

Maclure Wetland Management Plan



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Fraser Valley Conservancy
Placing lands in trust for our future

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Introduction

Background to Acquisition

The Fraser Valley Conservancy (FVC) was established in 1998 as charitable organization to protect land and water for future generations. The FVC's mission is to conserve biodiversity in the Fraser Valley by:

- protecting and preserving land and watercourses that have recognized local and regional ecological value;
- promoting, facilitating, and engaging in land stewardship activities;
- protecting, preserving, and enhancing habitat for native species, including rare and endangered species; and
- protecting and preserving land of recognized local and regional historic value.

The Maclure Wetlands property is 15.139 acres of wetland that is zoned as general industrial. The property was donated to the Fraser Valley Conservancy as an Eco Gift on June 3, 2008 by Maclure Road Holdings Ltd. (owned by Mr. Kenneth D. Voth). The terms of the transfer agreement were fulfilled in 2008. Mr. Voth also provided a donation to the FVC's property endowment fund to support some of the annual maintenance and monitoring costs.

The FVC's vision for Maclure Wetlands is to restore and maintain the land in a natural state and manage it for wildlife use.

Description of Property

Maclure Wetlands is located off Maclure road in Abbotsford, BC. Official access to the property is along Horne Creek from the intersection of Maclure Road and the Canadian Pacific Railway. Alternative access to the property is across the parking lots of the Maclure Business Park (33425 Maclure Road).



Land uses adjacent to the property include commercial developments, railway right-of-ways, BC Hydro land, and private land. The property is visible from the municipal Discovery Trail located north of Maclure Wetlands. The property is connected to City of Abbotsford parkland, Blackberry Park, which creates a more valuable, larger tract of protected land. In addition, the adjacent BC Hydro lands have the potential to be managed for the benefit of wildlife species further increasing the amount of wildlife habitat available. Development pressures on land upstream and downstream of this property may increase the conservation significance of this wetland.

This property was acquired by the FVC because of the ecological value of the wetland resources and habitat. The hydrology of this area creates an important refuge for many wildlife species and provides significant ecological function to the surrounding area. The wetland ecosystem on this property provides valuable habitat for native species both on the property and downstream including migratory birds and indigenous fish species. Wetlands provide valuable functions including buffering floodwaters, retaining and cleaning runoff, and recharging groundwater. The Maclure Wetlands are connected, via Willband Creek, to Willband Creek Park which contains ponds and wetlands that are a component of the stormwater management system for this area. There is potential to manage these areas in a manner that will increase the overall benefit to fish and other wildlife.

In addition, this property provides rearing habitat for fish species including Coho salmon and Cutthroat trout despite of the presence of invasive species such as Green frog, Large-mouth bass and Pumpkinseed sunfish. This property also contains valuable breeding and foraging habitat for birds.

Background and Environmental Values

The Maclure property is located in the Coastal Western Hemlock very dry mild (CWHxm1) biogeoclimatic zone, which is characterized by warm dry summer and mild moist winters. The property is within the floodplain of Willband and Horne Creeks. Attempts to drain this property for use in agriculture are evidenced by old drainage ditches running throughout the property. Reed canary grass has established a monotypic cover over half of the parcel obscuring these drainages (Biebighauser *et al* 2015). Fill was trucked onto the site and infilled along the southern border from 1985 to the early 1990s from various local sources including a wood treating facility (Astley 2007). No archaeological sites are known to occur on the property.

Several studies have been completed on the Maclure Property including a baseline inventory (Barstead 2004) and supplementary bioinventory (Henderson and Ryder 2008), environmental assessment (Astley 2007), draft wetland restoration and management plan (Pearson 2009), and restoration feasibility study (Biebighauser *et al* 2015). These reports describe the history of the property, inventory the species present on the property, assess water and soil quality, and make recommendations for restoring the property to a more natural state. This management plan summarizes background information on the property, including its environmental values. For more information please refer to the individual reports from the reference list.

The dominant vegetation communities found on this property are willow swamp and Reed Canary grass marsh. There is a small area of forest in the northwest and southeast corners of the property consisting of black cottonwood – red alder / salmonberry and black cottonwood / Sitka willow ecological communities both of which are provincially listed as ecological communities of Special Concern (blue-listed). Approximately half of the property is composed of monotypic reed canary grass marshland that is not of conservation concern and is recommended for restoration. The Sitka Willow - Pacific willow / skunk cabbage swamp on the

western side of the property is provincially red-listed meaning that it threatened or endangered in BC and therefore of significant conservation concern (Barstead 2004).

A diverse range of wildlife species have been identified on this property including Townsend's vole, Vagrant shrew, Coast mole, coyote, muskrat, beaver, raccoon, garter snake, Pacific chorus frog, and Northwestern salamander. The existing wetland habitat on this property, disturbed by agricultural clearing and drainage, currently supports many wildlife species. Restoration of the wetland to a more diverse natural state will create better quality habitat and opportunities for additional wildlife species to use this area. Several introduced species have also been found on the property including Eastern cottontails, Eastern grey squirrels and Green frogs (Henderson and Ryder 2008).

Many bird species have been identified on this property including Cooper's hawk, Rufous hummingbird, Willow flycatcher, Cedar waxwing, and Yellow warblers. Nests of American robins, Song sparrows, Northern flickers, Tree swallows, and Green herons have all been identified on this property. The habitat existing on this property provides valuable nesting and foraging areas for these species adjacent to a mostly urban environment (Henderson and Ryder 2008).

The property currently supports the at-risk Northern Red-legged frog and has historically supported the at-risk Mountain beaver. Northern Red-legged frogs are designated as of Special Concern pursuant to the *Species at Risk Act (SARA)*. This amphibian species uses the property for foraging and migrating. No breeding activity has been identified to date. The Mountain beaver is also designated as of Special Concern pursuant to SARA, however, this species is presumed extirpated from this location. There is evidence of Mountain beaver tunnels on the west side of the property but they are of poor condition and no longer active. An old Green heron nest, provincially blue-listed, was identified in swamp habitat on the west side of the property (Henderson and Ryder 2008). There is suitable habitat for Pacific water shrew which is listed as endangered pursuant to the *Species at Risk Act (SARA)* in the willow swamp ecosystem on this property. No targeted surveys for this species have been completed in this area. Continued monitoring and protection of suitable habitat for these species-at-risk will be important as more habitat is lost or altered by development over time.

The Maclure Wetlands support many abiotic values important to the ecological integrity of the area. The property is predominantly flat with elevations between 9 and 14 meters above sea level. There are two defined watercourses on the property. Horne Creek runs west to east along the northern border of the property with several drainage ditch tributaries from the property connecting to the watercourse. Willband Creek runs south to north along the eastern border of the property. These watercourses create the wetland habitat existing on this property and support several fish species including coho and cutthroat trout (Pearson 2009). During high flow events this property floods providing important water retention that protects habitat and properties downstream. Beaver activity downstream of the property can also result in flooding as water is backed up behind beaver dams. The impacts of these natural events must be taken into consideration when planning restoration works in this area. This

property also allows for natural hydrological processes which improves the quality of water provided downstream.

Cultural values for this property include supporting natural ecological process and sensitive species-at-risk habitats as well as providing a view of green space to neighbouring properties and the adjacent Discovery trail. This property is also a valuable resource for education and research.

Management Issues

Adjacent Land-Uses and Activities

The Maclure Wetland is bordered to the south and west by highly disturbed land while the areas to the north and east have some remnant natural features. There are several threats to the natural and cultural resources of the property. There is potential for leaching of toxins from fill used to develop the property to the south. Water samples from the creek flowing from the culvert under the fill showed slightly elevated concentrations (24.5µg/L) of Arsenic in 2007 just below the provincial criteria for wildlife (25µg/L). Selenium and hydrocarbons both tested well below provincial criteria. In addition, there is the potential for toxic or polluted runoff from the development impacting the site. The fill also has the potential to contribute elevated levels of siltation to the wetland from erosion along the exposed bank (Astley 2007).

There is the potential that a major flood event could result in leeching or surface contamination of the property from the old landfill approximately 275 meters downstream. An above ground sewage pipe is located just north of the property. A leak or failure of this pipe could also result in contamination of this property.

The impacts on wildlife of high voltage transmission lines, such as those on adjacent BC Hydro land, are not currently well understood. Assessing negative consequences of developing high quality wildlife habitat under and near these power lines may be an important factor when considering restoration of this area as a whole.

Another management issue on this property is the careless disposal of garbage. Garbage along the western property border likely comes from the adjacent residential development of Kinsmen Estates. Garbage along the southern border originates from the adjacent commercial development. Garbage elsewhere on the property is likely carried downstream by Horne and Willband Creeks then deposited on the property. This will be a continuing problem for this property for the foreseeable future.

Access to the property is limited to a narrow strip of property off Maclure road near the railway crossing. This location is unsuitable as an access point for machinery due to the presence of Horn Creek and steep slopes. Working with the City of Abbotsford to obtain alternative access to this property is a key component required before moving forward with any restoration works.

Visitor Control

Public access is detrimental to the sensitive wetland habitat existing on this property. In addition, the current condition of the property poses a safety hazard to the public as deep

drainage ditches are obscured by Reed canary grass and are a hazard to people walking on the property. Currently there is no apparent public access to the property as the very wet conditions of the property are not attractive. There is a poorly defined trail along the fence on the west side of the property but it does not appear to be actively used. The adjacent property between the Maclure Wetlands and Canadian Pacific Railway (CPR) land has a small temporary residence consisting predominantly of tarps. Care should be taken to discourage squatting on this property if restoration works create more dry land.

Invasive Species

Invasive plants often out-compete native vegetation by creating dense thickets that may also cause adverse changes to the microclimate and microhabitat that support at-risk species. Species including Himalayan blackberry, Yellow archangel, Creeping buttercup, European mountain-ash, Virginia creeper, Policeman's helmet, Japanese knotweed, and European bittersweet have been identified on this property. In addition, non-native Grovesnails, Green frogs, Eastern cottontail, and Eastern grey squirrel have also been identified on the property (Henderson and Ryder 2008). These species compete with their native counterparts for resources and thus have a detrimental impact on native flora and fauna.

Invasive Reed canary grass dominates the marshland across this property. Though this species has not been identified as the native or non-native variety the extensive monoculture created is not consistent with natural ecosystems and results in low biodiversity. This species likely colonized the property when it was cleared for farming and has persisted since that time.

Water Levels

There is little potential for continued development in the immediate area surrounding Maclure Wetlands as the property is bordered by existing developments as well as CPR and BC Hydro, land both of which are unlikely to be developed further. Continued development or changes to development upstream of this property have the potential to negatively impact the quality and quantity of water reaching this property through changes to drainage patterns and natural water levels. Altering flood duration or extent will impact the composition of plants and animals utilizing this property. Taking care to preserve the existing hydrological processes will help ensure the continued existence of the at-risk plant communities present on this property.

The management of properties downstream of this wetland also have a large impact on this property. Beaver dams downstream have resulted in major flooding and high water levels on the Maclure property. Development and drainage of properties downstream may have negative impacts by reducing the capacity of this system to retain water. In addition, Horne and Willband creeks weave in and out of this parcel requiring cooperation with adjacent landowners for effective restoration works. Any restoration works on the Maclure wetlands must carefully consider how future changes to this system may destroy the restored areas.

Management Goal and Objectives

As the property is now owned by the Fraser Valley Conservancy, it should be protected from development and managed in a manner that is consistent with the FVC's mission to conserve

biodiversity. The transfer agreement also contains a clause that states if the FVC is unable to protect the property, a suitable alternative conservancy will be found to take the land as per the FVC's constitution. **The management goal is to conserve and protect the ecological integrity and natural values of Maclure Wetland.**

The FVC's management objectives for the of the Maclure Wetland property are as follows:

1. to increase and protect native biodiversity and natural ecological processes ;
2. to support the persistence of provincially rare, endangered and vulnerable elements;
3. to provide habitat of value to migratory birds and indigenous fish species; and
4. to increase community involvement in environmental stewardship without impairing the natural conditions of the property.

Strategies and Actions

In support of the management goal, to date the following actions have been taken by the FVC:

- fulfilled requirements of property transfer agreement including provision of tax receipts;
- created restoration plan and attempted to implement in 2012, however, were unsuccessful because the required excavator was unable to gain sufficient access to the site due to wet conditions;
- completed 2 days of RCG control and planted over 300 native species in 2008;
- planted over 600 trees and plants in Maclure Wetlands in 2012;
- between 2004 and 2010 obtained Baseline Inventory Report and supplementary bioinventory, environmental assessment report, and water quality monitoring; and
- participated in a feasibility study for the restoration of Maclure Wetlands in 2015.

Specific actions to be undertaken over the next five years address protecting and enhancing wildlife values, landscape planning, and environmental stewardship.

Protecting and Enhancing Wildlife Values

Management actions to be implemented include:

- monitoring the property to identify unauthorized access and, if deemed necessary, installing fencing or signage as required;
- removing garbage from the property;
- using mechanical control methods on the invasive blackberry occurring throughout the property, which will require 3-4 treatments per year until the infestation is under control;
- using mechanical control methods on other invasive plant species occurring on the property, predominantly along the western border, to prevent their spread;
- follow up invasive plant removal by planting native species to help shade out invasive plants over time and limit re-infestations;
- assess feasibility of wetland restoration options to increase the diversity of the wetland habitats based on resources and partnerships available;

- continue to develop partnerships that will help make the restoration of Maclure Wetlands possible and effective;
- establish permanent access to the site that will allow for movement of machinery for restoration works,
- if determined to be feasible, create more varied wetland features in the existing Reed canary grass marsh including establishing diverse shallow, open water wetlands with associated upland habitat using best restoration practices;
- collect water quality data including water level and standard water quality parameters of the Maclure Wetlands including Horne and Willband creeks.
- monitoring for species-at-risk and ecosystems-at-risk occurring on the property to ensure increasing or stable population size; and
- register a covenant on the land title to ensure the vision for the property is protected.

Landscape Planning

The Maclure Wetlands are connected to adjacent natural areas including City of Abbotsford parkland and BC Hydro right-of-ways. In addition, municipal land northeast of the property has the potential to significantly impact Maclure Wetlands. Beaver dams built downstream on Willband creek likely result in flooding far upstream, including on this property. Complementary management of Maclure Wetlands with these surrounding properties is required to ensure success of any restoration efforts and to maintain the ecological communities present on this property. Coordinating restoration efforts on adjacent lands will also increase the impact of these efforts and result in much greater biodiversity and ecological function overall thus increasing the benefits to native species.

Management actions to be implemented include:

- continuing to participate in workshops and seek inputs from all local partners on wetland restoration efforts; and
- collaborating with BC Hydro and the City of Abbotsford to create a restoration plan that is in the best interest of the wildlife species as well as all partners involved.

Environmental Stewardship

The FVC is committed to increasing local knowledge and understanding of environmental issues through community stewardship activities. Outreach activities will be consistent with the vision and management objectives of the Three Creeks property.

Management actions to be implemented include:

- working with neighbouring landowners to ensure non-native species and garbage do not spread onto the property and to suggest nature-friendly gardening practices through a landowner contact program.

Management Phases

Phase 1: Short Term (1-2 years)

- Remove garbage (and repeat as required);

- Complete invasive plant removal and restoration of edge habitat bordering existing development properties;
- Continue to assess feasibility of wetland restoration plan and develop partnerships required to make restoration possible and effective;
- Conduct water quality monitoring of Maclure Wetlands including monitoring water level;
- Consult with donor (Mr. Voth) to officially name the property;
- Complete annual review of Maclure Wetlands Management Plan.

Phase 2: Medium Term (3-5 years)

- Conduct mechanical control efforts on invasive blackberry found throughout the property;
- Begin restoration works to increase diversity of wetland habitats present on the property and reduce the extent of Reed canary grass;
- Look for opportunities to work with adjacent property owners to complete large scale restoration of wetland habitat in this area;
- Begin community stewardship activities with a focus on educating neighbouring landowners on the environmental values of the property and how they can help preserve those values; and
- Register covenant on the property.

Phase 3: Long Term (5-10 years)

- Continue to conduct yearly monitoring assessments to evaluate success of restoration efforts and the health and stability of at-risk species and ecosystems.

References:

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