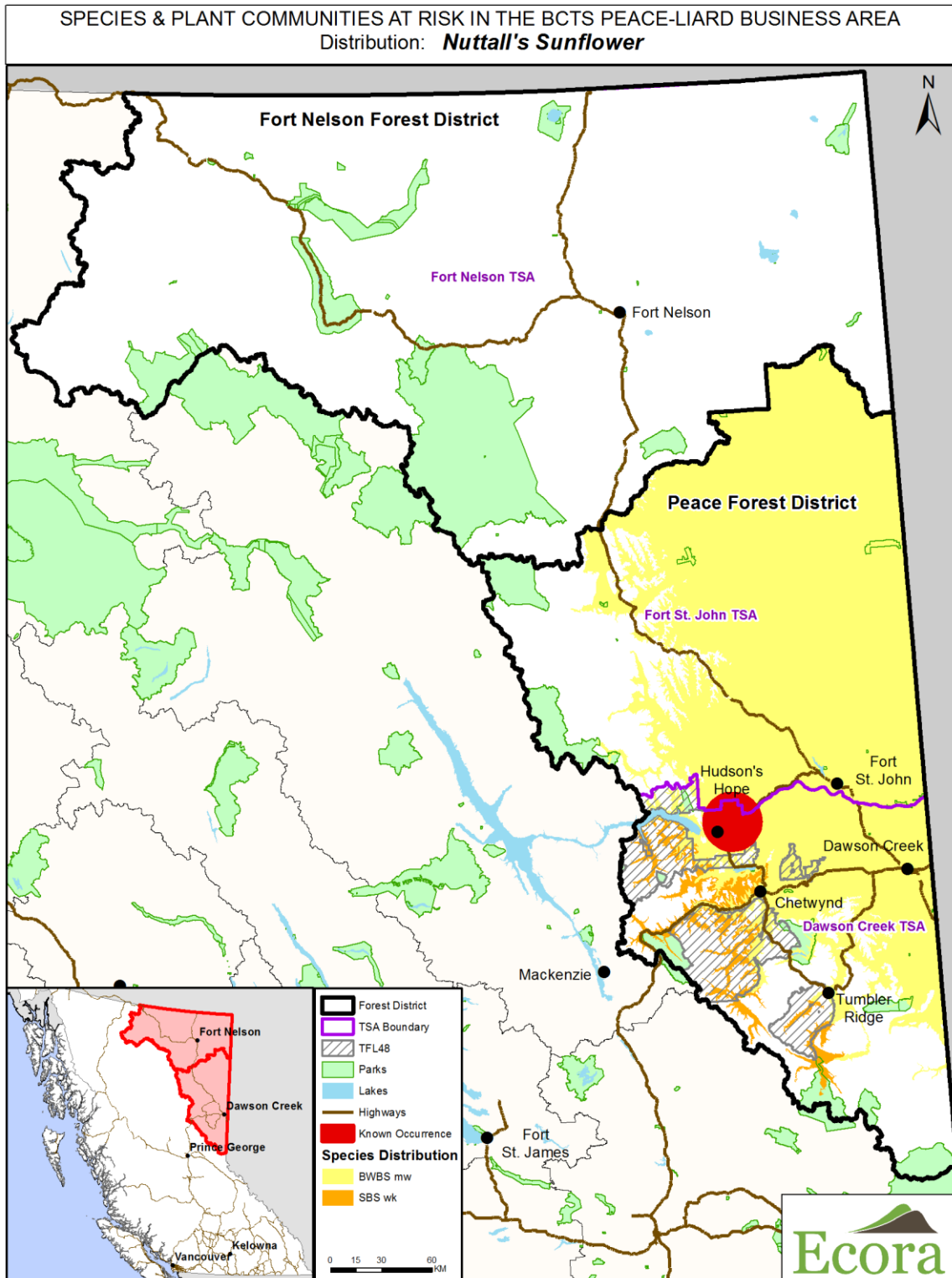
Further Information and Links:

B.C. Conservation Data Centre. 2011. Species Summary: *Helianthus nuttallii* ssp. *rydbergii*.
B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Douglas, G.W., D. Meidinger, and J. Penny. 2002. Rare Native Vascular Plants of British Columbia, 2nd ed. B.C. Conserv. Data Centre, Terrestrial Inf. Branch, Victoria.

Douglas, G.W., D. Meidinger, and J. Pojar, eds. 2001b. Illustrated Flora of British Columbia, Vol. 1, Monocotyledons (Orchidaceae through Zosteraceae). B.C. Minist. Sustainable Resour. Manage., and B.C. Minist. For. Victoria, BC.

E-Flora BC: Electronic Atlas of the Plants of British Columbia:
<http://linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Helianthus+nuttallii%20var.%20nuttallii>



Pink Campion

Silene repens

Kingdom	Phylum	Class	Order	Family	Genus	Species
Plantae	Anthophyta	Dicotyledoneae	Caryophyllales	Caryophyllaceae	Silene	repens

Description

General: Pink campion is a perennial originating from a branched stem-base and a short rhizome growing to 35 cm tall. Stems are tufted and often matted, erect, several, simple or branched, and densely crinkled-hairy. Basal leaves are linear to narrowly lance-shaped, 2-6 cm long, 2-6 mm wide and mostly deciduous by flowering time. Stem leaves are opposite, in pairs of 2-6, about the same size as the basal leaves, slightly hairy and lack stipules. Flowers are in a contracted cluster of usually 2-15 flowers. Flowers have 5 white to pink or occasionally purple petals, are stalk-like at the bases, and have 2-lobed blades up to 7 mm long. Sepals are white to usually pink or purple and united, forming a tube 10-15 mm long.



Status:

Global: G5

Canada:

Provincial: S1S3 – Red

Distribution

BEC Units: BAFA, BWBSmw

Forest District: Fort Nelson District

Known Locations: This plant is rare in northeastern BC and is known only from Nevis Creek and Toad Mountain areas.

Habitat

The pink campion is found in dry meadows and open forests from the montane to alpine zones and typically in areas of poor soil nutrient regimes.

Threats and Concerns

The main threats to this species are oil and gas exploration and development, mining, forest harvesting, and road construction, which may occur in or adjacent to preferred habitat. Threats due to human activity are probably low when located in remote alpine habitats.

Best Management Practices

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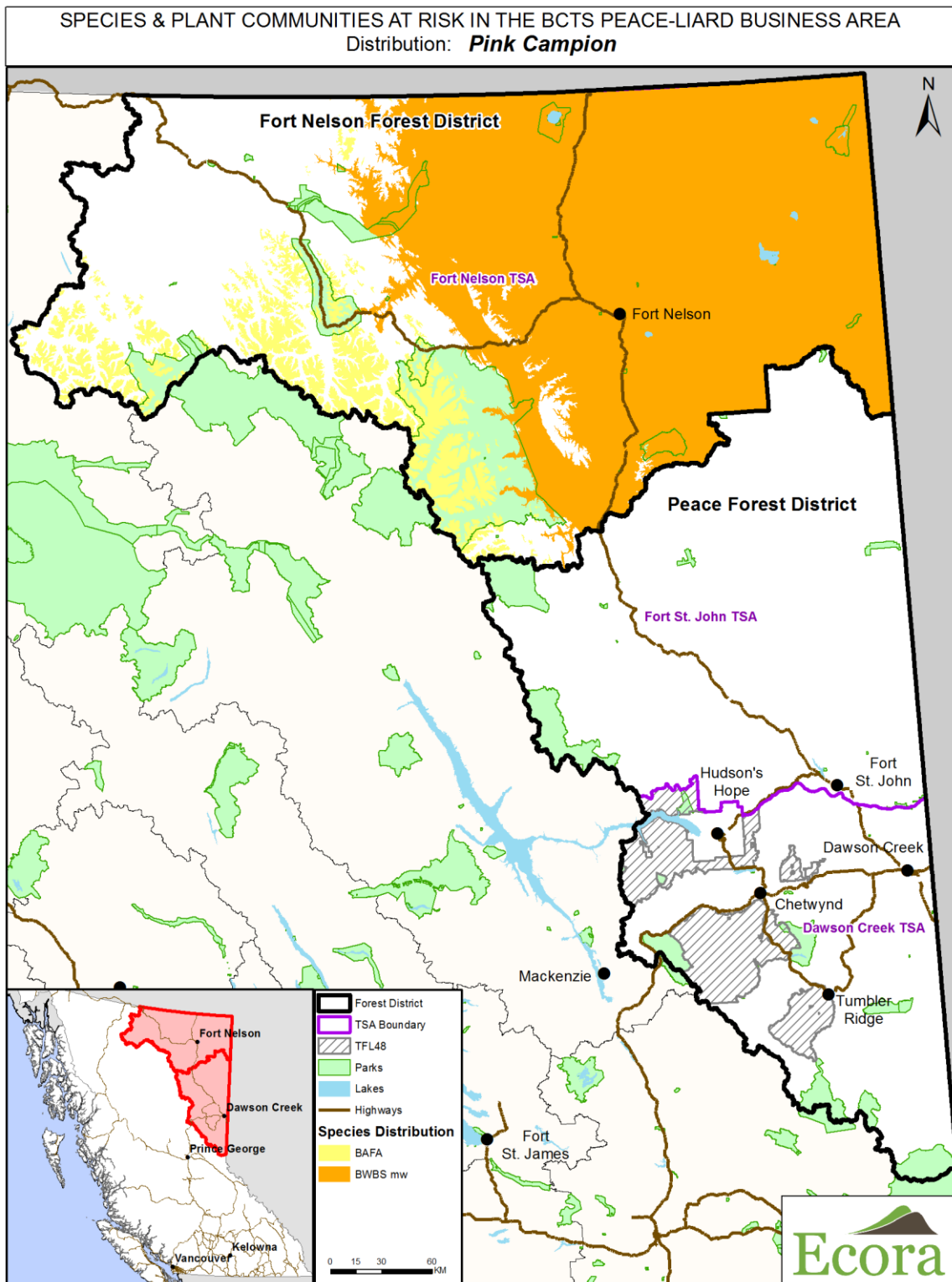
Further Information and Links:

B.C. Conservation Data Centre. 2011. Species Summary: *Silene repens*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Douglas, G.W., D. Meidinger, and J. Penny. 2002. Rare Native Vascular Plants of British Columbia, 2nd ed. B.C. Conserv. Data Centre, Terrestrial Inf. Branch, Victoria.

Douglas, G.W., D. Meidinger, and J. Pojar, eds. 2001b. Illustrated Flora of British Columbia, Vol. 2, Monocotyledons (Orchidaceae through Zosteraceae). B.C. Minist. Sustainable Resour. Manage., and B.C. Minist. For. Victoria, BC.

E-Flora BC: Electronic Atlas of the Plants of British Columbia:
<http://linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Silene+repens>



Prairie Buttercup

Ranunculus rhomboideus

Kingdom	Phylum	Class	Order	Family	Genus	Species
Plantae	Anthophyta	Dicotyledoneae	Ranunculales	Ranunculaceae	Ranunculus	rhomboideus

Description

General: Prairie buttercup is a perennial herb reaching 25 cm in height. Stems are erect, singular to several, usually with long, soft hairs when young becoming smooth with age. Basal leaves are undivided, egg to diamond-shaped, have entire, wedge-shaped bases, rounded tips, are shallowly round-toothed and have long stalks. Stem leaves are fan-shaped, unstalked and divided into 3-5 lance-shaped segments. Flowers have 5 distinct, yellow petals which are egg-shaped. The dry, single-seeded fruits are numerous, smooth and exist in a globular or semiglobular cluster.



© Derek Anderson

Status:

Global: G5

Canada:

Provincial: S1 – Red

Distribution

BEC Units: BWBSmw

Forest District: Peace District, TFL 48

Known Locations: In British Columbia it is found only around the Peace River region.

Habitat:

Dry thickets, grasslands and open forests in the montane zone.

Threats and Concerns

The main threats to this species are oil and gas exploration and development, mining, forest harvesting, and road construction, which may occur in or adjacent to preferred habitat.

Best Management Practices

Current management guidelines for plant species at risk are focused at the stand level. If a potential plant species at risk is located, it is recommended that the area have ribbon placed around it, photos taken and field cards filled out with the exact location recorded. This information should then be passed on to the designated species at risk coordinator.

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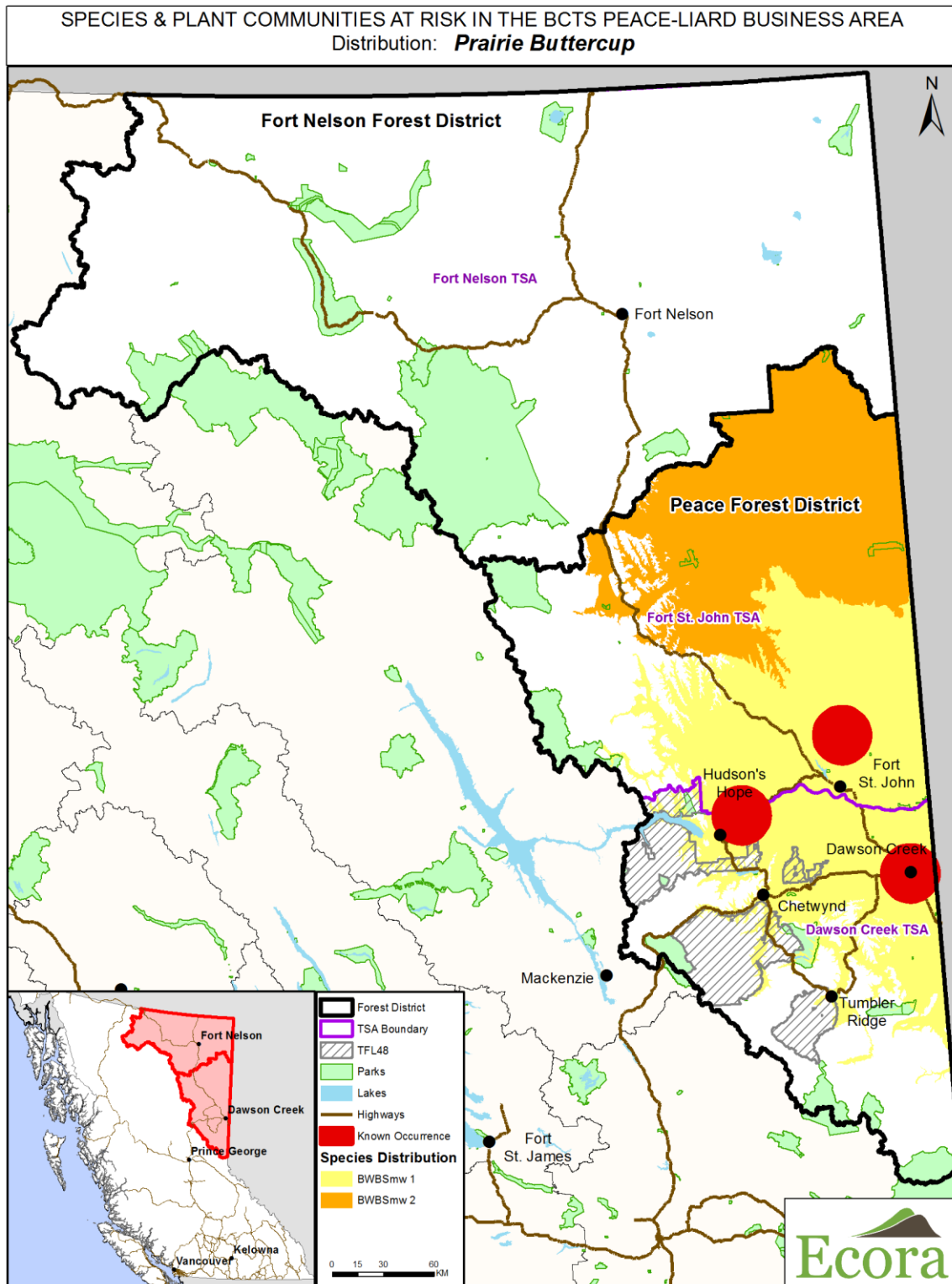
Further Information and Links:

B.C. Conservation Data Centre. 2011. Species Summary: *Ranunculus rhomboideus*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

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E-Flora BC: Electronic Atlas of the Plants of British Columbia:
<http://linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Ranunculus+rhomboideus>



Purple Rattlesnake-Root

Prenanthes racemosa ssp. Multiflora

Kingdom	Phylum	Class	Order	Family	Genus	Species
Plantae	Anthophyta	Dicotyledoneae	Asterales	Asteraceae	Prenanthes	racemosa

Description

General: Purple rattlesnake-root is a perennial herb reaching 1.2 m in height. Stems are solitary, erect, smooth below and soft-hairy above. It is usually purple in color and releases a milky juice when broken. Basal leaves are smooth, elliptic or egg to oblanceolate shaped, and blades are toothed to entire. Middle and lower stem leaves have winged stalks, possibly becoming unstalked. Flowers are strap-shaped and numerous in a spike-like cluster. Flowers are pink or purplish in color. The dry, one-seeded fruits are smooth and cylinder shaped.

Status:

Global: G5

Canada:

Provincial: SH – Red

Distribution

BEC Units: BWBSmw

Forest District: Peace District, TFL 48

Know Locations: In British Columbia it is found only around Dawson Creek and Pouce Coupe.



© Derek Anderson

Habitat

Dry grassy slopes in the montane zone.

Threats and Concerns

The main threats to this species are oil and gas exploration and development, mining, forest harvesting, and road construction, which may occur in or adjacent to preferred habitat.

Best Management Practices

Current management guidelines for plant species at risk are focused at the stand level. If a potential plant species at risk is located, it is recommended that the area have ribbon placed around it, photos taken and field cards filled out with the exact location recorded. This information should then be passed on to the designated species at risk coordinator.

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Further Information and Links:

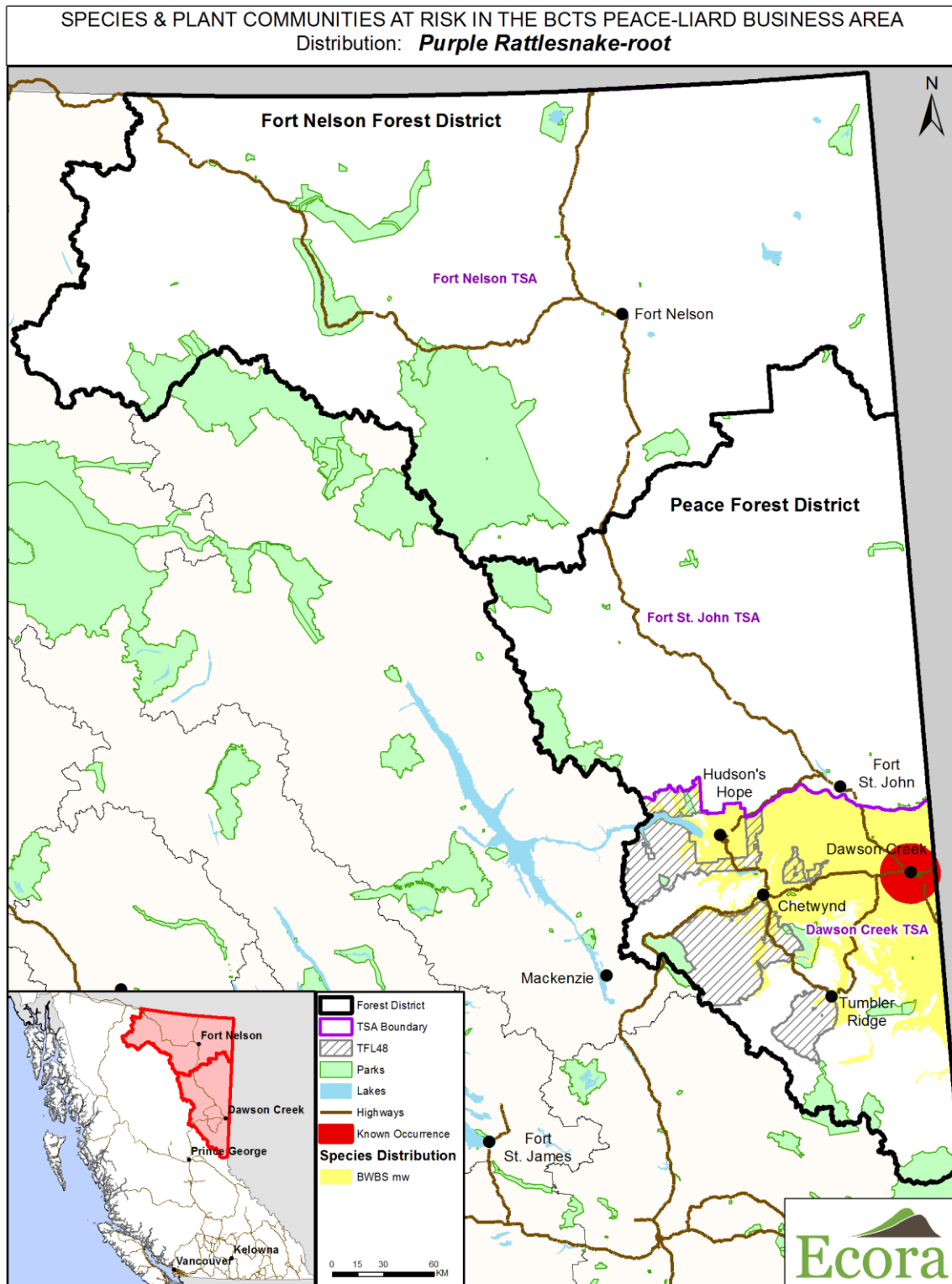
B.C. Conservation Data Centre. 2011. Species Summary: *Prenanthes racemosa*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

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Douglas, G.W., D. Meidinger, and J. Pojar, eds. 2001b. Illustrated Flora of British Columbia, Vol. 1, Monocotyledons (Orchidaceae through Zosteraceae). B.C. Minist. Sustainable Resour. Manage., and B.C. Minist. For. Victoria, BC.

E-Flora BC: Electronic Atlas of the Plants of British Columbia:

<http://linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Prenanthes+racemosa%20ssp.%20multiflora>



Raup's Willow

Salix raupii

Kingdom	Phylum	Class	Order	Family	Genus	Species
Plantae	Anthophyta	Dicotyledoneae	Salicales	Salicaceae	Salix	raupii

Description

General: The Raup's willow is a non-colonial shrub with male and female flowers on separate plants. Branches lack hairs. Leaves are alternate and elliptical with entire margins and pointed tips. The lower surfaces of the leaves are covered with short soft hairs. The unisexual flowers are borne from stout catkins on leafy twigs, and lack sepals and petals. The flowers contain two stamens, one smooth or hairy ovary, and 0.6-0.8 mm long styles. The floral bracts can be light brown or tawny colored.

Status:

Global: G2

Canada:

Provincial: S1 – Red

Distribution

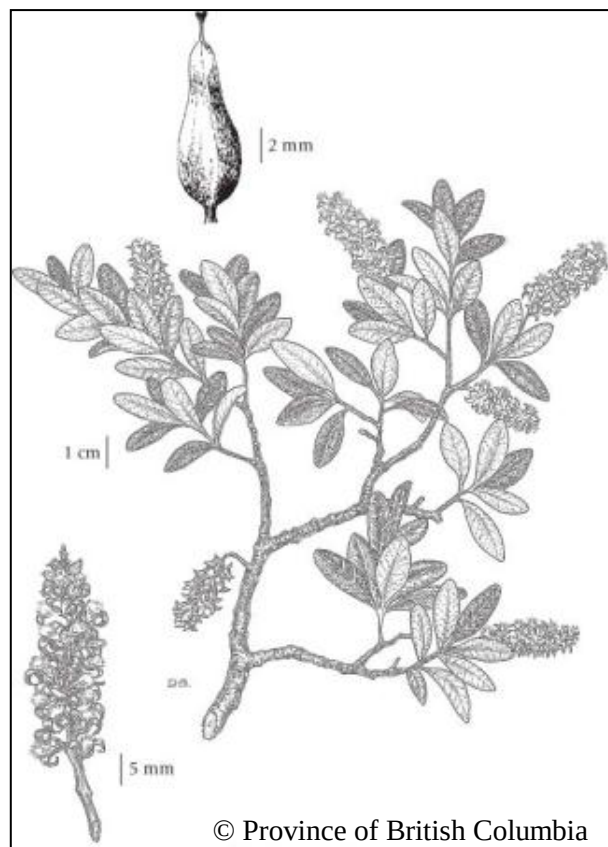
BEC Units: BWBSdk, BWBSmw, SWBmk, SWBun

Forest District: Fort Nelson District

Known Locations: In northern British Columbia it is found in several scattered areas. Two areas are west of Fort Nelson and the third is east of Dease Lake.

Habitat

This plant is typically found in moist brushy areas, open forests and gravel floodplains in the montane zone.



Threats and Concerns

The main threats to this species are oil and gas exploration, mining, forest harvesting, and road construction, which may occur in or adjacent to preferred habitat. As this species also occurs along stream banks and gravel bars, this may help to reduce the likelihood of it being affected by commercial activities. Changes in hydrological processes would affect the species in areas adjacent to watercourses. While clearcuts and roadsides can provide suitable germination sites, vegetation management often limits the ability for seedling establishment for long time frames.

Best Management Practices

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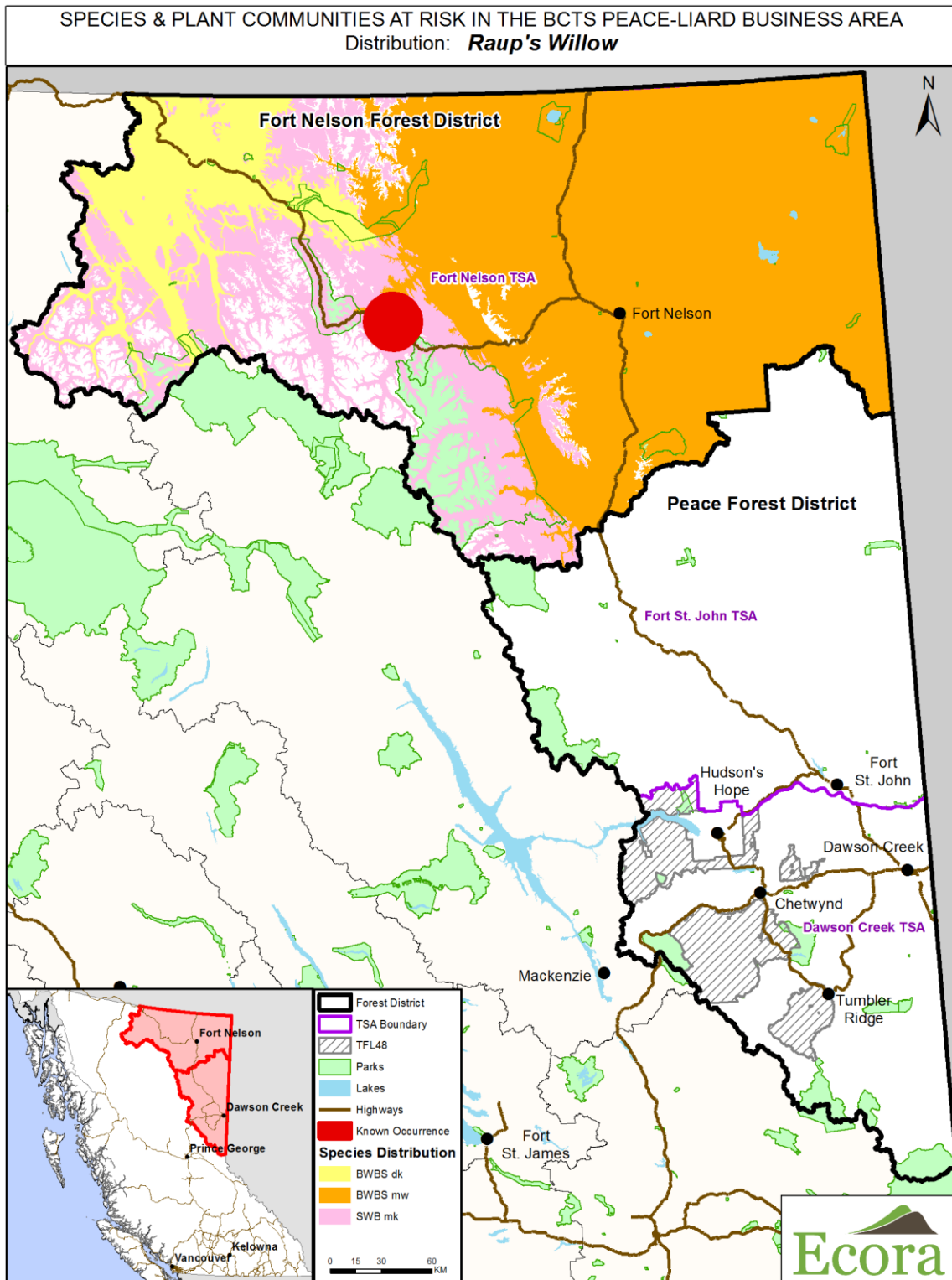
B.C. Conservation Data Centre. 2011. Species Summary: *Salix raupii*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

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E-Flora BC: Electronic Atlas of the Plants of British Columbia:
<http://linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Salix+raupii>

Proulx, G., D. Bernier, and K. Green. 2006. Accounts for Species and Plant Communities at Risk in the Fort Nelson Forest District. Unpublished report. Alpha Wildlife Research & Management Ltd., Sherwood Park, Alta., And Timberline Natural Resource Group Ltd., Dawson Creek, BC.



Riverbank Anemone

Anemone virginiana var. cylindroidea

Kingdom	Phylum	Class	Order	Family	Genus	Species
Plantae	Anthophyta	Dicotyledoneae	Ranunculales	Ranunculaceae	Anemone	virginiana

Description

General: The riverbank anemone is a perennial herb with erect stems growing from a woody stem-base without rhizomes. One to five palmate leaves grow from the base of the stem, and are 8 – 20 cm wide. Each leaf consists of three coarsely toothed sections that measure 2 – 9 cm long. The riverbank anemone has two to nine terminal flowers. The flowers do not have petals; instead, they usually have five sepals that are petal-like and range from white to greenish in color. The dry, single-seeded fruit are long hairy or densely woolly.

Status:

Global: G5T4T5

Canada:

Provincial: S1 - Red



© Jamie Fenneman

Distribution

BEC Units: BWBSmw

Forest District: Peace District, TFL 48

Known Locations: In the Peace region, it is found along the Beatton River approximately 10 km east of Fort St. John and in the Dawson Creek area.

Habitat

This plant is typically found in moist to mesic areas such as forests, gravel bars and stream banks.

Threats and Concerns

The main threats to this species are oil and gas exploration, mining, forest harvesting, and road construction, which may occur in or adjacent to preferred habitat. As this species also occurs along stream banks and gravel bars, this may help to reduce the likelihood of it being affected by commercial activities. Changes in hydrological processes would affect the species in riparian areas.

Best Management Practices

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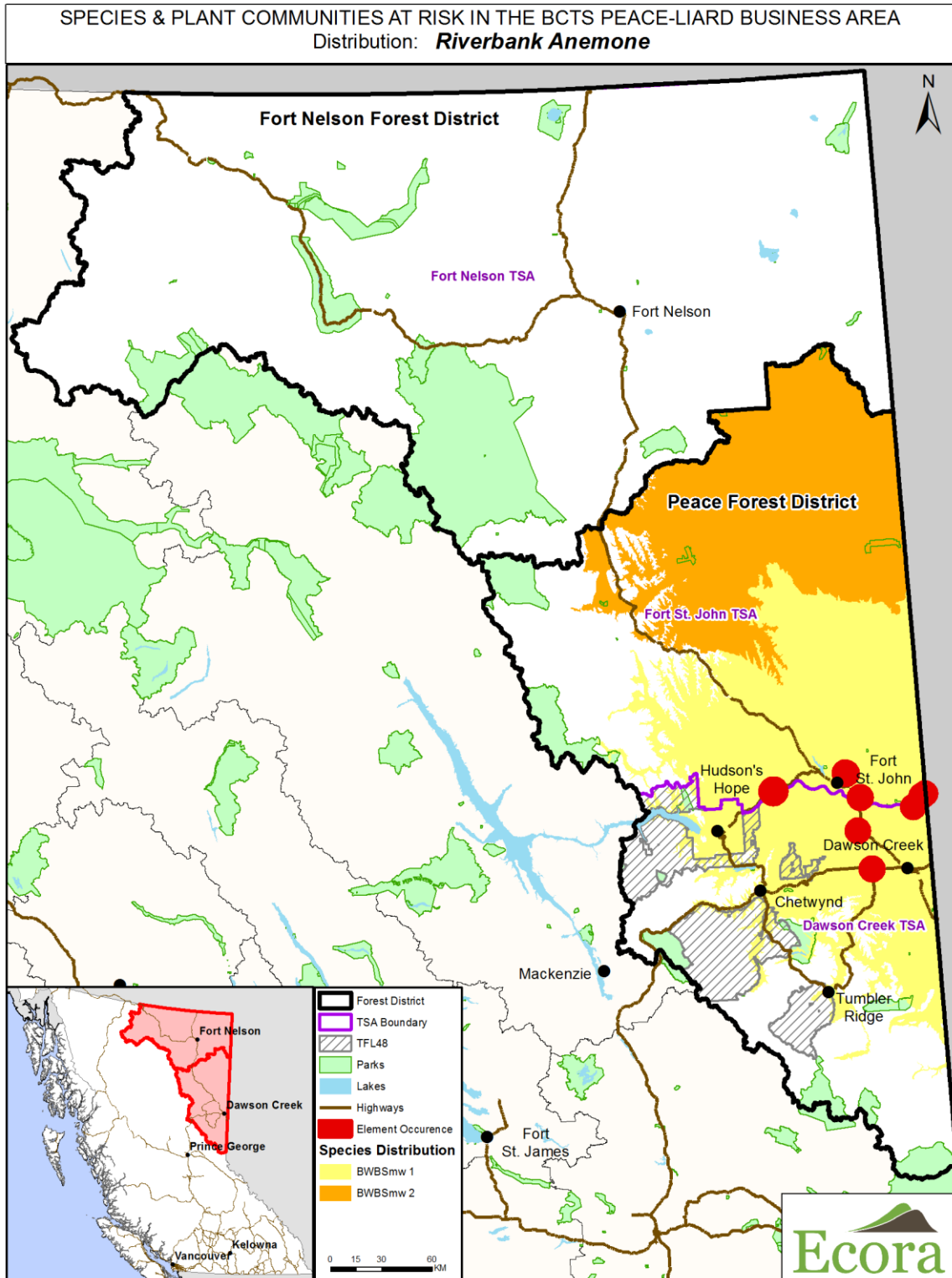
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Further Information and Links:

- B.C. Conservation Data Centre. 2011. Species Summary: *Anemone virginiana* var. *cylindroidea*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>
- Bernier, D. and G. Proulx. 2008. Identification and Management of Species and Plant Communities at Risk: BC Timber Sales – Prince George Business Area - 2008. Alpha Wildlife Research & Management Ltd., Sherwood Park, Alta., And Timberline Natural Resource Group Ltd., Dawson Creek, BC.
- Douglas, G.W., D. Meidinger, and J. Penny. 2002. Rare Native Vascular Plants of British Columbia, 2nd ed. B.C. Conserv. Data Centre, Terrestrial Inf. Branch, Victoria.
- Douglas, G.W., D. Meidinger, and J. Pojar, eds. 2001b. Illustrated Flora of British Columbia, Vol. 4, Monocotyledons (Orchidaceae through Zosteraceae). B.C. Minist. Sustainable Resour. Manage., and B.C. Minist. For. Victoria, BC.
- E-Flora BC: Electronic Atlas of the Plants of British Columbia:
<http://linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Anemone+virginiana%20var.%20cylindroidea>



Seneca-Snakeroot

Polygala senega

Kingdom	Phylum	Class	Order	Family	Genus	Species
Plantae	Anthophyta	Dicotyledoneae	Polygalales	Polygalaceae	Polygala	senega

Description

General: Seneca-snakeroot is a perennial herb reaching 10 to 50 cm in height. Its several stems originate from a stout taproot and are ascending to erect and have very small hairs. Basal leaves are absent. Stem leaves are alternate, egg to lance-shaped, 1-3 cm long and have toothed margins. Flowers are in dense terminal clusters similar to grapes. Flowers have greenish-white color and have petals which are 4-5 mm wide.

Status:

Global: G4G5

Canada:

Provincial: SH – Red

Distribution

BEC Units: BWBSmw

Forest District: Peace District

Known Locations: In British Columbia it is found only in the Peace River area of the province.



© Tom Barnes (University of Kentucky)

Habitat

Mesic to moist grassy slopes in the montane zone.

Threats and Concerns

The main threats to this species are oil and gas exploration and development, mining, forest harvesting, and road construction, which may occur in or adjacent to preferred habitat.

Best Management Practices

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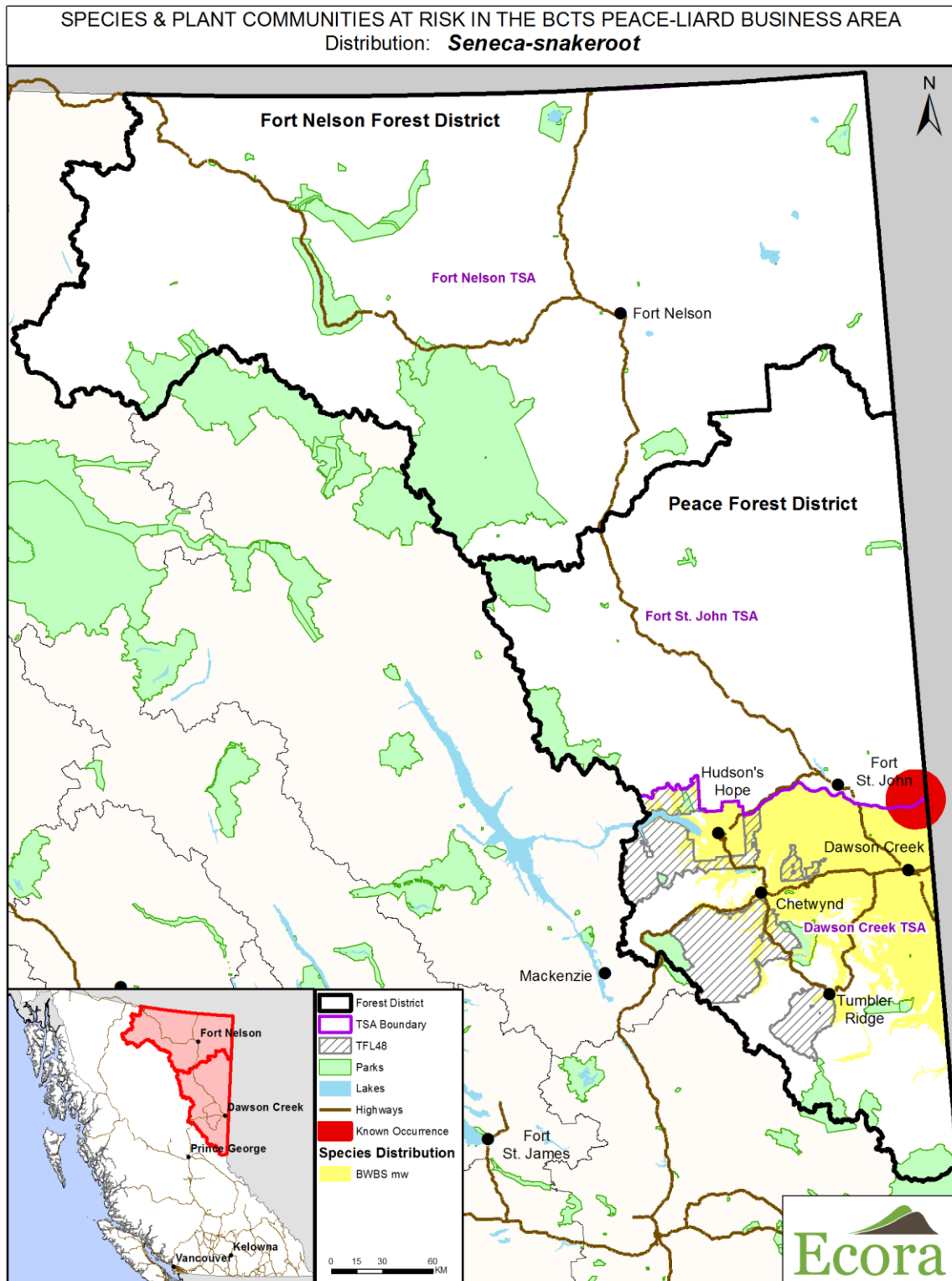
Further Information and Links:

B.C. Conservation Data Centre. 2011. Species Summary: *Polygala senega*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Douglas, G.W., D. Meidinger, and J. Penny. 2002. Rare Native Vascular Plants of British Columbia, 2nd ed. B.C. Conserv. Data Centre, Terrestrial Inf. Branch, Victoria.

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E-Flora BC: Electronic Atlas of the Plants of British Columbia:
<http://linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Polygala+senega>



Sickle – Pod Rockcress

Arabis sparsiflora

Kingdom	Phylum	Class	Order	Family	Genus	Species
Plantae	Anthophyta	Dicotyledoneae	Capparales	Brassicaceae	Arabis	sparsiflora

Description

General: The sickle-pod rockcress is a biennial or short-lived perennial herb growing to 1 m in height. Stems can be singular or in groups, and can be simple or branched. Stems are smooth towards the top, becoming hairy towards the bottom. Basal leaves have a rounded apex and tapering base and are situated in a rosette. Stem leaves are lance-shaped, have no stalks and are remotely or entirely toothed. Flowers are numerous, symmetric and white to purple in color.

Status:

Global: G5

Canada:

Provincial: S1 - Red

Distribution

BEC Units: BWBSmw

Forest District: Peace District, TFL 48

Known Locations: In British Columbia it is found in the northern/southern interior but is considered rare in south central and northeastern BC.

Habitat

This plant is found in previously disturbed areas, mesic to dry grasslands and on gravelly river banks and usually associated with areas of poor soil nutrient regimes.



© Werner Eigelsreiter

Threats and Concerns

The main threats to this species are oil and gas exploration and development, mining, forest harvesting, and road construction, which may occur in or adjacent to preferred habitat. As this species also occurs along gravelly river banks, this may help to reduce the likelihood of it being affected by commercial activities. However, the flooding of watercourses could also cause a loss or alteration of habitat in these areas.

Best Management Practices

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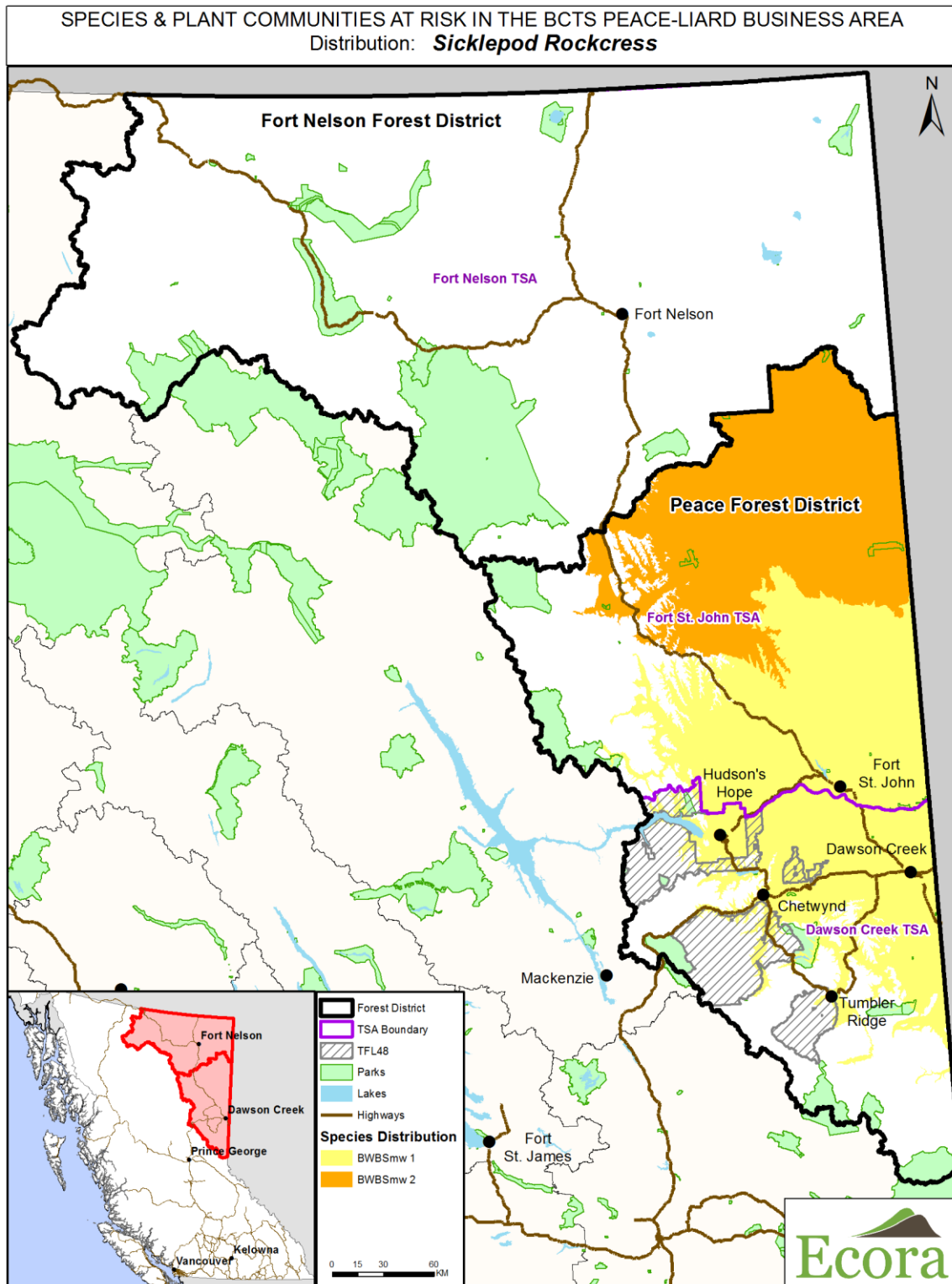
Further Information and Links:

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E-Flora BC: Electronic Atlas of the Plants of British Columbia:
<http://linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Arabis+sparsiflora>



Slender Penstemon

Penstemon gracilis

Kingdom	Phylum	Class	Order	Family	Genus	Species
Plantae	Anthophyta	Dicotyledoneae	Scrophulariales	Scrophulariaceae	Lomatium	foeniculaceum

Description

General: Slender penstemon is a perennial herb reaching 40 cm in height. Stems are ascending to erect, one to a few in number with gland-tipped hairs in the flower cluster and smooth-slightly hairy below. The lowermost stem and basal leaves are lance-elliptic shaped, with short stalks and usually with scattered short teeth. Stem leaves are opposite, smooth, almost or completely unstalked and linear to lance-shaped. The slender inflorescence has hairy stalks which are whitish in color. Flowers are in several whorls. The capsules and ovaries are smooth.

Status:

Global: G5

Canada:

Provincial: S2 – Red



Distribution

BEC Units: BWBSmw

Forest District: Peace District, TFL 48

Known Locations: In British Columbia it is found in the Peace River area of the province in the Clayhurst Ecological Reserve and Peace River Corridor, Peace River Islands and Wak' anahtaah Provincial Parks. An occurrence was also noted near Fort St. John in the western half of Section 31, Township 85 in Range 18.

Habitat

Dry to moist, rocky or sandy grasslands with a poor soil nutrient regime.

Threats and Concerns

The main threats to this species are oil and gas exploration and development, mining, forest harvesting, and road construction, which may occur in or adjacent to preferred habitat.

Best Management Practices

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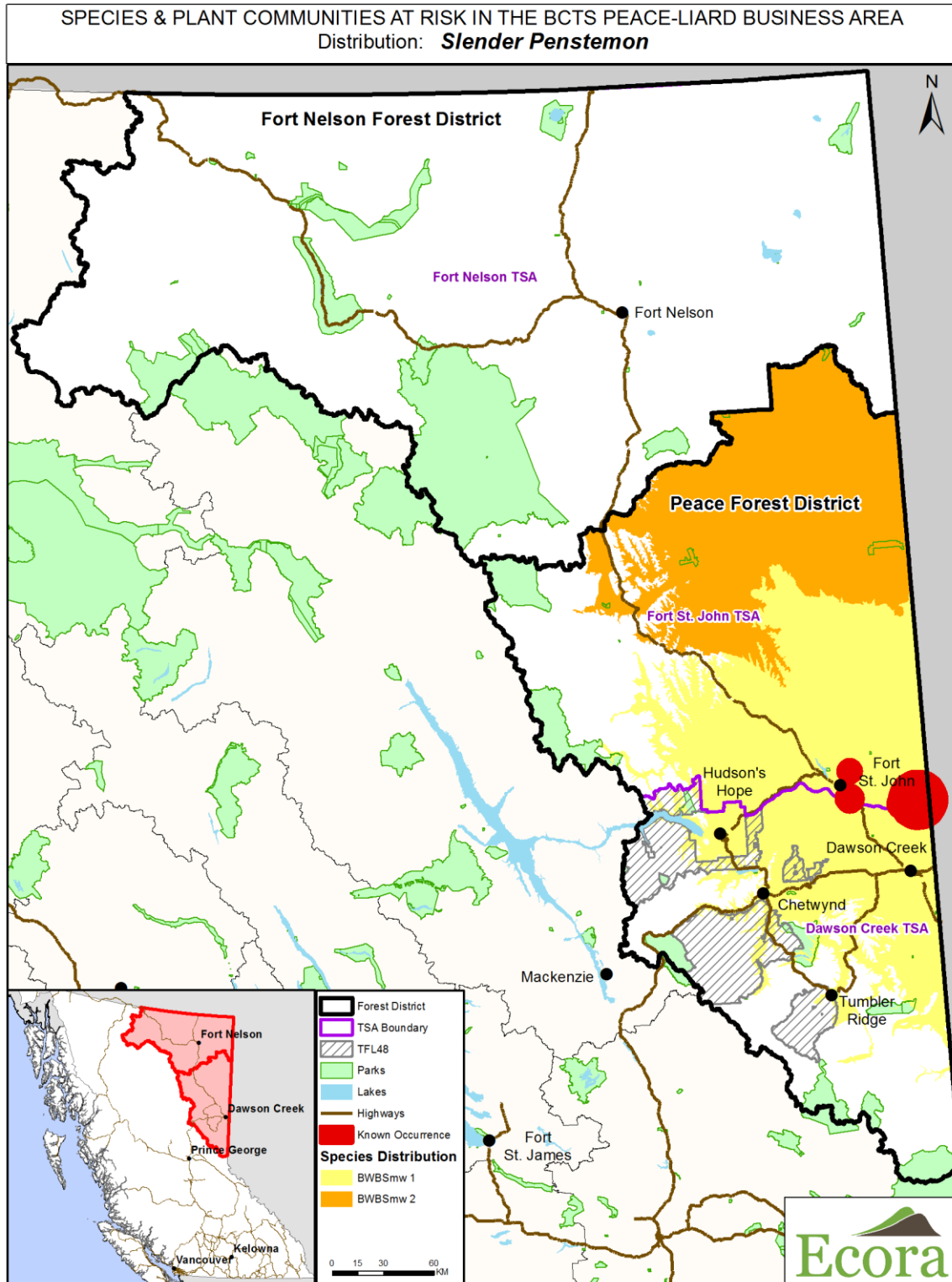
Further Information and Links:

B.C. Conservation Data Centre. 2011. Species Summary: *Penstemon gracilis*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

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



Three-Lobed Daisy

Erigeron trifidus

Kingdom	Phylum	Class	Order	Family	Genus	Species
Plantae	Anthophyta	Dicotyledoneae	Asterales	Asteraceae	Erigeron	trifidus

Description

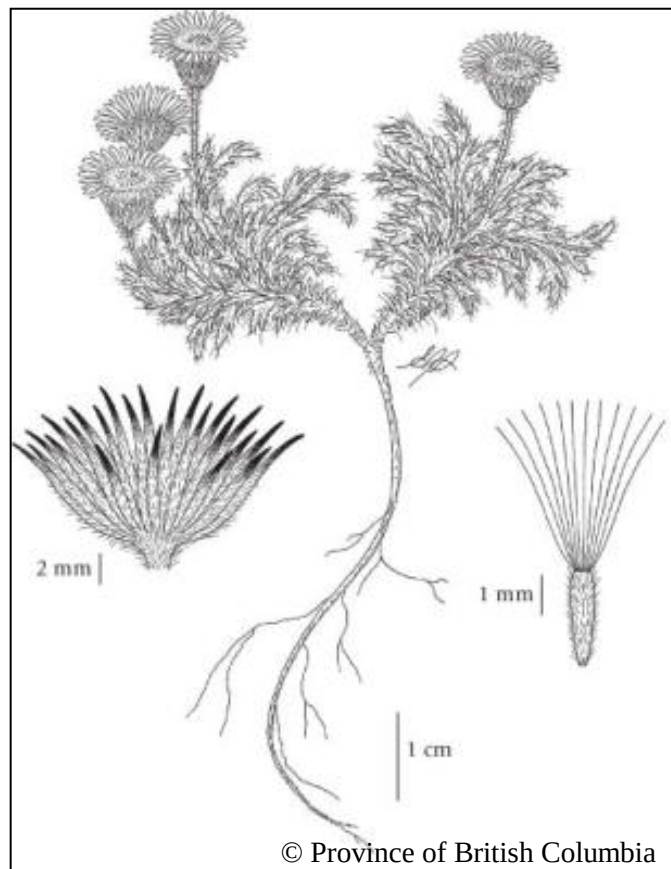
General: The three-lobed daisy is a 3 to 10 cm tall perennial herb. It has a compact, multibranched stem-base. Stems are leafless, simple, ascending, and somewhat hairy. The stem is often densely woolly below the heads. Leaves are mostly three-lobed, but sometimes entire. Lobes are usually lance to egg shaped, or oblong. Leaf segments are greater than 1mm wide. Central lobes are sharply pointed and fringed with small hairs. Flower bracts are sparse to dense, lance-shaped, and purplish in color. Flower heads with ray and disk flowers. Ray flowers are white or sometimes pink, 10-15 mm long. Disk flowers are shorter (3-5 mm long).

Status:

Global: G2G3Q

Canada:

Provincial: S2 – Red



Distribution

BEC Units: BAFA

Forest District: Peace District, TFL 48

Know Locations: It is located in the southernmost portion of the Dawson Creek TSA, northeast of Prince George.

Habitat

Dry scree and talus slopes in the upper alpine zone.

Threats and Concerns:

The main threats to this species are oil and gas exploration and development, mining, forest harvesting, and road construction, which may occur in or adjacent to preferred habitat. However, because of the unique habitat features desirable for this species' establishment, industrial development may not be a significant threat at this time.

Best Management Practices

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- where roads already exist or are necessary, ensure road is not changing the hydrology of element occurrence habitat ensure road maintenance activities do not alter, damage, or destroy the element occurrence
- if seeding occurs, use native species (prevent spread of exotic plant species)

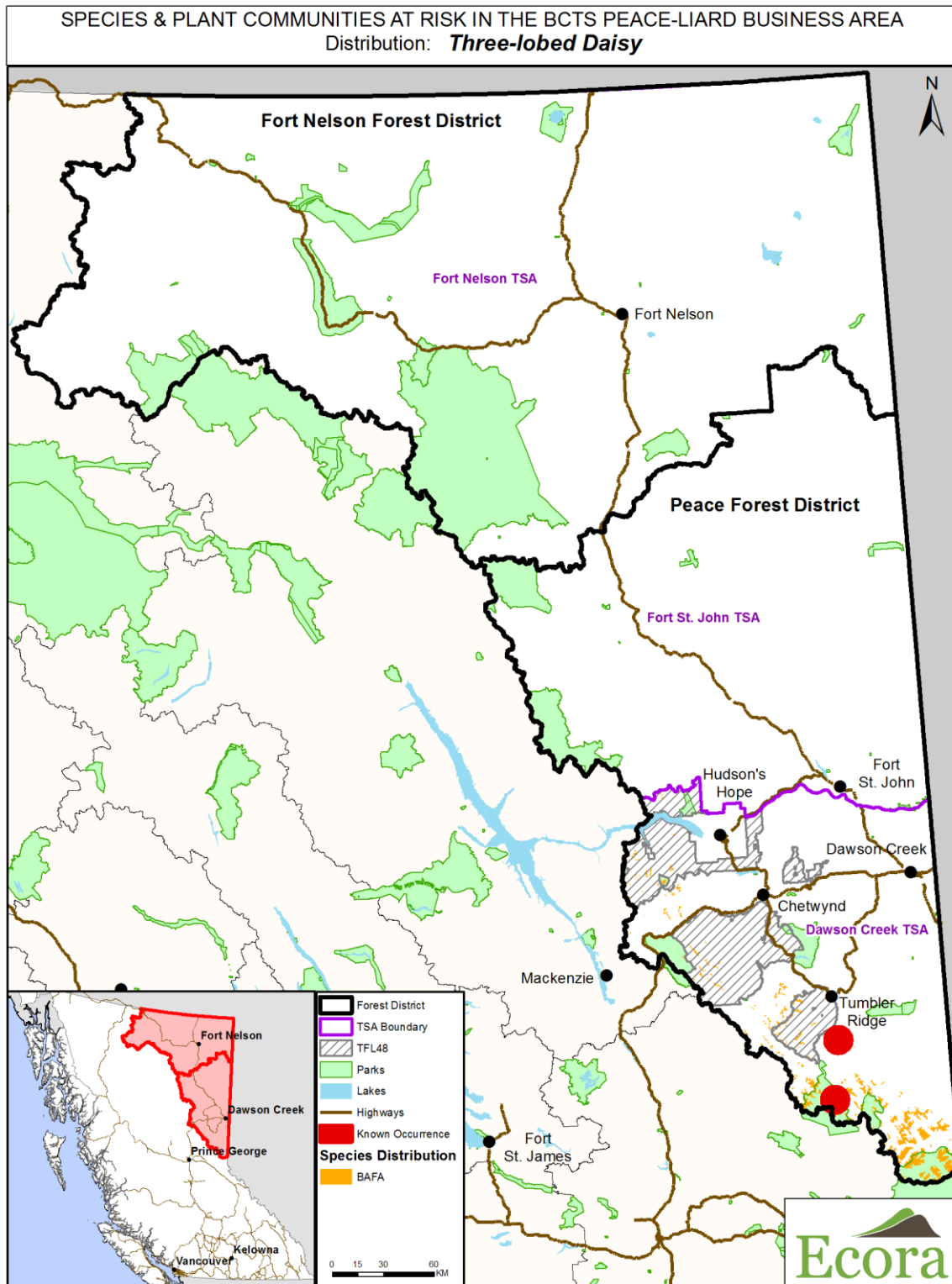
Further Information and Links:

B.C. Conservation Data Centre. 2011. Species Summary: *Erigeron trifidus*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Douglas, G.W., D. Meidinger, and J. Penny. 2002. Rare Native Vascular Plants of British Columbia, 2nd ed. B.C. Conserv. Data Centre, Terrestrial Inf. Branch, Victoria.

Douglas, G.W., D. Meidinger, and J. Pojar, eds. 2001b. Illustrated Flora of British Columbia, Vol. 1, Monocotyledons (Orchidaceae through Zosteraceae). B.C. Minist. Sustainable Resour. Manage., and B.C. Minist. For. Victoria, BC.

E-Flora BC: Electronic Atlas of the Plants of British Columbia:
<http://linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Erigeron+trifidus>



Yellow Marsh Saxifrage

Saxifraga hirculus ssp. hirculus

Kingdom	Phylum	Class	Order	Family	Genus	Species
Plantae	Anthophyta	Dicotyledoneae	Rosales	Saxifragaceae	Saxifraga	hirculus

Description

General: Yellow marsh saxifrage is a perennial herb growing to 25 cm tall. Stems are erect and have brown to yellow hairs above. Basal leaves are mostly smooth, unstalked, linear-oblongate to spoon shaped and exist in a rosette. The single, terminal flowers have bright yellow petals that have 5-7 veins. The calyx lobes are green to red in color, egg to lance-shaped and often glandular-hairy.



Status:

Global: G5TNR

Canada:

Provincial: S1S2 – Red

Distribution

BEC Units: BAFA

Forest District: Fort Nelson District

Known Locations: In British Columbia it is found north and west of Fort Nelson.

Habitat

Wet bogs and meadows in the alpine zone.

Threats and Concerns

The main threats to this species are oil and gas exploration and development, mining, forest harvesting, and road construction, which may occur in or adjacent to preferred habitat. Threats to yellow marsh saxifrage due to human activity are probably low due to the species being located in remote areas.

Best Management Practices

Current management guidelines for plant species at risk are focused at the stand level. If a potential plant species at risk is located, it is recommended that the area have ribbon placed around it, photos taken and field cards filled out with the exact location recorded. This information should then be passed on to the designated species at risk coordinator.

This is essentially a fine filter approach to managing the identified species, where an individual species and/or habitat is managed singularly and at a small scale (i.e. at the stand level). This approach should be used in association with a coarse filter approach which involves management for a variety of species/habitats simultaneously, mainly through the use of broad scale provisions at the landscape level such as protected areas and parks.

Both the plant species at risk and habitat they occur in should be protected. The current management strategies for plant species at risk are based on the Identified Wildlife Management Strategy (IWMS) wildlife and wildlife habitat provisions/measures set out by the BC Government. The best management practices are as follows:

- establish a core area around a known element occurrence with a 30-50 m wide buffer
- establish a management zone around the core area that is 150-200 m wide around the buffer
- do not harvest within the core area, unless harvesting is aimed specifically at improving the habitat for the particular rare plant species
- keep the identified area (core area + buffer) free from herbicide use
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- where roads already exist or are necessary, ensure road is not changing the hydrology of element occurrence habitat ensure road maintenance activities do not alter, damage, or destroy the element occurrence
- if seeding occurs, use native species (prevent spread of exotic plant species)

Further Information and Links:

B.C. Conservation Data Centre. 2011. Species Summary: *Saxifraga hirculus* ssp. *hirculus*.

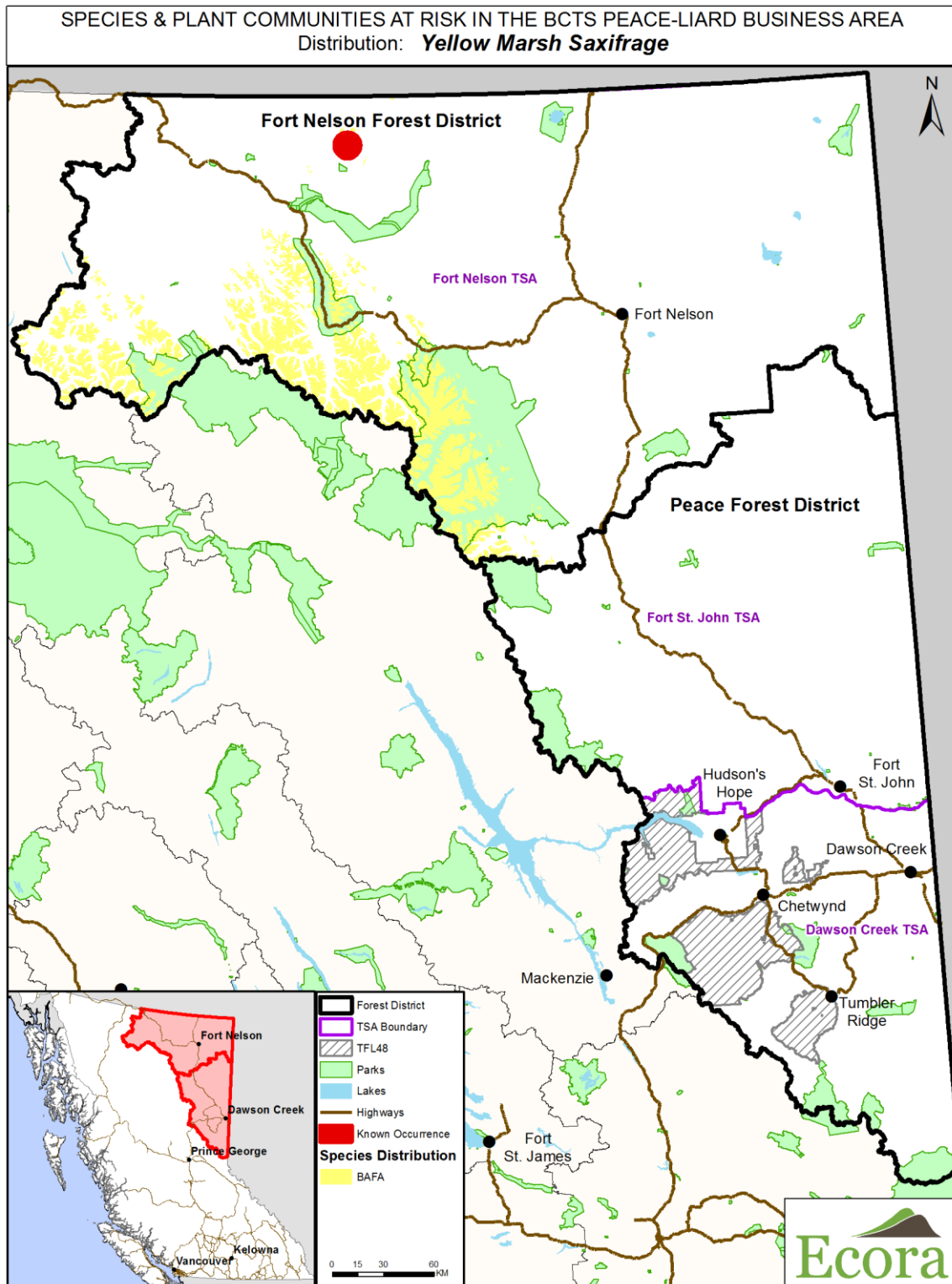
B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Douglas, G.W., D. Meidinger, and J. Penny. 2002. Rare Native Vascular Plants of British Columbia, 2nd ed. B.C. Conserv. Data Centre, Terrestrial Inf. Branch, Victoria.

Douglas, G.W., D. Meidinger, and J. Pojar, eds. 2001b. Illustrated Flora of British Columbia, Vol. 5, Monocotyledons (Orchidaceae through Zosteraceae). B.C. Minist. Sustainable Resour. Manage., and B.C. Minist. For. Victoria, BC.

E-Flora BC: Electronic Atlas of the Plants of British Columbia:

<http://linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Saxifraga+hirculus%20ssp.%20hirculus>



3.2 Vascular Plants - Ferns

Siberian Polypody*Polypodium sibiricum*

Kingdom	Phylum	Class	Order	Family	Genus	Species
Plantae	Filicinophyta	Filicopsida	Filicales	Polypodiaceae	Polypodium	sibiricum

Description

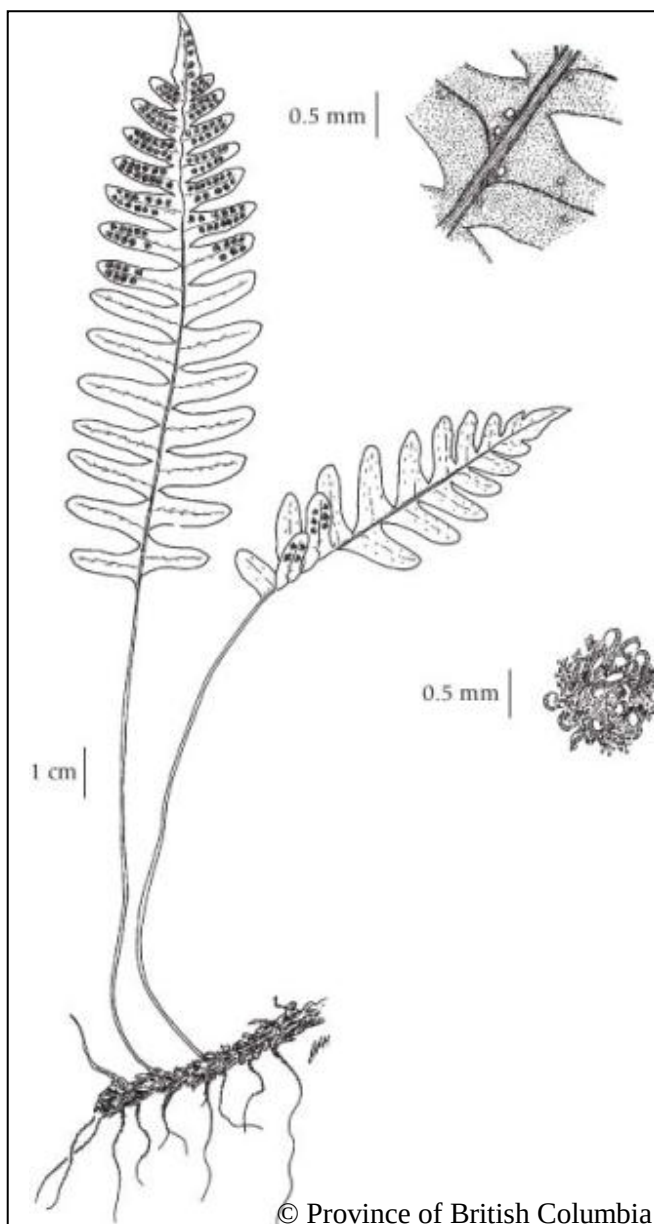
General: Siberian polypody is an evergreen perennial existing singly or in small groups along an underground, scaly rhizome. Leaves are yellow-green in color, 1-4 cm wide, 4-20 cm long, leathery and oblong. Leaves are also pinnately cleft and have broad, rounded sinuses as well as narrow, entire segments with tips that are broadly pointed. Sori (reproductive structures) are rounded. The spore producing structures lack glands.

Status:**Global:** G5?**Canada:****Provincial:** SH – Red**Distribution****BEC Units:** BWBSmw, SBSmk**Forest District:** Peace District

Known Locations: In British Columbia it is found only in the Williston Lake (Mount Selwyn) and Beatton River areas of the province.

Habitat

Mesic to dry rocky areas in the montane zone.



Threats and Concerns

The main threats to this species are oil and gas exploration and development, mining, forest harvesting, and road construction, which may occur in or adjacent to preferred habitat.

Best Management Practices

Current management guidelines for plant species at risk are focused at the stand level. If a potential plant species at risk is located, it is recommended that the area have ribbon placed around it, photos taken and field cards filled out with the exact location recorded. This information should then be passed on to the designated species at risk coordinator.

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- if seeding occurs, use native species (prevent spread of exotic plant species)

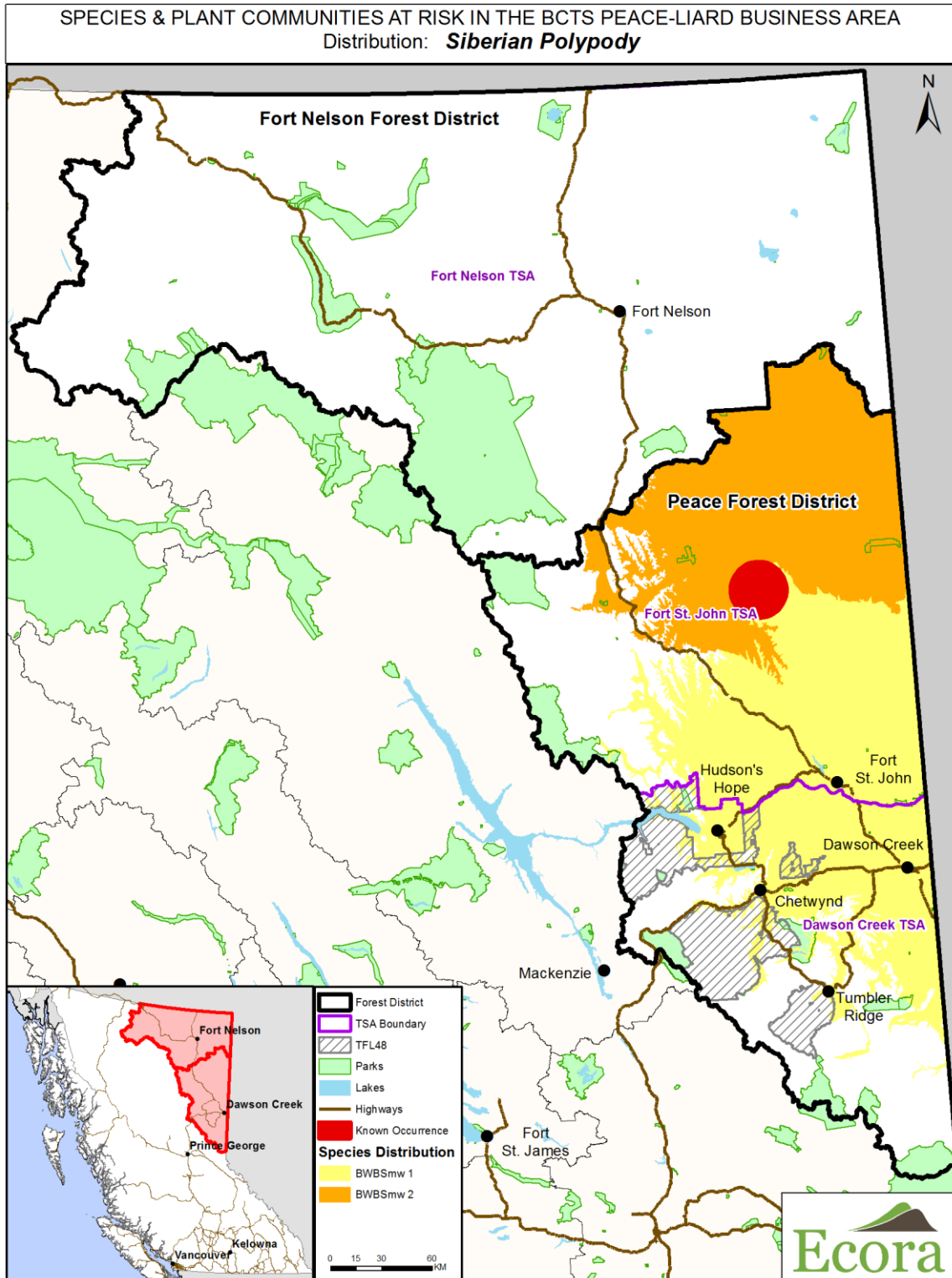
Further Information and Links:

B.C. Conservation Data Centre. 2011. Species Summary: *Polypodium sibiricum*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Douglas, G.W., D. Meidinger, and J. Penny. 2002. Rare Native Vascular Plants of British Columbia, 2nd ed. B.C. Conserv. Data Centre, Terrestrial Inf. Branch, Victoria.

Douglas, G.W., D. Meidinger, and J. Pojar, eds. 2001b. Illustrated Flora of British Columbia, Vol. 5, Monocotyledons (Orchidaceae through Zosteraceae). B.C. Minist. Sustainable Resour. Manage., and B.C. Minist. For. Victoria, BC.

E-Flora BC: Electronic Atlas of the Plants of British Columbia:
<http://linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Polypodium+sibiricum>



3.3 Vascular Plants - Monocots

Alpine Meadow-Foxtail

Alopecurus alpinus

Kingdom	Phylum	Class	Order	Family	Genus	Species
Plantae	Anthophyta	Monocotyledoneae	Cyperales	Poaceae	Alopecurus	alpinus

Description

General: Alpine meadow-foxtail is a perennial, tufted grass stemming from short rhizomes that grows to 20-80 cm in height. Sheaths are open and the blades are flat and have short hairs. Ligules are finely eroded, blunt and irregularly jagged. Spikes are cylinder-shaped with spikelets less than 4.5 mm in length. Dry, membranous bracts have dense, long woolly hairs on the entire surface. The outer, flower-enclosing bract has rounded tips.

Status:

Global: G5

Canada:

Provincial: S1S3 - Red

Distribution

BEC Units: BWBSmw, SWBmk

Forest District: Peace District, TFL 48

Know locations: In British Columbia, alpine meadow-foxtail is rare and has only been recorded from the Beaton River to Pink Mountain areas of the province.



Habitat

The alpine meadow-foxtail is found in moist meadows in the subalpine zone.

Threats and Concerns

The main threats to this species are oil and gas exploration and development, mining, forest harvesting, and road construction, which may occur in or adjacent to preferred habitat.

Best Management Practices

Current management guidelines for plant species at risk are focused at the stand level. If a potential plant species at risk is located, it is recommended that the area have ribbon placed around it, photos taken and field cards filled out with the exact location recorded. This information should then be passed on to the designated species at risk coordinator.

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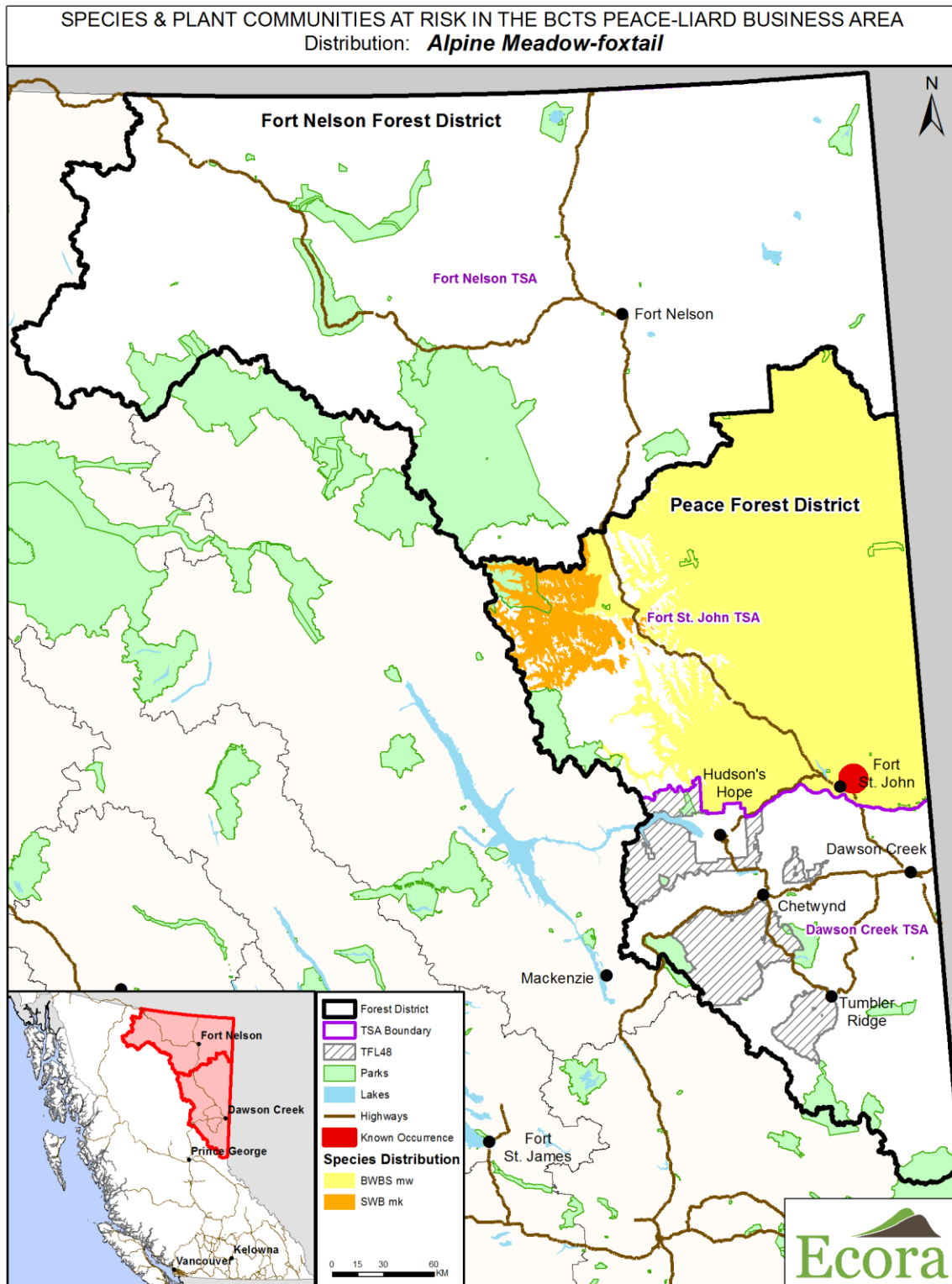
References and Links:

B.C. Conservation Data Centre. 2011. Species Summary: *Alopecurus alpinus*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Douglas, G.W., D. Meidinger, and J. Penny. 2002. Rare Native Vascular Plants of British Columbia, 2nd ed. B.C. Conserv. Data Centre, Terrestrial Inf. Branch, Victoria.

Douglas, G.W., D. Meidinger, and J. Pojar, eds. 2001b. Illustrated Flora of British Columbia, Vol. 7, Monocotyledons (Orchidaceae through Zosteraceae). B.C. Minist. Sustainable Resour. Manage., and B.C. Minist. For. Victoria, BC.

E-Flora BC: Electronic Atlas of the Plants of British Columbia:
<http://linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Alopecurus+alpinus>



Canada Ryegrass

Piptatherum canadense

Kingdom	Phylum	Class	Order	Family	Genus	Species
Plantae	Anthophyta	Monocotyledoneae	Cyperales	Poaceae	Piptatherum	canadense

Description

General: Canada Ryegrass grows to 90 cm in height, has smooth stems and generally grows in clumps. Leaves are basally concentrated. Sheaths are smooth. Blades are 4-15 cm long and 1-2 mm wide. Flowers are located on a multi-branched, loose structure. Branches are 1-6 cm long, flexous and ascending to divergent.

Status:

Global: G5

Canada:

Provincial: SH – Red

Distribution

BEC Units: BWBSmw

Forest District: Peace District, TFL 48

Known Locations: In British Columbia it is found only in the Peace River area of the province.

Habitat

Usually found in grasslands and open forests. Often in sandy-rocky dry, nutrient poor soils.

Threats and Concerns

The main threats to this species are oil and gas exploration and development, mining, forest harvesting, and road construction, which may occur in or adjacent to preferred habitat.

Best Management Practices

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Further Information and Links:

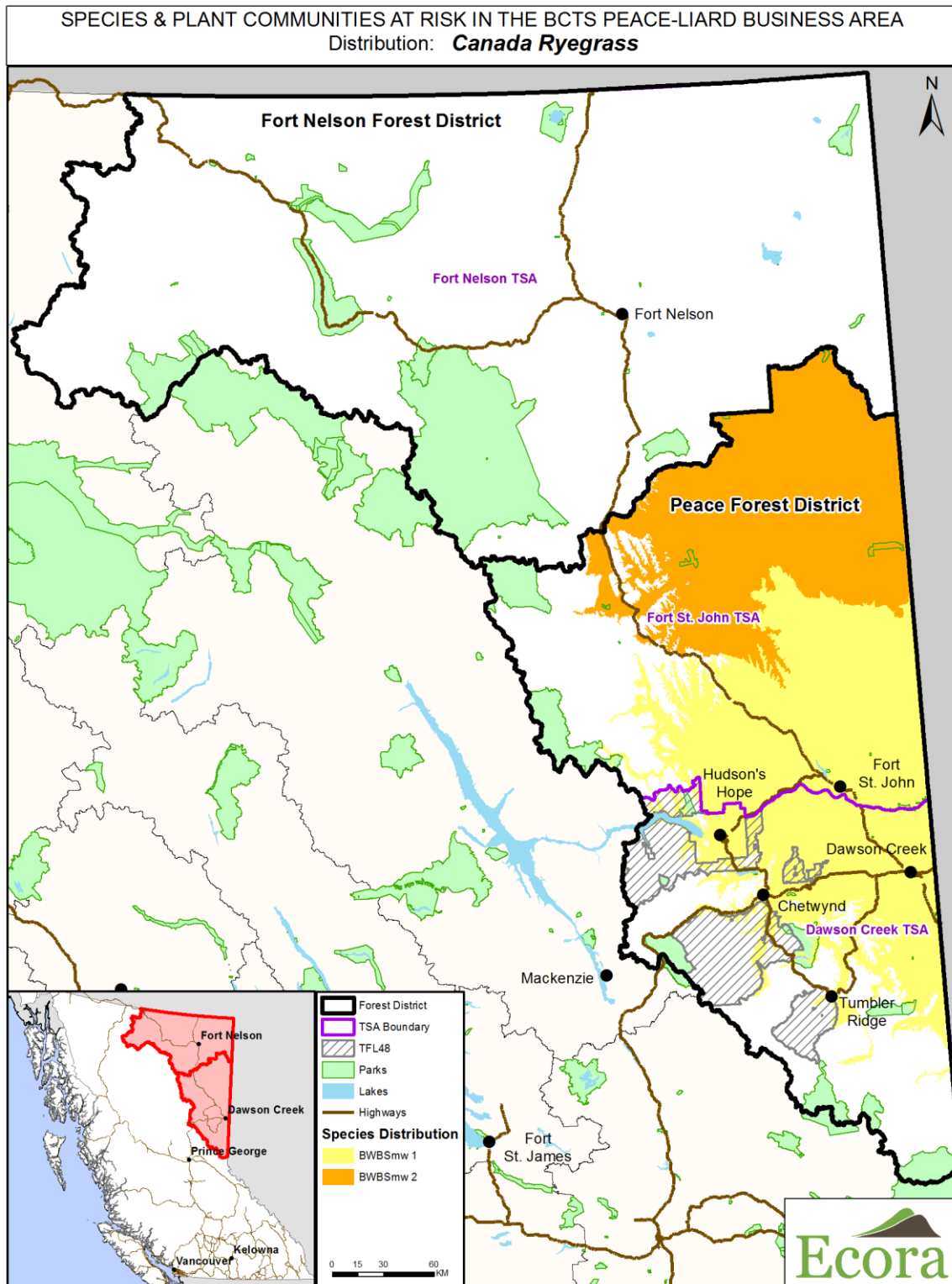
B.C. Conservation Data Centre. 2011. Species Summary: *Piptatherum canadense*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Lapin, Marc. 2004. *Piptatherum canadense* (Poiret) Dorn (Canada Ricegrass) Conservation and Research Plan for New England. New England Wild Flower Society, Framingham, Massachusetts, USA.

Nature Serve Explorer:

<http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Piptatherum+canadense>

Utah State University: <http://herbarium.usu.edu/treatments/Piptatherum.htm>



Dry-Land Sedge

Carex xerantica

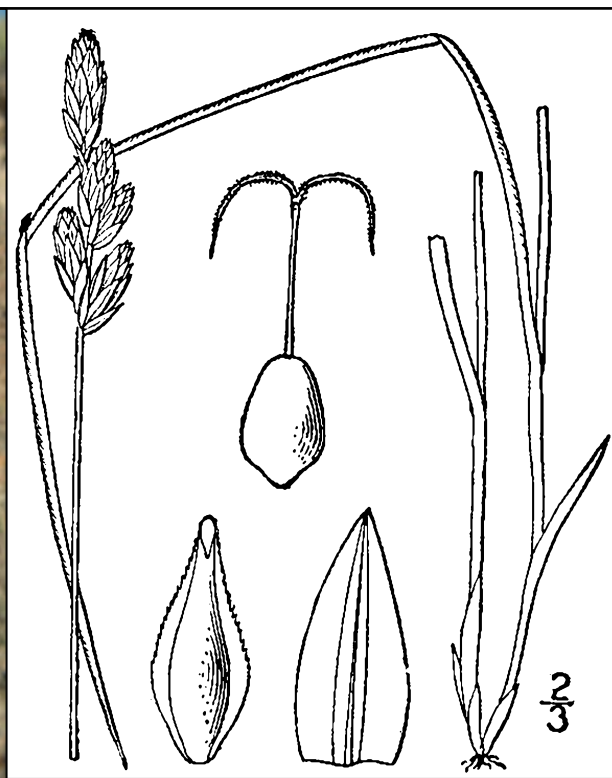
Kingdom	Phylum	Class	Order	Family	Genus	Species
Plantae	Anthophyta	Monocotyledoneae	Cyperales	Cyperaceae	Carex	xerantica

Description

General: Dry-land sedge is a tufted, perennial herb reaching 30 to 60 cm in height. Leaves have tight sheaths, and flat, 2-3 mm wide blades. Flowers are unstalked, have 3 to 6 spikes and a 3-5 cm long head. The bristles or scales around the female part of the flower are cylinder to elliptic shaped, green or yellow in color and flattened with translucent margins. The bracts surrounding the fruit



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N.L. Britton & A. Brown

Status:

Global: G5

Canada:

Provincial: S2 – Red

Distribution

BEC Units: BWBSmw

Forest District: Peace District, TFL 48

Known Locations: In the Peace Region distribution is localized to the Peace River drainage from Williston Lake to the Alberta border.

Habitat

Open forests and dry slopes in the steppe and montane zones.

Threats and Concerns

The main threats to this species are oil and gas exploration and development, mining, forest harvesting and road construction, which may occur in or adjacent to preferred habitat.

Best Management Practices

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Both the plant species at risk and habitat they occur in should be protected. The current management strategies for plant species at risk are based on the Identified Wildlife Management Strategy (IWMS) wildlife and wildlife habitat provisions/measures set out by the BC Government. The best management practices are as follows:

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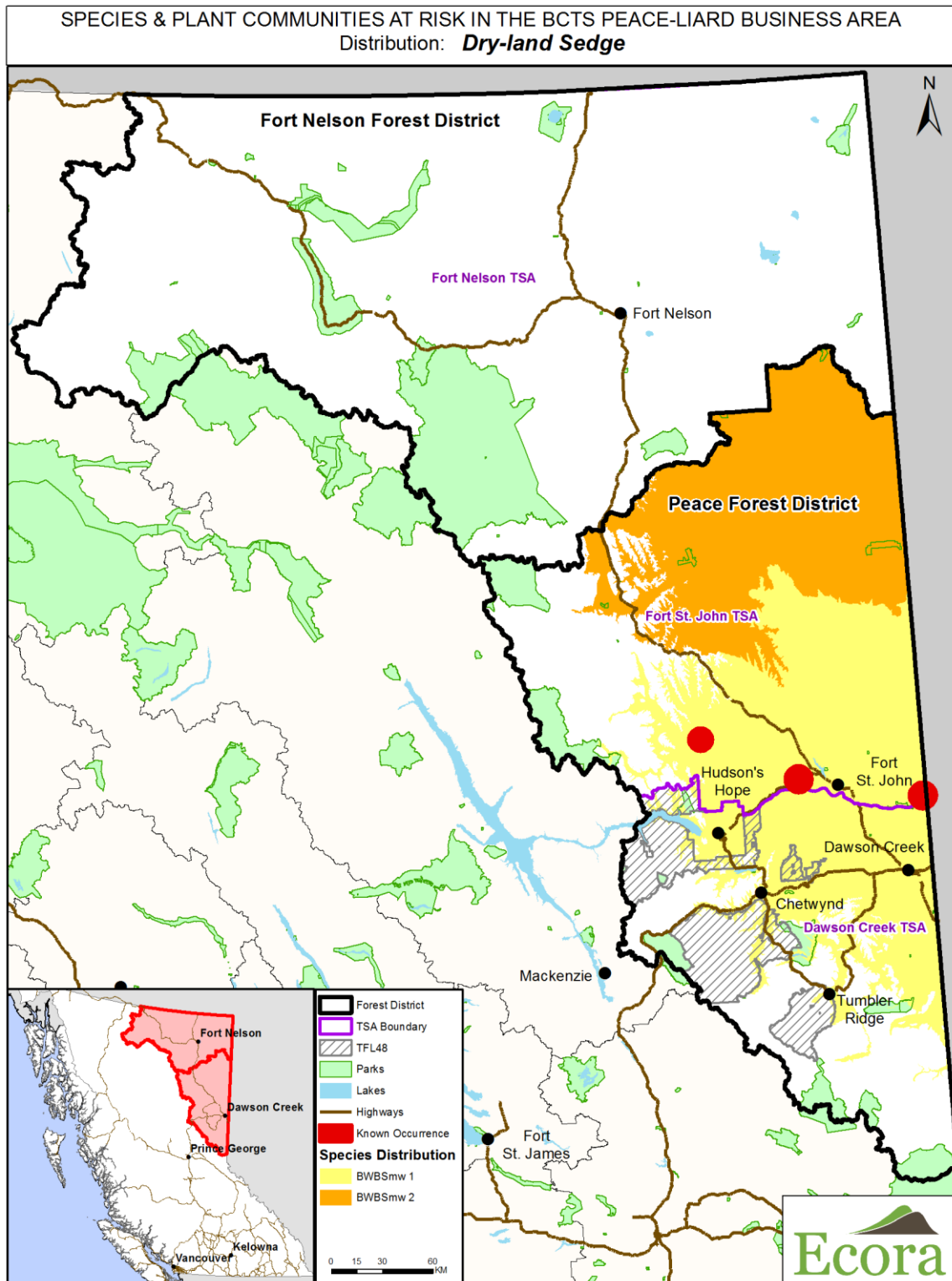
Further Information and Links:

B.C. Conservation Data Centre. 2011. Species Summary: *Carex xerantica*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Douglas, G.W., D. Meidinger, and J. Penny. 2002. Rare Native Vascular Plants of British Columbia, 2nd ed. B.C. Conserv. Data Centre, Terrestrial Inf. Branch, Victoria.

Douglas, G.W., D. Meidinger, and J. Pojar, eds. 2001b. Illustrated Flora of British Columbia, Vol. 6, Monocotyledons (Orchidaceae through Zosteraceae). B.C. Minist. Sustainable Resour. Manage., and B.C. Minist. For. Victoria, BC.

E-Flora BC: Electronic Atlas of the Plants of British Columbia:
<http://linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Carex+xerantica>



Porcupinegrass

Hesperostipa spartea

Kingdom	Phylum	Class	Order	Family	Genus	Species
Plantae	Anthophyta	Monocotyledoneae	Cyperales	Poaceae	Hesperostipa	spartea

Description

General: The porcupine grass is a perennial tufted bunchgrass, growing 45 to 140cm tall from fibrous roots. The leaves are long (20-30cm) and generally flat to slightly inrolled, up to 5mm wide. The ligules are short and stiff on the lower portions of the stem (0.3 – 3mm long), while the upper portions have thin, ragged, pointy ligules (3-7mm long). The inflorescence is a panicle 15-20cm long, is narrow and nodding, with the few slender branches having 1 or 2 large spikelets. Glumes are 2-4.5cm long, lemmas are 1.5-2.5cm long with large, twisted, bent awns 9-18cm long.



Robert Freckmann

Status:

Global: G5

Canada: NR

Provincial: S2 – Red

Distribution

BEC Units: BWBSmw1

Forest District: Peace District (TFL 48)

Known Locations: In the Peace District, it is known to occur near the Peace River and Halfway River junction. In British Columbia it is primarily found in several widely scattered locations between Williams Lake and the border with the US.

Habitat

In BC, the porcupinegrass is normally found along rivers and lower valley slopes, grasslands, and low to mid elevation open forests. Sites are usually dry to mesic.

Threats and Concerns

The main threats to this species are road construction, building of hydroelectric dams, oil and gas exploration and development, mining, and forest harvesting that may occur in or adjacent to preferred porcupinegrass habitat.

Best Management Practice

Current management guidelines for plant species at risk are focused at the stand level. If a potential plant species at risk is located, it is recommended that the area have ribbon placed around it, photos taken and field cards filled out with the exact location recorded. This information should then be passed on to the designated species at risk coordinator.

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Further Information and Links:

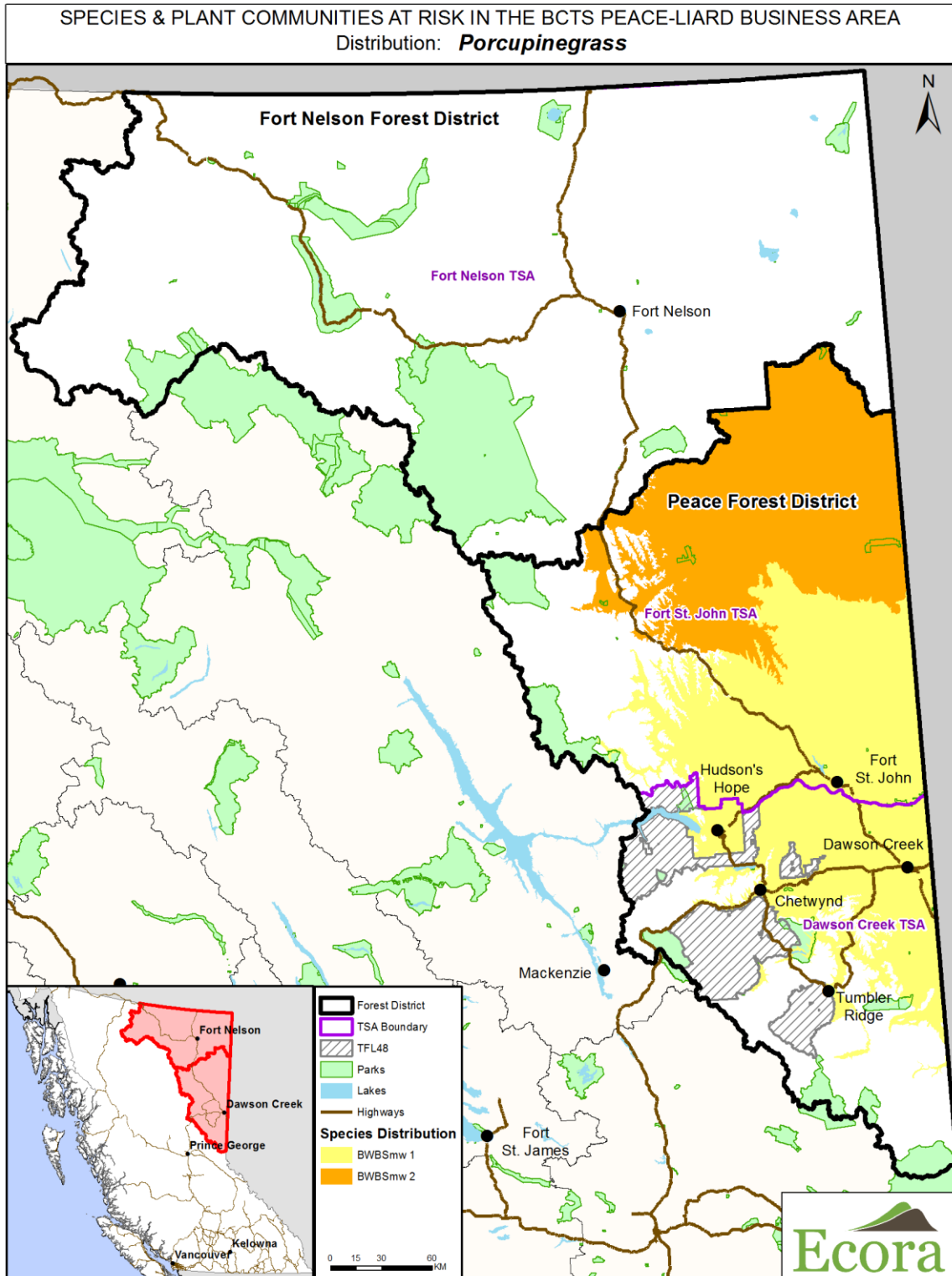
B.C. Conservation Data Centre. 2011. Species Summary: *Hesperostipa spartea*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Douglas, G.W., D. Meidinger, and J. Penny. 2002. Rare Native Vascular Plants of British Columbia, 2nd ed. B.C. Conserv. Data Centre, Terrestrial Inf. Branch, Victoria.

Douglas, G.W., D. Meidinger, and J. Pojar, eds. 2001. Illustrated Flora of British Columbia, Vol. 7, Monocotyledons (Orchidaceae through Zosteraceae). B.C. Minist. Sustainable Resour. Manage., and B.C. Minist. For. Victoria, BC.

E-Flora BC: Electronic Atlas of the Plants of British Columbia:
<http://linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Hesperostipa+spartea>

Proulx, G., D. Bernier and F. Caffrey. A field guide to species at risk in Canfor's planning areas in Central Interior British Columbia – 2005 Revision. Alpha Wildlife Research and Management, Sherwood Park, AB



3.4 Vascular Plants – Quillworts

Rock Selaginella

Selaginella rupestris

Kingdom	Phylum	Class	Order	Family	Genus	Species
Plantae	Lycophyta	Isoetopsida	Selaginellales	Selaginellaceae	Selaginella	rupestris

Description

General: Rock selaginella is an evergreen perennial growing in long spreading and rarely cushion-like mats. Leaves exist in alternate pseudowhorls of 4-6 and are linear to linear-lance-shaped. Margins are fringed with long, transparent hairs. Cones are square and unstalked and up to 3.5 mm in length. Spore-producing leaves are triangular in shape with margins slightly toothed or fringed with long bristle tips.



Status:

Global: G5

Canada:

Provincial: S1 – Red

Distribution

BEC Units: BWBSmw

Forest District: Peace District, TFL 48

Known Locations: In British Columbia it is found only in the Peace River area in the Clayhurst Ecological Reserve.

Habitat

Dry grassy ridges in the montane zone.

Threats and Concerns

The main threats to this species are oil and gas exploration and development, mining, forest harvesting, and road construction, which may occur in or adjacent to preferred habitat.

Best Management Practices

Current management guidelines for plant species at risk are focused at the stand level. If a potential plant species at risk is located, it is recommended that the area have ribbon placed around it, photos taken and field cards filled out with the exact location recorded. This information should then be passed on to the designated species at risk coordinator.

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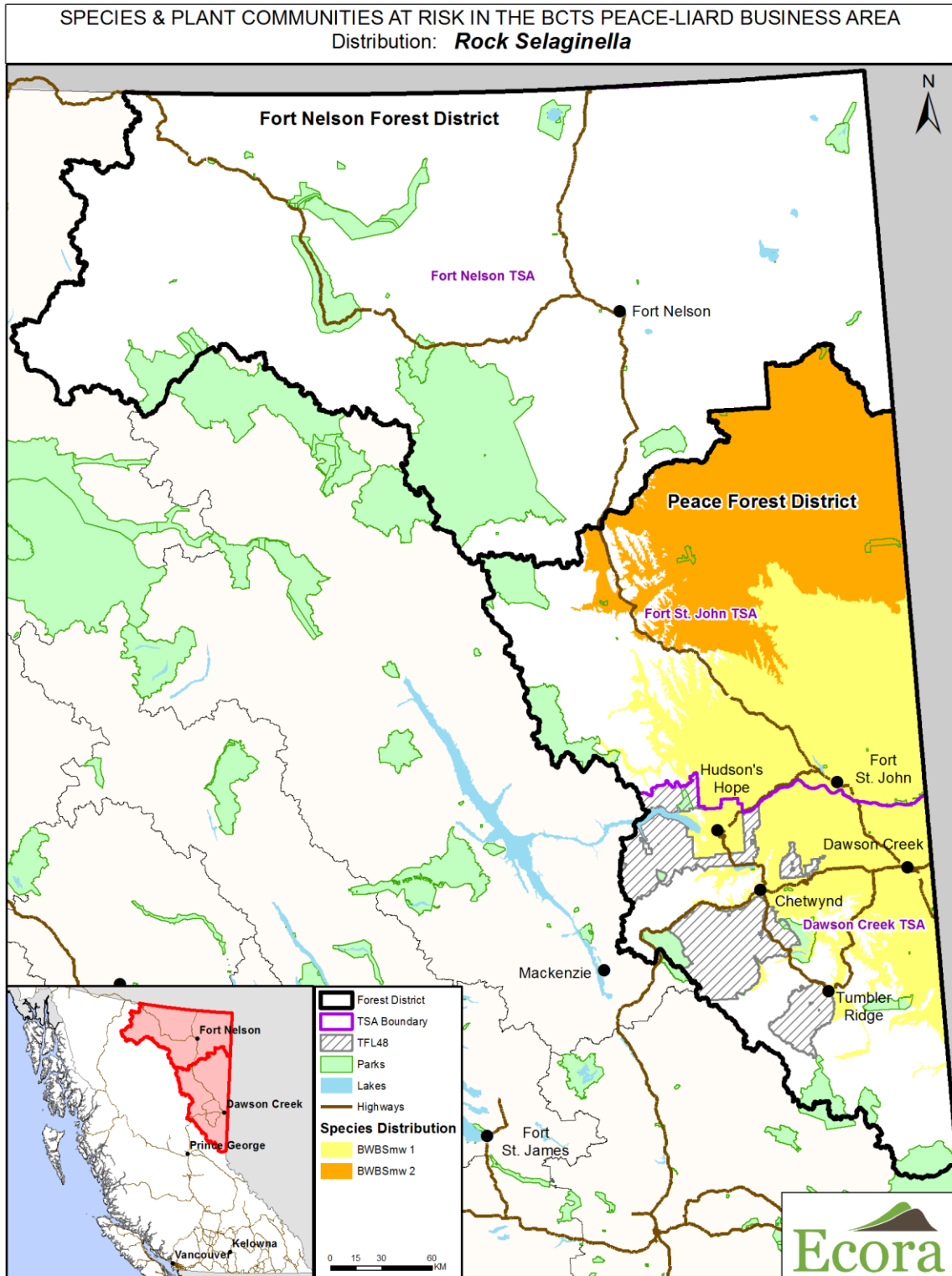
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Further Information and Links:

B.C. Conservation Data Centre. 2011. Species Summary: *Selaginella rupestris*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Douglas, G.W., D. Meidinger, and J. Penny. 2002. Rare Native Vascular Plants of British Columbia, 2nd ed. B.C. Conserv. Data Centre, Terrestrial Inf. Branch, Victoria.

E-Flora BC: Electronic Atlas of the Plants of British Columbia:
<http://linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Selaginella+rupestris>



3.5 Vascular Plants - Moonworts

Spoon-Shaped Moonwort

Botrychium spathulatum

Kingdom	Phylum	Class	Order	Family	Genus	Species
Plantae	Filicinophyta	Ophioglossopsida	Ophioglossales	Ophioglossaceae	Botrychium	spathulatum

Description

General: Spoon-shaped moonwort is a small (1-10 cm) deciduous perennial, with a single erect frond. The sterile portion has a stalk and a narrow, triangular-shaped, pinnately-compound blade. Pinnae (leaflets) are widely spaced and spoon-shaped. Basal pinnae are semicircular in shape or fan-shaped. The fertile portion is twice as long as the sterile portion and bears the spores.

Status:

Global: G3

Canada:

Provincial: S1 – Red

Distribution

BEC Units: BWBSmw1

Forest District: Peace District, TFL 48

Known Locations: It is known to occur in the BWBSmw1. In British Columbia it is found scattered throughout the Rocky Mountains and in Kootenay National Park in the south. Farther north its distribution reaches to Alaska, Yukon and Northwest Territories.



© Gary Fewless

Habitat

Mesic to dry old fields, sand dunes and grassy railroad sidings in the montane zone.

Threats and Concerns

The main threats to this species are oil and gas exploration and development, mining, forest harvesting and road construction, which may occur in or adjacent to preferred habitat.

Best Management Practices

Current management guidelines for plant species at risk are focused at the stand level. If a potential plant species at risk is located, it is recommended that the area have ribbon placed around it, photos taken and field cards filled out with the exact location recorded. This information should then be passed on to the designated species at risk coordinator.

This is essentially a fine filter approach to managing the identified species, where an individual species and/or habitat is managed singularly and at a small scale (i.e. at the stand level). This approach should be used in association with a coarse filter approach which involves management for a variety of species/habitats simultaneously, mainly through the use of broad scale provisions at the landscape level such as protected areas and parks.

Both the plant species at risk and habitat they occur in should be protected. The current management strategies for plant species at risk are based on the Identified Wildlife Management Strategy (IWMS) wildlife and wildlife habitat provisions/measures set out by the BC Government. The best management practices are as follows:

- establish a core area around a known element occurrence with a 30-50 m wide buffer
- establish a management zone around the core area that is 150-200 m wide around the buffer
- do not harvest within the core area, unless harvesting is aimed specifically at improving the habitat for the particular rare plant species
- keep the identified area (core area + buffer) free from herbicide use
- deactivate temporary roads after use, do not allow road or trail construction upslope or within the element occurrence
- restrict access to high elevation areas with the use of gates and trenches
- where roads already exist or are necessary, ensure road is not changing the hydrology of element occurrence habitat ensure road maintenance activities do not alter, damage, or destroy the element occurrence
- if seeding occurs, use native species (prevent spread of exotic plant species)

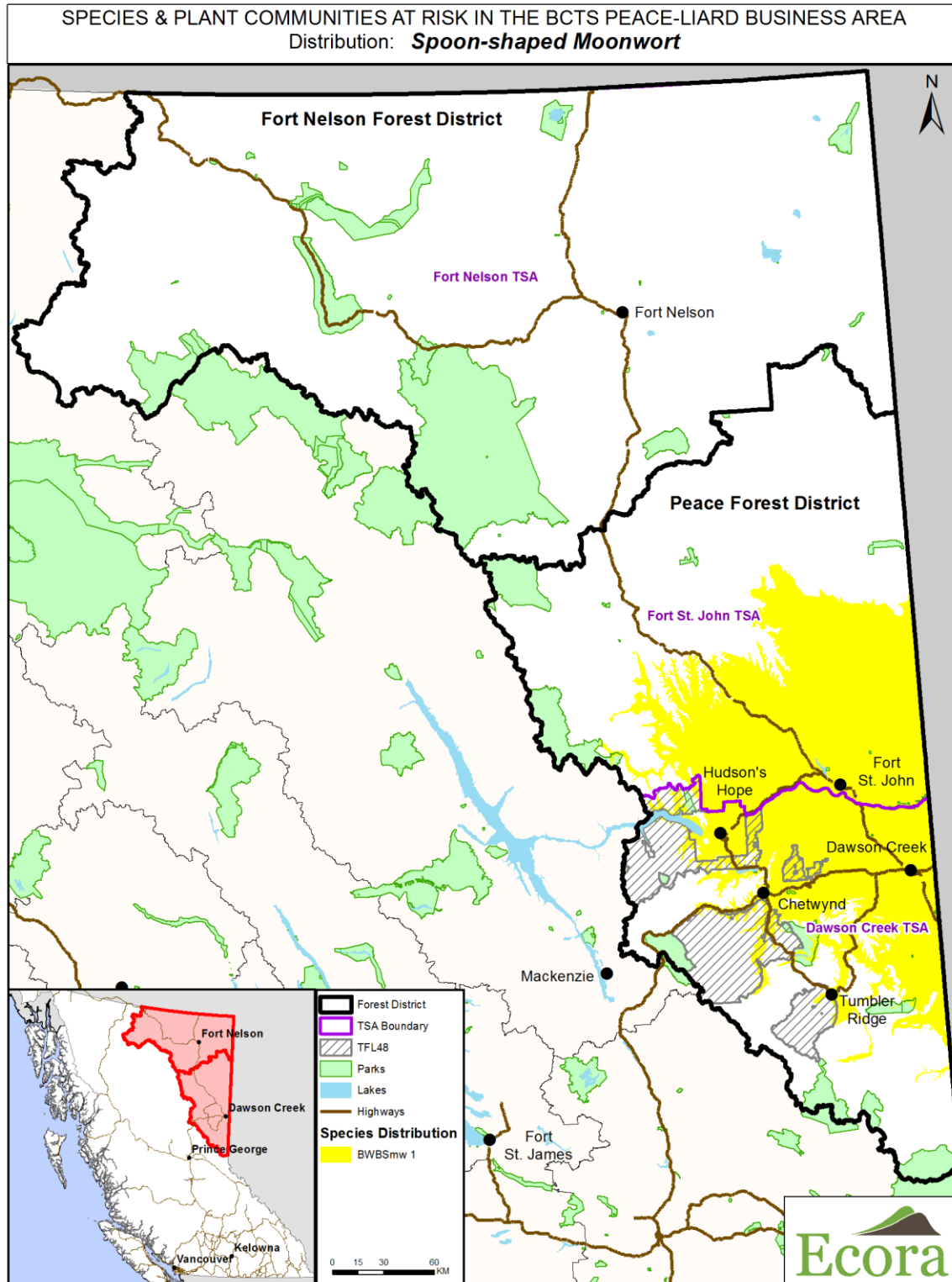
Further Information and Links:

B.C. Conservation Data Centre. 2011. Species Summary: *Botrychium spathulatum*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Douglas, G.W., D. Meidinger, and J. Penny. 2002. Rare Native Vascular Plants of British Columbia, 2nd ed. B.C. Conserv. Data Centre, Terrestrial Inf. Branch, Victoria.

Douglas, G.W., D. Meidinger, and J. Pojar, eds. 2001b. Illustrated Flora of British Columbia, Vol. 5, Monocotyledons (Orchidaceae through Zosteraceae). B.C. Minist. Sustainable Resour. Manage., and B.C. Minist. For. Victoria, BC.

E-Flora BC: Electronic Atlas of the Plants of British Columbia:
<http://linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Botrychium+spathulatum>



Upswept Moonwort

Botrychium ascendens

Kingdom	Phylum	Class	Order	Family	Genus	Species
Plantae	Filicinophyta	Ophioglossopsida	Ophioglossales	Ophioglossaceae	Botrychium	ascendens

Description

General: The upswept moonwort is a deciduous perennial fern from 5-13 cm in height. It has a single, yellow-green frond divided into two segments. The frond has up to six pairs of triangular-shaped, strongly ascending pinnae which have deeply lacerated margins. Grape-like sporangia are present on the fertile segment which is longer than the sterile segment.

Status:

Global: G2G3

Canada:

Provincial: S2 – Red

Distribution

BEC Units: BAFA

Forest District: Peace District, TFL 48

Known Locations: There are no BC CDC verified locations of this species but it likely occurs in high elevations west of Fort St. John. Although rare it is present in central and southern BC. Its distribution reaches Alaska to the north, Ontario to the east and south to the states of Colorado, Idaho, Nevada and California.

Habitat

Mesic to moist meadows and grassy fields typically associated with soils with a rich nutrient regime.



© Michael Rosenthal

Threats and Concerns

The main threats to this species are oil and gas exploration and development, mining, forest harvesting, and road construction, which may occur in or adjacent to preferred habitat.

Best Management Practices:

Current management guidelines for plant species at risk are focused at the stand level. If a potential plant species at risk is located, it is recommended that the area have ribbon placed around it, photos taken and field cards filled out with the exact location recorded. This information should then be passed on to the designated species at risk coordinator.

This is essentially a fine filter approach to managing the identified species, where an individual species and/or habitat is managed singularly and at a small scale (i.e. at the stand level). This approach should be used in association with a coarse filter approach which involves management for a variety of species/habitats simultaneously, mainly through the use of broad scale provisions at the landscape level such as protected areas and parks.

Both the plant species at risk and habitat they occur in should be protected. The current management strategies for plant species at risk are based on the Identified Wildlife Management Strategy (IWMS) wildlife and wildlife habitat provisions/measures set out by the BC Government. The best management practices are as follows:

- establish a core area around a known element occurrence with a 30-50 m wide buffer
- establish a management zone around the core area that is 150-200 m wide around the buffer
- do not harvest within the core area, unless harvesting is aimed specifically at improving the habitat for the particular rare plant species
- keep the identified area (core area + buffer) free from herbicide use
- deactivate temporary roads after use, do not allow road or trail construction upslope or within the element occurrence
- restrict access to high elevation areas with the use of gates and trenches
- where roads already exist or are necessary, ensure road is not changing the hydrology of element occurrence habitat ensure road maintenance activities do not alter, damage, or destroy the element occurrence
- if seeding occurs, use native species (prevent spread of exotic plant species)

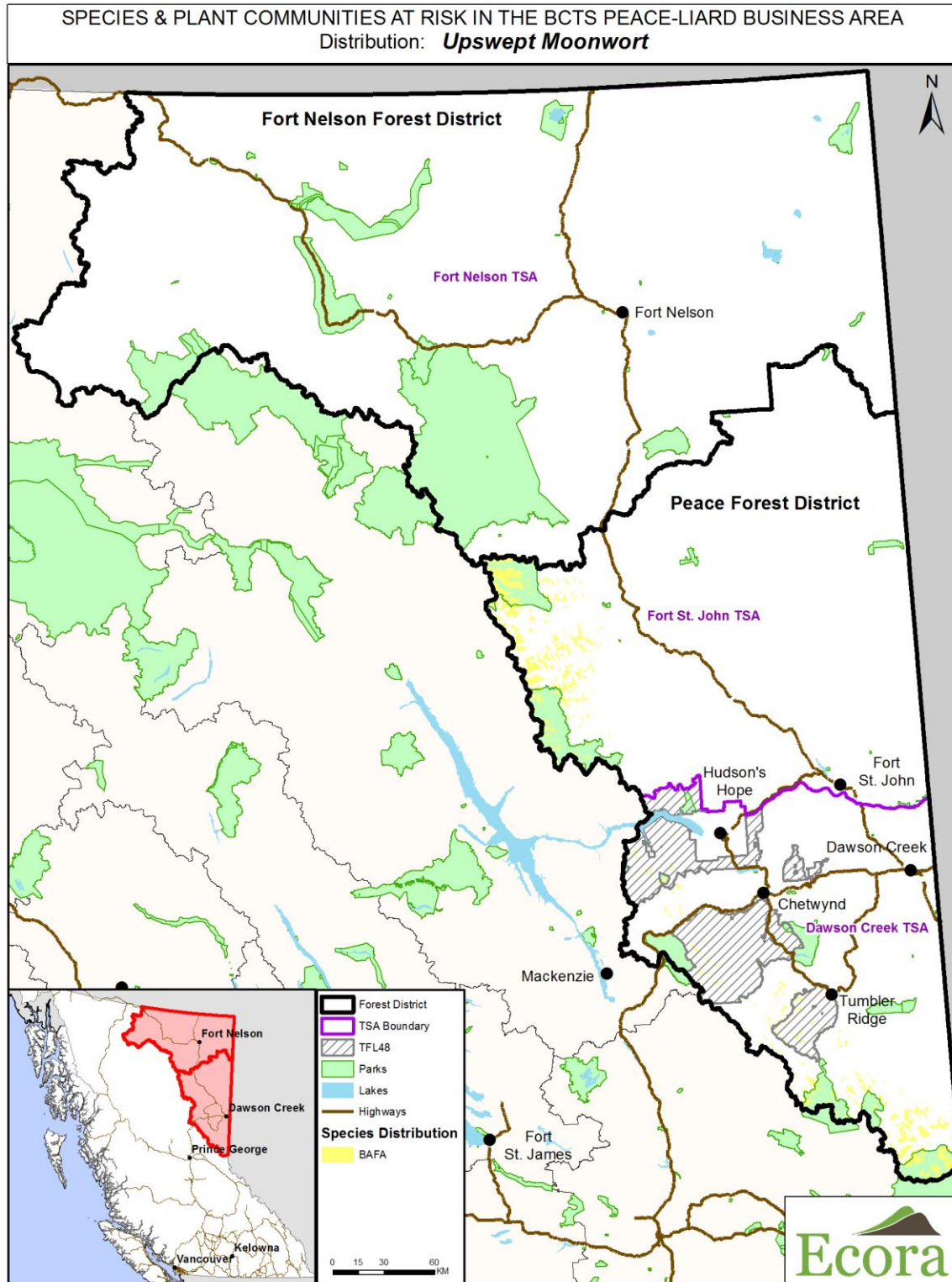
Further Information and Links:

B.C. Conservation Data Centre. 2011. Species Summary: *Botrychium ascendens*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Douglas, G.W., D. Meidinger, and J. Penny. 2002. Rare Native Vascular Plants of British Columbia, 2nd ed. B.C. Conserv. Data Centre, Terrestrial Inf. Branch, Victoria.

Douglas, G.W., D. Meidinger, and J. Pojar, eds. 2001b. Illustrated Flora of British Columbia, Vol. 5, Monocotyledons (Orchidaceae through Zosteraceae). B.C. Minist. Sustainable Resour. Manage., and B.C. Minist. For. Victoria, BC.

E-Flora BC: Electronic Atlas of the Plants of British Columbia:
<http://linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Botrychium+ascendens>



3.6 Non-Vascular Plants

Porsild's Bryum

Haplodontium macrocarpum

Kingdom	Phylum	Class	Order	Family	Genus	Species
<i>Plantae</i>	<i>Bryophyta</i>	<i>Bryopsida</i>	<i>Bryales</i>	<i>Bryaceae</i>	<i>Haplodontium</i>	<i>macrocarpum</i>

Description

General: these bryophytes are relatively small and grow to form short, compact cushions. These cushions usually have a “spongy texture” and are bright green but the individual stems are reddish brown. The leaves appear to be shiny, concave and recurved.

Status:

Global: G2G3

Canada: T

Provincial: S1 – Red

Distribution

BEC Units: SWBmk, SWBmks

Forest District: Fort Nelson District

Know locations: There is only 1 known occurrence for Porsild's bryum in British Columbia. The species is located in an area between and outside Muncho Lake and Stone Mountain Provincial Parks near the Alaska Highway.

Habitat

This species typically grows in mountainous areas on wet calcareous cliffs where there is a constant presence of seepage and winter desiccation.

Threats and Concerns

A potential threat to this cliff dwelling species would be natural and human-caused events such as recreational use that destabilize the cliff habitat where it occurs. Another potential threat is road construction and blasting that could cause large pieces of the unstable rocks to fall and taking the moss colonies with them.

Best Management Practices

Current management guidelines for plant species at risk are focused at the stand level. If a potential plant species at risk is located, it is recommended that the area have ribbon

placed around it, photos taken and field cards filled out with the exact location recorded. This information should then be passed on to the designated species at risk coordinator.

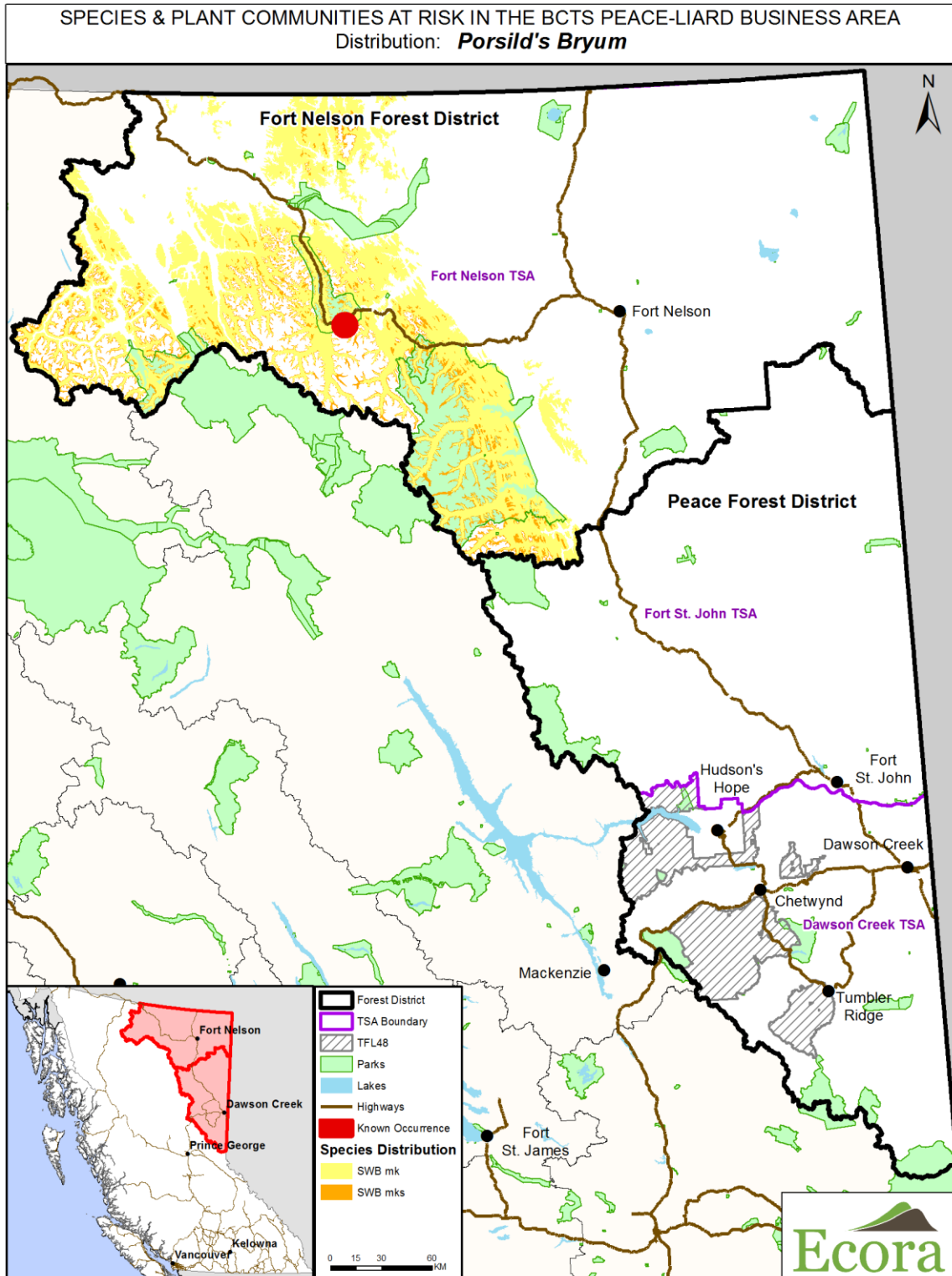
This is essentially a fine filter approach to managing the identified species, where an individual species and/or habitat is managed singularly and at a small scale (i.e. at the stand level). This approach should be used in association with a coarse filter approach which involves management for a variety of species/habitats simultaneously, mainly through the use of broad scale provisions at the landscape level such as protected areas and parks.

Both the plant species at risk and habitat they occur in should be protected. The current management strategies for plant species at risk are based on the Identified Wildlife Management Strategy (IWMS) wildlife and wildlife habitat provisions/measures set out by the BC Government. The best management practices are as follows:

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- restrict access to high elevation areas with the use of gates and trenches
- where roads already exist or are necessary, ensure road is not changing the hydrology of element occurrence habitat ensure road maintenance activities do not alter, damage, or destroy the element occurrence
- if seeding occurs, use native species (prevent spread of exotic plant species)

References and Links:

- B.C. Conservation Data Centre. 2011. Species Summary: *Haplodontium macrocarpum*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>
- COSEWIC.2003. COSEWIC assessment and status report on Porsild's bryum *Mielichhoferia macrocarpa* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. Vi + 22 pp. (www.sararegistry.gc.ca/status/status_e.cfm)



Other Non-Vascular Plants

Description

Non-vascular plants (bryophytes) include mosses, liverworts and hornworts. There are 42 non-vascular plants at risk in the Peace-Liard Business Area, all of which are mosses. There are no liverworts or hornworts currently listed as at risk. Mosses do not transport fluids through their bodies, instead they rely on their surroundings to provide required moisture. As such they are small in stature and grow on the ground, on rocks or on other plants. Many of the at-risk mosses in BC are found in uncommon ecosystems including calcareous soils, bedrock outcrops, wetlands, old growth forests, and alpine ecosystems.

With over 850 bryophytes identified, BC has the richest diversity of non-vascular plants in Canada. The 42 at risk mosses in northern BC are listed in the table below. Only Porsild's Bryum (*Haplodontium macrocarpum*) is designated at risk by Cosewic (threatened), and is described in more detail on the previous pages.

Table 2 Other Non-Vascular Plants at Risk in the PLBA

Scientific Name	Global Status	Prov Status	Forest Dist	BGC
<i>Haplodontium macrocarpum</i>	G2G3	S1	Fort Nelson	SWBmk;SWBmks
<i>Andreaeobryum macrosporum</i>	G2G3	S1	Fort Nelson	SWB
<i>Anoetangium sendtnerianum</i>	G3G4	S1S3	Fort Nelson	BAFA
<i>Aulacomnium acuminatum</i>	G3?	S1S3	Fort Nelson	BWBS;SWB
<i>Bryum arcticum</i>	G5?	S1S3	Fort Nelson	SWB
<i>Bryum uliginosum</i>	G3G5	S1S3	Peace	BWBS
<i>Cinclidium arcticum</i>	G4G5	S1S3	Fort Nelson	BAFA;SWB
<i>Cirriphyllum piliferum</i>	G5	S1S3	Fort Nelson	SWB
<i>Cnestrum glaucescens</i>	G3G4	S1S3	Fort Nelson	SWB
<i>Cnestrum schisti</i>	G3G5	S1S3	Fort Nelson	BAFA;SWB
<i>Desmatodon leucostoma</i>	G2G4	S1S3	Fort Nelson	BAFA; SWB
<i>Dicranum angustum</i>	G5?	S1S3	Fort Nelson	BAFA;BWBS;SWB
<i>Didymodon asperifolius</i>	G3G5	S1S3	Fort Nelson	SWB
<i>Didymodon johansenii</i>	G5?	S1S3	Fort Nelson	SWB
<i>Didymodon rigidulus</i>	G5	S2	Fort Nelson	SWBmk
<i>Drepanocladus tundrae</i>	GU	S1S3	Fort Nelson	BAFA;BWBS;SWB
<i>Entodon concinnus</i>	G4G5	S1S3	Fort Nelson	SWB
<i>Grimmia teretineris</i>	G3G5	S1S3	Fort Nelson	SWBmk
<i>Grimmia unicolor</i>	G4G5	S1S3	Fort Nelson	SWB
<i>Hygrohypnum alpestre</i>	G3G5	S1S3	Fort Nelson	BAFA;SWB
<i>Hygrohypnum polare</i>	G5?	S1S3	Fort Nelson	BAFA;SBS
<i>Hypnum holmenii</i>	GNR	S1S3	Fort Nelson	SWB

Scientific Name	Global Status	Prov Status	Forest Dist	BGC
<i>Myurella sibirica</i>	G4?	S1S3	Fort Nelson	SWB
<i>Oreas martiana</i>	G5?	S1S3	Fort Nelson	BAFA
<i>Plagiobryum demissum</i>	G3G5	S1S3	Fort Nelson	BAFA;SWB
<i>Plagiomnium ciliare</i>	G5	S1S3	Fort Nelson	BAFA;BWBS
<i>Pohlia bulbifera</i>	G4G5	S1S3	Fort Nelson	SWB
<i>Pylaisiella intricata</i>	G4	S1S3	Fort Nelson	SWBmk
<i>Rhizomnium punctatum</i>	G5	S1S3	Fort Nelson, Peace	BAFA;BWBS;ESSF;SBS
<i>Schistidium atrichum</i>	GNRQ	S1S3	Fort Nelson	BAFAunp;SWBmk
<i>Schistidium pulchrum</i>	GNR	S1S3	Fort Nelson, Peace	BWBSdk;BWBSmw;SWBmk
<i>Seligeria subimmersa</i>	G5?	S1S3	Fort Nelson	SWB
<i>Sphagnum annulatum</i>	GNR	S1S3	Fort Nelson	BWBS
<i>Sphagnum nitidum</i>	GNR	S1S3	Fort Nelson, Peace	BWBSmw;SWBmk
<i>Sphagnum platyphyllum</i>	G5	S1S3	Peace	BWBS;ESSF;SBS
<i>Splachnum rubrum</i>	G3	S1S3	Peace	SBS
<i>Splachnum vasculosum</i>	G3G5	S1S3	Fort Nelson	BWBS
<i>Stegonia latifolia</i> var. <i>pilifera</i>	G5T5?	S1S3	Fort Nelson	BAFA;SWB
<i>Timmia sibirica</i>	G5?	S1S3	Fort Nelson	SWBmk
<i>Tortella arctica</i>	GU	S1S3	Fort Nelson	SWB
<i>Trichostomum arcticum</i>	G5?	S1S3	Fort Nelson	SWB
<i>Trichostomum crispulum</i>	G5?	S1S3	Fort Nelson	SWB

Threats and Concerns

Forest harvesting and other resource extraction activities have a significant affect on the presence, abundance and distribution of all plants, and particularly the many non-vascular plants that require older growth forests for survival.

Best Management Practices

Whenever an unusual moss is identified in the field, crews should take a small specimen of the leaves and reproductive structures if present. Unlike vascular plants, mosses are best preserved using air-drying instead of pressing. Samples should be sent to an expert for identification under a microscope.

Current management guidelines for plant species at risk are focused at the stand level. If a potential plant species at risk is located, it is recommended that the area have ribbon placed around it, photos taken and field cards filled out with the exact location recorded. This information should then be passed on to a designated species at risk coordinator.

Both the plant species at risk and habitat they occur in should be protected. The current management strategies for plant species at risk are based on the Identified Wildlife Management Strategy (IWMS) wildlife and wildlife habitat provisions/measures set out by the BC Government. The best management practices are as follows:

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- if seeding occurs, use native species (prevent spread of exotic plant species)

References and Links:

- B.C. Conservation Data Centre. 2011. BC Species and Ecosystems Explorer. B.C. Minist. of Environ. Victoria, B.C. Available: <http://a100.gov.bc.ca/pub/eswp/>
- Raven, P.H., R.F. Evert and S.E. Eichhorn. 1999. Biology of Plants. W.H. Freeman and Company/Worth Publishers. New York, New York.
- Ryan, M.W. Bryophytes of British Columbia: rare species and priorities for inventory. Res. Br., B.C. Min. For., and Wildl. Br., B.C. Min. Environ, Lands and Parks. Victoria, B.C. Work. Pap.
- Schofield, Wilf. 2004. An introduction to bryophytes. In: Klinkenberg, Brian. (Editor). 2005. E-Flora BC: Atlas of the Plants of British Columbia [www.eflora.bc.ca]. Lab for Advanced Spatial Analysis, Department of Geography, University of British Columbia, Vancouver

4.0 PLANT COMMUNITIES

Forested plant communities at risk have been described in detail in recognition of the impact the forest industry has on these sites. Field staff should be able to identify forested communities at risk to ensure appropriate management decisions are made for these sites. Although non-forested plant communities could potentially be impacted by the forest industry, there is less likelihood of severe impact, as most are in the non-harvestable land base. Brief descriptions are provided in this report for non-forested communities to promote awareness of these sites.

4.1 Forest Upland Communities

(Balsam Poplar, Black Cottonwood) – Spruces / Red-Osier Dogwood

Populus balsamifera (ssp. *balsamifera*, ssp. *trichocarpa*) – *Picea* spp. / *Cornus stolonifera*

Description

General: This plant community is found along streams and rivers that are characterized by regular minor flooding. Open canopies of spruce and cottonwood are a feature of these sites. The shrub and herb layers that include common horsetail are often well developed on the middle bench sites. They can be underdeveloped relative to the amount of recent flood activity. There is little or no moss layer present. The moisture content is typically moist to very moist with a nutrient regime of rich to very rich (D-E).



	Common Vegetation
Trees	spruce (white or hybrid), black cottonwood
Shrubs	mountain alder, red-osier dogwood, black twinberry, prickly rose, highbush cranberry
Herbs	common horsetail
Mosses	Not usually present

Status:

Global: GNR

Canada:

Provincial: S2? – Red

Distribution

BEC Units: BWBSdk1, BWBSmw1

Forest Districts: Fort Nelson District, Peace District, TFL 48

Distinguishing the (balsam poplar, black cottonwood) - spruces / red-osier dogwood community from similar sites

Based on canopy and understorey attributes, this community is unique from others in the same variants.

Threats and Concerns

The main threats to this plant community are direct and indirect exposure to forest harvesting, disturbance from recreational users, and agriculture. All can lead to an increase in fragmentation and a loss of connectivity. As this plant community occurs adjacent to rivers and streams, it is also susceptible to changes in local hydrology caused by road and bridge construction.

Best Management Practices

Current management guidelines for plant communities at risk in the PGTSA are focused at the stand level. If the plant community in question is identified, it should be confirmed by a qualified biologist and rated to CDC specifications. All excellent and good quality communities should not be harvested and a management plan should be put in place. If the community is rated fair or poor, complete protection may not be needed, but the location and size should still be recorded for future reference and planning activities.

Management strategies for at risk forested floodplain communities are site specific but generally follow similar guidelines:

- these communities are sensitive to edge effects caused by adjacent timber harvesting and road construction, establish a 100m wide natural buffer surrounding the occurrence with no harvesting permitted
- when constructing roads, bridges and culverts, precaution should be taken to minimize any change in hydrology, especially upstream as these communities are highly susceptible to changes in local hydrology
- deactivate temporary roads after use, do not allow road or trail construction upslope or within the element occurrence

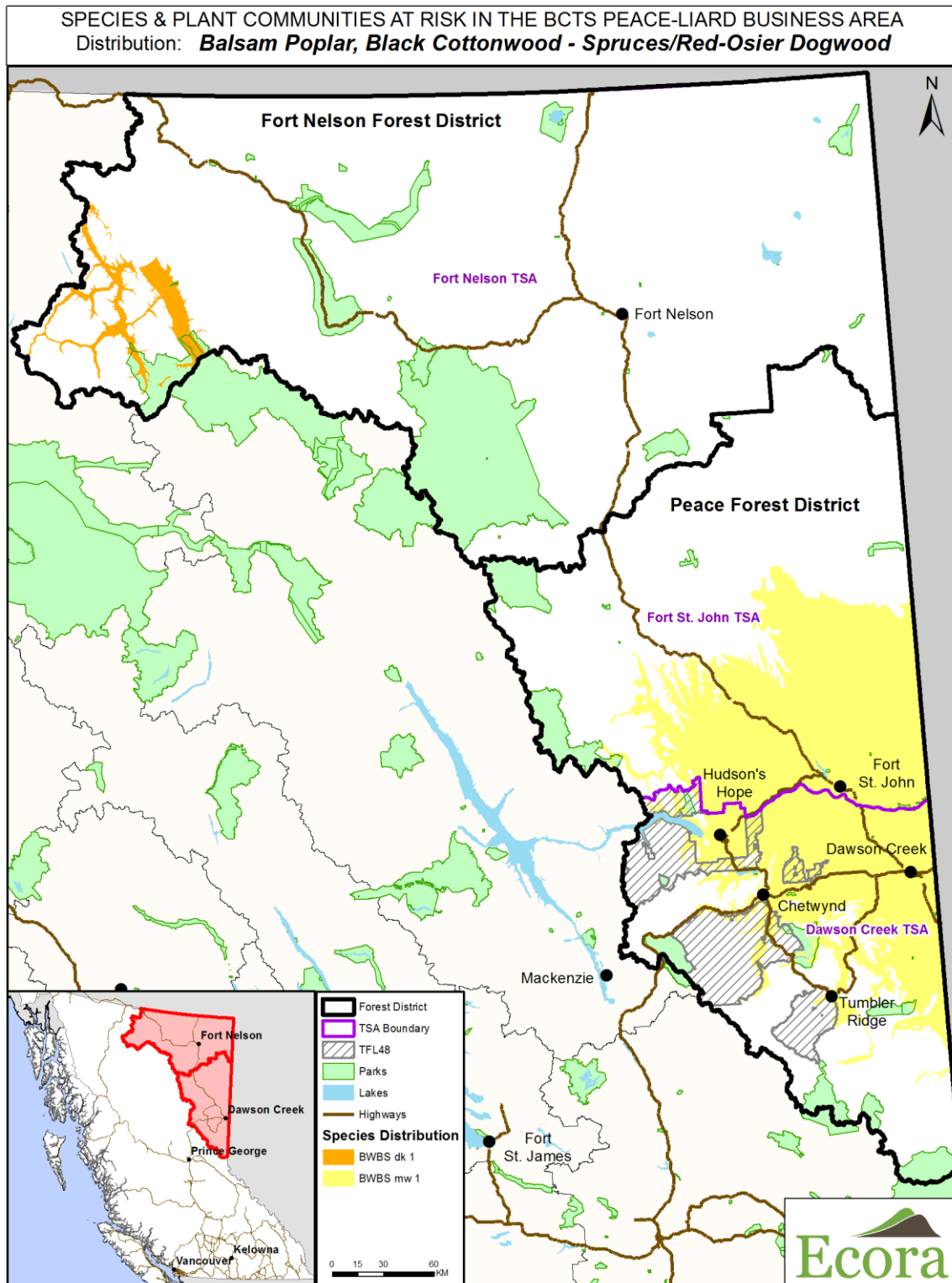
- avoid activities that could potentially cause the spread of invasive species
- avoid the use of pesticides within the buffered occurrence
- forest planners and field staff should make an effort to identify rare communities located near planned harvest zones and road construction

Further Information and Links:

B.C. Conservation Data Centre. 2011. Ecological Community Summary: *Populus balsamifera* (ssp. *balsamifera*, ssp. *trichocarpa*) - *Picea* spp. / *Cornus stolonifera*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Bernier, D., and G. Proulx. 2008. Identification and Management of Species and Plant Communities at Risk: BC Timber Sales – Prince George Business Area. Alpha Wildlife Publications, Sherwood Park, Alberta.

Identified Wildlife Management Strategy – BC Ministry Of Environment:
<http://www.env.gov.bc.ca/wld/frpa/iwms/index.html>



4.2 Non-Forested Upland Communities

Arctic Rush - Nuttall's Alkaligrass - Seablite

(*Juncus arcticus* - *Puccinellia nuttalliana* - *Suaeda calceoliformis*)

Description

General: This community is poorly described in the literature and was described from one known location along the Peace River near Bear Flats. This wetland community generally occurs with alkaline or saline soils and in the drawdown zone of permanent or temporary ponds. Soils in these locations are usually Solonchic Gleysols in heavy lacustrine deposits. In the Peace Forest Region, this community could be found on sites along the Peace River, from the eastern reach of Williston Lake to the BC/Alberta border.

Status:

Global: G3?

Canada:

Provincial: S1 – Red

Distribution

BEC Units: BWBSmw1/00

Forest Districts: Peace District

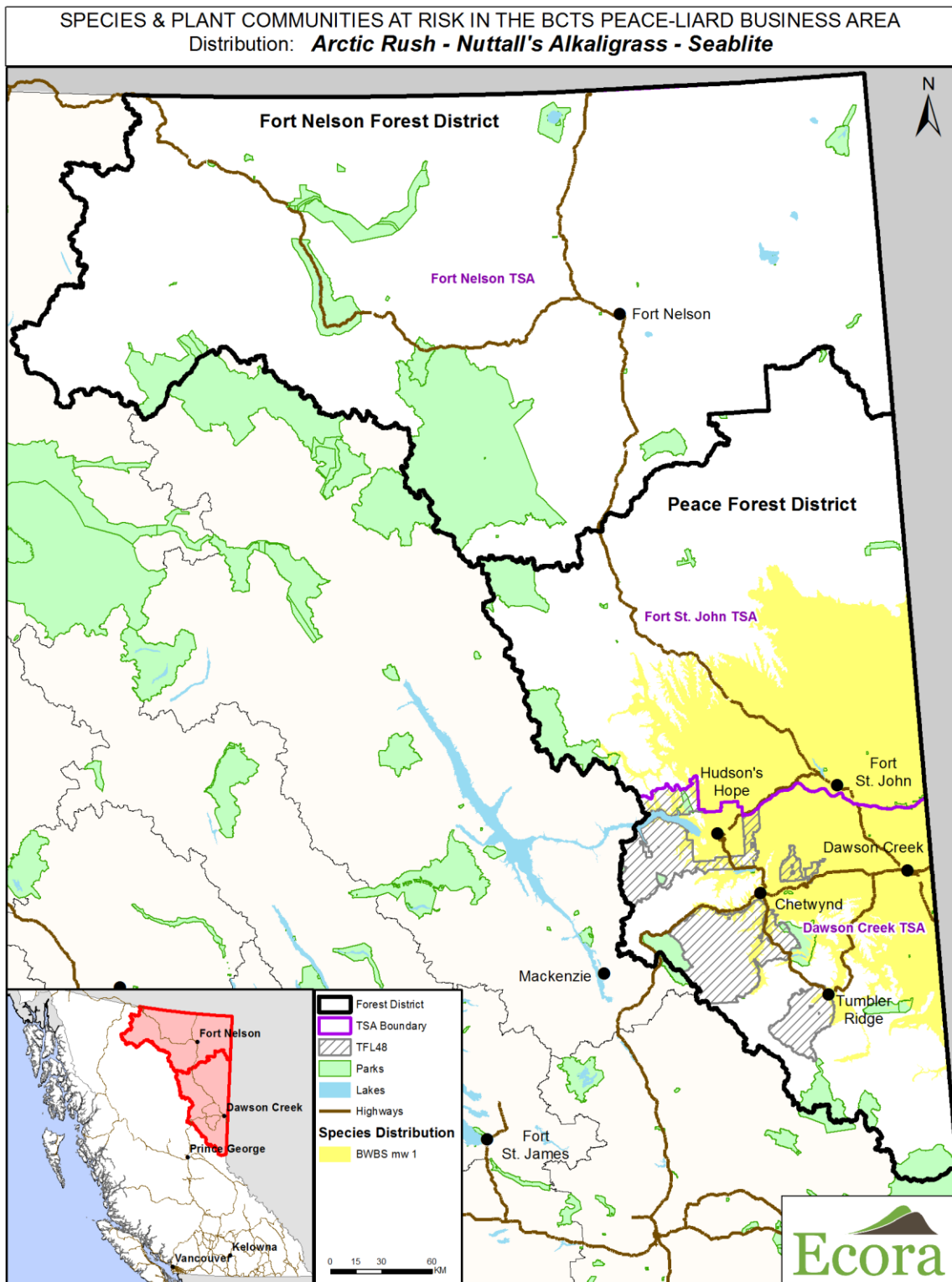
Best management practices for non-forested floodplains

- These communities are very sensitive to changes in local hydrology regimes and therefore any upstream activities should not alter the flow patterns.
- Although these communities are directly protected through riparian reserves and riparian management areas, any activity taking place upstream should be closely monitored.
- Ensuring the recommended widths assigned to these communities are large enough to accommodate the sites will also aid in creating effective management plans.

Further Information and Links:

B.C. Conservation Data Centre. 2011. Ecological Community Summary: *Juncus arcticus* - *Puccinellia nuttalliana* - *Suaeda calceoliformis*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Bernier, D., and G. Proulx. 2008. Identification and Management of Species and Plant Communities at Risk: BC Timber Sales – Prince George Business Area. Alpha Wildlife Publications, Sherwood Park, Alberta.



Mat Muhly – Arctic Rush – Nevada Bluegrass

(*Muhlenbergia richardsonis* - *Juncus arcticus* - *Poa secunda*
ssp. juncifolia)

Description

General: This community is poorly described in the literature and was described from one known location along the Peace River near Bear Flats. This wetland community generally occurs with alkaline or saline soils and in the drawdown zone of permanent or temporary ponds. Soils in these locations are usually poorly drained and consist of heavy clays. In the Peace Forest Region, this community is found on sites along the Peace River, from the eastern reach of Williston Lake to the BC/Alberta border.

Status:

Global: GNR

Canada:

Provincial: S1 – Red

Distribution

BEC Units: BWBSmw1/00

Forest Districts: Peace District

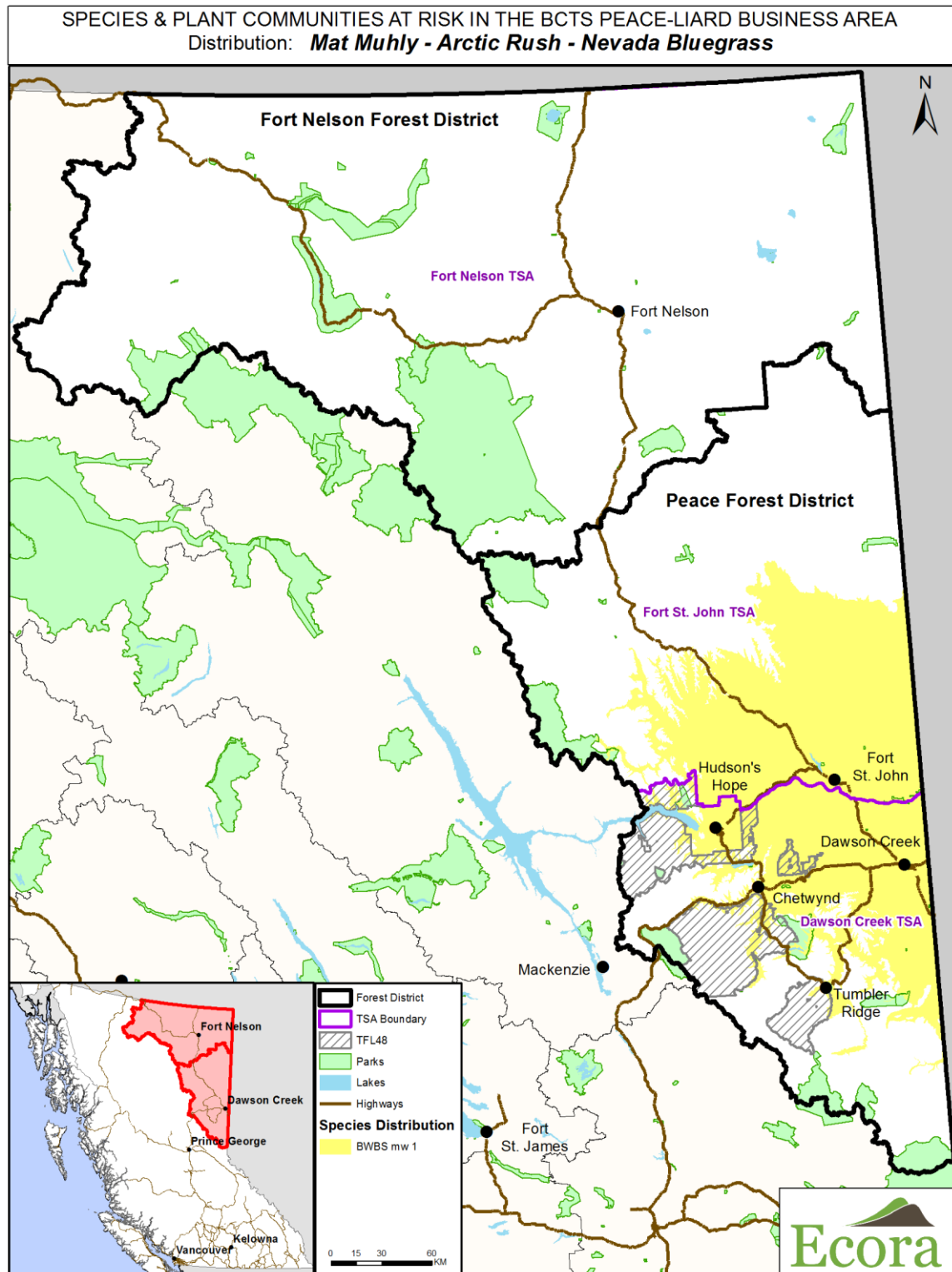
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Further Information and Links:

B.C. Conservation Data Centre. 2011. Ecological Community Summary: *Muhlenbergia richardsonis* - *Juncus arcticus* - *Poa secunda* ssp. *juncifolia*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Bernier, D., and G. Proulx. 2008. Identification and Management of Species and Plant Communities at Risk: BC Timber Sales – Prince George Business Area. Alpha Wildlife Publications, Sherwood Park, Alberta.



4.3 Non-Forested Floodplain Communities



Narrow-Leaf Willow Shrubland

Salix exigua Shrubland

Description

General: This community is found along large river systems at low elevations throughout the BC Interior. Sandy shorelines which receive lengthy spring floods are suitable sites for this community. Soils are always sandy Cumulic Regosols. Sites are dominated by narrow-leaf willow, although balsam poplar and mountain alder can be found sporadically. The understory is generally very sparse and scouring-rush is the dominant species. Usually, there is no moss/lichen layer present in this community.

Status:

Global: G5

Canada:

Provincial: S2 – Red

Distribution

BEC Units: BWBSmw2/F106

Forest Districts: Fort Nelson District, Peace District

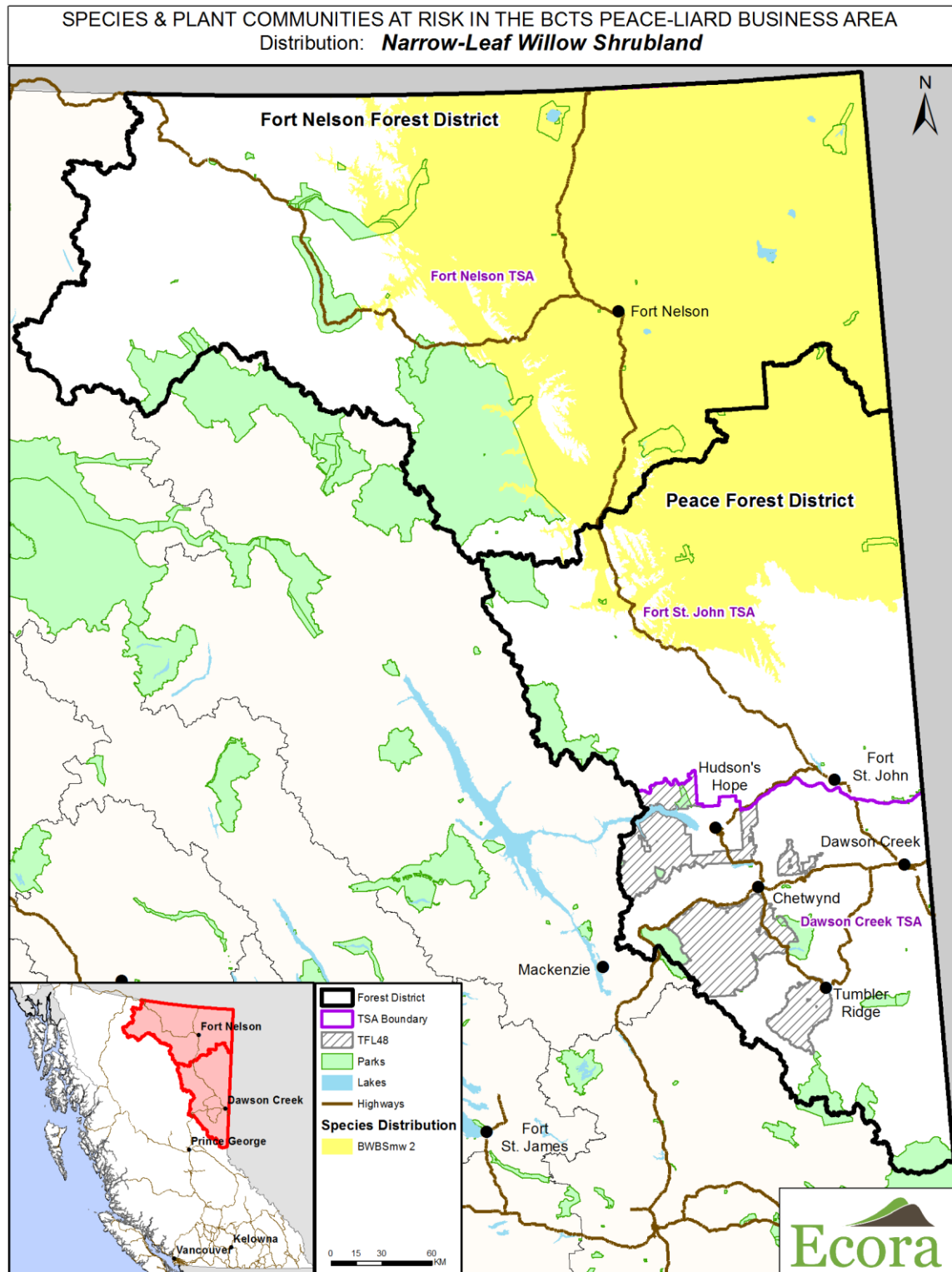
Best management practices for non-forested floodplains

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- Although these communities are directly protected through riparian reserves and riparian management areas, any activity taking place upstream should be closely monitored.
- Ensuring the recommended widths assigned to these communities are large enough to accommodate the sites will also aid in creating effective management plans.

Further Information and Links:

B.C. Conservation Data Centre. 2011. Ecological Community Summary: *Salix exigua* Shrubland. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Mackenzie, W.H., and J.R. Moran. 2004. Wetlands of British Columbia: A Guide to Identification. Res. Br., B.C. Min. For., Victoria, B.C. Land Manage. Hanb. No. 52.



Pacific Willow / Red-Osier Dogwood / Horsetails

Salix lucida ssp. lasiandra / *Cornus stolonifera* / *Equisetum* spp.

Description

General: This community is found in sites along large rivers that are subjected to prolonged spring flooding but also protected from erosive currents. These sites are often small in area and occur in river oxbows and drainage channels adjacent to larger black cottonwood ecosystems. Pacific willow dominates the canopy and may grow quite large (up to 15m). Red-osier dogwood, mountain alder and Mackenzie willow are also common. The understory is typically poorly developed with the exception of an abundance of horsetails.

Status:

Global: G2

Canada:

Provincial: S2 – Red

Distribution

BEC Units: BWBSdk1/FI03

Forest Districts: Fort Nelson District

Best management practices for non-forested floodplains

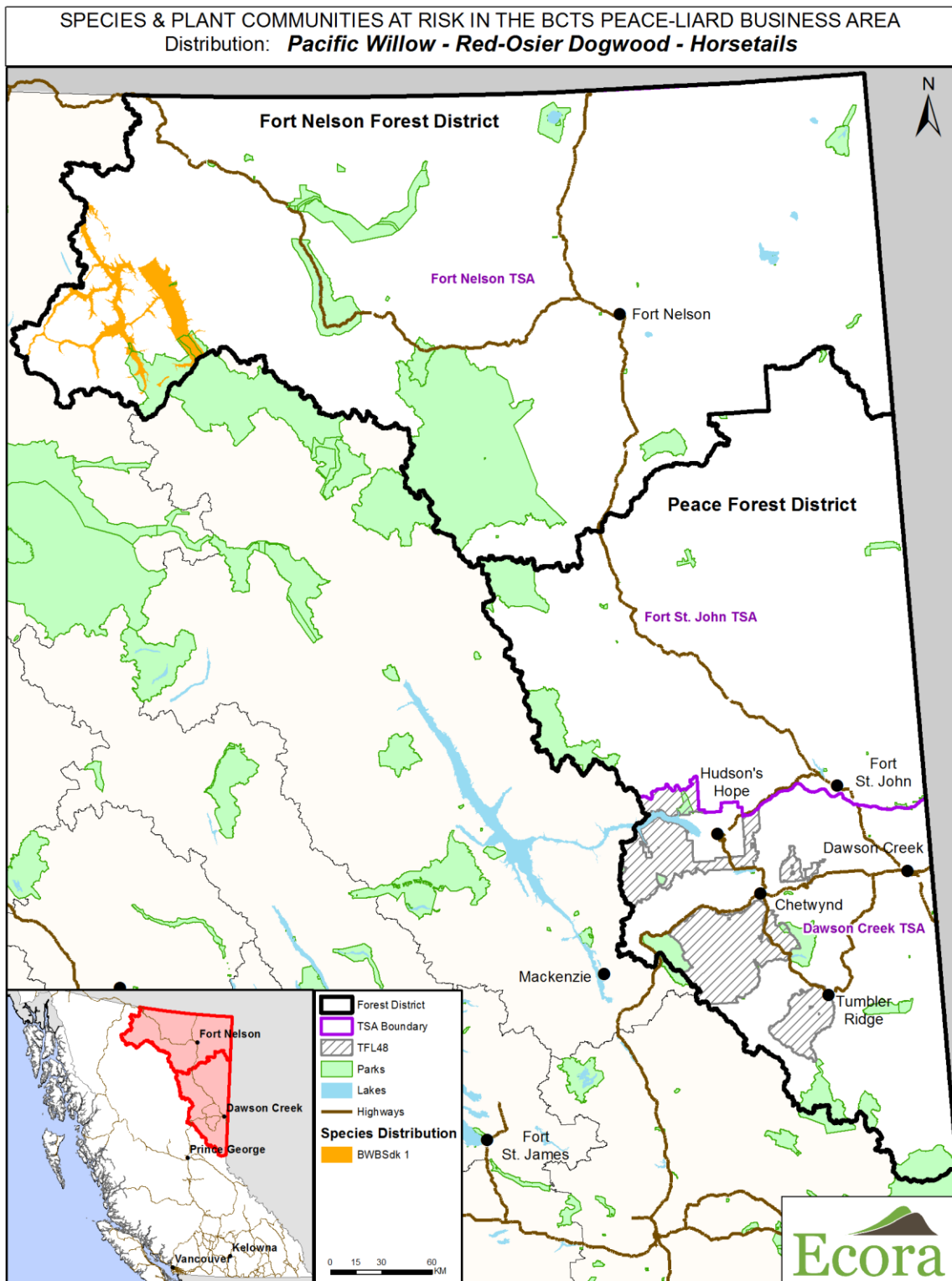
- These communities are very sensitive to changes in local hydrology regimes and therefore any upstream activities should not alter the flow patterns.
- Although these communities are directly protected through riparian reserves and riparian management areas, any activity taking place upstream should be closely monitored.
- Ensuring the recommended widths assigned to these communities are large enough to accommodate the sites will also aid in creating effective management plans.

Further Information and Links:

B.C. Conservation Data Centre. 2011. Ecological Community Summary: *Salix lucida ssp. lasiandra* / *Cornus stolonifera* / *Equisetum* spp.. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Bernier, D., and G. Proulx. 2008. Identification and Management of Species and Plant Communities at Risk: BC Timber Sales – Prince George Business Area. Alpha Wildlife Publications, Sherwood Park, Alberta.

- Mackenzie, W.H., and J.R. Moran. 2004. Wetlands of British Columbia: A Guide to Identification. Res. Br., B.C. Min. For., Victoria, B.C. Land Manage. Hanb. No. 52
- Proulx, G., D. Bernier, and K. Green. 2006. A Field Guide to Species and Plant Communities at Risk in Fort Nelson Forest District, British Columbia. Alpha Wildlife Research and Management Ltd., Sherwood Park, Alberta.



5.0 GLOSSARY

Term	Definition
Abdomen	The posterior major division of an insect body (after the head and thorax). The dragonfly abdomen is long and slender, and has 10 segments.
Asymmetrical	Not symmetrical, parts do not mirror each other.
Basal	Part of a structure closest to the body.
Basal area	Area of the cross section of a tree stem near its base, generally at breast height (1.37 m), above the ground and inclusive of bark.
Bract	A modified leaf subtending an inflorescence, flower stalk or flower that ranges from scale like in appearance to large, leafy and brilliantly coloured.
Bracteole	Secondary bract at the base of an individual flower.
Calyx	The outer portion of the flower when in bloom, usually green, and also encasing the flower bud. The sepals considered as a whole.
Capsule	A multi-celled fruit or pod that splits open when it is mature and has dried out. It is also the spore-containing structure in mosses and related plants.
Catkin	Also known as an ament, this dense, scaly, petal-less flower spike is found drooping on willow, birch and oak. It is unisexual and will drop from the plant after fruiting.
Compound flower	A single flower head composed of multiple florets as in the sunflower or dandelion.
Compound leaf	A leaf that is divided into two or more leaflets or separate leaf blades located on a common leaf stalk.
Eye stripe	A stripe running horizontally from the base of the bill through the eye.
Eye-spot	Eye-shaped spot on butterfly wings.
Flight period	The period that adults of a particular species can be found.
Floodplain	Nearly flat plain along the course of a stream, naturally subject to flooding.
Fragrant	Pleasantly smelling.
Frond	A leaf or palm of a fern.
Gland	A small vesicle containing oil, resin, or other liquid on any part of a plant.
Glandular	Gland bearing.
Glumes	The two basal bracts at the base of a grass spikelet or inflorescence as in the Cyperaceae and Gramineae families.
Inflorescence	The main flowering portion of a plant stem, which can include one or many individual flowers.
Internodes	Long portions of the stem located between two nodes or joints.
Lemma	The outer bract enclosing the individual flowers in a grass spikelet.
Ligule	A collar like appendage at the joining of the blade and the sheath.

Node	Parts or joints of the stem where leaves, shoots or flowers grow from.
Ovipositor	A structure consisting of blades and sheaths at the end of the female's abdomen used to lay eggs in plants.
Palmate	A shape similar to that of a hand, with leaflets, lobes or veins radiating from a similar point.
Perennial	A plant that lives for at least three years without new seeding.
Petal	One separate segment of the corolla.
Pinnae	One portion of the primary division of a pinnately compounded leaf, as in a fern.
Pinnate	Segments of a whole arranged on both sides of an axis as with a feather.
Receptacle	The point from which floral organs such as ovary, anthers, petals, etc. arise
Rhizome	A horizontal rootstalk, that is typically underground, and functions in giving rise to roots and shoots.
Rosette	A cluster of leaves arising in close circles from a central axis.
Scree	Accumulation of loose stones and pebbles at the base of a hill.
Sepal	One separate segment of the calyx.
Serrated	An edge or margin that is saw-toothed or notched forming tooth-like separations.
Sheath	A tube shaped portion of a leaf that covers certain plant parts such as around the stem near the base of a leaf.
Spike	A long inflorescence, as in sedge, that consists of a cluster of unbranched flowers (or spikelets) along a similar axis.
Spikelet	Individual flowers within a spike.
Spiral	In the direction of the coiling of the shell.
Sporangia	A cell or multicellular structure in which asexual non-motile spores are produced in fungi, algae, mosses, ferns.
Spore	Similar to seeds, spores are the reproductive bodies of fungi, ferns, mosses etc. They are typically single-celled and highly resistant to extremely hot dry situations.
Stamen	The male reproductive organ of a flower, consisting of an anther (which produces pollen), and a filament.
Stipules	The pair of leaf-like appendages subtending the leaf at the base of the petiole.
Taproot	The main vertical root of a plant, typically thicker and straighter than its lateral off shoots.
Thorax	The middle major division of an insect body. It has three segments, and it bears the wings and legs.

APPENDICES

Appendix 1 contains the Plains Bison which is a re- introduced species, as well as accounts for species recently ‘de-listed’ as at risk in the PLBA. De-listed accounts in the appendix are Peregrine Falcon, Emerald Shiner, Rivergrass, Polixenes Arctic, and Canada Warbler. The 2009 accounts are no longer up to date, are presented here for historical purposes but will be removed in future versions of this book.

6.1 Appendix 1

Plains Bison

Bos bison bison

Kingdom	Phylum	Class	Order	Family	Genus	Species
Animalia	Craniata	Mammalia	Artiodactyla	Bovidae	Bos	bison

Description

General: The Plains Bison is a large (shoulder height: 165 – 180 cm; weight: ≤ 800 kg) dark brown ungulate with a massive forequarters covered by a reddish-brown cape of long hair, and small hindquarters with short, lighter hair. The long hairs extend down the front legs, creating the appearance of chaps. The Plains Bison has a large, heavy head with a short, broad nasal area, and a mop of black hair between the short, curved horns. Both sexes have a beard of long hair below the chin, and a tufted tail of moderate length. There is a marked sexual dimorphism; females are about half the weight of males. Calves are reddish-brown for the first 3 months of their life.

Status:

Global: G4TU

Canada: T

Provincial: SX – Red

Distribution

BEC Units: BWBS, SWB

Forest Districts: Peace District

Known Locations: The largest free-ranging population of Plains Bison is found in the Pink Mountain-Sikanni Chief River area, 180 km northwest of Fort St. John. This herd is outside the historical range of the subspecies, and was established in 1971.

Habitat

The Plains Bison prefers open grasslands or meadow habitat types. It uses forested areas for escape, cover, thermal cover, or other purposes such as calving. Habitat selection by the genus *Bison* appears to be related to nutritional requirements, forage availability, snow depths, fire history, and predator avoidance.

Threats and Concerns

Habitat loss due to agriculture and urban development is the greatest threat to Plains Bison. Weak ice can be a risk to bison as they travel across rivers or swamps. Hunting is subject to varying degrees of regulation, and may impact on Plains Bison populations. In drought years, fires can be common on grasslands, chasing bison away from their range. Wolves also present a significant risk for bison, particularly in respect to calf survival. Grizzly bears are known to prey on plains bison in Pink Mountain, the only location in Canada where their current ranges overlap. Since the introduction of domestic cattle to North America, a number of diseases have been introduced to bison populations from domestic cattle herds either directly or indirectly, including tuberculosis, brucellosis and bovine viral diarrhea. Finally, even if the Pink Mountain Plains Bison are separated from Wood Bison by hundreds of kilometers, there is still the possibility that they mix with some of them, this resulting in the introgression of Wood Bison genetic material into the genome of the Pink Mountain Plains Bison.

Best Management Practices

Land clearing and seeding associated with expanding forestry and petroleum resource development have increased the amount of grasslands. Plains Bison are well adapted to a variety of grassland and meadow habitats and could benefit from some types of habitat alteration associated with resource development. Grazing by domestic cattle should not be allowed in areas used by Plains Bison.

Further Information and Links:

- B.C. Conservation Data Centre. 2011. Species Summary: *Bos bison bison*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>
- COSEWIC. 2004d. COSEWIC assessment and status report on the plains bison *Bison bison bison* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 71 pages.
- MacEwan, G. 1995. Buffalo: Sacred and Sacrificed. Alberta Sport, Recreation, Parks & Wildlife Foundation, Edmonton, Alberta. 208pp.
- Proulx, G. 2006. Management guidelines for “species at risk” in the Mistik FMA area (Saskatchewan). Alpha Wildlife Publications, Sherwood Park, Alberta.

Peregrine Falcon, *anatum* subspecies

Falco peregrinus anatum

Kingdom	Phylum	Class	Order	Family	Genus	Species
Animalia	Craniata	Aves	Falconiformes	Falconidae	Falco	peregrinus

Description

General: The Peregrine Falcon is a crow-size (height: 38-53 cm; wingspan: 1 m), slate gray bird of prey with a lighter salmon-coloured chest with fine black bars and spots. It has a black head with wide “sideburns”. It is a fast flier with a narrow tail and tapered wings. The juveniles are brown with extensive barring on the chest.

Status:

Global: G4T4

Canada: SC

Provincial: S2B – Red

Distribution

BEC Units: BWBS, SBS

Forest Districts: Peace District, TFL 48

Known Locations: The species is a migrant in northeastern BC. Breeding was recorded in the early 1960s in Fort St. John and along the Peace River.

Habitat

The Peregrine Falcon forages over open country. It prefers habitats that support numbers of shorebirds, waterfowl, and other small- to medium- size birds. Nests generally overlook large lakes, rivers and marshes.

Threats and Concerns

Peregrine Falcon populations have declined mainly because of pesticide poisoning.

Best Management Practices

Because the Peregrine Falcon feeds on aquatic bird species, forestry activities should follow The Forest and Range Practices Act's guidelines for aquatic systems.

- If a nest was to be found, special measures should be taken to protect it and its surroundings, and avoid disturbance from April to September.

Further Information and Links:

Beebe, F. L. 1965. The known status of the Peregrine Falcon in British Columbia. Pages 53-60 in J. J. Hickey, editor. Peregrine Falcon populations: their biology and decline. University of Wisconsin Press, Madison.

British Columbia Conservation Data Centre - <http://a100.gov.bc.ca/pub/eswp/>

Campbell, R. W., N. K. Dawe, I. McTaggart-Cowan, J. M. Cooper, G. W. Kayser, and M. C. E. McNall. 1990. The birds of British Columbia. Volume 2. Non passerines diurnal birds of prey through woodpeckers. Royal British Columbia Museum, Victoria, BC.

COSEWIC. 2007. COSEWIC assessment and update status report on the Peregrine Falcon *Falco peregrinus* (*pealei* subspecies - *Falco peregrinus pealei* and *anatum/tundrius* - *Falco peregrinus anatum/tundrius*) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 45pp.

Proulx, G., D. Bernier, and F. P. Caffrey. 2004 (2005 Revision). A field guide to species at risk in Canfor's Planning Areas in Central Interior British Columbia – 2004. Alpha Wildlife Publications, Sherwood Park, Alberta.

Emerald Shiner

Notropis atherinoides

Kingdom	Phylum	Class	Order	Family	Genus	Species
Animalia	Craniata	Actinopterygii	Cypriniformes	Cyprinidae	Notropis	atherinoides

Description

General: The Emerald Shiner is a 5-8-cm-long slender, compressed minnow with emerald green, bluish back with a distinctive silver lateral band. It has a triangular head with large eyes and a relatively large mouth.

Status:

Global: G5

Canada:

Provincial: SU

Distribution

BEC Units: BWBS

Forest Districts: Fort Nelson District

Known Locations: It is known from only one site in BC: the Fort Nelson River at Old Fort Nelson. It is possibly more widespread in the Fort Nelson/Liard Drainage.

Habitat

The Emerald Shiner inhabits large, open rivers and lakes, and the mouths of small streams. It often congregates in large schools in mid-water or near the surface. The only British Columbia site is a creek channel, 2-10 m wide, with brown-stained water flowing on a muddy bottom. The species spawns in late spring and summer over detritus-free substrate offshore at night at depths of 2-6 m.

Threats and Concerns

The degradation of streamside vegetation and bank integrity is the main threat.

Best Management Practices:

Forestry activities should follow The Forest and Range Practices Act's guidelines for aquatic systems.

- Do not alter the species' habitat (i.e., discharge of fill material, draining, etc.).
- Minimize the number of stream crossings.
- Maintain roads and right-of-ways in good condition to minimize impact on channel integrity, water quality, groundwater flow, substrate composition, cover, and natural temperature regimes.
- Do not apply pesticides near aquatic ecosystems.
- Avoid the introduction of predatory, exotic fish.

Further Information and Links:

British Columbia Conservation Data Centre - <http://a100.gov.bc.ca/pub/eswp/>

Proulx, G., K. Green, and D. Bernier. 2006. Accounts for species and plant communities at risk in the Fort Nelson Forest District. Alpha Wildlife Research & Management Ltd. and Timberline Forest Inventory Consultants report submitted to CANFOR, Fort Nelson, BC. 121 pages.

Rivergrass

Scolochloa festucacea

Kingdom	Phylum	Class	Order	Family	Genus	Species
Plantae	Anthophyta	Monocotyledoneae	Cyperales	Poaceae	Scolochloa	festucacea

Description

General: Rivergrass is a semi-aquatic perennial grass stemming from stout rhizomes. It is 100-150 cm tall. Sheaths are open, strongly keeled and usually smooth. Blades are flat, firm, elongate, 5-10 mm wide, and have gradually narrowed to slender tips. Flowers exist in an open panicle. Spikelets have 3-4 flowers. The basal bracts of the spikelet are lacking bristle-like appendages.

Status:

Global: G5

Canada:

Provincial: S2 – Red

Distribution

BEC Units: BWBSmw

Forest District: Peace District, TFL 48

Known Locations: There are no BC CDC verified locations in the Peace District. It is found in the south-central, southeastern and east-central portions of British Columbia and ranges north to the Yukon and Northwest Territories and Alaska.



Habitat

This plant is typically found around ponds, marshes, lakeshores and streamsides and is typically associated with rich soil nutrient regime in the steppe and montane zones.

Threats and Concerns

Because this species is found adjacent to watercourses, the main threats to this species are changes in hydrological processes caused by development such as bridge/road construction and hydroelectric power projects.

Best Management Practices

Current management guidelines for plant species at risk are focused at the stand level. If a potential plant species at risk is located, it is recommended that the area have ribbon placed around it, photos taken and field cards filled out with the exact location recorded. This information should then be passed on to the designated species at risk coordinator.

This is essentially a fine filter approach to managing the identified species, where an individual species and/or habitat is managed singularly and at a small scale (i.e. at the stand level). This approach should be used in association with a course filter approach which involves management for a variety of species/habitats simultaneously, mainly through the use of broad scale provisions at the landscape level such as protected areas and parks.

Both the plant species at risk and habitat they occur in should be protected. The current management strategies for plant species at risk are based on the Identified Wildlife Management Strategy (IWMS) wildlife and wildlife habitat provisions/measures set out by the BC Government. The best management practices are as follows:

- establish a core area around a known element occurrence with a 30-50 m wide buffer
- establish a management zone around the core area that is 150-200 m wide around the buffer
- do not harvest within the core area, unless harvesting is aimed specifically at improving the habitat for the particular rare plant species
- keep the identified area (core area + buffer) free from herbicide use
- deactivate temporary roads after use, do not allow road or trail construction upslope or within the element occurrence
- restrict access to high elevation areas with the use of gates and trenches
- where roads already exist or are necessary, ensure road is not changing the hydrology of element occurrence habitat ensure road maintenance activities do not alter, damage, or destroy the element occurrence
- if seeding occurs, use native species (prevent spread of exotic plant species)

Further Information and Links:

British Columbia Conservation Data Centre:

<http://a100.gov.bc.ca/pub/eswp/speciesSummary.do?id=15958>

Douglas, G.W., D. Meidinger, and J. Penny. 2002. Rare Native Vascular Plants of British Columbia, 2nd ed. B.C. Conserv. Data Centre, Terrestrial Inf. Branch, Victoria.

Douglas, G.W., D. Meidinger, and J. Pojar, eds. 2001b. Illustrated Flora of British Columbia, Vol. 7, Monocotyledons (Orchidaceae through Zosteraceae). B.C. Minist. Sustainable Resour. Manage., and B.C. Minist. For. Victoria, BC.

E-Flora BC: Electronic Atlas of the Plants of British Columbia:

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

Identified Wildlife Management Strategy – BC Ministry Of Environment:

<http://www.env.gov.bc.ca/wld/frpa/iwms/index.html>

Proulx, G., D. Bernier and F. Caffrey. 2004. A Field Guide to Species at Risk in Canfor's Planning Areas in Central Interior British Columbia – 2004. Alpha Wildlife Research and Management Ltd. Sherwood Park, Alberta.

Polixenes Arctic, yukonensis subspecies

Oeneis polixenes yukonensis

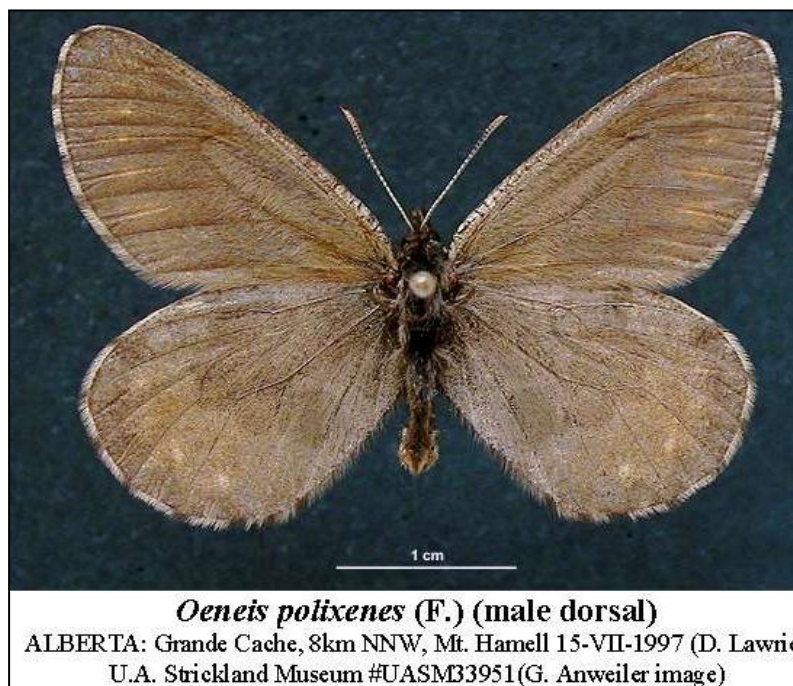
Kingdom	Phylum	Class	Order	Family
Animalia	Mandibulata	Insecta	Lepidoptera	Nymphalidae

Description

General: The adult butterfly is soft-brown with translucent wings. It is without eye-spots or markings. Larvae have black, tan and grey lateral stripes and a dorsal stripe that is grey-green. The head has six dark stripes and is greenish yellow in color. *O.p. yukonensis* is typically highly translucent and pale grey brown.

Size: 38-46 mm.

Field Signs: Adults are in flight from mid-June to late July.



Taxonomy: There are five subspecies in Canada. *O.p. beringianus*, *O.p. polixenes*, *O.p. subhyalina*, *O.p. woodi* and *O.p. yukonensis*. The latter is found in the area covered by this document.

Status:

Global: G5T5

Canada:

Provincial: S1S3 – red

Distribution

BEC Units: BAFA

Forest Districts: DSS_C (Skeena Stikine District)

Known Locations: *O. polixenes* extends into northwestern BC and the Rocky Mountains of BC and Alberta. The subspecies *yukonensis* is typically found from southwestern Yukon. *O.*

Habitat

General: This butterfly is found above the treeline in dry, grassy, rocky arctic and alpine tundra, windswept summits, ridges, and open bogs. It does avoid flying in rocky barrens and scree slopes.

Special Habitat Features: Presence of exposed gravel patches.

Food

Larvae eat grasses and sedges.

Biological notes

Oviposition has been observed on sedges (*Carex misandra*) and grasses (*Festuca mibra*). Adults make short flights above the grassy tundra and often land on small rocks.

Threats

Habitat loss due to agriculture and forestry practices.

Management Guidelines

- Do not apply herbicides or pesticides in or near potential habitats.

Information Gaps

- Research is required on distribution and habitat needs.

Further Information and Links:

BC Conservation Data Centre. 2005. Species summary. BC Ministry of Sustainable Resource Management. Available at: <http://a100.gov.bc.ca/pub/eswp/speciesSummary.do?id=15636>

Canadian Biodiversity Information Facility. 2009. Species Bank. Government of Canada. Available at: http://www.cbif.gc.ca/spp_pages/butterflies/species/PolixenesArctic_e.php

Proulx, G., D. Bernier, and K. Green. 2006. Accounts for Species and Plant Communities at Risk in the Fort Nelson Forest District. Unpublished report. Alpha Wildlife Research & Management Ltd., Sherwood Park, Alta., And Timberline Natural Resource Group Ltd., Dawson Creek, BC.

Canada Warbler

Wilsonia canadensis

Kingdom	Phylum	Class	Order	Family	Genus	Species
Animalia	Craniata	Aves	Passeriformes	Parulidae	Wilsonia	canadensis

Description

General: The Canada Warbler is a small (13 cm; wingspan: 20 cm) songbird with a gray back and a yellow belly. It has a crown showing faint black speckles, a yellow eye ring, and a necklace of black spots on the upper breast. Both sexes are similar, but females are paler.

Status:

Global: G5

Canada: Threatened

Provincial: S3S4B – Blue; IWMS listed

Distribution

BEC Units: BWBS

Forest Districts: Fort Nelson District, Peace District, TFL 48

Known Locations: The Canada Warbler is at the limit of its northwestern breeding range in northeastern BC. Most summer records are from the Peace Lowland in the Boreal Plains and from near Fort Nelson in the Fort Nelson Lowland of the Taiga Plains. Although it is believed that breeding populations are likely small, observations in mixedwoods southwest of Dawson Creek suggest that the species may be well established.

Habitat

The Canada warbler inhabits mature and old deciduous or mixedwood canopy with a tall, dense, shrub layer, located nearly always on a moist, rich site. Although deciduous trees are dominant, white spruce is often found in association with the main layer. White birch is usually present in the tree or tall shrub layer. Shrubby understoreys with variable foliage heights, dominated by soapberry, rose, red-osier dogwood, fireweed, Saskatoon, northern bedstraw, choke cherry, wild sarsaparilla, pink corydalis, creamy peavine, American vetch, purple peavine, bluegrass, fuzzy-spiked wildrye, kinnikinnick, and single delight.

Threats and Concerns

The harvest of mature and old-growth aspen-white spruce forests likely is the greatest threat for this species. Another concern is over-grazing by cattle.

Best Management Practices

- Maintain suitable nesting habitat by maintaining late-successional riparian aspen or mixedwood stands in BWBS.
- Incorporate aspen-leading mixed stands in old-growth management areas, wildlife tree patches, and riparian management areas. Wildlife tree patches should be ≥ 2 ha.
- Minimize edge habitat, maximize forest interior conditions, and establish corridors between favorable habitat patches.
- Do not construct roads, trails, or other access routes near nest sites.
- When a nest is found, special measures should be taken to protect it and its surroundings. Establish WHAs at known breeding sites or sites with high suitability nesting habitat.
- Do not apply pesticides or herbicides in or near occupied ecosystems.
- Avoid prime habitat when planning seismic explorations, transmission lines, and other access routes.

Further Information and Links:

B.C. Conservation Data Centre. 2011. Species Summary: *Wilsonia canadensis*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/>

Campbell, R. W., N. K. Dawe. I. McTaggart-Cowan, J. M. Cooper, G. W. Kaiser, A. C. Stewart, and M. C. E. McNall. 1990. The birds of British Columbia. Volume 4. Wood-warblers through old world sparrows. UBC Press, Vancouver, BC.

Lance, A. N., and M. Phinney. 1994. Bird diversity and abundance following aspen clearcutting in the Boreal White and Black Spruce Biogeoclimatic Zone. BC Min.For. report, Victoria, BC. 40 pages.

Proulx, G., K. Green, and D. Bernier. 2006. Accounts for species and plant communities at risk in the Fort Nelson Forest District. Alpha Wildlife Research & Management Ltd. and Timberline Forest Inventory Consultants report submitted to CANFOR, Fort Nelson, BC. 121 pages.

http://www.wildlifebc.org/UserFiles/File/4_1_Campbell_et_al.pdf

6.2 Appendix 2 – SAR / BGC / Habitat Summary Sheets

Common Species Name	BGC	Habitat Description	Fort Nelson District	Fort St John TSA	Dawson Creek TSA	TFL 48
INVERTEBRATES						
Hotwater Physa	BWBS	in the vicinity of hot springs	yes	no	no	no
Alberta Arctic	BWBS	grassland & meadows (dry bunchgrass hillsides)	no	yes	yes	no
Assiniboine Skipper	BWBS	short grass prairie, open grassy aspen stands	no	yes	yes	possible
Coral Hairstreak, <i>titus</i> subspecies	BWBS, ESSF	riparian areas with flowers such as milkweed and/or wild fruit producing shrubs	no	yes	yes	yes
Eastern Pine Elfin	BWBS	Pine dominated stands	yes	no	no	no
Great Spangled Fritillary	BWBS	grasslands and grassy open areas such as roadsides or open aspen stands	no	yes	yes	possible
Mormon Fritillary, <i>eurynome</i> subspecies	ESSF	dry grassy meadows at higher elevations, mixedforest openings, riparian areas	no	yes	yes	possible
Mt. McKinley Alpine	BAFA, BWBS, SWB	high elevation scree slopes and boulder fields	yes	no	no	no
Old World Swallowtail	ESSF	openings in boreal forest, northern subalpine willow-shrub habitat and possibly alpine tundra	no	yes	no	no
Philip's Artic	BWBS, SWB	open spruce bogs, open spruce forests and possibly alpine tundra	yes	no	no	no
Plains Forktail	BWBS	in the vicinity of hot springs	yes	no	no	no
Striped Hairstreak	BWBS	around thick shrubbery (i.e. Saskatoon berry) on the edge of wooded areas	no	yes	yes	possible
Yellow-dotted Alpine	BWBS, SWB	subalpine bogs and wet grassy meadows	yes	no	no	no
BIRDS						
Bay-breasted Warbler	BWBS	forest and riparian mature white spruce (pure or mixed with aspen and balsam poplar),	yes	yes	yes	yes

Species and plant communities at risk in the BCTS Peace – Liard Business Area

Common Species Name	BGC	Habitat Description	Fort Nelson District	Fort St John TSA	Dawson Creek TSA	TFL 48
Black-throated Green Warbler	BWBS	mature white spruce - aspen (balsam poplar) mixedwood forest but also frequent riparian spruce and mixedwood forests	yes	yes	yes	yes
Canada Warbler	BWBS	mature to old deciduous or mixedwood stands with a tall, dense shrub layer	yes	yes	yes	yes
Cape May Warbler	BWBS	mature or old white spruce (pure stand) or mixed with black spruce, balsam poplar, aspen, birch, willow, alder, and lodgepole pine.	yes	yes	yes	yes
Connecticut Warbler	BWBS	aspen stands with a fairly sparse shrub layer and a well-developed herbaceous layer	yes	yes	yes	yes
Lark Sparrow	BWBS	mixture of brush, grass and bare earth found in open woods, grasslands, river valleys with scattered trees, roadsides	no	yes	yes	yes
Nelson's Sharp-tailed Sparrow	BWBS	riparian sedge meadows with scattered willows	possible	yes	yes	possible
Sandhill Crane	BWBS, SBS, ESSF	isolated and undisturbed wetlands with abundant emergent vegetation, surrounded by forest cover	yes	yes	yes	yes
Short-eared Owl	BWBS, SBS, SWB	fields, grasslands and bushy meadows, marshlands, sloughs and cutblocks	possible	yes	yes	possible
Swainson's Hawk	BWBS, SBS	open woodlands with mixed forests adjacent to grasslands, farmlands and wetlands	no	yes	yes	yes
Upland Sandpiper	BWBS	open, grassy areas such as meadows, hay fields, pastures, wet meadows with vegetation less than 20 cm tall	yes	yes	yes	yes
Yellow Rail	BWBS	wet meadows and dense grass-sedge marshes with little or no standing water	no	yes	yes	possible

Species and plant communities at risk in the BCTS Peace – Liard Business Area

Common Species Name	BGC	Habitat Description	Fort Nelson District	Fort St John TSA	Dawson Creek TSA	TFL 48
MAMMALS						
Bighorn Sheep	ESSF, BAFA	Forage in meadows, grassy mountain slopes and high ridges and seek cover in open mature coniferous forests	no	no	yes	yes
Caribou (boreal pop.)	BWBS	associated with large peatlands adjacent to older forests	yes	yes	possible	no
Caribou (southern pop.)	ESSF, BAFA	winter aggregate in open coniferous stands to feed on arboreal lichen	no	yes	yes	yes
Caribou (northern mountain pop.)	BWBS, SBS, ESSF, BAFA	Areas of terrestrial lichens such as old forest pine stands and in spring forage rich area	yes	yes	yes	yes
Fisher	BWBS, SBPS, SBS	landscapes with mosaic of interconnected, young and mature forests, usually coniferous or mixed-coniferous stands	yes	yes	yes	yes
Grizzly Bear	BWBS, SBS, SWB, ESSF, BAFA	Mosaics of non-forested sites interspersed with forested sites but are mostly attracted to avalanche chutes, salmon streams, rich riparian areas and berry crops	yes	yes	yes	yes
Wolverine	BWBS, SBS, SWB, ESSF, BAFA	Search for wilderness area that have adequate food supplies and cover protection	yes	yes	yes	yes
Wood Bison	BWBS	Open trembling aspen or coniferous forests, shrub lands with extensive wet to dry meadows	yes	yes	no	no
FISH						
Arctic Cisco	BWBS	deep lakes, pools and large rivers	yes	no	no	no
Bull Trout	BWBS, SWB, ESSF	cool, clear mountain streams with an abundance of cobbles, stones and coarse woody debris	yes	yes	yes	yes
Cisco	BWBS	deep lakes, pools and large rivers	yes	no	no	no

Species and plant communities at risk in the BCTS Peace – Liard Business Area

Common Species Name	BGC	Habitat Description	Fort Nelson District	Fort St John TSA	Dawson Creek TSA	TFL 48
Ninespine Stickleback	BWBS	cool, quiet waters of lakes, estuaries, and streams	yes	no	no	no
Spottail Shiner	BWBS	large rivers and lakes typically with sandy or rocky shallows and scant vegetation	yes	no	no	no
VASCULAR PLANTS - DICOTS						
Drummond's Thistle	BWBSmw	mesic to dry forest openings, meadows and roadsides	no	possible	yes	possible
Fennel-Leaved Desert-Parsley	BWBSmw	dry grassy slopes	no	yes	yes	possible
Gaping Goosefoot	BWBSmw	moist to dry open areas such as pastures, prairies, roadsides, sand hills and lakeshores	no	yes	yes	yes
Gardner's sagebrush	BWBSmw	dry grassy slopes	no	yes	yes	possible
Hawkweed-Leaved Saxifrage	BAFA	moist to wet meadows and solifluction slopes	yes	no	no	no
Heart-Leaved Buttercup	BWBSmw	moist to mesic meadows, grasslands and forest openings	no	possible	yes	possible
Long-leaved Mugwort	BWBSmw	mesic stream banks and terraces	no	yes	yes	yes
Marsh Fleabane	BWBSdk, BWBSmw	moist to wet lakeshores, marshes, ponds and streambanks	yes	yes	yes	possible
Northern Swamp Willowherb	SWB, BAFA	bogs and wet meadows	yes	no	no	no
Nuttall's Sunflower	BWBSmw, SBSwk	moist to wet meadows and fields	no	yes	yes	yes
Pink Campion	BWBSmw, BAFA	dry meadows and open forests (poor soil nutrient regime)	yes	no	no	no
Prairie Buttercup	BWBSmw	dry thickets, grasslands and open forests	no	yes	yes	yes
Purple Rattlesnake-Root	BWBSmw	dry grassy slopes	no	possible	yes	possible
Raup's Willow	BWBSdk, BWBSmw, SWBmk, SWB	moist brushy areas, open forests and gravel floodplains	yes	no	no	no
Riverbank Anemone	BWBSmw	moist to mesic riparian forests, gravel bars and stream banks	no	yes	yes	yes
Seneca-Snakeroot	BWBSmw	mesic to moist grassy slopes	no	yes	yes	possible

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Sickle-Pod Rockcress	BWBSmw	mesic to dry grasslands and on gravelly river banks (poor nutrients)	no	yes	yes	yes
Slender Penstemon	BWBSmw	dry to moist, rocky or sandy grasslands (poor soil nutrient regime)	no	yes	yes	possible
Three-Lobed Daisy	BAFA	dry scree and talus slopes	no	possible	yes	yes
Yellow Marsh Saxifrage	BAFA	wet bogs and meadows	yes	no	no	no
VASCULAR PLANTS - FERNS						
Siberian Polypody	BWBSmw, SBSmk	mesic to dry rocky areas	no	yes	possible	possible
VASCULAR PLANTS - MONOCOTS						
Alpine Meadow-Foxtail	BWBSmw, SWBmk	moist meadows	no	yes	possible	possible
Canada Ryegrass	BWBSmw	grasslands and open forest often in sandy-rocky areas with poor SNR	no	yes	yes	yes
Dry-Land Sedge	BWBSmw	open forests and dry slopes	no	yes	yes	yes
Porcupinegrass	BWBSmw1	drier areas along rivers and lower valley slopes, grasslands, and low to mid elevation open forests	no	yes	yes	yes
VASCULAR PLANTS - QUILLWORTS						
Rock Selaginella	BWBSmw	dry grassy ridges	no	yes	yes	no
VASCULAR PLANTS - MOONWORTS						
Spoon-shaped Moonwort	BWBSmw1	Mesic to dry old fields, sand dunes and grassy railroad sidings	no	yes	yes	yes
Upswept Moonwort	BAFA	mesic to moist meadows and grassy fields typically areas with rich nutrients	no	yes	yes	yes
NON-VASCULAR PLANTS						
Porsild's Bryum	SWBmk, SWBmks	grows on wet calcareous cliffs	yes	no	no	no

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Common Species Name	BGC	Habitat Description	Fort Nelson District	Fort St John TSA	Dawson Creek TSA	TFL 48
PLANT COMMUNITIES						
(Balsam Poplar, Black Cottonwood)-Spruces/ Red-Osier Dogwood	BWBSdk1, BWBSmw1	typically found along streams and rivers that have regular minor flooding	yes	yes	yes	yes
Arctic Rush-Nuttall's Alkaligrass-Seablite	BWBSmw1/00	wetland community	no	yes	yes	possible
Mat Muhly-Arctic Rush – Nevada Bluegrass	BWBSmw1/00	Wetland community	no	yes	yes	possible
Narrow-Leaf Willow Shrubland	BWBSmw2/F106	Non-forested floodplain community and area usually has sandy shoreline	yes	yes	no	no
Pacific Willow/ Red-Osier Dogwood/ Horsetails	BWBSdk1/F103	Non-forested floodplain community which often occur in river oxbows and drainage channels	yes	no	no	no