McFadden Creek Nature Sanctuary
Property Management Plan
Salt Spring Island

Prepared for

ISLANDS TRUST FUND

Salt Spring Island CONSERVANCY

By

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i. Executive Summary

McFadden Creek Nature Sanctuary is a 5.08 hectares (12.57 acres) protected area on northwestern Salt Spring Island near the northern end of North Beach Road.

Efforts to secure McFadden Creek Nature Sanctuary began in 1996 as a collaborative effort between the Island Waterbird Watch Collective, WBT Wild Bird Trust and Islands Trust Fund. Wild Bird Trust assumed a mortgage on the property in 1998, which was paid off in 2004 and between 2004 and 2014, the Wild Bird Trust, the Waterbird Watch Collective and the Trust Fund Board negotiated to transfer the land from the Wild Bird Trust to the Trust Fund Board. The transfer was completed in 2014 and at that time a Section 219 Conservation Covenant and Section 218 Statutory Right of Way in favour of the Salt Spring Island Conservancy (SSIC) were registered on the land.

McFadden Creek Nature Sanctuary is one of the few protected areas on northern Salt Spring Island and acts as a refuge for the many native species that require maturing forested areas. To date, five Species at Risk have been found in the Sanctuary. Great Blue Herons used the site as a heronry from 1990-2000 and at their peak in 2000, there were 138 nests on the property. Other Species at Risk include Peacock Vinyl Lichen, Pacific Sideband Snail, Threaded Vertigo Snail and Coastal Cutthroat Trout.

The property is within the asserted traditional territory of 13 First Nations and 2 Treaty Groups. The area has also had a long history of European settlement dating back to 1875. The Sanctuary has not been developed although old growth Douglas-fir was selectively logged in 1953.

The Islands Trust Fund (ITF) manages nature reserves and protected areas to ensure that ecological communities and native species are protected in perpetuity. The management vision for McFadden Creek Nature Sanctuary is to protect the unique ecological values in perpetuity in order to support a diverse range of native plants and animals. The current threats to this vision include encroachment by non-native invasive plants, unauthorized tree cutting and over-grazing by Black-tailed Deer and Eastern Cottontail Rabbits. If Great Blue Herons return to the Sanctuary for nesting, they face specific threats associated with disturbance.

In order to achieve the management vision, the following actions are recommended as resources permit:

1. Conduct annual monitoring to monitor covenant compliance and identify management concerns.
2. Install a sign close to North End Road to inform the public that the area is closed to the public and to outline prohibited activities.
3. Provide information to local residents which describes the heron nesting window (January 15th-September 15th) and explains why foot traffic and other disturbances in or near the Sanctuary may prevent herons from nesting at the site.
4. Establish a volunteer warden to monitor the property and identify management concerns such as trespassing, tree cutting and other issues.
5. Develop an invasive species management work plan between the SSIC and the ITF to guide management and remove invasive non-native woody species as required.

6. Support ongoing research to inform management provided it does not negatively impact sensitive species.
7. Develop a landowner contact program with all landowners within a 1 km radius of the Sanctuary to provide information on conservation and protection of nearby properties and threats to Great Blue Herons as well as water quality protection to protect Coastal Cutthroat Trout.
8. Implement water quality monitoring in McFadden Creek to assess changes in water quality over time.
9. If Great Blue Herons return to the Sanctuary to breed, further steps are recommended to limit disturbance and monitor their reproductive success.

The action items will be addressed in priority sequence by Islands Trust Fund staff as resources permit. On the ground management will be supported by the covenant holder, Salt Spring Island Conservancy as resources permit.

ii. Tables, Lists and Maps

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Acknowledgements

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- Staff of the Islands Trust Fund for their persistence in ensuring protection and efficient management of the Sanctuary.
- Staff at the Salt Spring Island Conservancy for facilitating the conservation covenant work and aiding with the management of the Sanctuary.

1.0 Introduction

McFadden Creek Nature Sanctuary is a 5.08 hectare (12.57 acre) ecologically significant area that supports diverse forested communities and five known rare species. It is one of the few protected areas on northern Salt Spring Island and acts as a refuge for the many native species that require mature forested areas. In the past, it has been an important Great Blue Heron heronry and although the nesting area was abandoned in 2000, it is hoped the herons will return to nest in the future.

The Sanctuary is owned by the Trust Fund Board who will work with the covenant holder, the Salt Spring Island Conservancy (SSIC), to manage the property in order to protect the unique ecological values of the Sanctuary.

1.1. Islands Trust Fund (ITF) and the Trust Fund Board (TFB)

In 1974 the Province of British Columbia recognized the islands between Vancouver Island and the mainland as a special place within the province where the unique beauty, rural character and diverse ecosystems should be protected for future generations. Through the *Islands Trust Act*, the province established the Islands Trust, a local government, with the following mandate (known as the Object of the Islands Trust):

> "*To preserve and protect the trust area and its unique amenities and environment for the benefit of the residents of the trust area and of British Columbia generally, in cooperation with municipalities, regional districts, improvement districts, other persons and organizations and the government of British Columbia"* (Islands Trust 2015).

In 1990, through the enactment of a section of *Islands Trust Act*, the ITF was established as a conservation land trust to assist in carrying out the "preserve and protect" mandate. Part 6 of the *Islands Trust Act* establishes the corporate status, responsibilities, and governance structure of the TFB. The TFB is one of fifteen corporate entities[1] charged to uphold the Object of the Islands Trust. It is responsible for the actions of the ITF and since 1990 has protected over 1,184 hectares (2926 acres) of land as nature reserves, nature sanctuaries and conservation covenants.

The vision of the ITF is that the islands and waters of the Strait of Georgia and Howe Sound will be a vibrant tapestry of culture and ecology where humans live and work in harmony with the natural world. This special place will have a network of protected areas that preserve in perpetuity the native species and natural systems of the islands. Engaged residents and conservation partners will work together to protect large natural areas and key wildlife habitat. Viable ecosystems will flourish alongside healthy island communities.

The mission of the ITF is to protect special places by encouraging, undertaking and assisting in voluntary conservation initiatives within the Islands Trust Area. TFB Nature Reserves are managed to maintain, preserve and protect the natural features and values of ecosystems. This level of protection is similar to the International Union for Conservation of Nature (IUCN) protected area Category 1B: Wilderness area:

[1] The Corporate entities charged to uphold the Object of the Islands Trust include the Trust Council, twelve local trust committees, one island municipality and the TFB.

"large area of unmodified or slightly modified land and/or sea; retaining its natural character and influence, without permanent or significant habitation, which is protected and managed in order to preserve its natural condition" (Lockwood, 2006).

1.2 Purpose of Islands Trust Fund Management Plans

ITF management plans provide background information and set out the direction of property management as follows:

- Provide general and descriptive information on the property, including location, history, and land use;
- Set out the conservation goals and objectives for the property;
- Identify the property's ecological and/or cultural values and features;
- Describe the management issues associated with the property; and,
- Provide short, medium and long-term management recommendations (action items or tasks) on issues such as: Species at Risk protection; ecological restoration; public access; educational and research opportunities; invasive species management; and signage needs.

Once the management plan process is complete, the ITF will work to carry out the management actions or strategies identified in the plan, as resources allow. Following general practice and as outlined in the conservation covenant and statutory right of way, the ITF will revise the Management Plan every ten years.

1.3 Nature Sanctuary Purpose

The purpose of McFadden Creek Nature Sanctuary is to:

- Preserve and protect the natural values of forest, wetland and its watershed;
- Protect populations of five rare species and three rare plant communities at risk identified to date, including the 3 Species at Risk identified by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as well as any potential Species at Risk that may be discovered in future surveys;
- Allow natural succession of the Sanctuary's ecosystems to occur unimpeded, except in the case of wildfire; and,
- Protect the site in accordance with the objectives outlined in Section 1.4.

1.4 Nature Sanctuary Objectives

The Islands Trust Fund objectives for the management of McFadden Creek Nature Sanctuary are to:

- Preserve the natural features and functions of the land;
- Protect and, where necessary and feasible, restore the plant and animal communities and ecological processes at the site;
- Permit only uses that do not significantly impair the natural condition of the Sanctuary or its special features such as management of invasive species or monitoring to guide management actions;
- Develop an agreement between ITF and SSIC to ensure efficient and effective management of the site;
- Support ongoing inventory, mapping and monitoring to guide management provided it does not interfere with Species at Risk protection; and,

- Allow the natural ecological processes and functions to proceed unimpeded without human intervention, except in the case of wildfire or other exceptional situations where remediation is considered imperative.

2.0 Property Information

McFadden Creek Nature Sanctuary is 5.08 hectares (12.57 acres) of a mixed second growth forest. McFadden Creek flows through the northern portion of the property under North Beach Road and to the ocean.

2.1 Location

McFadden Creek Nature Sanctuary is located near the northern end of North Beach Road, on Salt Spring Island. To reach the property from Ganges, follow Lower Ganges Road north through the intersection at Upper Ganges Road/Vesuvius Bay Road where it becomes North End Road. Follow North End Road for approximately 7km and turn right on North Beach Road. After Castillou Way the road curves to the right. The McFadden Creek Nature Sanctuary is the second lot on the right past Castillou Way on North Beach Road, approximately 200 m from the curve in the road. The property can be seen easily from the corner of North Beach Road and Castillou Way by looking to the east across the neighbouring property (Map in Figure 1).

2.2 Legal Description

Parcel Identifier No. 001-162-357

Lot 6, Plan 31272, District Lot 16, Section 7, Salt Spring Island, Cowichan Land District

2.3 Local and Regional Context

McFadden Creek Nature Sanctuary is in an area of rural residential lots with lot sizes ranging from 1.1 to 4.4 hectares. The northeastern boundary of the properties abuts North Beach Road and the remaining boundaries are adjacent to private lands (map in Figure 1).

2.4 Adjacent Land Use and Connectivity

McFadden Creek Nature Sanctuary is one of the few protected areas on northern Salt Spring Island. It is not directly adjacent to any other protected areas and is surrounded by wooded residential lots and agricultural fields. The closest protected areas are Sun Eagle Linear Park and North View Nature Reserve which are 1.1 km to the northwest. The covenanted Saint Mary Lake watershed lands are 1.1 km to the southwest (map in Figure 1).

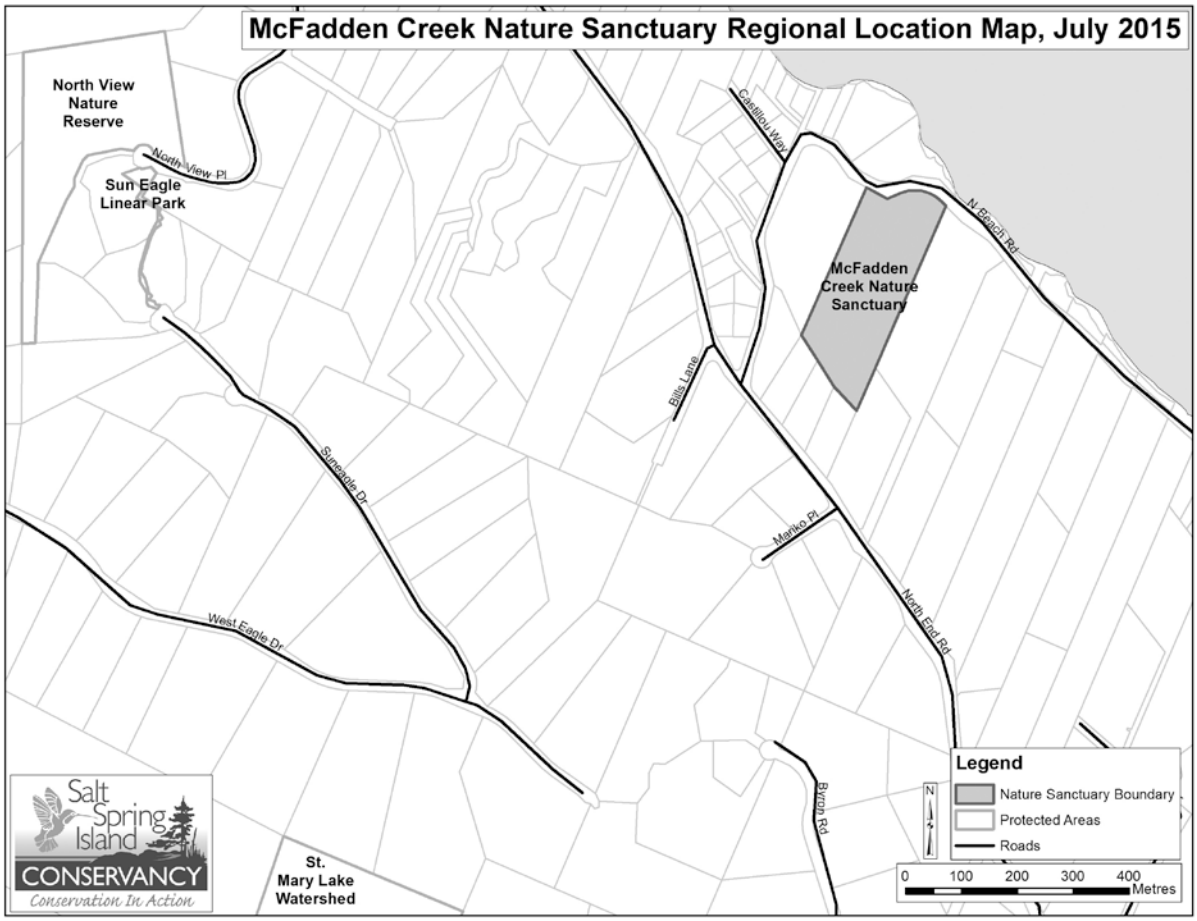

Figure 1. Location of McFadden Creek Nature Sanctuary in relation to other protected areas on northern Salt Spring Island

2.5 Site History

2.5.1 Pre-Contact

According to the BC Provincial Consultative Areas Database, McFadden Creek Nature Sanctuary is located within the asserted traditional territories of the following 13 First Nations and two treaty groups:

- Cowichan Tribes
- Halalt First Nation
- Lake Cowichan First Nation
- Lyackson First Nation
- Malahat First Nation
- Pauquachin First Nation
- Penelakut Tribe
- Semiahmoo First Nation
- Stz'uminus First Nation (Chemainus)
- Tsawwassen First Nation

- Tsartlip First Nation
- Tsawout First Nation
- Tseycum First Nation
- Te'Mexw Treaty Association
- Hul'qumi'num Treaty Group

It is likely that the site was used extensively by First Nations because of the proximity to beaches with abundant shellfish and the presence of a freshwater creek. Further consultation is needed to determine traditional First Nation use of the Sanctuary.

2.5.2 Previous Landowners

The property lines were first mapped in 1870 for administrative purposes. According to the 1875 Ashdown Green survey notes, the original settler on the land that is now McFadden Creek Nature Sanctuary was Jacob Crook Crane, a Hudson's Bay Company man (Rautenbach n.d., Rautenbach pers. comm. 2015).

McFadden Creek (map in Figure 2) is named after James (Jimmy) McFadden who worked for the Hudson's Bay Company before becoming one of the original settlers in the Fernwood area of northern Salt Spring (originally known as Beggsville). James McFadden applied for pre-emption #516 in 1863 and by 1877 records show he had "improved the land" by logging and fencing 20 acres, and by building a 20' x 16' cabin, a barn, and a "cow house" (Rautenbach pers. comm. 2015).

Prior to purchase by the Trust Fund Board and Wild Bird Trust, the property was owned by Doctor Davis from Victoria who intended to move to the land after his retirement (Johnson, 1997 in Islands Trust Fund *et. al.* 2005).

2.5.3 Forestry

The south and southwest portions of the land were selectively logged in 1953 for old growth Douglas-fir. No forestry has occurred on the property since that time.

2.5.4 Conservation Efforts from 1996-2015

Efforts to secure the McFadden Creek colony site began as a proposal by the Saltspring Island Waterbird Watch Collective in the summer of 1996. By the spring of 1997 a formal option to purchase the land was put in place between the landowner, the Trust Fund Board and the Wild Bird Trust. On January 1, 1998, Wild Bird Trust assumed the mortgage on the site. The mortgage on the land was discharged on August 18, 2004 after all the funds for the purchase were raised. Between 2004 and 2014, the Wild Bird Trust, the Waterbird Watch Collective and the Trust Fund Board negotiated to transfer the land from the Wild Bird Trust to the Trust Fund Board. A section 219 conservation covenant and section 218 statutory right of way were registered in favour of the Salt Spring Island Conservancy as a requirement of the 2014 transfer agreement.

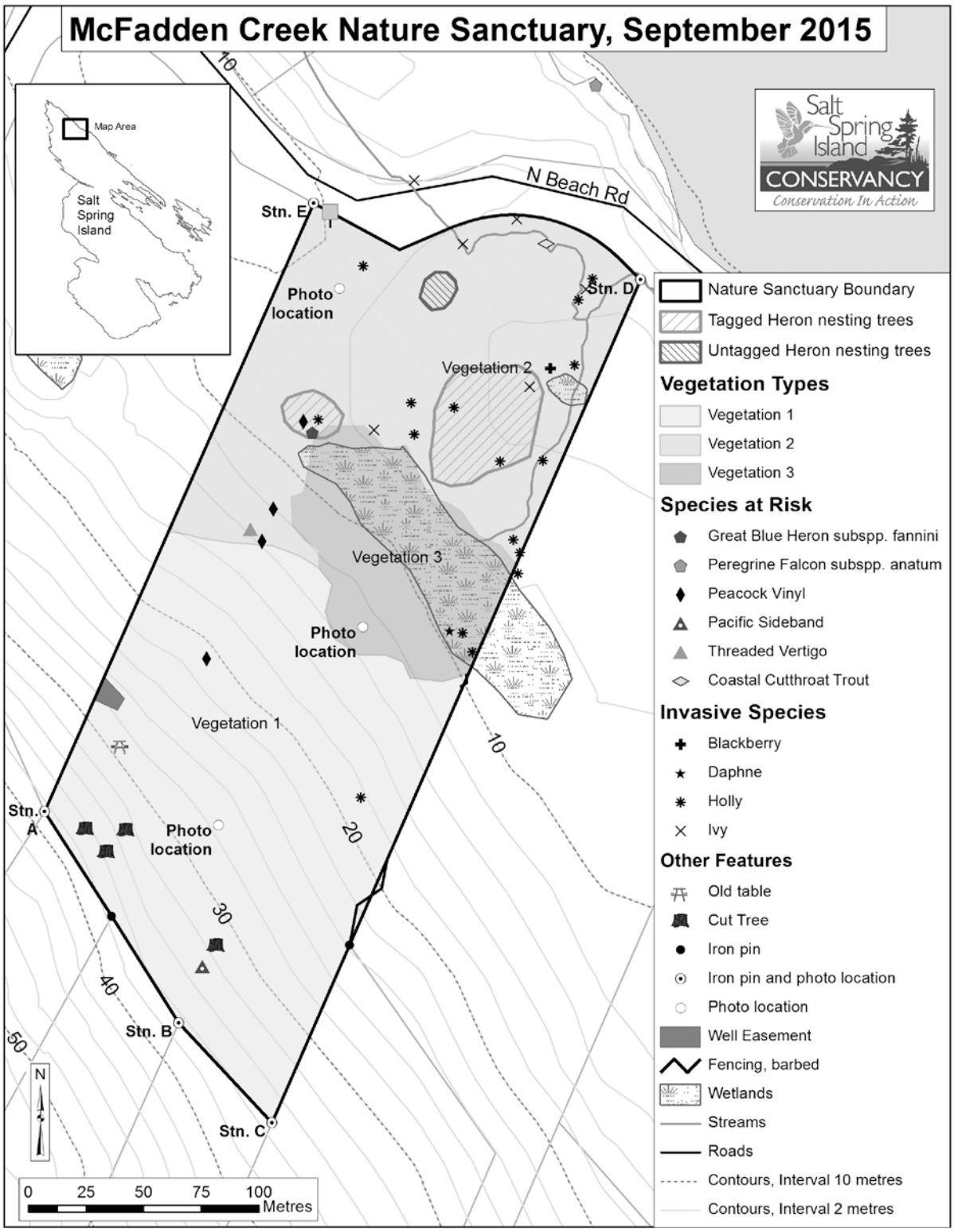

Figure 2. Map of Vegetation Types, Species at Risk, Photopoints and Other Features

2.6 Undersurface Rights

Undersurface rights for McFadden Creek Nature Sanctuary are currently held in favour of Her Majesty the Queen in Right of the Province of British Columbia.

2.7 Easements and Covenants

2.7.1 Restrictive Covenant

A restrictive covenant was filed on the property on December 7th, 1977 with the Capital Regional District that the property "*would not be used for the purpose of constructing, erecting, placing or maintaining thereon more than one (1) single family dwelling*" (Land Title Office 1977). The 1977 covenant is superseded by the conservation covenant and statutory right of way registered on the land in 2014, which prohibits all construction.

2.7.2 Easement for Well to Supply Lot 5

An easement registered September 26th, 1978 grants an "*Easement upon, through, under and across Lot 6 for the purpose of providing a well for drawing water and all necessary systems and appurtenances thereto for the benefit of Lot 5*" (map in Figure 2). Associated with this easement is the right and liberty to enter the property for the purpose of "*constructing, installing, operating and maintaining in, on and under the easement area a well for drawing water and all necessary installations, systems and appurtenances thereto*" (Land Title Office 1978).

According to the owner of Lot 5, this well has not been dug although he retains the right of way (MacDonald pers. comm. 2015).

2.7.3 Right of First Refusal

The Right of First Refusal was granted to WBT Wild Bird Trust of British Columbia on September 30th 2014 (Land Title Office 2014a). Should ITF wish or intend to transfer the land or cease to exist as a statutory corporation, the Wild Bird Trust will be given the right of first refusal to purchase the land.

2.7.4 Conservation Covenant and Statutory Right of Way

A Section 219 Conservation Covenant and Section 218 Statutory Right of Way were registered on the Title on September 30th, 2014 in favor of the Salt Spring Island Conservancy (Land Title Office 2014b). The general intent of the Agreement is:

> *"a) to protect, preserve, conserve, maintain, enhance, and if applicable from time to time restore, the natural state of the Land and the Amenities as described in the Report; and b) to prevent any occupation or use of the Land that will impair or interfere with the natural state of the Land or the Amenities as described in the Report"*

According to Section 4.2, the owner must not:

> *"a) use the Land or permit the use of the Land for an activity which:*
> *i. causes or allows silts, leachates, fills or other deleterious substances to be released into any watercourse on the Land;*
> *ii. causes or contributes to the erosion of the Land;*
> *iii. causes or facilitates the loss of soil on the Land;*

iv. alters or interferes with the hydrology of the Land, including by the diversion of natural drainage or flow of water in, on or through the Land in a manner which may impact the Land;
v. causes or allows fill, rubbish, ashes, garbage, waste or other material foreign to the Land to be deposited in or on the Land;
vi. causes or allows any component of the Land, including soil, gravel or rock, to be disturbed, explored for, moved, removed from or deposited in or on the Land;
vii. causes or allows pesticides, including but not limited to herbicides, insecticides or fungicides, to be applied to or introduced on the Land; or
viii. causes or allows any indigenous flora on the Land to be cut down, removed defoliated or in any way tampered with;

b) use the Land or allow the use of the Land for hunting, fishing, or gathering, or for the grazing of domestic animals;

c) construct, build, affix or place on the Land any buildings, structures, fixtures or improvements of any kind that are inconsistent with the protection of the Land or that are not contemplated in the Management Plan;

d) lay out or construct any new roads or paths on the Land that are not contemplated in the Management Plan;

e) lease or license the Land or any part thereof unless the lease or license is expressly made subject to the provisions of this Agreement and expressly entitles the Owner to terminate the lease and license if the tenant or licensee breaches any of the provisions of this Agreement; and

f) subdivide the Land by any means."

2.8 Official Community Plan

2.8.1 Zoning

In the Salt Spring Island Official Community Plan Bylaw No. 434, McFadden Creek Nature Sanctuary is zoned Parks and Reserves 6 (PR6).

2.8.2 Trail and Public Access

There are currently no official trails through McFadden Creek Nature Sanctuary; however, there are a few informal trails from adjacent properties south of the Sanctuary and off North Beach Road. No trails will be developed in the Sanctuary and public access is not permitted.

2.8.3 Building and Other Infrastructure

There are no buildings or other infrastructure in McFadden Creek Nature Sanctuary. There are small sections of a wire fence remaining along the eastern property line. An adjacent landowner has installed a new deer fence built from page wire and pressure treated wooden posts along the southern property line in the southwest portion of the reserve.

2.8.4 Utilities

There are no utilities in McFadden Creek Nature Sanctuary.

3.0 Ecological Inventory

3.1 Ecological Significance

McFadden Creek Nature Sanctuary is one of the few protected areas on northern Salt Spring Island and provides a refuge for plants and animals that require a maturing forest. The Sanctuary is home to five known Species at Risk and three rare plant communities. The Sanctuary was home to a large heronry from 1990-2000.

3.2 Climate

The rain shadow effect of the Olympic and Vancouver Island Mountains and the moderating forces of the ocean are the dominant influences on the climate of Salt Spring Island. The island has a pattern of warm dry summers and mild wet winters.

The weather data from the closest station on Salt Spring Island is from Saint Mary Lake. Climate normals from 1981 to 2010 at Saint Mary Lake record an average of 334 frost free days per year with an average annual precipitation of 987 mm. Almost 60% of the total annual precipitation falls during the winter months (November through February), with only 3% falling as snow (Government of Canada 2015a).

The months of December and January are the coldest, with daily average temperature of 4.1˚ and 4.3˚ Celsius, while July and August are the warmest months with mean temperatures of 18.1 to 18.4˚ Celsius (Government of Canada 2015a). The combined effects of low precipitation, warm temperatures, and high number of sunshine hours often result in an annual moisture deficit on Salt Spring Island from mid-June to early October (Figure 2).

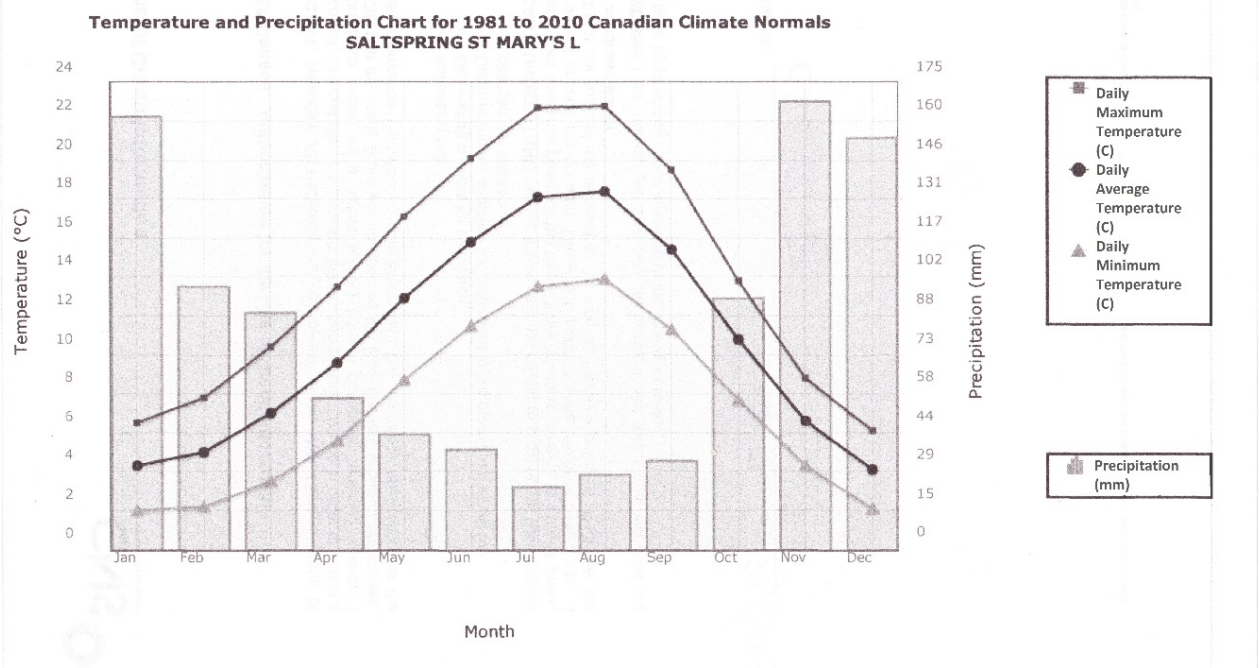

Figure 3. Temperature and Precipitation Normals (1981-2010) for Saint Mary Lake Weather Station

3.3 Geology and Physiology

Salt Spring Island lies within the Nanaimo Basin, a large depression at the southern end of the Georgia Strait. Salt Spring Island is underlain predominantly by sedimentary rocks from the Nanaimo Group that date from the Upper Cretaceous and are composed of marine and non-marine sediments deposited during five major periods (Van Vliet et al. 1987).

3.4 Hydrology

McFadden Creek Nature Sanctuary is located in the Trincomali Channel Groundwater Region (Hodge 1995). Some bedrock wells along North Beach Road have salt water contamination similar to the salt water springs that give Salt Spring Island its name (Hodge 1995).

McFadden Creek flows through the northeastern portion of the property from the southeast to the northeast and then flows west, draining into the ocean on the far side of North Beach Road (map in Figure 2). The Islands Trust classifies McFadden Creek as a stream that is subject to the Riparian Areas Regulation (Mainstream Biological Consulting 2014).

East of the creek, the land slopes gently from an old fence line where a ditch was dug to drain the adjacent farmland and watershed above into McFadden creek.

The southwestern third of the property is moderately well drained whereas the middle of the property is poorly drained with areas of standing water. Previous logging in the Sanctuary may have altered the hydrology from historic times.

In 2015, a neighbor reported unusual flow rates and an oily appearance to the water in McFadden Creek. An Islands Trust Bylaw Officer inspected the water but found the sheen was related to the presence of protein slime associated with natural bacterial decomposition and pollen rather than oil and did not observe any indicators of changes in water volume (Loo pers. comm. 2015). A few months later there was another complaint of possible sewage contamination of McFadden Creek and more sampling will be required (ibid). Water quality issues due to human impacts may be an ongoing issue.

3.5 Soils

According to the report, *Soils of the Gulf Islands of British Columbia: Volume 1* the following map units have been delineated within the covenant area: Haslam, Haslam-Brigantine and Cowichan (Van Vliet et al. 1987):

A narrow band of the **Haslam** map unit covers the southern end of the property. This map unit is gently to strongly sloped (4 to 17 degrees) and consists of 75-100% well-drained Haslam soils with inclusions of Mexicana soils. Haslam soils are described as ranging in texture from channery and shaly sandy loam to channery and shaly silt loam colluvial, residual, and glacial drift materials over sandstone, siltstone, or shale bedrock within 100cm. Coarse fragment content is between 20 and 50%.

The **Haslam-Brigantine** map unit is characterized by moderate to very strong slopes (5-24 degrees) and consists of 50 to 75% Haslam soil with 25 to 50% Brigantine soils. Brigantine soils are imperfectly drained soils with a 30 to 100cm capping of loamy sand to sandy loam texture

over more than 100cm of silty clay loam to silty clay marine deposits that are usually stone free.

The **Cowichan** map unit is found in depressional to very gently sloping landscape positions such as swales and basins where ancient sea levels were able to deposit large amounts of fine textured sediments. This map unit makes up a broad band of the property on the northern end. Cowichan soils are poorly drained soils that have developed on deep (>100cm) silty clay loam to silty clay marine deposits that are usually stone free.

3.6 Ecological Classification

Ecoprovince: Georgia Depression

Biogeoclimatic Units: The Sanctuary is within Coastal Douglas-fir (CDFmm) Biogeoclimatic Zone. Historically, there were about 260,000 hectares which would have been classified as CDFmm (Ministry of Natural Resource Operations 2011). Unfortunately, much of this habitat has been destroyed by urban development, agriculture or logging: less than 1% of old growth in the CDFmm remains (CDFCP 2013).

Natural Area Conservation Plan (Nature Conservancy of Canada): Salish Sea Natural Area Conservation Plan (Iachetti *et al.* 2010).

3.7 Ecological Plant Communities

An inventory of biological features was conducted in the Sanctuary from March- July 2015 by a number of consulting biologists. Three ecological communities were identified and classified by Carrina Maslovat using *A Field Guide for Site Identification and Interpretation for the Vancouver Forest Region* (Green and Klinka, 1994) (map in Figure 2). These ecological communities are described below.

Table 1. Plant Communities Identified in McFadden Creek Nature Sanctuary

Ecological Community	Provincial Rank
Grand Fir/Dull Oregon-grape (CDFmm04)	Red List
Grand Fir/Three-leaved Foamflower (CDFmm06)	Red List
Western Redcedar/Sword Fern- Skunk Cabbage (CDFmm11)	Blue List

A list of bird species observed can be found in Appendix A. A list of all plant species observed is included in Appendix B. Locations of photopoints are given in Appendix C.

3.6.1 Ecological Community 1

Vegetation Type 1: Grand Fir/Dull Oregon-grape (CDFmm04)
WD: coYF DG5 (CDF mm04) Woodland: conifer dominated, young forest Douglas-fir/Grand Fir/Oregon-grape, Structural Stage 5 (Young Forest)

Photo 1. Vegetation Type 1 (Photo: C. Maslovat)

Description: This ecosystem is classified as Douglas-fir/Grand Fir/Oregon-grape according to Green and Klinka (1994) and is also referred to as Grand-fir/Dull Oregon-grape by the Conservation Data Centre's Species and Ecosystems Explorer (2015). This ecosystem is red-listed and was provincially ranked S1 (critically imperiled) in 2005. Although this vegetation type is red-listed, the forest is young (40-80 years old/Structural Stage 5).

Vegetation Type 1 is found in the southern portion of the Sanctuary (map in Figure 2). Dominant tree species include Western Redcedar, Grand Fir and Douglas-fir with Bigleaf Maple and Red Alder in wetter areas. Slopes are moderate with a north aspect. Soils are rich and have a moderate moisture regime. This is a moderately open canopy, upper slope woodland with a diverse understory vegetation dominated by Salal and Swordfern. Oregon Beaked-Moss is the dominant bryophyte.

Table 2. Description of Ecological Community 1

FLORA **Main Canopy** Species & percent cover **Western Redcedar** (*Thuja plicata*) (30%) Age (estimated) Height DBH **Grand Fir** (*Abies grandis*) (15%) Age (estimated) Height DBH **Douglas-fir** (*Pseudotsuga menziesii*) (5%) Age (estimated) Height DBH **Bigleaf Maple** (*Acer macrophyllum*) (5%) Age (estimated) Height DBH **Red Alder** (*Alnus rubra*) (2%) Age (estimated) Height DBH	**Red-listed Plant Community** 50-70 years 15-20m 55-60cm 30-50 years 12-16m 30cm 40-60 years 15-20m 50-60cm 50-70 years 15-20m 50-60cm 20-40 years 12-15m 15-30cm
Secondary Canopy Species & percent cover **Western Redcedar** (3%) Age (estimated) Height DBH **Grand Fir** (3%) Age (estimated) Height DBH	 10-20 years 3-5m 5-15cm 10-15 years 3-4m 5cm
Total Canopy Cover	50-60%
Understory (species & percent cover) Shrubs, including trees <10 m Herbs, ferns, grasses, mosses, etc.	**Shrubs:** 20% Salal (*Gaultheria shallon*), 5% Oceanspray (*Holodiscus discolor*), 2% Dull Oregon-grape (*Mahonia nervosa*), <1% English Holly* (*Ilex aquifolium*), <1% Red Huckleberry (*Vaccinium parvifolium),* <1% Bitter Cherry

	(*Prunus emarginata*) **Forbs:** <1% Cleavers (*Galium aparine*), <1% Columbia Brome (*Bromus vulgaris*), <1% Northern Starflower (*Trientalis latifolia*), <1% Wall Lettuce* (*Mycelis muralis*) **Ferns:** 40% Swordfern (*Polystichum munitum*) **Mosses:** Oregon Beaked-moss (*Eurhynchium oreganum*)
Observed rare/threatened species & locally uncommon species	Peacock Vinyl Lichen (*Leptogium polycarpum*)
Potential Other Species at Risk	Leafless Wintergreen (*Pyrola aphylla*), Ozette Coralroot (*Corallorhiza maculata* var. *ozettensis*)
Special Features	Maturing forest with some larger trees and very diverse understory vegetation. Small pocket wetlands in depressed areas.
Expected Changes	Forest will mature overtime and may lead to less light in the understory decreasing diversity of shrub layer over time. Clearing on adjacent property may lead to windthrow at the edges.
Disturbance History	Douglas-fir stumps show evidence of historic logging.

*Indicates a non-native species

FAUNA Wildlife Habitat / Features	Diverse forest with maturing trees provides habitat for a range of wildlife species.
Observed Species	Black-tailed Deer (*Odocoileus hemionus*), American Robin (*Turdus migratorius*), Common Raven (*Corvus corax*)
Observed rare/threatened species	Pacific Sideband Snail (*Monadenia fidelis*)
Potential Other Species at Risk	Red-legged Frog (*Rana aurora*), Western Screech-owl (*Megascops kennicottii kennicottii*), Northern Pygmy-owl (*Glaucidium gnoma swarthi*)

3.6.2 Ecological Community 2

Vegetation Type 2: Grand Fir/Three-leaved Foamflower (CDFmm06)
WD: coYF FDBG5 (CDF mm06): Woodland: conifer dominated, young forest Grand Fir/Three-leaved Foamflower, Structural Stage 5 (Young Forest)

Photo 2. Vegetation Type 2 (Photo: C. Maslovat).

Description: This ecosystem is classified as Grand Fir/Three-leaved Foamflower according to Green and Klinka (1994) and by the Conservation Data Centre's Species and Ecosystems Explorer (2015). This ecosystem is red-listed and was provincially ranked S1 (critically imperiled)in 2013. Although this vegetation type is red-listed, the forest is young (40-80 years old/Structural Stage 5). Although this ecosystem is common throughout the Coastal Douglas-fir zone, it is not commonly found on Saltspring Island, where notably fewer units are present.

Vegetation Type 2 is found in the northern portion of the Sanctuary (map in Figure 2). Dominant tree species include Western Redcedar and Grand Fir with Bigleaf Maple and Red Alder in wetter areas. Slopes are flat to gently sloping with a north aspect. Soils are rich and have a moderately wet moisture regime. This is a moderately open canopy, lower slope woodland with a diverse understory vegetation dominated by Salal and Dull Oregon-grape with Swordfern as the dominant herbaceous species. Grand fir/Three-leaved Foamflower ecosystems are often found adjacent to streams.

Table 3. Description of Ecological Community 2

FLORA **Main Canopy** Species & percent cover **Western Redcedar** (*Thuja plicata*) (35%) Age (estimated) Height DBH **Grand-fir** (*Abies grandis*) (20%) Age (estimated) Height DBH **Red Alder** (*Alnus rubra*) (5%) Age (estimated) Height DBH **Bigleaf Maple** (*Acer macrophyllum*) (2%) Age (estimated) Height DBH	**Red-listed Plant Community** 40-60 years 15-25m 40-55cm 40-60 years 20-25m 30-50cm 20-40years 10m 20-40cm 60-80 years 20m 40-60cm
Secondary Canopy Species & percent cover **Western Redcedar** (5%) Age (estimated) Height DBH **Grand Fir** (1%) Age (estimated) Height DBH	 10-25 years 3-7m 35cm 10-15 years 3-4m 5cm
Total Canopy Cover	50-60%
Understory (species & percent cover) Shrubs, including trees <10 m Herbs, ferns, grasses, mosses, etc.	**Shrubs:** 40% Dull Oregon-grape (*Mahonia nervosa*), 5% Salal (*Gaultheria shallon*), <1% Oceanspray (*Holodiscus discolor*), <1% California Blackberry (*Rubus ursinus*), <1% Cascara (*Rhamnus purshiana*), <1% Red huckleberry (*Vaccinium parvifolium*), <1% English Holly* (*Ilex aquifolium*), <1% Thimbleberry (*Rubus parviflorus*), <1% Indian Plum (*Oemleria cerasiformis*) Trembling Aspen (*Populus tremuloides*) is present in large numbers outside of the plot location.

	Forbs: <1% Starflower (*Trientalis latifolia*), <1% Cleavers (*Galium aparine*), <1% Pathfinder (*Adenocaulon bicolor*), <1% Wall lettuce* (*Mycelis muralis*) **Ferns:** 15% Swordfern (*Polystichum munitum*), <1% Bracken Fern (*Pteridium aquilinum*) **Mosses:** 5% Oregon Beaked-moss (*Eurhynchium oreganum*)
Observed rare/threatened species & locally uncommon species	Peacock Vinyl Lichen (*Leptogium polycarpum*)
Potential Other Species at Risk	None likely
Special Features	Maturing forest with very diverse understory vegetation grading into wetland areas in Vegetation Type 3
Expected Changes	Forest will mature overtime and may lead to less light in the understory decreasing diversity of shrub layer over time. Clearing on adjacent property may lead to windthrow at the edges.
Disturbance History	Douglas-fir stumps show evidence of historic logging.

*Indicates a non-native species

FAUNA Wildlife Habitat / Features	
Observed Species	Black-tailed Deer (*Odocoileus hemionus*), Northwestern Crow (*Corus caurinus*), American Robin (*Turdus migratorius*), Common Raven (*Corvus corax*), Chestnut-backed Chickadee (*Poecile rufescens*), Bald Eagle (*Haliaeetus leucocephalus*), Red-breasted Nuthatch (*Sitta canadensis*), Swainson's Thrush (*Catharus ustulatus*), Pacific Slope Flycatcher (*Empidonax difficilis*), Spotted Towhee (*Pipilo maculatus*), Brown Creeper (*Certhia americana*), Pacific Wren (*Troglodytes pacificus*), River Otter (*Lontra canadensis*)
Observed rare/threatened species	Threaded Vertigo Snail (*Nearctula* sp. 1) Coastal Cutthroat Trout (*Oncorhynchus clarkii clarkii*) Great Blue Heron (*Ardea herodias fannini*)
Potential Other Species at Risk	Pacific Sideband (*Monadenia fidelis*), Red-legged Frog (*Rana aurora*), Western Screech-owl (*Megascops kennicottii kennicottii*), Northern Pygmy-owl (*Glaucidium gnoma swarthi*)

3.6.3 Ecological Community 3

Vegetation Type 3: Western Redcedar/Sword Fern- Skunk Cabbage (CDFmm11)
WD: coYF Cw5 (CDF mm11): Woodland: conifer dominated, young forest Western Redcedar/Sword Fern – Skunk Cabbage, Structural Stage 5 (Young Forest)

Photo 3. Vegetation Type 3 (Photo: C. Maslovat).

Description: This ecosystem is classified as Western Redcedar/Skunk Cabbage according to Green and Klinka (1994) and is also called Western Redcedar/Sword Fern – Skunk Cabbage by the Conservation Data Centre's Species and Ecosystems Explorer (2015). This ecosystem is blue-listed and was provincially ranked S3? in 2012. Although this vegetation type is blue-listed, the forest is young (40-80 years old/Structural Stage 5).

Vegetation Type 3 occurs in the central portion of McFadden Creek Nature Sanctuary (map in Figure 2). It is characterized by a slight depression in topography and the soils are saturated with moisture in the winter and drying in the summer. Part of this vegetation type has been mapped as a wetland with the surrounding shrubs influenced by the wetter soils. There is a rich diversity of species including a broad selection of shrubs and forbs.

Table 4. Description of Ecological Community 3

FLORA **Main Canopy** Species & percent cover	**Blue-listed Plant Community**
Douglas-fir (*Pseudotsuga menziesii*) (10%)	
Age (estimated)	50 years
Height	15-20m
DBH	45-50cm
Bigleaf Maple (*Acer macrophyllum*) (10%)	
Age (estimated)	30-60 years
Height	12-15m
DBH	30-55cm
Western Redcedar (*Thuja plicata*) (5%)	
Age (estimated)	20-50 years
Height	8-10m
DBH	15-35cm
Grand Fir (*Abies grandis*) (5%)	
Age (estimated)	35 years
Height	12m
DBH	30cm
Red Alder (*Alnus rubra*) (3%)	
Age (estimated)	30 years
Height	12m
DBH	35cm
Total Canopy Cover	30-50%
Understory (species & percent cover) Shrubs, including trees <10 m Herbs, ferns, grasses, mosses, etc.	**Trees:** **Shrubs:** 15% Salal (*Gaultheria shallon*), 5% Salmonberry (*Rubus spectabilis*), 5% Indian Plum (*Oemleria cerasiformis*), 5% Oceanspray (*Holodiscus discolor*), 5% Red Huckleberry (*Vaccinium parvifolium*), 3% California Blackberry (*Rubus ursinus*), 3% Red Osier Dogwood (*Cornus stolonifera*), 1% Pacific Ninebark (*Physocarpus captitatus*), 1% Scouler's Willow (*Salix scouleriana*), <1% Coastal Black Gooseberry (*Ribes divaricatum*), <1% Baldhip Rose (*Rosa gymnocarpa*), <1% English Holly* (*Ilex aquifolium*), <1% Bitter Cherry (*Prunus emarginata*), <1% Pacific Crab Apple (*Malus fusca*), <1% Cascara (*Rhamnus purshiana*), <1% Snowberry (*Symphoricarpus albus*), <1% Western Trumpet (*Lonicera ciliosa*), <1% Nootka Rose (*Rosa nutkana*) **Forbs:**

	<1% Skunk Cabbage (*Lysichiton americanus*), <1% Creeping Buttercup* (*Ranunculus repens*), <1% Enchanter's Nightshade (*Circaea alpina*), <1% Vanilla Leaf (*Achlys triphylla*), <1% Water Parsley (*Oenanthe sarmentosa*), <1% Hedge-nettle (*Stachys chamissonis*), <1% Pathfinder (*Adenocaulon bicolor*), <1% Horsetail (*Equisetum arvense*), <1% American Brooklime (*Veronica americana*), <1% Three-leaved Foamflower (*Tiarella trifoliata*), <1% Starflower (*Trientalis latifolia*), <1% Sweet Vernalgrass* (*Anthoxanthum odoratum*), <1% Slough Sedge (*Carex obnupta*), <1% Columbia Brome (*Bromus vulgaris*) **Ferns:** 20% Swordfern (*Polystichum munitum*), <1% Lady Fern (*Athyrium felix-femina*) **Mosses:** 25 % Step Moss (*Hylocomium spendens*), <1% Oregon Beaked-moss (*Eurhynchium oreganum*)
Observed rare/threatened species & locally uncommon species	None observed
Potential Other Species at Risk	None likely
Special Features	Seasonal wetland that provides good habitat for a diverse vegetation understory and for a range of fauna
Expected Changes	If changes to drainage occur on adjacent properties, the species composition may change. Sediment deposit may lead to gradual filling in of wetland.
Disturbance History	Ditching noted which has altered hydrology patterns

*Indicates a non-native species

FAUNA Wildlife Habitat / Features	
Observed Species	Black-tailed Deer (*Odocoileus hemionus*), holes from Pileated Woodpecker (*Dryocopus pileatus*)
Observed rare/threatened species	None observed
Potential Other Species at Risk	Red-legged Frog (*Rana aurora*)

3.7 Wildlife Species

Many different wildlife species use McFadden Creek Nature Sanctuary. Black-tailed Deer (*Odocoileus hemionus*) and River Otter (*Lontra canadensis*) scat were observed during the preparation of the baseline report. Neighbours reported that Raccoon (*Procyon lotor*) are present (Aptekmann pers. comm. 2015). Fisheries Information Summary System (FISS) records indicate that Threespine Stickleback (*Gasterosteus aculeatus*) and Coastal Cutthroat Trout (*Oncorhynchus clarkii clarkii*) are present in McFadden Creek (Province of British Columbia 2015).

The dense and diverse scrub layer around the wetland is excellent habitat for nesting birds including Common Yellowthroat, Wilson's Warbler, Orange-crowned Warbler, Song Sparrow, Swainson's Thrush, and Rufous Hummingbird (Ferguson 2015). Avian surveys in 2015 identified a total of 27 avian species and breeding was confirmed for American Robin, Chestnut-backed Chickadee, Song Sparrow, Black-throated Gray Warbler and Northwestern Crow. There was evidence of small owl activity in the form of whitewash, a size more likely associated with Northern Saw-whet, Northern Pygmy or Western Screech-Owl (Ferguson 2015). Birds of prey may use this property for nesting and hunting (Johnson 1997). There was a significant Great Blue Heron colony in the Sanctuary from 1990-2000.

3.8 Red and Blue Listed Species

Table 5. Species at Risk Identified to Date in McFadden Creek Nature Sanctuary

Species Common Name	Species Latin Name	Provincial Rank[2]	COSEWIC Rank[3]	SARA Status
Great Blue Heron	*Ardea herodias fannini*	Blue List (S2S3b, S4N)	Special Concern	Schedule 1 - Special Concern
Coastal Cuttroat Trout	*Oncorhynchus clarkii clarkii*	Blue List (S3S4)	Not Ranked	
Peacock Vinyl Lichen	*Leptogium polycarpum*	Red List (S1S2)	Special Concern	
Threaded Vertigo Snail	*Nearctula* sp. 1	Red List (S2)	Special Concern	Schedule 1 – Special Concern
Pacific Sideband	*Monadenia fidelis*	Blue List (S3S4)	Not Ranked	

Heron Colony

As reported by local resident May McKinley, a Great Blue Heron (*Ardea herodias fannini*) colony was established as a single nest in 1990 and grew each year until 2000, when it was abandoned (Moul, 1998; Raginsky, 2002). The former heron colony was roughly centered on the property and covered an area of approximately three acres (map in Figure 2 shows location of former heron colony).

[2] BC Conservation Data Centre (BC CDC 2015)
[3] Committee on the Status of Endangered Wildlife in Canada (Government of Canada 2015b)

The first comprehensive nest count was conducted by Ian Moul in February 1997, when 39 trees containing 118 nests were inventoried. A second count in February 1998 identified 41 nest trees and a total of 122 nests. The nest count was 131 in 1999 and 138 nests were counted in 2000 (Raginsky, 2002). Shortly after 2000, the heronry was abandoned and there have been no confirmed nesting herons on the property since that time (Sprague *et al*., 2001). A heron feather was found during 2015 surveys suggesting the birds are still connected to the site (Ferguson 2015).

Photo 4. Active McFadden Creek heronry in 1999 (Photo: Islands Trust Fund files).

Photo 5. Abandoned heron nests in McFadden Creek Nature Sanctuary in 2015 (Photo: C. Maslovat).

Most of the herons moved to the property following the abandonment of the Shoal Island heron colony near Crofton in 1995. The abandonment of the Shoal Island colony was most likely in response to a log salvage operation immediately next to the nest trees and it is believed that

approximately 55 breeding pairs moved to the McFadden Creek site (Moul, 1998). The increase in colony size after 1995 may have been from herons moving from the Holden Lake site near Nanaimo, a site that has seen increasing depredation by Bald Eagles and diminished steadily in size from 100 active nests in 1990 down to 16 in 1997 (*ibid*.). Two other colony sites in the immediate area, Southey Point, last reported active with 21 nests in 1989, and Madrona Creek, last reported active with 15 nests in 1994, may also have contributed to the colonization and growth of the McFadden Creek colony (Moul, 1998).

From a sample of 21 nests in the Sanctuary taken in 1997, 19 were successful and produced 51 chicks. This average of 2.4 chicks per active nest is well above the averages of other colonies, with the average for Vancouver Island at 1.2 chicks per active nest, and that of the Lower Fraser Valley 0.6 chicks per active nest (Moul, 1998).

While 60 of the 122 nests inventoried in 1998 were located in a fairly compact stand of Trembling Aspen, a second cluster of 23 nests was located in two large Black Cottonwood approximately 50 m to the east (Moul, 1998). The remaining nests were found in Red Alder, Douglas-fir and Bigleaf Maple (ibid). The trees with nesting sites were numbered as part of a Ministry of Environment survey.

Photo 6. Metal plaque indicating numbered tree associated with Ministry of Environment Great Blue Heron inventory (Photo: C. Maslovat).

Although there are currently no active nests, herons do continue to use the property and remain connected to the site (Jaeger pers. comm. 2015; Ferguson 2015). There are numerous potential feeding areas for herons close to the Sanctuary including a major eelgrass bed north of the Sanctuary at the outlet of McFadden Creek which is used extensively by herons at low tide. Although it is likely that heron colonies will come and go over the years, protection of this property ensures the valuable habitat these birds depend on will remain available.

Legal Protection of Herons

The property has been identified as an Important Bird Area by an international conservation initiative coordinated by BirdLife International. In Canada, the partners are the Canadian Nature Federation and Bird Studies Canada. In British Columbia, the provincial partners are WBT Wild Bird Trust of BC and the Federation of BC Naturalists. The McFadden Creek Nature Sanctuary was the first Important Bird Area identified in British Columbia (Islands Trust Fund *et al.* 2005).

The nests and nest trees are protected year-round whether or not the nest is currently active by Section 34 of the BC Wildlife Act. "Molestation of wildlife" is an offense under the act and any activity that causes the birds to abandon active nests including walking near a nest may be considered "molestation" (Province of British Columbia 2014).

Herons and their nests are also protected under the Federal Migratory Birds Convention Act (Province of British Columbia 2014).

4.0 Threats

4.1 Invasive Species

Invasive non-native woody plant species are a threat to the diversity and reproductive success of native vegetation in McFadden Creek Nature Sanctuary. Along North Beach Road, there are dense patches of English Ivy (*Hedera helix*). English Ivy can smother understory vegetation and can kill trees by reducing their photosynthetic capacity. There are moderate numbers of English Holly (*Ilex aquifolium*) throughout the Sanctuary and patches of Himalayan Blackberry (*Rubus armeniacus*) primarily in the northeast portion of the property. The spread of Himalayan Blackberry and English Holly will be somewhat limited by the shaded conditions in the Sanctuary but if left unchecked they will continue to be spread by birds. There are also low numbers of Evergreen Daphne (*Daphne laureola*).

Ivy, Holly and Blackberry are difficult to eradicate because they will all re-sprout from cut stems. Cut portions of Ivy and Blackberry can sprout roots if left on the ground. Evergreen Daphne is in the early stages of invasion and will be most easily controlled if removed before it becomes more widespread.

Photo 7. English Ivy forming a dense carpet in the understory next to North Beach Road (Photo: C. Maslovat)

4.2 Tree Cutting

In 2014, several large established trees were cut by at least one and possibly two neighbours to the south. No further tree cutting will be allowed in the Sanctuary.

Photo 8. Recently cut Douglas-fir tree in southern portion of the Sanctuary (Photo: C. Maslovat).

4.3 Over-grazing by Black-tailed Deer and Eastern Cottontail Rabbits

Currently, levels of native Black-tailed Deer (*Odocoileus hemionus columbianus)* are extremely high in the Gulf Islands because of declines in hunting, the eradication of predators and the fragmentation of habitat (Gonzales and Arcese 2008; MacDougall 2008; Arcese and Martin

2011). Loss of undergrowth from overgrazing can result in loss of songbird nesting and foraging habitat (Arcese and Martin 2011). Over-grazing also shifts the composition of native species, favouring less palatable plants and limiting regeneration. Some of the neighbours feed the deer (Jaeger pers. comm. 2015), which could be increasing deer abundance in the Nature Reserve.

Non-native Eastern Cottontail Rabbits (*Sylvilagus floridanus*) are spreading rapidly on Salt Spring Island and neighbours have noted seeing them in McFadden Creek Nature Sanctuary (Jaeger pers. comm. 2015). In addition to grazing pressure from rabbits, the burrows of feral rabbits create soil disturbance which may increase erosion and promote invasion by exotic plant species (Banman pers. comm. 2011; U.S. National Park Service 2011).

4.4 Threats to Nesting Herons

The breeding period of the Great Blue Heron lasts from January 15th-September 15th (Province of British Columbia 2014). Although nesting doesn't start until March, courtship and pair formation begins as early as January (Ferguson pers. comm. 2015).

During the breeding period, herons are extremely vulnerable to disturbance. Tree clearing next to colonies, low flying aircraft and people walking below the nest sites have been associated with breeding failure (Islands Trust Fund *et al.* 2005). The Develop with Care guidelines recommend blasting or similarly excessive noises should not occur closer than 1000 m from a colony during the nesting window (Province of British Columbia 2014).

Disturbance and nest predation by Bald Eagles may have contributed to the abandonment of the colony at McFadden Creek Nature Sanctuary (Islands Trust Fund *et. al.* 2005). Land clearing of 10 acres southwest of the sanctuary may have contributed to the predation since recent studies indicate that forested areas act as protective buffers (Islands Trust Fund et. al. 2005). Increased foot traffic may also increase Bald Eagle predation (Eissinger pers. comm. 1999 in Islands Trust Fund *et. al.* 2005). A neighbour suggested that natural die off of trees may have contributed to the abandonment of the nests by creating a more open habitat (MacDonald pers. comm. 2015). Herons are very vulnerable to a wide range of disturbance, including foot traffic, during their breeding period. Minimizing all use of the Sanctuary to prevent potential disturbance is essential for encouraging herons to nest at this site again.

Land use on adjacent properties may also have a negative impact on nesting herons. The Province of BC recommends there be no development within a 200-300 m of the heron colony and no blasting or loud noise is recommended within 1000m between January 15th and September 15th to protect herons during breeding season (Province of BC 2014).

5.0 Stakeholder Consultation

5.1 Adjacent Landowners

The Islands Trust Fund undertook a public consultation process as part of the development of this management plan. Seven of the eight adjacent landowners were phoned and informed that a management plan was in development for the Sanctuary. They were asked for their input related to broad-scale management issues for the property (list of neighbours contacted is included in Appendix D).

A follow up letter was also sent to 62 neighbours including the above adjacent landowners. The letter informed them of the management plan process and included an invitation to the open house scheduled for August 14th, 2015 to discuss the plan.

5.2 First Nations Communications

A letter was sent to all of the 13 First Nations and two treaty groups who have asserted traditional territories that includes McFadden Creek Nature Sanctuary (letter included in Appendix F). The letter informed First Nations that a management plan was being prepared and they were asked for input related to broad-scale management concerns. At the date of the plan approval there has been no response from any of the First Nations, but the Islands Trust Fund remains open to communication throughout the life of this management plan.

5.3 Community Members

A community open house and celebration was held from 2-4 pm on August 14th, 2015 at Blackburn Lake Nature Reserve facility. The open house was advertised in the local Driftwood newspaper and was posted on the Salt Spring Exchange List serve. The meeting was attended by three staff from Islands Trust Fund, three staff from the Salt Spring Island Conservancy, the consultant who prepared the management plan and 11 community members.

5.4 Cultural Significance

Further research is required to determine the First Nations cultural significance of the property.

There is a long settlement history dating back to the 1870s and McFadden Creek is named after one of the first settlers in the region. There are no known European cultural artifacts in the Sanctuary.

6.0 Management Plan

6.1 Vision

That the unique ecological values of McFadden Creek Nature Sanctuary will be protected in perpetuity in order to support a diverse range of native plants and animals.

6.2 Discussion

The purpose of McFadden Creek Nature Sanctuary is to protect the ecological integrity of the land in accordance with the objectives of the ITF. Ongoing monitoring and management is required in order to ensure that ecosystems and species continue to remain protected from threats. All management activities within the protected area must consider the specific sensitivities of the Species at Risk and their habitat found to date on the property and any additional Species at Risk found in the future.

Although the original purpose of securing the land was to protect a large nesting colony of Great Blue Heron, the site is not currently being used as a nesting site. However, long-term protection of the site will ensure that suitable habitat for nesting herons is available should they decide to return.

In this section several key areas of the management planning process are identified and recommendations are formulated to achieve the vision, purpose and objectives for McFadden Creek Nature Sanctuary.

6.3 Management of the Sanctuary

The Trust Fund Board is the sole owner of the Sanctuary but will rely on its partnership with the Salt Spring Island Conservancy to assist with on the ground management.

6.4 Permitted and Prohibited Uses

There will be no public access to the Sanctuary. Only activities associated with the management and monitoring of the property will be permitted.

The following activities by the public are prohibited:

- Use of motorized vehicles
- Bicycling
- Hiking
- Horseback riding
- Camping
- Fires
- Forestry
- Livestock grazing
- Trail development
- Tree cutting
- Collection of plants or animals

6.5 Public Access

There are currently informal trails that lead from adjacent properties to the south and from North Beach Road into the Sanctuary. These trails are narrow and informal, often becoming difficult to follow. Some of the trails have been flagged with green flagging tape which is now disintegrating.

No public access will be permitted to the reserve. Formal trails through the Sanctuary will not be developed and trail head signs will not be installed. The property will not be promoted or advertised in any way.

A member of the public who attended the open house recommended the installation of fencing along North Beach Road. If public access is deemed to threaten the ecological values of the Sanctuary, the ITF should consider the costs and benefits of installing fencing to limit access.

6.6 Signage

There is currently a single old wooden sign along the informal trail from North Beach Road close to the property line. There are also small metal markers attached to trees which formerly had heron nests which were installed during Ministry of Environment monitoring of the nests.

Photo 9. Sign on the informal trail from North Beach Road into McFadden Creek Nature Sanctuary (Photo: C. Maslovat)

A sign should be installed along the informal trail from North Beach Road in order to identify the site as a protected area, outline prohibited activities (including no public access) and highlight the heron's sensitivity to disturbance. Installing the sign well off the road allowance will avoid inadvertently promoting access to the Sanctuary. Clearly stating prohibited activities may be necessary if future enforcement is required. As stipulated in the conservation covenant and statutory right of way, each sign should be no larger than 1m x 1m in size.

Recommendation
That ITF install a sign at the property boundary that identifies the property as a protected area and outlines prohibited uses of the land.

6.7 Ecological Restoration

There have been significant changes to the hydrology of the property from ditching which has diverted natural water flow. Restoring natural hydrologic patterns would require large-scale restoration involving heavy machinery to remove the ditches and reslope adjacent contours. This work would cause significant damage to existing vegetation and is not recommended at this time.

Ecological restoration in McFadden Creek Nature Sanctuary should focus on ongoing invasive species removal and management. Invasive species can severely impact Species at Risk and sensitive ecosystems, decreasing diversity over time. Management of invasive species should focus on removing woody species, in particular Evergreen Daphne, English Holly, English Ivy and Himalayan Blackberry. If English Ivy cannot be completely removed, control efforts should focus on removing vegetation that is climbing up the trees since flowers and fruit are found primarily on vertical growth and removing this vegetation will help limit the spread to new areas. Removal techniques should be outlined in an invasive species management plan since many of these species will re-sprout from cut stems and some may root from cut fragments.

In locations where removal of invasive species leaves large areas of disturbed soil, native species may be planted in order to prevent re-establishment of invasive species.

No pesticides, herbicides or insecticides should be used for the control of invasive species. Exemptions may be made for target applications if other options for invasive species control prove insufficient.

Recommendation
That the ITF develop a plan in conjunction with SSIC to address invasive species and remove non-native woody vegetation regularly in order to prevent the spread of invasive species in the protected area, and that all invasive species removal occur outside of the heron breeding period (January 15th-September 15th). If the Great Blue Herons do not return to breed at the Sanctuary, it may be possible to start invasive species removal earlier when the birds have already begun breeding elsewhere.

That the ITF plant native species if necessary in areas where invasive species have been removed.

6.8 Protection of Sensitive Ecosystems and Species at Risk

Protection of water quality in McFadden Creek is important to maintain Cutthroat Trout and the diversity of species that rely on the freshwater from the creek. In the past there have been reports of foam in the creek, possibly from upstream pollution by detergents (Islands Trust Fund *et. al.* 2005) and irregularities in the flow rates (Loo pers. comm. 2015). If funding is available, ongoing monitoring of water quality and flow rates is recommended.

Recommendation
That the ITF partner with a local stream monitoring group such as the Water Preservation Society to conduct regular water quality monitoring of McFadden Creek.

6.9 Scientific Research/Education

Scientific research plays a critical role in understanding natural processes and shaping potential management options. All research in the Sanctuary should be approved by ITF and should ensure there is no associated harm to Species at Risk and their habitat.

Recommendation
That the ITF endorse appropriate scientific research that is required to inform appropriate management of the Sanctuary that will not harm Species at Risk, subject to the approval of the TFB.

7.0 Action Items

Management Plan action items are measurable and achievable tasks that the ITF and partners can complete to ensure that the protected area is managed in the best possible way. The following management action items are based on the recommendations made in this management plan and listed in priority sequence, subject to available funding resources.

7.1 Immediate Actions (1-2 years)

1. Conduct annual monitoring to monitor covenant compliance and identify management concerns.
2. Install a sign close to North Beach Road to inform the public that the area is protected and to outline prohibited activities (including no public access).
3. Provide information to local residents that outlines the heron nesting window (January 15th -September 15th) and explains why disturbance including foot traffic in or near the Sanctuary may prevent herons from nesting at the site.
4. Establish a volunteer warden program to monitor the property and identify management concerns such as trespassing, tree cutting and other issues.
5. Develop an invasive species management work plan between the SSIC and the ITF to guide management and monitoring of invasive species in the Sanctuary.
6. Remove invasive non-native woody species as directed by the invasive species work plan.
7. Conduct regular monitoring to assess invasive species spread and management.
8. Support ongoing research to inform management provided it does not negatively impact sensitive species including nesting herons.

7.2 Short term Actions (3-5 years)

1. Develop a landowner contact program with all landowners within a 1 km radius of the Sanctuary to provide information on the following:
    a. encourage long-term conservation and protection of nearby properties;
    b. inform landowners about threats to Great Blue Herons including foot traffic in the Sanctuary and disturbance associated with clearing and development on properties within 1000m of the Sanctuary; and,
    c. provide information to landowners related to protecting water quality downstream.
2. Ongoing invasive species management as guided by work plan developed under immediate actions.
3. Implement water quality monitoring with a local stream monitoring group in McFadden Creek to assess changes in water quality over time (provided this can be done without causing disturbance to breeding herons).

7.3 Long term Actions (5+ years)

1. Develop long-term public education program to inform residents about the importance and sensitivities of heron rookeries and feeding areas.
2. Develop education plan to inform local residents about impacts to water quality including offering Stream Keepers programs (provided this can be done without causing disturbance to breeding herons).

7.4 Management Actions if Herons Return to Breed

1. Monitor the reproductive success of herons if they return to the Sanctuary to breed.
2. Work with adjacent landowners to limit disturbance associated with land clearing and development activities during the nesting window within 1000m of the heronry.
3. Establish educational materials at nearby feeding sites to inform the public of the negative impact of dogs and clam digging.
4. Work with aviation authorities and aviation companies to limit low level flights over the Sanctuary to limit noise disturbance.
5. Develop communications with road maintenance companies and BC Hydro to limit disturbance associated with road work and tree clearing within 1000 m of the heronry during heron nesting window.
6. Develop public outreach materials to provide information to trades persons working within 1000m of the heronry to inform them of the threats associated with tree cutting, construction to herons.

8.0 Conclusion

McFadden Creek Nature Sanctuary is an important protected area which is surrounded by private land. It provides critical habitat for Great Blue Herons which will hopefully return to nest at this site again. It also provides important habitat for a range of other native species.

The ITF will act on the management action items identified in this plan to achieve the vision, objectives and purpose of the McFadden Creek Nature Sanctuary. Future management issues may lead to further action items that will be identified in work plans and in future revisions of this plan.

9.0 References

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10.0 Appendices

Appendix A. McFadden Avian Species List as of May 20, 2013

Compiled by:
Karen Ferguson, Avian Survey Specialist
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Salt Spring Island, B.C.
V8K 2G4
250-537-2831
siskin59@shaw.ca

Species At Risk

Common Name	Scientific Name	BC List	COSEWIC	BC Conservation Framework
Great Blue Heron** (Historic breeding)	*Ardea herodias fannini*	Blue	Special Concern 2008	1

Other Species

Common Name	Scientific Name	BC Conservation Framework
Bald Eagle*	*Haliaeetus leucocephalus*	6
Rufous Hummingbird*	*Selasphorus rufus*	2
Red-breasted Sapsucker*	*Sphyrapicus ruber*	6
Downy Woodpecker*	*Picoides pubescens*	5
Pileated Woodpecker*	*Dryocopus pileatus*	4
Pacific-slope Flycatcher*	*Empidonax difficilis*	2
Warbling Vireo*	*Vireo gilvus*	6
Northwestern Crow**	*Corvus caurinus*	5
Common Raven*	*Corvus corax*	5
Violet-green Swallow*	*Tachycineta thalassina*	2
Chestnut-backed Chickadee**	*Poecile rufescens*	2
Red-breasted Nuthatch*	*Sitta canadensis*	5
Brown Creeper*	*Certhia americana*	1
Bewick's Wren*	*Thryomanes bewickii*	2
Pacific Wren*	*Troglodytes pacificus*	6
Golden-crowned Kinglet*	*Regulus satrapa*	5

Swainson's Thrush*	*Catharus ustulatus*	2
American Robin**	*Turdus migratorius*	6
Orange-crowned Warbler*	*Oreothlypis celata*	5
Common Yellowthroat*	*Geothlypis trichas*	5
Black-throated Gray Warbler**	*Setophaga nigrescens*	2
Townsend's Warbler*	*Setophaga townsendi*	5
Wilson's Warbler*	*Cardellina pusilla*	2
Spotted Towhee*	*Pipiolo maculatus*	5
Song Sparrow**	*Melospiza melodia*	6
Brown-headed Cowbird*	*Molothrus ater*	5
Purple Finch*	*Carpodacus purpureus*	2
Red Crossbill*	*Loxia curvirostra*	2

** Breeding confirmed
* Breeding probable

B.C. Conservation Framework: Priority 1 (highest) 6 (lowest) for each of the three Conservation Framework Goals. The value shown here represents the highest priority across the three goals.

List Order: Species names and order follows the American Ornithologist Union Checklist of Birds of North America, Seventh Edition, 1998 and supplements to August 2011.

Appendix B. Plant Species Observed in McFadden Creek Nature Sanctuary

This list of plant species was compiled by Carrina Maslovat, Botanist, 175 Stewart Road, Salt Spring Island BC, V8K 2C4. Telephone: (250) 537-1573, Email: maslovat@telus.net.

*Indicates non-native species
**Indicates species noted by Marc Johnson in February 1997 which were not observed during 2015 field surveys

Species Common Name	**Species Latin Name**
Trees:	
**Arbutus	*Arbutus menziesii*
Bigleaf Maple	*Acer macrophyllum*
Bitter Cherry	*Prunus emarginata*
Black Cottonwood	*Populus balsamifera*
Cascara	*Rhamnus purshiana*
Douglas-fir	*Pseudotsuga menziesii*
Grand Fir	*Abies grandis*
Pacific Crab Apple	*Malus fusca*
Red Alder	*Alnus rubra*
Trembling Aspen	*Populus tremuloides*
Western Redcedar	*Thuja plicata*
Western Hemlock	*Tsuga heterophylla*
**Western Yew	*Taxus brevifolia*
Shrubs:	
Baldhip Rose	*Rosa gymnocarpa*
Blackcap	*Rubus leucodermis*
California Blackberry	*Rubus ursinus*
Coastal Black Gooseberry	*Ribes divaricatum*
Cutleaf Evergreen Blackberry*	*Rubus laciniatus*
Dull Oregon-grape	*Mahonia nervosa*
English Holly*	*Ilex aquifolium*
English Ivy*	*Hedera helix*
Evergreen Daphne*	*Daphne laureola*
Hairy Honeysuckle	*Lonicera hispidula*
Hardhack	*Spiraea douglasii*
Himalayan Blackberry*	*Rubus armeniacus*
Indian Plum	*Oemleria cerasiformis*
Ninebark	*Physocarpus captitatus*
Nootka Rose	*Rosa nutkana*
Oceanspray	*Holodiscus discolor*
Red Elderberry	*Sambucus racemosa*
Red Huckleberry	*Vaccinium parvifolium*
Red-osier Dogwood	*Cornus stolonifera*
Salal	*Gaultheria shallon*
Salmonberry	*Rubus spectabilis*

Saskatoon	*Amelanchier alnifolia*
Scouler's Willow	*Salix scouleriana*
Snowberry	*Symphoricarpos albus*
Thimbleberry	*Rubus parviflorus*
Western Trumpet	*Lonicera ciliosa*
Forbs:	
American Brooklime	*Veronica americana*
Cleavers	*Galium aparine*
Columbia Brome	*Bromus vulgaris*
Common Dandelion	*Taraxacum officinale*
Common Horsetail	*Equisetum arvense*
Common Rush	*Juncus effusus*
Common Velvet-grass	*Holcus lanatus*
Creeping Buttercup*	*Ranunculus repens*
Crested Dogtail*	*Cynosurus cristatus*
Enchanter's Nightshade	*Circaea alpina*
European Forget-me-not	*Myosotis scorpiodes*
Fringecup	*Tellima grandiflora*
Hairy Cat's-ear*	*Hypochaeris radicata*
Hedge Nettle	*Stachys chamissonis*
Helleborine*	*Epipactis helleborine*
Large-leaved Avens	*Geum macrophyllum*
Little Buttercup	*Ranunculus uncinatus*
Nemophila	*Nemophila parviflora*
Northern Starflower	*Trientalis latifolia*
Orchard Grass	*Dactylis glomerata*
Oxeye Daisy*	*Leucanthemum vulgare*
Pacific Sanicle	*Sanicula crassicaulis*
Pacific Water-parsley	*Oenanthe sarmentosa*
Pathfinder	*Adenocaulon bicolor*
Purple Peavine	*Lathyrus nevadensis*
Ribwort Plantain*	*Plantago lanceolata*
Scouler's Harebell	*Campanula scouleri*
Sedge	*Carex sp.*
Self-heal	*Prunella vulgaris*
Short-styled Thistle	*Cirsium brevistylum*
Siberian Miner's-lettuce	*Claytonia sibirica*
Skunk Cabbage	*Lysichiton americanus*
Slough Sedge	*Carex obnupta*
Stinging Nettle	*Urtica dioica*
Sweet-cicely	*Osmorhiza berteroi*
Sweet Vernalgrass*	*Anthoxanthum odoratum*
Tall Mannagrass	*Glyceria elata*
**Tall Scouring Rush	*Equisetum hyemale*
Three-leaved Foamflower	*Tiarella trifoliata*

Twinflower	*Linnaea borealis*
Vanilla Leaf	*Achlys triphylla*
Wall lettuce*	*Mycelis muralis*
Water Parsley	*Oenanthe sarmentosa*
Western Fescue	*Festuca occidentalis*
Western Trillium	*Trillium ovatum*
**Yerba Buena	*Clinopodium douglasii*
Ferns:	
Bracken Fern	*Pteridium aquilinum*
Lady Fern	*Athyrium filix-femina*
Swordfern	*Polystichum munitum*
Mosses:	
Electrified Cat's-tail Moss	*Rhytidiadelphus triquestrus*
Oregon Beaked-moss	*Eurhynchium oreganum*
Step Moss	*Hylocomium spendens*
Wavy Leaved Cotton Moss	

Appendix C. Locations of Photopoints

Feature	Vegetation Type	UTM Easting	UTM Northing	Photo Aspect	Date	Comments
Stn. A	1	10U 458859	5419111	135º 45º	June 24, 2015	Photo taken at corner of property at iron pin
Stn. B	1	10U 458921	5419024	315º 135º	June 24, 2015	Photo taken at corner of property at iron pin
Stn. C	1	10U 458962	5418973	315º 45º	June 24, 2015	Photo taken at iron pin along southwest property line
Stn. D.	2	10 U 459106	5419366	315º 225º	June 24, 2015	Photo taken at corner of property at iron pin
Stn. E	2	10 U 458981	5419385	225º 135º	June 24, 2015	Photo taken at corner of property at iron pin

Appendix D. Stakeholders Contacted During the Development of the McFadden Creek Nature Sanctuary Management Plan

Contact Name	Connection to McFadden	Telephone Number	Summary of Contact
John Sprague	Waterbird Watch Collective	(250) 537-0760	Phone conversation July 24th
Nina Raginsky	Waterbird Watch Collective	(250) 537-4515	Phone conversation July 20th
Patricia Banning-Lover	Wildbird Trust	(604) 922-1550	Phone conversation July 20th Follow up email July 24th
Owen (Rodrick) Benwell	2161 North End Road Neighbour to the southeast of McFadden	(250) 537-1785	Phone conversation with Owen July 23rd
Jason Charlebois and Elizabeth Nolan	2183 North End Road Neighbour to the south of McFadden	(250) 537-2740	Phone conversation with Elizabeth July 29th
Kim (Liza) Tebbutt	2191 North End Road	(250) 537-8444	Phone conversation August 4th
Michael and Gail Jaeger	2199 North End Road Neighbour to the south of McFadden	(250) 537-5366	Phone conversation with Michael July 20th
Susan Fotch	1520 North Beach Road	Unable to find contact information	
Leon and Rita Aptekmann	1551 North Beach Road Neighbour on north side of North Beach Road	(250) 537-5669	Phone conversation with Leon July 20th
Donald and Maureen MacDonald	1644 North Beach Road Neighbour to the northeast of McFadden	(250) 537-8381	Phone conversation with Donald July 20th
Julie and Matthew Nowell	1684 North Beach Road Neighbour kitty-corner to southeast corner of McFadden	(250) 537-0613	Phone conversation with Matthew July 20th