

Fish and Wildlife Compensation Program
Inventory and Project Development for Wiseman Lakes Fen



Seed Funding Report

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Prepared for

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Prepared by

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Executive Summary

This report summarizes the results of the FWCP seed funding project to conduct a baseline botanical inventory, develop a rationale for conservation, and identify stewardship options for Wiseman Lakes and associated fen habitat. The wetland complex is located on crown benchlands ~230 m above the Columbia River northwest of Golden and southwest of Donald, B.C. The wetland provides habitat for a diverse array of plants, including one of the only confirmed provincial locations for pygmy waterlily (*Nymphaea tetragona*). It also supports several amphibian species (including the at-risk Western Toad), at least 85 bird species, bats, and large carnivores (e.g., lynx, cougar, black bear), and has been designated as Caribou recovery habitat.

The botanical inventory in July 2019 yielded a total of 152 plant taxa representing 104 different genera, including records for three provincially listed rare plants. The overall species assemblage was unusual and possibly unique in the province. The fen species composition was characteristic of a WF11 (Tufted Clubrush – Star Moss) Fen Site Association. This fen association occurs with only incidental frequency in the Interior Cedar Hemlock (ICH) zone, comprising < 5% of all wetlands.

Despite its potential ecological significance to the region, the wetland complex is currently under year-around pressure from commercial and recreational ATV and snowmobile operators, and signs of recent disturbance related to motorized recreational activities were documented during site visits in 2018 and 2019. Adding to these pressures, a local outdoor adventure company has recently applied for a tenure amendment that would allow for an expanded commercial recreational operation in the Wiseman Lakes area. A viable stewardship strategy for the Wiseman Lakes habitat is required to ensure that its ecological integrity is preserved in the face of ongoing threats. It is suggested that such a strategy be structured around four complementary elements: (1) legal securement; (2) access barriers; (3) outreach and education; and (4) habitat restoration and monitoring. Initial priority should be placed on applying for, and obtaining, a Section 16 Map Reserve designation, which would immediately protect the area from any future Lands Act applications (e.g., commercial recreation). Beyond this, the most appropriate and feasible actions for achieving conservation goals moving forward will be determined through a process of outreach and consultation as part of a large FWCP grant proposal development. A grant application will be developed and submitted in 2020, the objective of which will be to support concrete actions to secure and protect this site into the future.

This project aligns with the following primary FWCP Action Plan: Wetlands and Riparian Areas. The corresponding priority action is to: Identify threats to habitat connectivity and support opportunities, including but not limited to land securement, in order to secure and steward lands with high conservation values for wetland and riparian areas (priority level: P2).

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1 Introduction

Wiseman Lakes fen is a small, largely intact, upslope wetland complex situated on crown land 230 m above the Columbia River northwest of Golden and southwest of Donald, B.C. (Figure 1-1). The wetland is confirmed, through recent surveys, to support at least three provincially rare plants. These include a rare orchid (yellow widelip orchid) and a rare aquatic macrophyte (pygmy waterlily), the latter of which is known from <10 other locations in the province. The fen plant assemblage is highly diverse and may be unique in the region. The habitat supports populations of amphibians and bats and may also be locally important for birds, large carnivores, and ungulates. The area is a proposed Caribou recovery area. The approximately 20 ha wetland complex is forest service road-accessible and is currently under pressure from recreationalists, primarily off-road vehicle users (including snowmobile operators). Some temporary structures (e.g., wooden bridge, picnic table, outhouse, firepit) have been illegally erected around the shoreline in recent years. In 2018, BC Ministry of Forests, Lands, Natural Resource Operations, and Rural Development (MFLNRORD) took initial steps to limit ATV access into the wetland via the placement of boulders across strategic access points. However, the long-term efficacy of this barrier as a protective measure has yet to be determined.

Recently, a local tour company filed an application to amend their existing tenure (Notice of Application for a Disposition of Crown Land) to include various summer and winter operations (e.g., snowmobiling) in the Wiseman Lakes and surrounding area. This application is currently under review by the B.C. Lands Branch (MFLNRORD).



Figure 1-1. Location of Wiseman Lakes fen.

In 2018, at the invitation of local concerned citizens, a team of botanists visited Wiseman Lakes to conduct an informal survey of the habitat and resident flora associated with the fen. The team was struck by quality and botanical diversity of this wetland situated so close to the TransCanada Highway and Golden. A seed funding grant was subsequently submitted to the Fish and Wildlife Compensation Program to identify potential conservation options. Specifically, seed funding was requested to support the following activities: (1) a baseline botanical inventory and wetland integrity assessment of Wiseman Lakes; (2) development of

an ecological and social rationale, and a roadmap of options, for protecting this valuable habitat; and (3) the development of a proposal for a large FWCP grant, the objective of which will be to support concrete actions to secure and protect this site into the future.

This study was designed to align with Actions in the following two Columbia Region Action Plans 1) Riparian and Wetlands Action Plan (Action: Identity threats to habitat connectivity and support opportunities, including but not limited to land securement, in order to secure and steward lands with high conservation values for wetland and riparian areas); and 2) Species of Interest Action Plan (Action: Habitat stewardship/acquisition).

2 Project Activities

The following activities were undertaken for this project:

- Communication with stakeholders
- Information gathering
- Field survey
- wetland classification and preliminary assessment of wetland integrity
- development of a conservation rationale
- Summary of restoration and conservation options
- Preparation and submission of a proposal for Year 2 (pending).

3 Methods

3.1 Stakeholder Engagement and Information Gathering

Preliminary stakeholder engagement was accomplished through phone calls, emails, and a field session. For this initial seed work, direct stakeholder engagement was limited to MFLNRORD and MECCS staff and local naturalist groups. Any future Large Grant-related work on this project will also include direct engagement with local Indigenous Nations (Okanagan Nation Alliance, Secwepemc, and Ktunaxa).

Relevant reports and data for this project were obtained through searches of the following online data sources:

- BC Conservation Data Centre: <http://www2.gov.bc.ca/gov/content/environment/plantsanimals-ecosystems/conservation-data-centre/explore-cdc-data>
- BC Species and Ecosystem Explorer: <http://a100.gov.bc.ca/pub/eswp/>
- Cross-Linked Information Resources (CLIR): <http://www.env.gov.bc.ca/clir/>, which searches:
 - Species Inventory Web Explorer (SIWE)
 - Ecocat
 - Biodiversity/Environmental Information Resources (EIRS BD) e-Library
 - Natural Resources Sector (NRS) Library eBird: <http://ebird.org/>
- Royal BC Museum Online Database: <http://royalbcmuseum.bc.ca/collections>
- Canadian Museum of Nature Online Database: <http://collections.nature.ca/>

3.2 Field Assessment

Two LGL botanists, accompanied by a local naturalist, conducted a floristic inventory of Wiseman Lakes fen on July 23, 2019 (Figure 3-1, Figure 3-2). All species of vascular plants, as well as a selection of non-vascular plants and aquatic macrophytes were recorded, and rare plant observations were georeferenced.

Opportunistic wildlife sightings were also recorded. To check for bat activity, a heterodyne detector was deployed for several hours on the evening of August 26.



Figure 3-1. Wiseman Lakes and fen. Inventory area consisted of the unforested (wetland) habitat within the red polygon.



Figure 3-2. Wiseman Lakes and fen, showing shallow open water habitat containing the blue listed Pygmy Waterlily (*Nymphaea tetragona*) along with other pond-lilies and fringing emergent sedges.

3.3 Riparian Health Assessment

A rapid riparian health assessment was undertaken following the methodology outlined in Hansen et al. (2000) and Ambrose et al. (2009). A representative 200-m length of reach (shoreline) was selected for assessment. This consisted of nine separate measurements or assays, some categorical and some quantitative, which at the end were tallied together to derive a riparian health score or rating. The measurements recorded for each reach were:

1. Total vegetation cover (%) of the riparian area
2. Proportion of total cover comprised of invasive plant species
3. Proportion of total cover comprised of disturbance-caused undesirable herbaceous species
4. Proportion of total canopy cover comprised of establishing stems (seedlings and saplings) of preferred woody species
5. Proportion of preferred woody growth used for browse and/or removed by other means
6. Proportion of reach vegetation altered by human activity
7. Human alteration of the physical site (% of area and severity)
8. Amount (%) of human-caused bare ground
9. Degree of artificial water level change

The riparian health score was a cumulative measure of the 9 rapid assessment factors. The score was transformed into a percentage based on the total possible score and the following ratings were then applied (Dulisse and Hanson 2018):

- $\geq 80\%$ = Proper Functioning Condition (healthy; all riparian functions being performed)

- 60-79% = Functional at Risk (healthy, but with problems; many riparian functions still performed, but some clear signs of stress apparent)
- ≤60% = Non-functional (unhealthy; most riparian functions severely impaired or lost)

The rapid field assessment provides an indication of the functional health of a riparian stream or wetland area and can be used to prescribe simple conservation actions. It also allows for the measurement of change (hopefully an increase in wetland health) over time (Ambrose et al. 2009; Dulisse and Hanson 2018).

4 Project Outcomes

4.1 Engagement

Staff from MFLNRORD and MECCS were contacted to discuss potential protection and securement options for the Wiseman Lakes habitat. A volunteer naturalist (anonymous) from the Golden area was engaged to assist with the field session and with plant/lichen identifications. This individual has been a strong local advocate for the area and their extensive knowledge of its natural values and past and current land use (e.g., recreational use) were invaluable to the development and delivery of this study.

4.2 Information Summary

There is limited documented information pertaining to Wiseman Lakes. Reports, documents, and information on the wildlife, flora, and environs that were reviewed are listed in Table 4-1. Regional amphibian surveys have confirmed usage of the habitat by several species including Columbia Spotted Frog, Western Toad, and Long-toed Salamander. Approximately 85 bird species have been recorded at Wiseman Lakes since the 1990s. A checklist of birds is provided in the Appendix (Table 6-2). This checklist includes five provincially listed species: Long-Tailed Duck (BLUE S2S3B, S4N), Northern Goshawk (RED S2), Broad-Winged Hawk (BLUE S3B), Northern Pygmy Owl (BLUE S3S4), and Olive Sided Flycatcher (BLUE S3S4B). A report by the Habitat Management office (MFLNRORD) indicates that the area is within the range of Grizzly Bear, Mountain Goat, and Rocky Mountain Bighorn Sheep and has been designated as a Caribou recovery area (Table 4-1). The report notes outstanding concerns around unauthorized trails in the vicinity; that increasing the trail network in this area will increase public use and increase hunter access and opportunity; and that motorized use compromises habitat values and displaces wildlife.

Table 4-1. Table of information reviewed.

Year	Author	Title and Description
1973	Burns and Klein	<u>A Reconnaissance Survey of Wiseman Lake</u> . Data from an aquatic habitat and fish survey. Cutthroat trout were detected. Lake pH was neutral to slightly alkaline. Report available via CLIR.
1996	Ohanjanian and Teske	<u>Herpetological survey of 87 wetlands in the Columbia Basin Fish and Wildlife Compensation Area</u> . Results of regional amphibian survey. Columbia Spotted Frog, Western Toad, and Long-toed Salamander observed.
2005	Ohanjanian et al.	<u>An amphibian inventory of the East Kootenays with an emphasis on <i>Bufo boreas</i>. Results of regional amphibian survey</u> . Columbia Spotted Frog observed.
2019	McKay	<u>Untitled</u> . Habitat Management (Resource Management Division, MFLNRORD) review of proposal for Adventure Tourism/Commercial Recreation submitted by a local outdoor adventure company. Obtained via personal communication. Review recommends refusal of the proposed project. Among main listed concerns: "One of the proposed Caribou recovery areas is Wiseman Lake area. Understandably, these areas will require minimal human disturbance. Additional recreational pressure and motorized use near this area is not supported."

2020	Conservation Data Centre (CDC)	<u>CDC iMap: online database of tracked element occurrences. No records of provincially tracked species at Wiseman Lakes. This database does not reflect recent EO (rare plant) observations at Wiseman Lakes, however.</u>
2020	eBird.org	<u>eBird: online database of bird distribution and abundance. Data from 1997 to 2019. Records for 85 species observed. Primary contributor is Douglas Leighton.</u>

4.2.1 Field Observations

4.2.1.1 Flora and Fauna

The one-day floristic inventory of Wiseman Lakes fen (focusing primarily on terrestrial vascular plants but also including aquatic macrophytes observable from the shoreline) yielded a total of 152 taxa representing 104 different genera (Appendix: Table 6-1). The highly diverse species mix included both herbaceous and woody-stemmed species, with sedges (*Carex*) and willows (*Salix*) comprising the most species-rich groups. Fen associates (e.g., brown mosses, Yellow Sedge, Kalm's lobelia) and bog plants (e.g. peat mosses, Sundews, Creeping Snowberry) were both well represented, consistent with a poor (slightly acidic) fen or transitional bog. Several species (e.g., Sticky False-asphodel) were indicators of moderately calcareous soil conditions. In addition to the provincially rare elements described below, notable range disjuncts include Water Clubrush, a species generally limited to southwest B.C.

Columbia Spotted Frogs (*Rana luteiventris*) were recorded in the wetland on the day of the survey. During its single evening deployment, the heterodyne detector obtained signals indicating the presence of Little Brown Bat (*Myotis lucifugus*) in large numbers (anonymous, pers. comm.). Signs of Canada lynx (*Lynx canadensis*), Cougar (*Puma concolor*), and Black Bear (*Ursus Americanus*) were also observed at the site in 2019 (anonymous, pers. comm.).

4.2.1.2 Wetland Classification

Wiseman Lakes lies within the Interior Cedar – Hemlock biogeoclimatic zone (ICH mw1 subzone). The wetland habitat consists of two connected, shallow open water pond systems (supporting pond-lilies and emergent macrophytes around the marsh fringes) ringed by a marginal fen, the middle tier of which is sedge-dominated while the upper tier is (at least in certain portions) *Sphagnum*-derived (Figure 4-1, Figure 4-2). The fen species composition, which included covers of Bog Birch and Bog Willow in the shrub layer; Tufted Clubrush, Hudon Bay Clubrush, Sea Arrow-grass, Narrow-leaved Cotton-grass, and Few-flowered Spike-rush in the graminoid layer, and Swamp Horsetail, Round-leaved Sundew, and Fragrant White Rein Orchid in the herb layer, is characteristic of a WF11 (Tufted Clubrush – Star Moss) Fen Site Association (McKenzie and Moran 2004). This fen association occurs with only incidental frequency in the ICH zone, comprising < 5% of all wetlands (McKenzie and Moran 2004).



Figure 4-1. Wiseman Lakes and fen. Left: shallow open water habitat. Right: lawn with blooming Mountain Death-Camas.

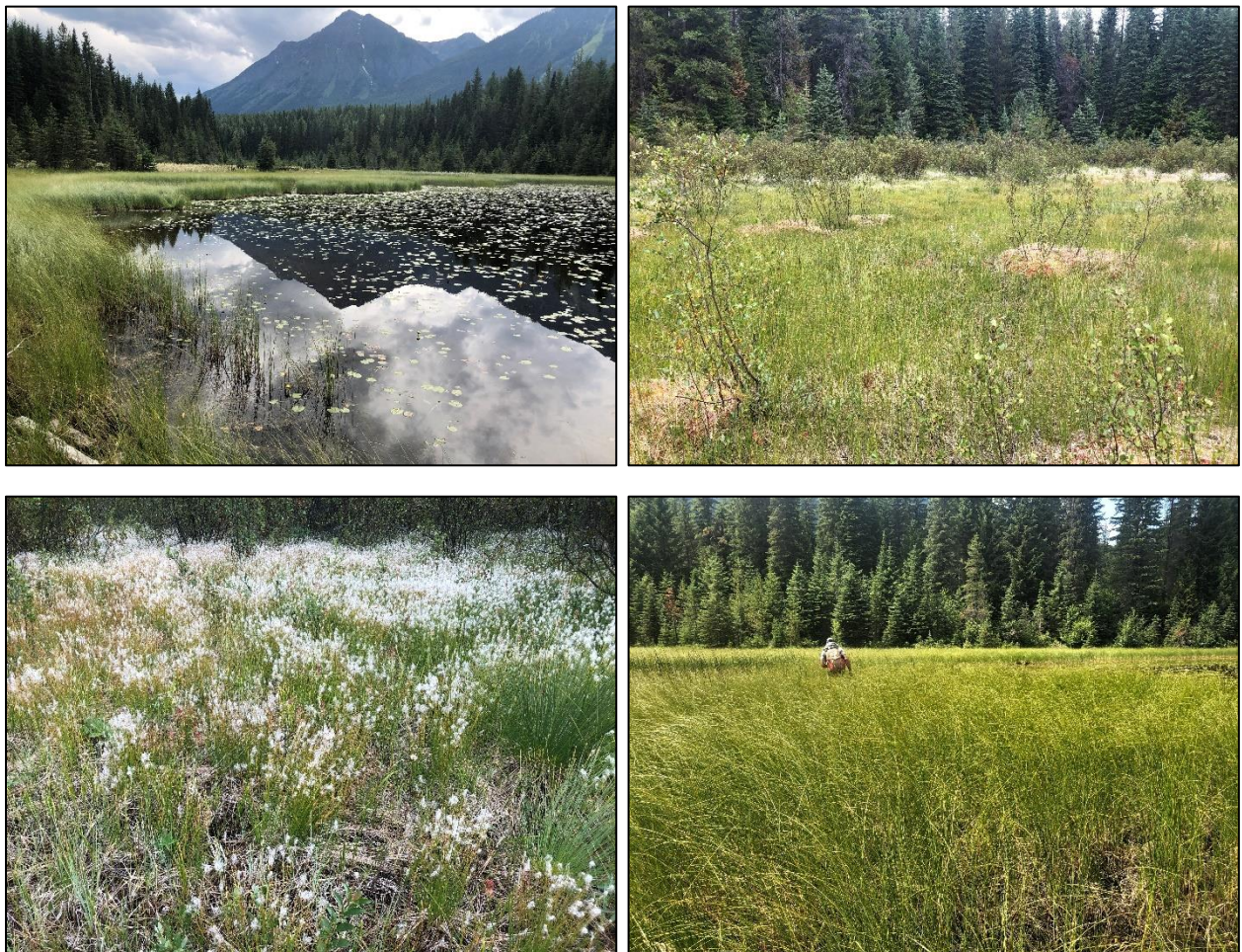




Figure 4-2. Wiseman Lakes and fen. Clockwise from top left: shallow open water wetland; *Sphagnum*/Scrub Birch transitional bog; sedge meadow; tufted clubrush; riparian zone; Narrow-leaved Cotton-grass.

4.2.1.3 Rare Plants

Three provincially listed rare plants and bryophytes were observed on the survey: *Nymphaea tetragona* (Pygmy Waterlily, red listed at survey time; since down-listed to blue), *Liparis loeselii* (Yellow Widelip Orchid, blue listed), and the liverwort *Moerckia hibernica* (Irish Ruffwort, blue listed; Figure 4-3).

In British Columbia, Pygmy Waterlily is known from only a few isolated occurrences, primarily in central and northwest (coastal) B.C. The only recently confirmed records in southeast B.C. are at Brisco, south of Golden, and Wiseman Lakes. Pygmy Waterlily generally occurs in clear water, with a neutral or slightly alkaline pH, over a rich, organic substrate. Its habitats include ponds, shallow lakes, slow-moving streams, and edges of slow, open water channels through marshes. It may also occur in streams impounded by beaver or by humans (B.C. Conservation Data Centre 1994). Due to its outward resemblance to other pond-lilies, combined with its aquatic habitat, it may be somewhat overlooked and thus may have a wider distribution than has been reported. Partly on this assumption, its conservation ranking was changed in 2019 from S1 (red) to S3 (blue). The species has no legal protection in B.C. Because its range extends across northwest Canada (Yukon, Northwest Territories, Alberta, Manitoba), it is also unlikely to qualify for federal protected (*SARA*) status.

Yellow Widelip Orchid is another provincial rarity that, until recently, was red listed in B.C. on account of its highly limited distribution and low local abundances. As survey efforts have intensified in the past decade, the number of recorded populations has also increased, resulting in a revised ranking. It is currently blue listed (S2). However, with a few exceptions (e.g., Shuswap region), most confirmed locations in B.C. are restricted to the Columbia Valley around Golden. It is considered critically imperiled (S1) in Saskatchewan and Washington, and imperiled (S2) in Northwest Territories, Alberta, and Montana. This diminutive orchid is known to inhabit bogs, fens, wet peaty or sandy meadows, and exposed sand along edges of lakes, often colonizing previously open and disturbed habitats during early and middle stages of succession (Magrath 2003). Wiseman Lakes is the only known location in B.C. where Yellow Widelip Orchid is known to occur together with Pygmy Water-lily, making this wetland unique from a rare plant perspective.

Irish Ruffwort (*Moerckia Hibernica*) is a rare liverwort listed provincially as blue (S3). Twelve records exist for this liverwort in B.C., the majority of which are coastal and on S. Moresby Island. There is one record

from Smithers and another, more recent (2013) record from the interior at Wells Gray Provincial Park. The species has been recorded from Ontario (2), Quebec (3) and Newfoundland (2). A few records also exist from the US and Europe. This liverwort is typically found in damp shaded calcareous habitats, on lake edges, and in cliff waterfall spray zones.

A rare (but currently unranked) lichen, *Mollisia cinerea*, was also recorded (on a subsequent visit to the site by one of the original survey team; Figure 4-4). This lichen is not found on any provincial watchlist and the Wiseman Lakes observation may represent a first record for the province.



Figure 4-3. Provincially listed rare plants observed at Wiseman Lakes in 2019. Top left: *Nymphaea tetragona* (S3 Blue). Right: *Liparis loeselii* (S3 Blue). Bottom left: *Moerckia Hibernica* (S3 Blue).



Figure 4-4. *Mollisia cinerea* (lichen), photographed at Wiseman Lakes in 2019. Identification tentative and awaiting confirmation.

4.2.1.4 Riparian Health Assessment

Based on the rapid health assessment, Wiseman Lakes fen scored overall as Functional at Risk (healthy, but with problems; Table 4-2). Issues identified included the presence (albeit generally at low densities) of several problematic invasive species (e.g., *Agrostis gigantea*, *Cirsium arvensis*, *C. vulgare*, *Elymus repens*, *Hieracium aurantiacum*, *H. piloselloides*, *Leucanthemum vulgare*, and *Myriophyllum spicatum*) as well as disturbance increasers such as *Poa pratensis* (Table 6-1). Other score reductions resulted from intentional woody plant removal/trimming, human-altered changes to vegetation (species introductions), human-caused disturbance to the physical site (e.g., rutting and compaction), and human-caused soil exposure due to machine operation (Table 4-2).

Table 4-2. Riparian health rapid assessment scores. An overall score of 80-100% indicates Proper Functioning Condition (healthy); an overall score of 60-79% indicates Functional at Risk (healthy, but with problems); an overall score <60% indicates Non-functional (unhealthy). After Ambrose et al. (2009).

Attribute	Description	Actual Score	Possible Score
1	Total vegetation cover (%) of the riparian area	6	6
2a	Proportion of total cover comprised of invasive plant species	2	3
2b	Invasive plant density distribution	2	3
3	Proportion of total cover comprised of disturbance-caused undesirable herbaceous species	2	3
4	Proportion of total canopy cover comprised of establishing stems (seedlings and saplings) of preferred woody species	6	6
5a	Proportion of preferred woody growth used for browse	3	3
5b	Proportion of preferred woody growth removed by other means (beavers and/or humans)	1	3
6	Proportion of reach vegetation altered by human activity	4	6
7a	Human alteration of the physical site (% of area)	8	12
7b	Human alteration of the physical site (severity)	0	3
8	Amount (%) of human-caused bare ground	4	6
9	Degree of artificial water level change	9	9

Overall Health Score: 47/63 = 75%, indicating a condition of **Functional at Risk (healthy, but with problems)**

4.3 Rationale for Conservation

Wiseman Lakes is a small but biodiverse wetland complex situated on crown land on mid-slope benchlands above the Columbia River. The fen and shallow open water habitats of this wetland have recently come under intense pressure from recreational ATV and snow machine operators (Figure 4-5). Operators have constructed unsanctioned picnic areas around the shore, installed bridge structures through the wetland, and carried out brushing in the fen (Figure 4-6). In the winter of 2016/17, a snow grooming machine went through the ice, requiring extraction by heavy machinery and resulting in deep, persistent rutting of the fen as well as a widening of the single-track access into the wetland (Figure 4-6).

These ongoing activities pose direct short- and long-term threats to the unique plant assemblage found at this site, which includes populations of at least three provincially listed rare plants not known to occur together anywhere else in the province. The activities also threaten federally listed wildlife species (e.g., Western Toad) and other animals (e.g., salamanders, bats, small mammals, ungulates, large carnivores, and birds) that may depend on this habitat for all or part of their life cycle. The checklist of birds utilizing the area includes five provincially listed species (Long-Tailed Duck, Northern Goshawk, Broad-Winged Hawk, Northern Pygmy Owl, and Olive Sided Flycatcher) that could be negatively impacted by ongoing motorized disturbance. Lastly, the habitat has been identified by the province as a potential Caribou recovery area, and as such requires minimal human disturbance. The utility of the area for Caribou recovery, and potential for other future protection measures, could be permanently diminished if the habitat continues to experience recreational motorized use at the current levels. Adding to these pressures, a local outdoor adventure company has recently applied for a tenure amendment that would allow for an expanded commercial recreational operation in the Wiseman Lakes area.

4.1 Stewardship Opportunities

A viable stewardship strategy for the Wiseman Lakes habitat should be developed as soon as possible to ensure its ecological integrity is preserved in the face of ongoing (and intensifying) commercial recreation pressures. We envision such a strategy being structured around four complementary elements, listed here in descending perceived order of imminent priority: (1) legal securement; (2) access barriers; (3) outreach and education; and (4) habitat restoration and monitoring.

Securement: A provincial Section 16 Map Reserve designation would immediately protect the area from any future Lands Act applications (e.g., commercial recreation). Therefore, applying for, and obtaining, a Section 16 should be regarded as a short-term stewardship priority. Longer-term securement strategies could include pursuit of WHA (Wildlife Habitat Area) designation, Ecological Reserve status, or direct habitat acquisition through a non-profit land stewardship group.

Access barriers: In 2019, MFLNRORD, in response to concerns expressed by local concerned citizens, installed exclusionary rock barriers near the primary trail entrance to the wetland complex (Figure 4-7). The long-term effectiveness of this measure is currently unknown and needs to be assessed. If it appears motorized vehicles are continuing to access the area (by driving around the barriers or accessing from other points), the installation of additional or larger barriers should be considered to increase the effectiveness of this strategy.



Figure 4-5. Evidence of recent disturbance at Wiseman Lakes and associated fen. Top: ATV-caused ruts in sensitive shoreline habitat. Lower four panels: snowmobile tracks.



Figure 4-6. Evidence of recent disturbance at Wiseman Lakes and associated fen. Clockwise from top left: unsanctioned picnic site, bridges for ATVs/snowmobiles, clipped shrubs (brushing), ruts created by heavy machinery used to extract winter recreational equipment that had broken through the ice.

Outreach and education: Outreach could take the form of information sessions to raise public awareness of the conservation value of Wiseman Lakes and fen, in concert with the installation of informative signage at the entrances to the site. User groups (e.g., snowmobile clubs, ORV clubs, rod-and-gun clubs, and commercial operations) could be engaged in future project phases. Presentations at local club meetings or other targeted outreach activities could be considered.

Habitat restoration and monitoring: Once imminent threats have been mitigated through stewardship measures such as those outlined above, restoration work can be considered to “undo” some of the physical and functional damage inflicted on the habitat to date. Potential restorative actions range from removal of unsanctioned bridges and other structures (Figure 4-6) to reclaiming and revegetation of rutted fen turf (Figure 4-5). Additional wildlife inventories (e.g., including bat, small mammal, amphibian, and ungulate inventories) would also be very useful to help fill some of the existing data gaps around wildlife usage at this site and to establish future monitoring baselines for assessing the effectiveness of stewardship actions.

The actions listed above represent one possible roadmap of conservation options for Wiseman Lakes. The most appropriate and feasible actions for achieving conservation goals have not yet been determined; instead, these will be identified through a process of outreach and consultation as part of the large FWCP grant proposal development. A large FWCP Grant Application will be developed and submitted in 2020.



Figure 4-7. Rock barriers installed by MFLNRORD at the trail access to Wiseman Lakes wetland.

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6 Appendix

Table 6-1. Plant species checklist for Wiseman Lakes, July 2019, showing provincial conservation status. Listed species are displayed in bold text. SNA = status not assigned.

Species	Common Name	Family	Native/Intro.	Provincial Status
<i>Abies lasiocarpa</i> var. <i>lasiocarpa</i>	Subalpine Fir	Pinaceae	N	Yellow
<i>Agrostis gigantea</i>	Redtop	Poaceae	I	Exotic
<i>Agrostis scabra</i>	Hair Bentgrass	Poaceae	N	Yellow
<i>Alnus incana</i> subsp. <i>tenuifolia</i>	Mountain Alder	Betulaceae	N	Yellow
<i>Anaphalis margaritacea</i>	Pearly Everlasting	Asteraceae	N	Yellow
<i>Antennaria</i> sp.	Pussytoes	Asteraceae	N	Yellow
<i>Anticlea elegans</i>	Mountain Death-camas	Melianthaceae	N	Yellow
<i>Apocynum androsaemifolium</i> var. <i>androsaemifolium</i>	Spreading Dogbane	Apocynaceae	N	Yellow
<i>Aquilegia formosa</i>	Sitka Columbine	Ranunculaceae	N	Yellow
<i>Arctostaphylos uva-ursi</i>	Kinnikinnick	Ericaceae	N	Yellow
<i>Betula papyrifera</i>	Paper Birch	Betulaceae	N	Yellow
<i>Betula pumila</i>	Bog Birch	Betulaceae	N	Yellow
<i>Botrypus virginianus</i>	Rattlesnake Fern	Ophioglossaceae	N	Yellow
<i>Bromus ciliatus</i>	Fringed Brome	Poaceae	N	Yellow
<i>Calamagrostis canadensis</i>	Canada Bluejoint	Poaceae	N	Yellow
<i>Calamagrostis stricta</i>	Slimstem Reegrass	Poaceae	N	Yellow
<i>Canadanthus modestus</i>	Great Northern Aster	Asteraceae	N	Yellow
<i>Carex aquatilis</i>	Water Sedge	Cyperaceae	N	Yellow
<i>Carex aurea</i>	Golden Sedge	Cyperaceae	N	Yellow
<i>Carex bebbiana</i>	Bebb's Sedge	Cyperaceae	N	Yellow
<i>Carex buxbaumii</i>	Buxbaum's Sedge	Cyperaceae	N	Yellow
<i>Carex capillaris</i>	Hair-like Sedge	Cyperaceae	N	Yellow
<i>Carex diandra</i>	Lesser Panicked Sedge	Cyperaceae	N	Yellow
<i>Carex flava</i>	Yellow Sedge	Cyperaceae	N	Yellow
<i>Carex interior</i>	Inland Sedge	Cyperaceae	N	Yellow
<i>Carex lasiocarpa</i>	Slender Sedge	Cyperaceae	N	Yellow
<i>Carex leptalea</i>	Bristle-stalked Sedge	Cyperaceae	N	Yellow
<i>Carex lividum</i>	Pale Sedge	Cyperaceae	N	Yellow
<i>Carex utriculata</i>	Beaked Sedge	Cyperaceae	N	Yellow
<i>Carex vaginata</i>	Sheathed Sedge	Cyperaceae	N	Yellow
<i>Carex viridula</i>	Greenish Sedge	Cyperaceae	N	Yellow
<i>Cerastium nutans</i>	Nodding Chickweed	Caryophyllaceae	N	Yellow
<i>Chamerion angustifolium</i>	Fireweed	Onagraceae	N	Yellow
<i>Chara braunii</i>	Stonewort	Characeae	Unlisted	Unlisted
<i>Cicuta bulbifera</i>	Bulbous Water-hemlock	Apiaceae	N	Yellow
<i>Cirsium arvensis</i>	Canada Thistle	Asteraceae	I	Exotic

<i>Cirsium vulgare</i>	Bull Thistle	Asteraceae	I	Exotic
<i>Comarum palustre</i>	Marsh Cinquefoil	Rosaceae	N	Yellow
<i>Cornus canadensis</i>	Common Bunchberry	Cornaceae	N	Yellow
<i>Cornus stolonifera</i>	Red-osier Dogwood	Cornaceae	N	Yellow
<i>Dasiphora fruticosa</i> ssp. <i>floribunda</i>	Shrubby Cinquefoil	Rosaceae	N	Yellow
<i>Drosera anglica</i>	English Sundew	Droseraceae	N	Yellow
<i>Drosera rotundifolia</i>	Round-leaved Sundew	Droseraceae	N	Yellow
<i>Eleocharis palustris</i>	Common Spike-rush	Cyperaceae	N	Yellow
<i>Eleocharis quinqueflora</i>	Few-flowered Spike-rush	Cyperaceae	N	Yellow
<i>Elymus repens</i>	Quackgrass	Poaceae	I	Exotic
<i>Epilobium ciliatum</i> subsp. <i>glandulosum</i>	Purple-leaved Willowherb	Onagraceae	N	Yellow
<i>Equisetum arvense</i>	Field Horsetail	Equisetaceae	N	Yellow
<i>Equisetum fluviatile</i>	Swamp Horsetail	Equisetaceae	N	Yellow
<i>Equisetum variegatum</i> subsp. <i>variegatum</i>	Northern Scouring-rush	Equisetaceae	N	Yellow
<i>Eriophorum angustifolium</i>	Narrow-leaved Cotton-grass	Cyperaceae	N	Yellow
<i>Euphrasia nemorosa</i>	Eastern Eyebright	Orobanchaceae	I	Exotic
<i>Fragaria virginiana</i> var. <i>glauca</i>	Wild Strawberry	Rosaceae	N	Yellow
<i>Galium boreale</i>	Northern Bedstraw	Rubiaceae	N	Yellow
<i>Galium triflorum</i>	Sweet-scented Bedstraw	Rubiaceae	N	Yellow
<i>Gaultheria hispidula</i>	Creeping Snowberry	Ericaceae	N	Yellow
<i>Geocaulon lividum</i>	Bastard Toad-flax	Santalaceae	N	Yellow
<i>Geum allepicum</i>	Yellow Avens	Rosaceae	N	Yellow
<i>Glyceria striata</i>	Fowl Mannagrass	Poaceae	N	Yellow
<i>Halenia deflexa</i>	Spurred Gentian	Gentianaceae	N	Yellow
<i>Hieracium albiflorum</i>	White Hawkweed	Asteraceae	N	Yellow
<i>Hieracium aurantiacum</i>	Orange Hawkweed	Asteraceae	I	Exotic
<i>Hieracium piloselloides</i>	Glaucous Hawkweed	Asteraceae	I	Exotic
<i>Hippuris vulgaris</i>	Common Mare's-tail	Plantaginaceae	N	Yellow
<i>Juncus castaneus</i>	Chestnut Rush	Cyperaceae	N	Yellow
<i>Juncus ensifolius</i>	Dagger-leaved Rush	Cyperaceae	N	Yellow
<i>Juncus nodosus</i>	Knotted Rush	Cyperaceae	N	Yellow
<i>Juniperus communis</i> var. <i>kelleayi</i>	Common Juniper	Cupressaceae	N	Yellow
<i>Leucanthemum vulgare</i>	Oxeye Daisy	Asteraceae	I	Exotic
<i>Linnaea borealis</i> subsp. <i>longiflora</i>	Twinflower	Caprifoliaceae	N	Yellow
<i>Liparis loeselii</i>	Loesel's Twayblade	Orchidaceae	N	Blue
<i>Lobelia kalmii</i>	Kalm's Lobelia	Campanulaceae	N	Yellow
<i>Lonicera involucrata</i>	Black Twinberry	Caprifoliaceae	N	Yellow
<i>Lycopodium annotinum</i>	Stiff Clubmoss	Lycopodiaceae	N	Yellow
<i>Lycopodium dendroideum</i>	Ground-pine	Lycopodiaceae	N	Yellow
<i>Lysimachia thysiflora</i>	Tufted Loosestrife	Primulaceae	N	Yellow

<i>Maianthemum stellatum</i>	Star-flowered False Solomon's-seal	Liliaceae	N	Yellow
<i>Melampyrum lineare</i> var. <i>lineare</i>	Cow-wheat	Orobanchaceae	N	Yellow
<i>Mentha arvensis</i>	Field Mint	Lamiaceae	N	Yellow
<i>Menyanthes trifoliata</i>	Buckbean	Menyanthaceae	N	Yellow
<i>Menziesia ferruginea</i>	False-azalea	Ericaceae	N	Yellow
<i>Moerckia hibernica</i>	Irish Ruffwort (liverwort)	Pallaviciniaceae	N	Blue
<i>Moneses uniflora</i>	Single-delight	Ericaceae	N	Yellow
<i>Myriophyllum spicatum</i>	Eurasian water-milfoil	Haloragaceae	I	Exotic
<i>Najas flexilis</i>	Wavy Water Nymph	Najadaceae	N	Yellow
<i>Nuphar variegata</i>	Variegated Yellow Pond-lily	Nymphaeaceae	N	Yellow
<i>Nymphaea tetragona</i>	Pygmy Waterlily	Nymphaeaceae	N	Blue
<i>Packera paupercula</i>	Canadian Butterweed	Asteraceae	N	Yellow
<i>Panicum</i> sp.	Witchgrass	Poaceae	N	Yellow
<i>Parnassia palustris</i>	Northern Grass-of-Parnassus	Celastraceae	N	Yellow
<i>Paxistima myrsinites</i>	Falsebox	Celastraceae	N	Yellow
<i>Persicaria amphibia</i>	Water Smartweed	Polygonaceae	N	Yellow
<i>Petasites frigidus</i> var. <i>palmatus</i>	Palmate Coltsfoot	Asteraceae	N	Yellow
<i>Petasites frigidus</i> var. <i>sagittatus</i>	Arrow-leaved Coltsfoot	Asteraceae	N	Yellow
<i>Petasites frigidus</i> var. <i>x vitifolius</i>	Grape-leaved Coltsfoot	Asteraceae	N	Yellow
<i>Phalaris arundinacea</i>	Reed Canarygrass	Poaceae	I	Exotic
<i>Picea engelmannii</i>	Engelmann Spruce	Pinaceae	N	Yellow
<i>Pinus contorta</i> var. <i>latifolia</i>	Lodgepole Pine	Pinaceae	N	Yellow
<i>Pinus monticola</i>	Western White Pine	Pinaceae	N	Yellow
<i>Platanthera aquilonis</i>	Northern Green Bog-orchid	Orchidaceae	N	Yellow
<i>Platanthera dilatata</i>	Fragrant White Rein Orchid	Orchidaceae	N	Yellow
<i>Poa palustris</i>	Fowl Bluegrass	Poaceae	N	Yellow
<i>Poa pratensis</i>	Kentucky Bluegrass	Poaceae	I	n/a
<i>Populus tremuloides</i>	Trembling Aspen	Salicaceae	N	Yellow
<i>Potentilla anserina</i>	Common Silverweed	Rosaceae	N	Yellow
<i>Potentilla norvegica</i>	Norwegian Cinquefoil	Rosaceae	N	Yellow
<i>Prunella vulgaris</i> subsp. <i>vulgaris</i>	Self-heal	Lamiaceae	I	Exotic
<i>Pyrola asarifolia</i>	Pink Wintergreen	Ericaceae	N	Yellow
<i>Ranunculus acris</i>	Meadow Buttercup	Ranunculaceae	I	Exotic
<i>Rhododendron groenlandicum</i>	Labrador-tea	Ericaceae	N	Yellow
<i>Rosa acicularis</i>	Prickly Rose	Rosaceae	N	Yellow
<i>Rubus arcticus</i> subsp. <i>acaulis</i>	Arctic Raspberry	Rosaceae	N	Yellow
<i>Rubus idaeus</i> var. <i>strigosus</i>	Red Raspberry	Rosaceae	N	Yellow
<i>Rubus parviflorus</i>	Thimbleberry	Rosaceae	N	Yellow
<i>Rubus pubescens</i>	Trailing Raspberry	Rosaceae	N	Yellow
<i>Salix bebbiana</i>	Bebb's Willow	Salicaceae	N	Yellow
<i>Salix candida</i>	Sage Willow	Salicaceae	N	Yellow
<i>Salix commutata</i>	Undergreen Willow	Salicaceae	N	Yellow

<i>Salix discolor</i>	Pussy Willow	Salicaceae	N	Yellow
<i>Salix macalliana</i>	MacCalla's willow	Salicaceae	N	Yellow
<i>Salix pedicellaris</i>	Bog Willow	Salicaceae	N	Yellow
<i>Salix sitchensis</i>	Sitka Willow	Salicaceae	N	Yellow
<i>Sceptridium multifidum</i>	Leathery Grape Fern	Ophioglossaceae	N	Yellow
<i>Schoenoplectus subterminalis</i>	Water Clubrush	Cyperaceae	N	Yellow
<i>Schoenoplectus tabernaemontani</i>	Soft-stemmed Bulrush	Cyperaceae	N	Yellow
<i>Scutellaria galericulata</i>	Marsh Skullcap	Lamiaceae	N	Yellow
<i>Selaginella selaginoides</i>	Mountain-moss	Selaginellaceae	N	Yellow
<i>Shepherdia canadensis</i>	Soopolallie	Elaeagnaceae	N	Yellow
<i>Solidago lepida</i> var. <i>lepida</i>	Western Canada Goldenrod	Asteraceae	N	Yellow
<i>Sparganium angustifolium</i>	Narrow-leaved Bur-reed	Typhaceae	N	Yellow
<i>Sphagnum capillifolium</i>	Red Bog-moss	Sphagnaceae	N	Yellow
<i>Sphagnum</i> spp.	Sphagnum moss	Sphagnaceae	N	Yellow
<i>Spiraea betulifolia</i>	White Meadow-sweet	Rosaceae	N	Yellow
<i>Spiraea douglasia</i>	Hardhack	Rosaceae	N	Yellow
<i>Spiranthes romanzoffiana</i>	Hooded Ladies'-tresses	Orchidaceae	N	Yellow
<i>Stuckenia</i> sp.	Pondweed	Potamogetonaceae	N	Yellow
<i>Symphotrichum ciliolatum</i>	Lindley's Aster	Asteraceae	N	Yellow
<i>Tanacetum vulgare</i>	Common Tansy	Asteraceae	I	Exotic
<i>Thuja plicata</i>	Western Redcedar	Cupressaceae	N	Yellow
<i>Triantha glutinosa</i>	Sticky False-asphodel	Tofieldiaceae	N	Yellow
<i>Trichophorum alpinum</i>	Hudson Bay Clubrush	Cyperaceae	N	Yellow
<i>Trichophorum cespitosum</i>	Tufted Clubrush	Cyperaceae	N	Yellow
<i>Trientalis europaea</i>	Arctic Starflower	Primulaceae	N	Yellow
<i>Trifolium hybridum</i>	Alsike Clover	Fabaceae	N	Yellow
<i>Trifolium pratense</i>	Red Clover	Fabaceae	N	Yellow
<i>Triglochin maritima</i>	Sea Arrow-grass	Juncaginaceae	N	Yellow
<i>Tsuga heterophylla</i>	Western Hemlock	Pinaceae	N	Yellow
<i>Utricularia minor</i>	Lesser Bladderwort	Lentibulariaceae	N	Yellow
<i>Vaccinium caespitosum</i>	Dwarf Blueberry	Ericaceae	N	Yellow
<i>Verbascum thapsus</i>	Woolly Mullein	Scrophulariaceae	N	Yellow
<i>Viola macloskeyi</i>	Small White Violet	Violaceae	N	Yellow
<i>Viola nephrophylla</i>	Northern Bog Violet	Violaceae	N	Yellow

Table 6-2. Checklist of bird species recorded at Wiseman Lakes from 1997 to 2010. List generated with data from eBird.org.

Martins and Swallows	Grouse, Quail, and Allies	Cardinals, Grosbeaks, and Allies
Northern Rough-winged Swallow	Ruffed Grouse	Western Tanager
Tree Swallow	Spruce Grouse	Owls
Kinglets	Dusky Grouse	Northern Pygmy-Owl
Golden-crowned Kinglet	Hummingbirds	Woodpeckers
Ruby-crowned Kinglet	Rufous Hummingbird	Red-naped Sapsucker
Nuthatches	Shorebirds	American Three-toed Woodpecker
Red-breasted Nuthatch	Wilson's Snipe	Pileated Woodpecker
Treecreepers	Solitary Sandpiper	Northern Flicker
Brown Creeper	Loons	Falcons and Caracaras
Wrens	Common Loon	American Kestrel
Pacific Wren	Vultures, Hawks, and Allies	Merlin
Marsh Wren	Turkey Vulture	Tyrant Flycatchers: Pewees, Kingbirds, and Allies
Thrushes	Northern Harrier	Olive-sided Flycatcher
Varied Thrush	Sharp-shinned Hawk	Alder Flycatcher
Swainson's Thrush	Northern Goshawk	Willow Flycatcher
Hermit Thrush	Bald Eagle	Least Flycatcher
American Robin	Broad-winged Hawk	Hammond's Flycatcher
Waxwings	Fox Sparrow	Dusky Flycatcher
Cedar Waxwing	Dark-eyed Junco	Pacific-slope Flycatcher
Finches, Euphonias, and Allies	Savannah Sparrow	Vireos
Pine Grosbeak	Song Sparrow	Cassin's Vireo
Red Crossbill	Lincoln's Sparrow	Warbling Vireo
White-winged Crossbill	Wood-Warblers	Red-eyed Vireo
Pine Siskin	Northern Waterthrush	Jays, Magpies, Crows, and Ravens
New World Sparrows	Tennessee Warbler	Canada Jay
Chipping Sparrow	Orange-crowned Warbler	Steller's Jay
Waterfowl	MacGillivray's Warbler	Clark's Nutcracker
Canada Goose	Common Yellowthroat	American Crow
Wood Duck	American Redstart	Common Raven
Mallard	Magnolia Warbler	Tits, Chickadees, and Titmice
Green-winged Teal	Yellow Warbler	Black-capped Chickadee
Ring-necked Duck	Blackpoll Warbler	Mountain Chickadee
Long-tailed Duck	Yellow-rumped Warbler	Chestnut-backed Chickadee
Bufflehead	Townsend's Warbler	Boreal Chickadee
Common Goldeneye	Townsend's x Black-throated Green Warbler (hybrid)	
Barrow's Goldeneye	Wilson's Warbler	
Hooded Merganser		

