

Jackpine Meadows: Rare Plants and Wildflower Blooms

Final Report (September, 2017)

Peter Courtney*, MSc, BSc

(in association with the Central Okanagan Naturalists' Club)

Introduction:

We named the study area Jackpine Meadows because it is located on Jackpine Forest Service Road and features several meadows. It is located near the Crystal Mountain Ski Resort in West Kelowna, aligned along the Jackpine Forest Service Road between 1.5 and 4 km from its junction with Glenrosa Road at latitude 49°53'22.50"N longitude 119°42'1.30"W (Figure 1). The study area ranges in elevation between 1170 and 1470 masl; the highest elevation in the area is Mount Last at 1531 masl.

The area was first noticed for its spectacular spring blooms of wildflowers. Between 2013 and 2017 members of the Central Okanagan Naturalists' Club (CONC) catalogued the vascular flora and found a high diversity of plants. These plants included 4 'red-listed' species defined at risk of being lost (extirpated, endangered or threatened) and 3 'blue-listed' species defined as being of special concern in British Columbia (B.C. Conservation Data Centre). In 2016 CONC found Steer's head (*Dicentra uniflora*), a red-listed plant that is rarely found in Canada. Unfortunately the area is very accessible and subject to human disturbance. A preliminary report providing details on this unique flora was produced in 2016 and circulated amongst stakeholders and government agencies to raise awareness. The present report finalizes that earlier report by updating the plant list, by defining specific areas of concern (AOC) within the study area, and including information on land use issues and protection measures.

Physiography and Land Use:

Jackpine Meadows is located within the Powers Creek drainage area, an area of 139 km² that drains into Okanagan Lake. This drainage has a snow-dominated hydrologic system with peak flows in late-April to mid-June (Powers Creek Source Assessment Report, 2010). The regional surficial geology consists primarily of glacial till and shallow bedrock. Most of the Jackpine Meadows slope between 10-15 degrees and consist of exposed bedrock with pockets of silt, sand and gravel up to 3 m thick (Final Environmental Assessment Crystal Mountain Resort Expansion, 2001). The shallow bedrock and thin soils likely account for the relatively tree-free meadows, although fire and selective timber harvesting may also be factors. Snowmelt and rainfall on these slopes quickly runs off via gullies or evaporates. However, some precipitation does accumulate for short periods in shallow bedrock depressions in more level areas where water-retention is enhanced by organic deposits and moss covers.

The area lies within the Montane Spruce (MS) and Interior Douglas-Fir (IDF) biogeoclimatic zones and includes subzones consisting of grassland and open forest (NDT4) (Final Environmental Assessment Crystal Mountain Resort Expansion, 2001). The principal trees are Englemann spruce, Douglas-fir, Subalpine fir and Lodgepole pine but there are also some deciduous trees including Trembling aspen, Water and Paper birch and Scouler's willow. The grassland and open forest areas (i.e. meadows) contain a very high diversity of native plants, including all of the red- and blue-listed species identified in this report. Logging in the Powers Creek watershed started in the mid-1940s, focussed initially on selective harvesting of Ponderosa pine and Douglas-fir at the lower elevations and in the 1980s clear-cut harvesting started in the upper portion of the watershed (Powers Creek Source Assessment Report, 2010). Loss of Lodgepole pine to Mountain pine beetle has been extensive and selective removal and/or salvage of affected trees is practiced. There has been no recent harvesting evident in the Jackpine Meadows area.

Wildlife in the area were assessed during the Crystal Mountain Ski Resort expansion and although it was noted that a number of red- and blue-listed wildlife species could potentially occur in the area, none were found (Final Environmental Assessment Crystal Mountain Resort Expansion, 2001). Ungulates were sparse as only 4 mule deer were seen during that assessment. During our plant surveys we did not see any ungulates but we saw lots of moose and some deer feces in 2017. Plants were not surveyed during the Crystal Mountain Resort Expansion studies and we are not aware of any other surveys or records of rare plant species in this area.

The study area above the Jackpine Forest Service Road lies within a 60 year provincial lease (expiry 2063) held by Crystal Mountain Resort. While the Crystal Mountain Ski Area is currently inactive its expansion plan indicates that Single Family Chalets are to be built in the study area (Crystal Mountain Ski Resort Expansion Master Plan, 2003). The study area below the road falls within the Westbank First Nation Community Forest - we are not aware of any development plans for this area.

The Powers Creek watershed area is used for cattle grazing and as of 2010 five Grazing Leases (ILRR) were in effect in the Powers and Lambly watersheds (Powers Creek Source Assessment Report, 2010). The permits are issued for 10 years and allow grazing during the June 1 to October 30 period. There is currently no cattle grazing in the study area but there is evidence that grazing occurred there in the recent past (i.e. we have not seen grazing in the last 5 years but there are old cow pies).

The Crystal Mountain Ski area is currently shut down. Its associated infrastructure is located over the ridge from the study area and with vehicle entry via Glenrosa Road we see no evidence of any historic impact of that facility on the study area. There is a maintained trail (perhaps an old logging road) that bisects the study area used by ATVs, snowmobiles, and hikers that has facilitated some damage. There are obvious signs of pick-up truck activity on the ATV trail and what looks like firewood harvesting. We have occasionally seen trail-type motorcycles on the Jackpine Forest Service Road and they have evidently climbed slopes in the study area judging by the tire damage. There is an old mountain bike trail through the area including wooden ramps and jumps, now apparently abandoned. The area is used extensively by target shooters, mostly gun but some bow and arrow. One large target staging area is located below the road at km 2 and there are discarded shell casings, clay pigeons, targets on several trees and what appears to be a hunter's platform. There is also several fire pits, a picnic table and a few piles of refuse in the study area.

Our Findings:

CONC members visited the study area at least 3 times per year during the 2013 to 2017 period and documented the vascular plants found there (Appendix 1). Red- and blue-listed species, determined in accordance with the BC Conservation Data Centre website, were verified by more than 1 person, photos were taken (Figures 2 and 3), and in most instances specimens were collected. Note, the identifications of vascular plants have not been verified by a professional botanist. Bryophyte and lichen samples collected in 2016 were identified by the National Herbarium of Canada.

Appendix 1 lists vascular plants, bryophytes and lichen found in the study area, and the red- and blue-listed species found are highlighted below:

<u>Red-Listed Species</u>	<u>Blue-listed species</u>
Cusick's paintbrush, <i>Castilleja cusickii</i> Needle-leaved navarretia, <i>Navarretia intertexta</i> Steer's head, <i>Dicentra uniflora</i> Alpine sorrel, <i>Rumex paucifolius</i>	Kellogg's knotweed, <i>Polygonum polygaloides</i> ssp <i>Kelloggi</i> Three-leaved lewisia, <i>Lewisia triphylla</i> False-mermaid, <i>Floerkea proserpinacoides</i>

In addition to red- and blue-listed species the finding of the lichen *Umbilicaria arctica* appears to be the first known record for BC.

Within the larger study area we identified 2 specific Areas of Concern (AOC) (Figure 1): AOC1, where all the red- and blue-listed species and the majority of the other species occur, and AOC2, where the greatest Steer's head flowering was found in both 2016 and 2017. These designations identify the critical areas to assist future efforts in preserving the most important parts of the area.

Based on our experience at other sites in the Okanagan valley the plant diversity and number of unique flora at this site is very high and comparable to sites given official provincial protection for their unique flora (i.e. Wrinkly Face Provincial Park and Mara Meadows Ecological Reserve). The finding of red-listed Steer's head plants is particularly noteworthy as it is rarely found in Canada (Courtney and Scotter, 2017). We do not know why the diversity is so high or why the unique species are here as there are similar meadow areas nearby that are not as diverse. However, we note that all of the red- and blue-listed species occur in the meadows (none in the forested area), half in the grassland portion and the other half associated with small pockets of seasonally wet habitat occurring within or at the edges of the meadows, so we recognize the importance of these specific habitats.

In 2016 and 2017 the CONC Conservation Committee contacted stakeholders, provided them with a copy of the predecessor to this report, and discussed their current and future plans for the study area. Those contacted included the grazing lease holder, Crystal Mountain Resort owners, Westbank First Nation, and various government personnel including Conservation Officers, Ecosystem Biologist, Range Managers and Technicians, and Mountain Resorts Division staff.

Recommendations:

The study area is currently held under land tenure agreements by Crystal Mountain Resort and the Westbank First Nation so first steps toward protection should start with discussions with these landholders. One option could involve one or both landholders giving up that portion of their landholding occupied by AOC1 so that a new land tenure holding could be established, held possibly by a land trust organization such as the Central Okanagan Land Trust. Another option could involve the landholders partnering with CONC in establishing a management plan defined in a formal agreement. On its own CONC could establish a citizen's committee to monitor and report to authorities any illegal and harmful activities (such as Wilderness Watch), hopefully with the landowners cooperation. Other approaches showing promise such as establishing an Ecological Reserve should continue to be investigated.

In terms of general protection measures, it needs to be recognized that the Jackpine Meadows are unique and activities that would damage the plants or the habitat need to be avoided. Some specific recommendations are:

1. Minimize or avoid any timber harvesting activity in the area. Felling and removal of trees can change the watershed characteristics and vehicular access to conduct such activities could be particularly damaging;
2. Minimize or avoid vehicular access to avoid trampling plants and/or damaging the watershed characteristics. Vehicular tracks that create runoff gullies are particularly bad. Current use of the ATV trail through the area should be evaluated;
3. Avoid any cattle grazing in the area, to prevent trampling and consumption of rare plants;
4. Consider constructing an information Kiosk at the beginning of the ATV trail to raise awareness of the sensitivity of the area and to provide interpretative information. To minimize damage from target shooters set the Kiosk back so that it is not visible from the road;
5. Consider fencing and signage to restrict access to AOC1 and AOC2 (Figure 1);
6. Stop the use of the area by target shooters and garbage dumpers.

Thanks: To Dr. George Scotter for collecting bryophytes and lichens and CONC for identifying vascular plants.

References Cited:

B.C. Conservation Data Centre website: <http://www.env.gov.bc.ca/cdc>

Courtney, P and G. Scotter. Pending. Occurrence of Steer's Head (*Dicentra uniflora*) in the Central Okanagan, British Columbia.

Crystal Mountain Ski Resort. 2001. Final Environmental Assessment Crystal Mountain Resort Expansion Westbank, BC. Prepared by ENKON Environmental Limited. 176 pp

Crystal Mountain Ski Resort, 2003. Crystal Mountain Ski Resort Expansion Master Plan. Prepared by Pheidias Development Management Corp. 211 pp

eFlora BC website: <http://www.geog.ubc.ca/biodiversity/eflora/>

Powers Creek Source Assessment Report. July 2010. Dobson Engineering Ltd.

*Peter Courtney can be contacted at pcourtney59@gmail.com

Figure 1: Location of Jackpine Meadows Showing Circled Areas of Concern (AOC)



The study area is aligned along the Jackpine Forest Service Rd between 1.5 to 4 km from its start at Glenrosa Road. The 2 circled AOCs indicated on the map are located between 1.6 and 2.6 km along the road. Note the Crystal Mountain Ski Resort in the upper left hand corner of the aerial photo.

Area of Concern (AOC1) enclosing meadows J1, J2 and J4 is 13.35 ha in size with elevation between 1170 – 1260 m asl, This area encloses all of the red- and blue-listed species as well as the majority of other plants listed in Appendix 1.

Area of Concern (AOC2) enclosing meadow J3 is 0.28 ha in size and with elevation between 1300 – 1315 m asl. This area encloses the highest concentration of flowering Steer’s head plants.

FIGURE 2: Red-listed Species Found at Jackpine Meadows 2013-2017



Cusick's paintbrush (*Castilleja cusickii*)



Needle-leaved navarretia (*Navarretia intertexta*)



Alpine sorrel (*Rumex paucifolius*)



Steer's head (*Dicentra uniflora*)

FIGURE 3: Blue-listed Species Found at Jackpine Meadows 2013-2017



Three-leaved lewisia (*Lewisia triphylla*)



False-mermaid (*Floerkea proserpinacoides*)



Kellogg's knotweed (*Polygonum polygaloides* ssp Kelloggi)

Appendix 1

Jackpine Meadows Plant List

[Identification of bryophytes and lichen by National Herbarium of Canada and vascular plants by Central Okanagan Naturalists' Club]

FAMILY	SPECIES	COMMON NAME
VASCULAR PLANTS		
AMARANTHACEAE	<i>Amaranthus blitoides</i>	PROSTRATE PIGWEED
AMARYLLIDACEAE	<i>Allium cernum</i>	NODDING ONION
APIACEAE	<i>Lomatium ambiguum</i>	SWALE DESERT-PARSLEY
APIACEAE	<i>Lomatium dissectum</i>	FERN-LEAVED DESERT-PARSLEY
APIACEAE	<i>Lomatium geyeri</i>	GEYER'S DESERT-PARSLEY
APIACEAE	<i>Osmorhiza berteroi</i>	MOUNTAIN SWEET-CICELY
APIACEAE	<i>Perideridia gairdneri</i>	GAIRDNER'S YAMPA
APIACEAE	<i>Sanicula graveolens</i>	SIERRA SANICLE
ARALIACEAE	<i>Oplopanax horridus</i>	DEVIL'S CLUB
ASPARAGACEAE	<i>Maianthemum racemosum</i>	LARGE FALSE SOLOMON'S SEAL
ASPARAGACEAE	<i>Muscari</i> sp	GRAPE HYACINTH
ASTERACEAE	<i>Achillea millefolium</i>	YARROW
ASTERACEAE	<i>Adenocaulon bicolor</i>	PATHFINDER
ASTERACEAE	<i>Anaphalis margaritacea</i>	PEARLY EVERLASTING
ASTERACEAE	<i>Antennaria howellii</i>	HOWELL'S PUSSYTOES
ASTERACEAE	<i>Antennaria luzuloides</i>	SILVERY-BROWN PUSSYTOES
ASTERACEAE	<i>Antennaria racemosa</i>	RACEMOSE PUSSYTOES
ASTERACEAE	<i>Antennaria rosea</i>	ROSY PUSSYTOES
ASTERACEAE	<i>Arnica cordifolia</i>	HEART-LEAVED ARNICA
ASTERACEAE	<i>Arnica latifolia</i>	MOUNTAIN ARNICA
ASTERACEAE	<i>Arnica parryi</i>	PARRY'S ARNICA
ASTERACEAE	<i>Artemisia ludoviciana</i>	WESTERN MUGWORT
ASTERACEAE	<i>Balsamorhiza sagittata</i>	ARROWLEAF BALSAMROOT
ASTERACEAE	<i>Centaurea diffusa</i>	DIFFUSE KNAPWEED
ASTERACEAE	<i>Cichorium intybus</i>	CHICORY
ASTERACEAE	<i>Cirsium vulgare</i>	BULL THISTLE
ASTERACEAE	<i>Erigeron divergens</i>	DIFFUSE FLEABANE
ASTERACEAE	<i>Eucephalus engelmannii</i>	ENGLEMANN'S ASTER
ASTERACEAE	<i>Eurybia conspicua</i>	SHOWY ASTER
ASTERACEAE	<i>Gnaphalium uliginosum</i>	MARSH CUDWEED
ASTERACEAE	<i>Hieracium albiflorum</i>	WHITE HAWKWEED
ASTERACEAE	<i>Hieracium praealtum</i>	KING DEVIL
ASTERACEAE	<i>Hieracium umbellatum</i>	UMBELLATE HAWKWEED
ASTERACEAE	<i>Lactuca serriola</i>	PRICKLY LETTUCE
ASTERACEAE	<i>Leucanthemum vulgare</i>	OXEYE DAISY
ASTERACEAE	<i>Logfia arvensis</i>	FIELD FILAGO
ASTERACEAE	<i>Madia exigua</i>	LITTLE TARWEED
ASTERACEAE	<i>Matricaria discoidea</i>	PINEAPPLE WEED
ASTERACEAE	<i>Microseris nutans</i>	NODDING MICROSERIS
ASTERACEAE	<i>Packera streptanthifolius</i>	ROCKY MOUNTAIN BUTTERWEED
ASTERACEAE	<i>Senecio integerrimus</i>	WESTERN GROUNDSEL
ASTERACEAE	<i>Symphyotrichum spathulatum</i>	WESTERN MOUNTAIN ASTER
ASTERACEAE	<i>Taraxacum officinale</i>	COMMON DANDELION
ASTERACEAE	<i>Tragopogon dubius</i>	YELLOW SALSIFY

Appendix 1

Jackpine Meadows Plant List

[Identification of bryophytes and lichen by National Herbarium of Canada and vascular plants by Central Okanagan Naturalists' Club]

FAMILY	SPECIES	COMMON NAME
BERBERIDACEAE	<i>Mahonia aquifolium</i>	TALL OREGON-GRAPE
BETULACEAE	<i>Alnus viridis</i> var <i>sinuata</i>	SITKA ALDER
BETULACEAE	<i>Betula occidentalis</i>	WATER BIRCH
BETULACEAE	<i>Betula papyrifera</i>	PAPER BIRCH
BORAGINACEAE	<i>Anchusa officinalis</i>	ALKANET
BORAGINACEAE	<i>Cryptantha ambigua</i>	OBSCURE CRYPTANTHA
BORAGINACEAE	<i>Mertensia longiflora</i>	LONG-FLOWERED BLUEBELLS
BORAGINACEAE	<i>Plagiobothrys scouleri</i>	SCOULER'S POPCORNFLOWER
BRASSICACEAE	<i>Berteroa incana</i>	HOARY ALYSSUM
BRASSICACEAE	<i>Boechera calderi</i>	CALDER'S SUNCRESS
BRASSICACEAE	<i>Boechera retrofracta</i>	DANGLING SUNCRESS (Holboell's)
BRASSICACEAE	<i>Rorippa palustris</i>	MARSH YELLOW CRESS
CAPRIFOLIACEAE	<i>Linnaea borealis</i>	TWINFLOWER
CAPRIFOLIACEAE	<i>Lonicera utahensis</i>	UTAH HONEYSUCKLE
CAPRIFOLIACEAE	<i>Symphoricarpos albus</i>	COMMON SNOWBERRY
CARYOPHYLLACEAE	<i>Arenaria serpyllifolia</i>	THYME-LEAVED SANDWORT
CARYOPHYLLACEAE	<i>Cerastium fontanum</i>	COMMON CHICKWEED
CARYOPHYLLACEAE	<i>Eremogone capillaris</i>	SLENDER MOUNTAIN SANDWORT
CARYOPHYLLACEAE	<i>Sagina procumbens</i>	BIRD'S-EYE PEARLWORT
CARYOPHYLLACEAE	<i>Silene douglasii</i>	DOUGLAS'S CAMPION
CARYOPHYLLACEAE	<i>Silene drummondii</i>	DRUMMOND'S CAMPION
CARYOPHYLLACEAE	<i>Silene noctiflora</i>	NIGHT-FLOWERING CATCHFLY
CARYOPHYLLACEAE	<i>Silene parryi</i>	PARRY'S CAMPION
CARYOPHYLLACEAE	<i>Spergularia rubra</i>	RED SAND-SPURREY
CARYOPHYLLACEAE	<i>Stellaria longifolia</i>	LONG-LEAVED STARWORT
CARYOPHYLLACEAE	<i>Stellaria longipes</i>	LONG-STALKED STARWORT
CARYOPHYLLACEAE	<i>Stellaria nitens</i>	SHINING STARWORT
CELASTRACEAE	<i>Paxistima myrsinites</i>	FALSEBOX
CORNACEAE	<i>Cornus stolonifera</i>	RED-OSIER DOGWOOD
CRASSULACEAE	<i>Sedum lanceolatum</i>	LANCE-LEAVED STONECROP
CRASSULACEAE	<i>Sedum stenopetalum</i>	WORM-LEAVED STONECROP
CUPRESSACEAE	<i>Juniperus communis</i>	COMMON JUNIPER
CYPERACEAE	<i>Carex athrostachya</i>	SLENDER-BEAKED SEDGE
CYPERACEAE	<i>Carex concinoides</i>	NORTHWESTERN SEDGE
CYPERACEAE	<i>Carex deweyana</i>	DEWEY'S SEDGE
CYPERACEAE	<i>Carex hoodii</i>	HOOD'S SEDGE
CYPERACEAE	<i>Carex microptera</i>	SMALL-WINGED SEDGE
CYPERACEAE	<i>Carex petasata</i>	PASTURE SEDGE
CYPERACEAE	<i>Trichophorum cespitosum</i>	TUFTED CLUBRUSH
DRYOPTERIDACEAE	<i>Athyrium filix-femina</i>	LADY FERN
DRYOPTERIDACEAE	<i>Cystopteris fragilis</i>	FRAGILE FERN
DRYOPTERIDACEAE	<i>Polystichum munitum</i>	SWORD FERN
DRYOPTERIDACEAE	<i>Woodsia oregana</i>	WESTERN CLIFF FERN
ERICACEAE	<i>Arctostaphylos uva-ursi</i>	KINNIKINNICK
ERICACEAE	<i>Chimaphila umbellata</i>	PRINCE'S PINE

Appendix 1

Jackpine Meadows Plant List

[Identification of bryophytes and lichen by National Herbarium of Canada and vascular plants by Central Okanagan Naturalists' Club]

FAMILY	SPECIES	COMMON NAME
ERICACEAE	<i>Orthilia secunda</i>	ONE-SIDED WINTERGREEN
ERICACEAE	<i>Pyrola asarifolia</i>	PINK WINTERGREEN
ERICACEAE	<i>Pyrola chlorantha</i>	GREEN WINTERGREEN
ERICACEAE	<i>Pyrola picta</i>	WHITE-VEINED WINTERGREEN
ERICACEAE	<i>Vaccinium membranaceum</i>	BLACK HUCKLEBERRY
FABACEAE	<i>Lupinus arcticus</i>	ARCTIC LUPINE
FABACEAE	<i>Trifolium aureum</i>	YELLOW CLOVER
FABACEAE	<i>Trifolium hybridum</i>	ALSIKE CLOVER
FABACEAE	<i>Trifolium pratense</i>	RED CLOVER
GENTIANACEAE	<i>Gentianella amarella</i>	NORTHERN GENTIAN
GROSSULARIACEAE	<i>Ribes hudsonianum</i>	NORTHERN BLACKCURRANT
GROSSULARIACEAE	<i>Ribes lacustre</i>	BLACK GOOSEBERRY
HYDROPHYLLACEAE	<i>Hydrophyllum capitatum</i>	DWARF WATERLEAF
HYDROPHYLLACEAE	<i>Nemophila breviflora</i>	GREAT BASIN NEMOPHILA
HYPERICACEAE	<i>Hypericum perforatum</i>	COMMON ST. JOHN'S WORT
JUNCACEAE	<i>Juncus articulatus</i>	JOINTED RUSH
JUNCACEAE	<i>Juncus bufonius</i>	TOAD RUSH
JUNCACEAE	<i>Juncus ensifolius</i>	DAGGER-LEAF RUSH
JUNCACEAE	<i>Juncus longistylis</i>	LONG-STYLED RUSH
JUNCACEAE	<i>Juncus tenuis</i>	SLENDER RUSH
JUNCACEAE	<i>Luzula comosa</i>	PACIFIC WOOD-RUSH
JUNCACEAE	<i>Luzula multiflora</i>	MANY-FLOWERED WOOD-RUSH
LAMIACEAE	<i>Lamium amplexicaule</i>	COMMON DEAD-NETTLE
LAMIACEAE	<i>Prunella vulgaris</i>	SEAF-HEAL
LILIACEAE	<i>Clintonia uniflora</i>	QUEEN'S CUP
LILIACEAE	<i>Fritillaria affinis</i>	CHOCOLATE LILY
LILIACEAE	<i>Fritillaria pudica</i>	YELLOW BELL
LILIACEAE	<i>Lilium columbianum</i>	TIGER LILY
LILIACEAE	<i>Prosartes trachycarpa</i>	ROUGH-FRUITED FAIRYBELLS
LIMNANTHACEAE	<i>Floerkea proserpinacoides</i>	FALSE-MERMAID
MELANTHIACEAE	<i>Toxicoscordion venenosum</i>	MEADOW DEATH-CAMAS
MONTIACEAE	<i>Claytonia lanceolata</i>	WESTERN SPRINGBEAUTY
MONTIACEAE	<i>Lewisia pygmaea</i>	ALPINE LEWISIA
MONTIACEAE	<i>Lewisia triphylla</i>	THREE-LEAVED LEWISIA
MONTIACEAE	<i>Montia linearis</i>	NARROW-LEAVED MONTIA
ONAGRACEAE	<i>Epilobium angustifolium</i>	FIREWEED
ONAGRACEAE	<i>Epilobium brachycarpum</i>	TALL ANNUAL WILLOWHERB
ONAGRACEAE	<i>Epilobium ciliatum</i>	PURPLE-LEAVED WILLOWHERB
ORCHIDACEAE	<i>Calypso bulbosa</i>	FAIRY-SLIPPER
ORCHIDACEAE	<i>Corallorhiza maculata</i>	SUMMER CORALROOT
ORCHIDACEAE	<i>Corallorhiza striata</i>	STRIPED CORALROOT
ORCHIDACEAE	<i>Cypripedium montanum</i>	MOUNTAIN LADY'S SLIPPER
ORCHIDACEAE	<i>Goodyera oblongifolia</i>	RATTLESNAKE-PLANTAIN
ORCHIDACEAE	<i>Piperia unalascensis</i>	ALASKA REIN ORCHID
ORCHIDACEAE	<i>Spiranthes romanzoffiana</i>	HOODED LADIES' TRESSES

Appendix 1

Jackpine Meadows Plant List

[Identification of bryophytes and lichen by National Herbarium of Canada and vascular plants by Central Okanagan Naturalists' Club]

FAMILY	SPECIES	COMMON NAME
OROBANCHACEAE	<i>Castilleja cusickii</i> var <i>lutea</i>	CUSICK'S PAINTBRUSH
OROBANCHACEAE	<i>Castilleja hispida</i>	HARSH INDIAN PAINTBRUSH
OROBANCHACEAE	<i>Castilleja miniata</i>	SCARLET PAINTBRUSH
OROBANCHACEAE	<i>Orobanche fasciculata</i>	CLUSTERED BROOMRAPE
OROBANCHACEAE	<i>Orobanche uniflora</i>	NAKED BROOMRAPE
OROBANCHACEAE	<i>Pedicularis bracteosa</i>	BRACTED LOUSEWORT
OROBANCHACEAE	<i>Pedicularis racemosa</i>	SICKLETOP LOUSEWORT
OROBANCHACEAE	<i>Rhinanthus minor</i>	YELLOW RATTLE
PAPAVERACEAE	<i>Dicentra uniflora</i>	STEER'S HEAD
PHRYMACEAE	<i>Mimulus breweri</i>	BREWER'S MONKEY-FLOWER
PHRYMACEAE	<i>Mimulus guttatus</i>	YELLOW MONKEY-FLOWER
PINACEAE	<i>Abies lasiocarpa</i>	SUBALPINE FIR
PINACEAE	<i>Picea engelmannii</i>	ENGLEMANN SPRUCE
PINACEAE	<i>Pinus contorta</i>	LOGGEPOLE PINE
PINACEAE	<i>Pseudotsuga menziesii</i>	DOUGLAS-FIR
PLANTAGINACEAE	<i>Collinsia parviflora</i>	SMALL-FLOWERED BLUE-EYED MARY
PLANTAGINACEAE	<i>Penstemon fruticosus</i>	SHRUBBY PENSTEMON
PLANTAGINACEAE	<i>Plantago major</i>	COMMON PLANTAIN
PLANTAGINACEAE	<i>Veronica arvensis</i>	WALL SPEEDWELL
PLANTAGINACEAE	<i>Veronica beccabunga</i> var. <i>americana</i>	AMERICAN SPEEDWELL
PLANTAGINACEAE	<i>Veronica peregrina</i>	PURSLANE SPEEDWELL
PLANTAGINACEAE	<i>Veronica serpyllifolia</i>	THYME-LEAVED SPEEDWELL
POACEAE	<i>Achnatherum nelsonii</i>	COLUMBIA NEEDLE GRASS
POACEAE	<i>Agrostis gigantea</i>	REDTOP
POACEAE	<i>Agrostis scaber</i>	HAIR BENTGRASS
POACEAE	<i>Bromus inermis</i>	SMOOTH BROME
POACEAE	<i>Bromus tectorum</i>	CHEATGRASS
POACEAE	<i>Bromus carinatus</i>	CALIFORNIA BROME
POACEAE	<i>Calamagrostis rubescens</i>	PINEGRASS
POACEAE	<i>Dactylis glomerata</i>	ORCHARD-GRASS
POACEAE	<i>Danthonia intermedia</i>	TIMBER OATGRASS
POACEAE	<i>Danthonia unispicata</i>	ONE-SPIKE OATGRASS
POACEAE	<i>Elymus elymoides</i>	SQUIRRELTAIL GRASS
POACEAE	<i>Elymus glaucus</i>	BLUE WILDRYE
POACEAE	<i>Koeleria macrantha</i>	JUNEGRASS
POACEAE	<i>Melica spectabilis</i>	PURPLE ONIONGRASS
POACEAE	<i>Phleum pratense</i>	COMMON TIMOTHY
POACEAE	<i>Poa bulbosa</i>	BULBOUS BLUEGRASS
POACEAE	<i>Poa compressa</i>	CANADA BLUEGRASS
POACEAE	<i>Poa secunda</i>	SANDBERG BLUEGRASS
POACEAE	<i>Poa pratensis</i>	KENTUCKY BLUEGRASS
POACEAE	<i>Pseudoregneria spicata</i>	BLUEBUNCH WHEATGRASS
POACEAE	<i>Trisetum cernuum</i>	NODDING TRisetum
POACEAE	<i>Vahlodea atropurpurea</i>	MOUNTAIN HAIRGRASS
POLEMONIACEAE	<i>Collomia linearis</i>	NARROW-LEAVED COLLOMIA

Appendix 1

Jackpine Meadows Plant List

[Identification of bryophytes and lichen by National Herbarium of Canada and vascular plants by Central Okanagan Naturalists' Club]

FAMILY	SPECIES	COMMON NAME
POLEMONIACEAE	<i>Microsteris gracilis</i>	PINK MICROSTERIS
POLEMONIACEAE	<i>Navarretia intertexta</i>	NEEDLE-LEAVED NAVARRETIA
POLYGONACEAE	<i>Eriogonum heracleoides</i>	PARSNIP-FLOWERED BUCKWHEAT
POLYGONACEAE	<i>Eriogonum umbellatum</i> var. <i>subalpinum</i>	SULPHUR BUCKWHEAT
POLYGONACEAE	<i>Polygonum aviculare</i>	COMMON KNOTWEED
POLYGONACEAE	<i>Polygonum douglasii</i>	DOUGLAS'S KNOTWEED
POLYGONACEAE	<i>Polygonum minimum</i>	LEAFY DWARF KNOTWEED
POLYGONACEAE	<i>Polygonum polygaloides</i> ssp. <i>Kelloggii</i>	KELLOGG'S KNOTWEED
POLYGONACEAE	<i>Rumex acetosella</i>	SHEEP SORREL
POLYGONACEAE	<i>Rumex crispus</i>	CURLED DOCK
POLYGONACEAE	<i>Rumex paucifolius</i>	ALPINE SORREL
PRIMULACEAE	<i>Dodecatheon pulchellum</i>	FEW-FLOWERED SHOOTINGSTAR
PTERIDACEAE	<i>Cryptogramma acrostichoides</i>	PARSLEY FERN
RANUNCULACEAE	<i>Aconitum columbianum</i>	COLUMBIA MONKSHOOD
RANUNCULACEAE	<i>Delphinium nuttallianum</i>	UPLAND LARKSPUR
RANUNCULACEAE	<i>Ranunculus glaberrimus</i>	SAGEBRUSH BUTTERCUP
RANUNCULACEAE	<i>Ranunculus sceleratus</i>	CELERY-LEAVED BUTTERCUP
RANUNCULACEAE	<i>Ranunculus uncinatus</i>	LITTLE BUTTERCUP
RANUNCULACEAE	<i>Thalictrum occidentale</i>	WESTERN MEADOWRUE
ROSACEAE	<i>Amelanchier alnifolia</i>	SASKATOON
ROSACEAE	<i>Dryocallis glandulosa</i>	STICKY CINQUEFOIL
ROSACEAE	<i>Fragaria virginiana</i>	WILD STRAWBERRY
ROSACEAE	<i>Geum macrophyllum</i>	LARGE-LEAVED AVENS
ROSACEAE	<i>Geum triflorum</i>	OLD MAN'S WHISKERS
ROSACEAE	<i>Potentilla argentea</i>	SILVERY CINQUEFOIL
ROSACEAE	<i>Potentilla gracilis</i>	GRACEFUL CINQUEFOIL
ROSACEAE	<i>Potentilla norvegica</i>	NORWEGIAN CINQUEFOIL
ROSACEAE	<i>Rosa gymnocarpa</i>	BALDHIP ROSE
ROSACEAE	<i>Rosa nutkana</i>	NOOTKA ROSE
ROSACEAE	<i>Rosa woodsii</i>	WOOD'S ROSE
ROSACEAE	<i>Rubus idaeus</i>	RED RASPBERRY
ROSACEAE	<i>Rubus parviflorus</i>	THIMBLEBERRY
ROSACEAE	<i>Sorbus scopulina</i>	WESTERN MOUNTAIN-ASH
ROSACEAE	<i>Spiraea betulifolia</i>	WHITE MEADOW-SWEET
RUBIACEAE	<i>Galium boreale</i>	NORTHERN BEDSTRAW
RUBIACEAE	<i>Galium triflorum</i>	SWEET-SCENTED BEDSTRAW
SALICACEAE	<i>Populus balsamifera</i> ssp. <i>trichocarpa</i>	BLACK COTTONWOOD
SALICACEAE	<i>Populus tremuloides</i>	TREMBLING ASPEN
SALICACEAE	<i>Salix scouleriana</i>	SCOULER'S WILLOW
SAPINDACEAE	<i>Acer glabrum</i>	DOUGLAS MAPLE
SAXIFRAGACEAE	<i>Hemieva ranunculifolia</i>	BUTTERCUP-LEAVED SUKSDORFIA
SAXIFRAGACEAE	<i>Lithophragma glabrum</i>	SMOOTH FRINGECUP
SAXIFRAGACEAE	<i>Lithophragma parviflorum</i>	SMALL-FLOWERED WOODLAND STAR
SAXIFRAGACEAE	<i>Mitella trifida</i>	THREE-TOOTHED MITREWORT
SAXIFRAGACEAE	<i>Saxifraga nidifica</i>	PEAK SAXIFRAGE

Appendix 1

Jackpine Meadows Plant List

[Identification of bryophytes and lichen by National Herbarium of Canada and vascular plants by Central Okanagan Naturalists' Club]

FAMILY	SPECIES	COMMON NAME
SAXIFRAGACEAE	<i>Saxifraga occidentalis</i>	WESTERN SAXIFRAGE
SAXIFRAGACEAE	<i>Tiarella trifoliata</i> var. <i>unifoliata</i>	ONE-LEAVED FOAMFLOWER
SCROPHULARIACEAE	<i>Verbascum thapsus</i>	GREAT MULLEIN
SELAGINELLACEAE	<i>Selaginella densa</i>	COMPACT SELAGINELLA
VIOLACEAE	<i>Viola adunca</i>	SAND VIOLET
VIOLACEAE	<i>Viola orbiculata</i>	ROUND-LEAVED VIOLET
VIOLACEAE	<i>Viola tricolor</i>	JOHNNY-JUMP-UP
MOSSES		
AULACOMNIACEAE	<i>Aulacomnium palustre</i>	GLOW MOSS
BARTRAMIACEAE	<i>Philonotis fontana</i>	SPRING MOSS
BRYACEAE	<i>Pohlia nutans</i>	NODDING THREAD-MOSS
DITRICHACEAE	<i>Ceratodon purpureus</i>	FIRE-MOSS
DITRICHACEAE	<i>Dicranoweisia crispula</i>	YELLOW-GREEN CUSHION MOSS
DITRICHACEAE	<i>Dicranum brevifolium</i>	SHORTLEAF DICRANUM MOSS
DITRICHACEAE	<i>Dicranum fuscescens</i>	CURLY HERON'S-BILL MOSS
DITRICHACEAE	<i>Dicranum scoparium</i>	BROOM-MOSS
DITRICHACEAE	<i>Dicranum tauricum</i>	BROKEN-LEAF MOSS
GRIMMIACEAE	<i>Grimmia montana</i>	SUN GRIMMIA
GRIMMIACEAE	<i>Racomitrium canescens</i>	GREY ROCK-MOSS
LESKEACEAE	<i>Pseudoleskea radicata</i>	PSEUDOLESKEA MOSS
LESKEACEAE	<i>Pseudoleskea stenophylla</i>	PSEUDOLESKEA MOSS
MNIACEAE	<i>Mnium spinulosum</i>	RED-MOUTHED LEAFY MOSS
MNIACEAE	<i>Plagiomnium cuspidatum</i>	WOODS LEAFY MOSS
POLYTRICHACEAE	<i>Pogonatum urnigerum</i>	GREY HAIRCAP MOSS
POLYTRICHACEAE	<i>Polytrichum juniperinum</i>	JUNIPER HAIRCAP MOSS
POTTIACEAE	<i>Syntrichia norvegica</i>	NORWEGIAN TORTULA MOSS
POTTIACEAE	<i>Syntrichia ruralis</i>	SIDEWALK MOSS
ROELLOBRYACEAE	<i>Roellobryon roellii</i>	NO COMMON NAME
LIVERWORTS		
JUNGERMANNIACEAE	<i>Barbilophozia hatcheri</i>	HATCHER'S LEAFY WORT
JUNGERMANNIACEAE	<i>Barbilophozia lycopodioides</i>	COMMON LEAFY WORT
JUNGERMANNIACEAE	<i>Schistochilopsis incisa</i>	RAGGED-LEAF LIVERWORT
LOPHOCOLEACEAE	<i>Chiloscyphus polyanthos</i>	NO COMMON NAME
LICHEN		
CLADONIACEAE	<i>Cladonia borealis</i>	BOREAL PIXIE-CUP
CLADONIACEAE	<i>Cladonia carneola</i>	ROYAL PIXIE-CUP
CLADONIACEAE	<i>Cladonia cenotea</i>	SINGING PIXIE
CLADONIACEAE	<i>Cladonia chlorophaea</i>	GRANULATING PIXIE-CUP
CLADONIACEAE	<i>Cladonia ecmocyna</i> ssp. <i>ecmocyna</i>	PIXIE
CLADONIACEAE	<i>Cladonia ecmocyna</i> ssp. <i>intermedia</i>	PIXIE

Appendix 1

Jackpine Meadows Plant List

[Identification of bryophytes and lichen by National Herbarium of Canada and vascular plants by Central Okanagan Naturalists' Club]

FAMILY	SPECIES	COMMON NAME
CLADONIACEAE	<i>Cladonia fimbriata</i>	TRUMPETING PIXIE
CLADONIACEAE	<i>Cladonia macrophyllodes</i>	LOW-RISE PIXIE
CLADONIACEAE	<i>Cladonia mitis</i>	ECTOMORPHIC REINDEER
CLADONIACEAE	<i>Cladonia pyxidata</i>	PEBBLED PIXIE-CUP
CLADONIACEAE	<i>Cladonia rangiferina</i>	GREY REINDEER
CLADONIACEAE	<i>Cladonia sulphurina</i>	EXTRA HOT PIXIE
LECANORACEAE	<i>Lecanora pulicaris</i>	OLIGOTROPHIC RIM
LECANORACEAE	<i>Ramboldia cinnabarina</i>	PRUDISH CRIMSONS
NEPHROMATACEAE	<i>Nephroma parile</i>	POWDERED PAW
PARMELIACEAE	<i>Alectoria sarmentosa</i>	WITCH'S HAIR
PARMELIACEAE	<i>Bryoria fremontii</i>	EDIBLE HORSEHAIR
PARMELIACEAE	<i>Bryoria kockiana</i>	NO COMMON NAME
PARMELIACEAE	<i>Bryoria pseudofuscescens</i>	MOUNTAIN HORSEHAIR
PARMELIACEAE	<i>Cetraria platyphylla</i>	CRINKLED WRINKLE
PARMELIACEAE	<i>Hypogymnia imshaugii</i>	FORKING BONE
PARMELIACEAE	<i>Hypogymnia physodes</i>	MONK'S HOOD
PARMELIACEAE	<i>Hypogymnia wilfiana</i>	DEFLATED BONE
PARMELIACEAE	<i>Letharia vulpina</i>	VALLEY WOLF
PARMELIACEAE	<i>Platismatia glauca</i>	RAGBAG
PARMELIACEAE	<i>Usnea lapponica</i>	POWDER-RINGED BEARD
PELTIGERACEAE	<i>Peltigera cf. degenii</i>	LUSTROUS PELT
PELTIGERACEAE	<i>Peltigera leucophlebia</i>	RUFFLED PELT
PELTIGERACEAE	<i>Peltigera praetextata</i>	BORN-AGAIN PELT
PELTIGERACEAE	<i>Peltigera rufescens</i>	BLACK-BELLIED PELT
PELTIGERACEAE	<i>Peltigera venosa</i>	LESSER TOAD PELT
STEREOCAULACEAE	<i>Stereocaulon tomentosum</i>	EYED FOAM
UMBILICARIACEAE	<i>Umbilicaria arctica</i>	ARCTIC ROCKTRIBE
UMBILICARIACEAE	<i>Umbilicaria deusta</i>	PEPPERED ROCKTRIBE