

**ORIGINAL PURPOSE** Protection of a unique calcareous fen and its diverse flora, including several rare orchids

#### OVERVIEW

<b>Date established:</b>	1 Sept. 1972	<b>Location:</b>	In the Larch Hills, 17 km N of Enderby
<b>Date amended (land addition):</b>	28 March 1974	<b>Latitude:</b>	50°41'N
<b>ORC #:</b>	3042	<b>Longitude:</b>	119°07'W
<b>Map number:</b>	82 L/11		
<b>Total Area:</b>	178 ha	<b>Elevation:</b>	670-730 m
<b>Land:</b>	178 ha		
<b>Access:</b>	Closed to public by Order-in-Council (no. 1920, 16 June 1977) to protect fragile vegetation. Permit required to enter reserve. Accessible from Highway 97A by Grandview Flats and Edgar Roads.		
<b>Biogeoclimatic Zones:</b>	Interior Cedar-Hemlock (ICH)		
<b>Biogeoclimatic Variant:</b>	ICH mw2 ICH Shuswap Moist Warm		
<b>Ecosection:</b>	Shuswap Highland		
<b>Region:</b>	Okanagan		
<b>Management Area:</b>	North Okanagan		

#### COMPOSITION

**Physical:** The reserve lies in a shallow north-south oriented valley near the southeastern edge of the Larch Hills. Hills rise to about 1000 m on both sides of the reserve. Topography within the reserve is quite flat except for two low, oval, drumlin-like hills in its north-central area. The reserve encloses an area of impeded drainage at the headwaters of two streams.

Much of the uniqueness of this area is attributed to a carbonate-rich spring emanating from limestone bedrock and surficial materials derived from the Sicomous Formation. Evidence for this includes the presence of marl pools and the formation of calcareous deposits on some aquatic plants. Soils in the wetlands and meadows are organic in origin, evidently underlain by a layer of marl, a lime-rich mud.

**Biological:** The major feature of the reserve is a large treeless wetland centrally located in the southern half of the reserve. This is bordered by upland forest around its eastern and northern edges, and by predominantly boggy forest along its western side. Plant communities in the large wetland vary with the moisture regime. The lowest-lying central areas of the wetland have many pools of standing water. These are surrounded by expanses of fen and wet meadow which get drier toward the forest margin. Graminoids dominate the open wetlands, which are enriched by seepage of external water into and through them, and therefore are best classified as fens.

A small pond and the central drainage ditch support submerged communities

dominated by greater bladderwort, water-milfoil and muskgrass. The marl ponds have a margin of great bulrush, spikerush and aquatic mosses, but little else. The relatively extensive fen-meadow communities, of major interest here, tend to be dominated by bulrush, spike-rush and sedges. Considerable moss is present in the wettest fens while less saturated meadows contain a variety of wildflowers like Kalm's lobelia, mountain death-camas, fringed grass-of-Parnassus, giant helleborine, Canadian butterweed, boreal aster, Canada goldenrod and northern bog violet.

Various kinds of treed wetland contribute to habitat diversity. These vary from typical wet meadows containing scattered spruce trees and willows to dense lodgepole pine stands with an understory of Labrador tea, bog cranberry, buckbean and sphagnum moss. Also present are hummocky bog forests with ponds of water, dominated by Engelmann spruce, western redcedar, and mountain alder with an understory of black twinberry, cattail, skunk cabbage and fowl mannarass. Standing dead trees occur in the latter type. Boggy islands within the wetlands support stunted conifer stands, some dominated by lodgepole pine, others by white spruce and redcedar.

Beaver dams along the south edge of the main meadow has resulted in flooding and has led to speculation that the entire wetland was created by beavers.

Upland forests tend to be dominated by Douglas-fir or western hemlock with falsebox and mosses characterizing the understory.

Variations in moisture, nutrient availability, and soil and water chemistry have resulted in a great diversity of habitats and plant species in this relatively small reserve. A preliminary inventory lists over 220 species of higher plants, 56 mosses and 43 lichens. The complement of trees is impressive.

The reserve and its delicate wetlands and meadows are of particular importance for orchids. Fourteen of 32 species recorded in British Columbia occur here, a diversity unmatched anywhere else in the province. Species rare in British Columbia include the yellow lady's-slipper, sparrow's egg lady's-slipper, yellow widelip orchid, and giant helleborine. The giant helleborine is a threatened species in Canada. Other rare plants in the reserve are mallow ninebark, slimstem reedgrass and common reed.

About 50 species of birds have been seen in the reserve, mostly during migration periods. Species nesting in the wetlands include mallards, snipe, and probably one pair of greater sandhill cranes. The sandhill crane is a rare nesting bird in British Columbia. Mammals include mule deer, black bear, coyote, snowshoe hare, and red squirrel. Garter snakes, Pacific treefrogs, spotted frogs and wood frogs occur. Forty-six species of spiders have been collected of which six are new to British Columbia.

## MANAGEMENT CONCERNS

SIGNIFICANT SPECIES	BC LIST STATUS	COSEWIC STATUS	CF PRIORITY
brown beak-rush	Red listed		2
giant helleborine	Blue listed	Special Concern (1998)	2
yellow widelip orchid	Red listed		2
beaked spike-rush	Blue listed		3
crested wood fern	Blue listed		3
marsh muhly	Blue listed		4
Sandhill Crane		Not At Risk (1979)	5

## THREATS

<b>Climate Change:</b>	The rising temperatures and changed precipitation that have been projected as characteristic of the future climate may pose a threat to the rare and specialized flora associated with the unique calcareous fen. Changes in water level and rates of evapotranspiration could alter the composition of the wetland systems, thus impacting the outstanding diversity and unique habitat for which this reserve was designated.
<b>Forestry:</b>	Adjacent logging may impact the aquifers that feed the meadows.
<b>Non-native species:</b>	Invasive species outside the reserve have the potential to spread due to increased and unauthorized visitation.
<b>Recreation:</b>	Unauthorized visitors disrupt and destroy the rare plant communities.

## RESEARCH OPPORTUNITIES

A comprehensive natural history account and plant list is available. Members of the North Okanagan Naturalists Club have been instrumental in proposing, describing and protecting this reserve. An opportunity exists to explore the hypothesis that beavers are responsible for the wetland character of the entire reserve.

## SCIENTIFIC NAMES OF SPECIES MENTIONED IN THE MARA MEADOWS ER ACCOUNT

### Flora

alder, mountain (*Alnus incana* ssp. *tenuifolia*)  
 aster, rush (aka boreal aster) (*Symphyotrichum boreale*)  
 beak-rush, brown (*Rhynchospora capillacea*)  
 bladderwort, greater (*Utricularia macrorhiza*)  
 buckbean (*Menyanthes trifoliata*)  
 bulrush, soft-stemmed (aka great bulrush) (*Schoenoplectus tabernaemontani*)  
 butterweed, Canadian (*Senecio pauperculus*)  
 cabbage, skunk (*Lysichiton americanus*)

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cattail, common (*Typha latifolia*)  
cranberry, bog (*Oxycoccus oxycoccus*)  
death-camas, mountain (*Zigadenus elegans*)  
falsebox (*Paxistima myrsinites*)  
fern, crested wood (*Dryopteris cristata*)  
goldenrod, Canada (*Solidago canadensis*)  
grass-of-Parnassus, fringed (*Parnassia fimbriata*)  
helleborine, giant (*Epipactis gigantean*)  
hemlock, western (*Tsuga heterophylla*)  
Labrador tea (*Ledum groenlandicum*)  
lady's slipper, sparrow's egg (*Cypripedium passerinum*)  
lady's slipper, yellow (*Cypripedium parviflorum*)  
lobelia, Kalm's (*Lobelia kalmii*)  
mannagrass, fowl (*Glyceria striata*)  
marsh muhly (*Muhlenbergia glomerata*)  
moss, peat (*Sphagnum spp.*)  
muskgrass (*Chara sp.*)  
ninebark, mallow (*Physocarpus malvaceus*)  
orchid, yellow widelip (*Liparis loeselii*)  
pine, lodgepole (*Pinus contorta* var. *latifolia*)  
redcedar, western (*Thuja plicata*)  
reed, common (*Phragmites australis* ssp. *australis*)  
reedgrass, slimstem (*Calamagrostis stricta*)  
spike-rush, beaked (*Eleocharis rostellata*)  
spruce, Engelmann (*Picea engelmannii*)  
spruce, white (*Picea glauca*)Douglas-fir  
twinberry, black (*Lonicera involucrata*)  
violet, northern bog (*Viola nephrophylla* var. *nephyrophylla*)  
water-milfoil (*Myriophyllum sp.*)  
willow (*Salix spp.*)

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### **Fauna**

Bear, American Black (*Ursus americanus*)  
Beaver, American (*Castor canadensis*)  
Coyote (*Canis latrans*)  
Crane, Sandhill (*Grus canadensis*)  
Deer, Mule (*Odocoileus hemionus*)  
Frog, Pacific Chorus (formerly Pacific Treefrog) (*Pseudacris regilla*)  
Frog, Spotted (*Rana sp.*)  
Frog, Wood (*Lithobates sylvaticus*)  
Hare, Snowshoe (*Lepus americanus*)  
Mallard (*Anas platyrhynchos*)  
Snake, Garter (*Thamnophis sp.*)  
Snipe, Wilson's (*Gallinago delicata*)  
Squirrel, Red (*Tamiasciurus hudsonicus*)