The Town of Logy Bay - Middle Cove - Outer Cove

Wetlands, Waterbodies and Waterways Study

Draft Final Report

CBCL

Prepared for

Logy Bay Middle Cove Outer Cove

193029.00 ● Draft Final Report ● November 2019

Draft Final Report	Ian Bryson	November 15, 2019	Lisa MacDonald
Issue or Revision	***Reviewed By:***	***Date***	***Issued By:***

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Consulting Engineers

Report: 193029.00

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Solving today's problems with tomorrow in mind

November 12, 2019

Adele Carruthers
Town Clerk / Manager
Town of Logy Bay-Middle Cove-Outer Cove
744 Logy Bay Rd.
Logy Bay, NL A1K 3B5
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Dear Ms. Carruthers:

RE: Draft Report REV01 – Wetland, Waterbody and Waterway Study – Town of Logy Bay – Middle Cove – Outer Cove (CBCL Project # 193029.00)

We are pleased to provide you with an updated Draft Report for environmental services pertaining to the above-noted Project.

Please contact the undersigned if you have any questions or concerns.

Yours very truly,

CBCL Limited

Ian Bryson
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Attachments

Project No: 193029.00

CANADA'S BEST MANAGED COMPANIES

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Acronyms

AC CDC	Atlantic Canada Conservation Data Centre
AEP	Annual Exceedance Probability
ARC	Antecedent Runoff Condition
DFO	Fisheries and Oceans Canada
FAC	Facultative
FACU	Facultative Upland
FACW	Facultative Wetland
GIS	Geographic Information System
GPS	Global Positioning System
ha	Hectares
HADD	Harmful Alteration, Disruption or Destruction
HEC-HMS	Hydrologic Engineering Center's Hydrologic Modeling System
HEC-RAS	Hydrologic Engineering Center's River Analysis System
IDF	Intensity-Duration-Frequency
LiDAR	Light Detection and Ranging
m	Meters
mm	Millimeters
MAE	Municipal Affairs and Environment
NLESA	Newfoundland *Endangered Species Act*
NSE	Nova Scotia Environment
OBL	Obligate
RFP	Request for Proposal
S-Rank	Subnational Rarity Rank
SAR	Species at Risk
SARA	*Species at Risk Act*
SCS	Soil Conservation Service
SoCC	Species of Conservation Concern
TSS	Total Suspended Solids
UPL	Upland
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
WESP-AC	Wetland Ecosystem Services Protocol for Atlantic Canada
WRMD	Water Resources Management Division

CHAPTER 1 INTRODUCTION

The Town of Logy Bay-Middle Cove-Outer Cove (the Town) is located on the northeastern coast of Newfoundland bordering the City of St. John's (Figure 1.1). As of 2016, the population in the Town was approximately 2,200 people (Statistics Canada, 2019). Due to its proximity to St. John's, the population is growing and development is rapidly expanding. This development has resulted in land use changes, whereby the natural landscape is being converted to impervious surfaces comprising residential areas. These changes can result in an increase in storm water run-off into rivers, water levels, and risks of flooding.

Over the past several years, the Town has experienced issues with flooding, particularly during severe storm events. As such, the Town has proposed amendments to the Municipal Plan and Development Regulations to include the delineation of 1:100 year flood risk areas along Kenney's Brook, Outer Cove Brook, Coaker's River, Druken's River and Soldier's Brook – this is being conducted as part of its Municipal Plan and Development Regulations Review process. The purpose of identifying these high risk areas is to ensure that residential construction, or other development, is restricted or highly controlled in these areas, so as to prevent further issues with flooding and the subsequent risks to properties, infrastructure, and personal safety.

The Town retained an engineering consultant to review a flood risk analysis that was previously completed for Soldier's Brook by developers of the Gebraltar subdivision. The consultant also completed a new flood risk analysis of Soldier's Brook. In consultation with the Water Resources Management Division (WRMD) of the Department of Municipal Affairs and Environment (MAE), the Town retained another engineering consultant to conduct a flood risk analysis and accurately map the 1:100 year flood risk areas along Kenney's Brook, Outer Cove Brook, Coaker's River, and Druken's River. Significant wetland areas were also identified. The Municipal Plan Future Land Use map was then amended to reflect these flood risk and significant wetland areas.

Further amendments to the Municipal Plan and Development Regulations were developed in order to preserve and protect the Town's natural assets and inherent rural character with future development and expansion. Valuable natural assets to be conserved and managed include floodplains or lands that are prone to flooding (e.g., areas along Kenney's Brook, Outer Cove Brook, Coaker's River, Druken's River, and Soldier's Cove) and other sensitive wetlands that are important for controlling flooding, recharging groundwater, supporting sensitive wildlife or vegetation, or providing aesthetic value to the surrounding area. The Town has recognized that in order to preserve and manage these natural assets, an inventory of such assets is required.

1.1 Project Overview

CBCL Limited (CBCL) was engaged by the Town to complete environmental services to collect information required for the completion of the Municipal Plan and Development Regulation Review which is anticipated to be completed by the end of 2019. These environmental services include the following tasks:

- Identification of all wetlands, waterbodies and waterways within the Town municipal boundaries;
- Identification of wetlands, waterbodies and waterways that require flood zone provisions;
- Review of proposed flood zones to ensure that they are consistent with the provincial Department of Municipal Affairs and Environment MAE requirements for flood zone identification and management;
- Identification of appropriate buffers around the wetlands, waterways and waterbodies within the Town;
- Provide rationale for and recommend policies that conserve and protect wetlands, waterways and waterbodies, taking into consideration the desire for ongoing rural residential development as the predominant growth option of the Town Council; and
- Mapping of the collected information onto the Town's digital mapping for inclusion into the Municipal Plan and Development Regulations.

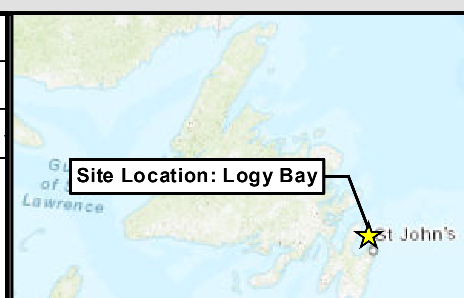
Figure 1.1
Logy Bay - Middle Cove - Outer Cove

Site Location

Municipal Boundary

Drawn By: MD	Checked By: IB
Approved By:	CBCL Project #: 193029.00
Date: 28/08/2019	Coordinate System: NAD 1983 MTM

0 0.5 1 1.5 2 km



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CHAPTER 2 METHODOLOGY

2.1 Desktop Studies

Desktop studies were completed in preparation for the Project field program. The details of these studies are described in Section 2.1.1 – Section 2.1.3.

2.1.1 Desktop Inventory of Wetlands, Waterbodies and Waterways

In preparation for field surveys, a variety of geospatial data sources were reviewed to identify the presence, size, and distribution of potential wetlands, waterbodies, and waterways within the municipal boundaries for Logy Bay-Middle Cove-Outer Cove (Study Area; Figure 1.1). These sources included, but were not limited to:

- LiDAR digital elevation model and derived elevation products such as slope, and surface flow accumulation models;
- Depth to water table model (Wet Areas Mapping);
- Orthophotos; and
- Pictometry oblique imagery.

Upon completion of the field program, all wetland boundaries and georeferenced points were then downloaded into ArcGIS to finalize the wetland mapping within the Study Area.

2.1.2 Review of AC CDC Rare Species Data

In Newfoundland, species at risk (SAR) or species of conservation concern (SoCC) are designated and tracked at three levels. The federal *Species at Risk Act* (SARA) and the provincial *Endangered Species Act* (NLESA) provide legislative designations, while the Atlantic Canada Conservation Data Centre (AC CDC) provides technical tracking lists.

Species of conservation concern identified within 5 km proximity to the Study Area were obtained from the AC CDC database and are outlined in Appendix A. These species were then sorted based on their federal and provincial designations under the SARA and NLESA, as well as, their Sub-national (provincial) rarity ranks (S-Ranks).

This data was reviewed prior to the commencement of field surveys in order to assess what SAR or SoCC might occur within the Study Area and whether any of the identified wetlands, waterbodies, or waterways may provide suitable habitat for SAR or SoCC. This information would be pertinent for subsequent recommendations of conservation measures and protective buffers around wetlands, waterbodies or waterways, as requested by the Town.

2.1.3 Public Outreach and Review

CBCL has found that one of the most valuable sources of information on the ecology of an area is the local knowledge of landowners and naturalists familiar with the area. CBCL reached out to a local naturalist to obtain additional information on flora and fauna, particularly avian species and SoCC, that may utilize wetlands in the area throughout the year. CBCL reviewed and compiled the information provided and identified SoCC, where applicable.

2.2 Field Surveys

In order to confirm the presence/absence of wetlands, waterbodies, and waterways identified during the desktop review, as well as, the extent of such features, reconnaissance-level site surveys were conducted by CBCL Biologists and Technicians between July 8 and July 12, 2019.

2.2.1 Field Verification of Wetlands

Ground-truthing in the field was completed to confirm the presence/absence of potential wetlands, which had been identified using geospatial data during the desktop study. Wetlands were not assessed in the Coastal Conservation Zone in the area of Torbay Southern Head as development in this area is not currently anticipated.

The general protocols used for wetland determination were based on those outlined by the US Army Corps of Engineers (USACE) Wetland Delineation Manual (Environmental Laboratory, 1987), whereby wetlands are confirmed based on the presence of positive indicators for the following three parameters, described further in Sections 2.2.1.1-2.2.1.3:

- Hydrophytic vegetation;
- Hydric soils; and
- Wetland hydrology.

In most situations, a positive indicator must be present for all three parameters in order to definitively identify any given site as a wetland. Observations of these parameters were made within the suspected wetlands and in adjacent upland areas, as necessary.

Upon positive wetland determination, a wetland edge condition was established and georeferenced using a handheld GPS (3 to 5 m accuracy typically). Wetland inflows and outflows were georeferenced where encountered. Whenever possible, hydrological connections to other wetlands, waterbodies, and waterways were determined during the course of the field program. General drainage patterns and impacts of land use to wetlands were noted, where appropriate. Additional ground-truthing was also conducted in areas where potential wetlands were not identified during the desktop review, in order to confirm the absence of wetlands in these areas. Due to the sheer number and extent of the wetlands within the Study Area boundaries, partial delineations were completed in many cases. The remaining boundaries were then interpreted using LiDAR and geospatial imagery.

2.2.1.1 Hydrophytic Vegetation

Hydrophytic vegetation refers to plant species which have adapted to living in saturated soils (Environmental Laboratory, 1987). Every plant species has an associated wetland indicator status per the Nova Scotia Wetland Indicator Plant List (NSE, 2012), a regional adaptation of the United States Department of Agriculture (USDA) indicator status. Wetland indicator status can be summarized as the probability or likelihood of a species occurring in a wetland versus non-wetland. The following five basic levels of wetland indicator status exist:

- Obligate (OBL);
- Facultative (FAC);
- Facultative Wetland (FACW);
- Facultative Upland (FACU); and
- Upland (UPL).

If the majority of plant cover (>50%) in the sample area is composed of species with facultative (FAC), facultative wetland (FACW) or obligate (OBL) statuses, then the positive indicator for hydrophytic vegetation is met.

2.2.1.2 Hydric Soils

Hydric soils are formed as a result of prolonged periods of saturation, flooding, or ponding during the growing season, resulting in anaerobic (oxygen-free) conditions (USDA Natural Resources Conservation Service, 1994). These anaerobic conditions may manifest themselves in a variety of ways, including the formation of reduction-oxidation (i.e., redox) features, organic soils (i.e., peat), and hydrogen sulphide (i.e., rotten egg odour), among other indicators. The presence or absence of such indicators, along with interpretation of the soil profile (i.e., color, texture, thickness), provides the basis for determining whether or not any given soil is hydric.

2.2.1.3 Wetland hydrology

Primary hydrology indicators (of which at least one must be present) include surface water, high water-table, saturation, and sediment deposits, among others. Secondary indicators (two of which are required when a primary indicator is not present) include, but are not limited to, surface soil cracks and drainage patterns.

2.2.2 Field Verification of Waterbodies and Waterways

The presence/absence of waterbodies and waterways identified during the desktop review was verified during the site reconnaissance level surveys completed in July, 2019. Similar to the wetland program, the extent of waterbodies and waterways were partially delineated by georeferencing portions of these features using GPS. The remaining boundaries were then interpreted using LiDAR and geospatial imagery. The full on-the-ground delineation of these features was not conducted due to the large size of the Study Area (~1,700 ha), the anticipated high number of drainage features present, and the timeframe in which the surveys were to be completed. Whenever possible, the watercourse type (ephemeral, intermittent, permanent) was identified and an evaluation of the likelihood of fish presence was conducted.

2.2.3 Identification of Species at Risk

Although a SAR survey was not part of this Project, an effort was made to record all occurrence observations or detections of SAR or potentially rare species. As indicated in Section 2.1.2, information on such species would be pertinent for subsequent recommendations of conservation measures and protective buffers around wetlands, waterbodies or waterways.

2.3 Review of Proposed Flood Zones

CBCL reviewed proposed flood zones for Soldiers Brook in order to ensure that they are consistent with the provincial Department of Municipal Affairs and Environment MAE requirements for flood zone identification and management, and to describe any deviations of the flood zones from MAE's requirements.

2.4 Identification of Buffers

CBCL investigated the potential application of buffers to wetlands, waterbodies and waterways within the Study Area and the necessary dimensions of such buffers based upon, but not limited to:

- A review of buffering practices in other jurisdictions, for general guidance;
- Consideration of the specific sensitivities of individual features, such as habitat value, or potential presence of rare species; and
- Other factors, as necessary.

2.5 Conservation Recommendations

CBCL developed a series of recommendations for conservation policies and mitigation measures for preserving wetlands, waterbodies and waterways, which may be incorporated into the Town's future Development Regulations.

CHAPTER 3 RESULTS

3.1 Desktop Studies

The results of the desktop inventory of wetlands, waterbodies and waterways within the municipal boundaries and a review of the AC CDC rare species data are outlined in Section 3.1.1 and Section 3.1.2.

3.1.1 Desktop Inventory of Wetlands, Waterbodies and Waterways

The results of the initial desktop mapping exercise completed prior to the field program identified 150 wetlands and multiple waterbodies (e.g., Jones Pond, Soldiers Brook Pond, Stick Pond) and major waterways (e.g., Soldiers Brook, Kennedy's Brook, Stick Pond Brook) and within the Logy Bay-Middle Cove-Outer Cove municipal boundaries.

3.1.2 Review of AC CDC Rare Species Data

The AC CDC data identified 50 rare species (34 fauna and 16 flora) within 5 km proximity to the Study Area. This data is provided in Appendix A. Of these rare species, 12 species are protected within the province of Newfoundland and Labrador under the NLESA or within Canada under the SARA. All are fauna species and are identified in Table 3.1, along with their corresponding designations and S-Ranks. The definitions for each S-Rank are outlined below. Species descriptions and the likelihood that they may inhabit wetlands within the municipality are provided in Sections 3.1.2.1 to 3.1.2.12.

SX: Extinct or extirpated in province
SH: Historically occurring but currently undetected in province
S1: Extremely rare in province
S2: Rare in province
S3: Uncommon in province
S4: Widespread, common and apparently secure in province
S5: Widespread, abundant and demonstrably secure in province
SE: Exotic in province
SU: Unrankable due to lack of data in province
SA: Accidental, infrequent and outside of range within province
SNA: Ranking not applicable in province
SNR: Not yet assessed in province

Table 3.1 Federally and Provincially Protected SAR Identified by AC CDC

Common Name	Scientific Name	SARA Designation	NL ESA Designation	S-Rank
Bobolink	*Dolichonyx oryzivorus*	---	Vulnerable	S1B, SUM
Chimney Swift	*Chaetura pelagica*	Threatened	Threatened	SNR
Common Nighthawk	*Chordeiles minor*	Threatened	Threatened	SNA
Gray-cheeked Thrush	*Catharus minimus*	---	Threatened	S2B, SUM
Harlequin Duck	*Histrionicus histrionicus*	Special Concern	Vulnerable	S3B, S2N, SUM
Ivory Gull	*Pagophila eburnea*	Endangered	Endangered	S1N, SUM
Olive-sided Flycatcher	*Contopus cooperi*	Threatened	Threatened	S3B,SUM
Peregrine Falcon	*Falco peregrinus* subsp. *anatum*	Special Concern (anatum/tundrius)	Vulnerable	S3M, S2N
Polar Bear	*Ursus maritimus*	Special Concern	Vulnerable	SNA
Red Crossbill	*Loxia curvirostra*	Endangered	Endangered	S1S2
Rusty Blackbird	*Euphagus carolinus*	Special Concern	Vulnerable	S2S3B, SUM
Short-eared Owl	*Asio flammeus*	Special Concern	Vulnerable	S3B, SUM

Species description for the AC CDC identified species can be found in Appendix B.

3.1.3 Public Outreach and Review

Consultation with a local resident, Ken Knowles, provided valuable information on the flora and fauna of Jones Pond and adjacent wetland habitat. The pond hosts a variety of aquatic vegetation and fish and amphibian species, providing foraging opportunities for terrestrial mammals, such as river otter (*Lontra canadensis*), American mink (*Vison vison*), muskrat (*Ondatra zibethicus*), weasel (*Mustela erminea*), moose (*Alces americana*), red fox (*Vulpes vulpes*), and snowshoe hare (*Lepus americanus*). Most notably, the pond and adjacent wetland habitat provide valuable foraging and breeding habitat for a diversity of avian species. Osprey have reportedly nested at Jones Pond for 8 consecutive years, typically fledging 2-3 chicks per year. American Bittern are known to breed in the wetland on the south side of Middle Cove Road, while solitary sandpipers have been observed using the small wetland at the western edge of the pond (Knowles, *pers. comm*., 2019).

Typical waterfowl observed at Jones Pond include common loons (*Gavia immer*), American Black Ducks (*Anas rubripes*), Mallards (*Anas platyrhynchos*), and Ring-necked Ducks (*Aythya collaris*). Male Ring-necked Ducks commonly use the pond as a post-breeding staging area. Waterfowl not typical of the northeast Avalon and which have been sighted at Jones Pond include the Eurasian Wigeon (*Mareca penelope*), Green-winged Teal (*Anas crecca*) and Tufted Duck (*Aythya fuligula*). Rare occurrences of migrating and post-breeding Bufflehead (*Bucephala albeola*), Hooded Merganser (*Lophodytes* *cucullatus*), Gadwall (*Mareca strepera*), Northern Shoveller (*Spatula clypeata*), Pied-billed Grebe (*Podilymbus podiceps*), Great Blue Heron (*Ardea herodias*), Little Blue Heron (*Egretta caerulea*), and Surf Scoter (*Melanitta perspicillata*) have also been detected over the years (Knowles, *pers. comm*., 2019).

Knowles has observed 104 avian species at Jones Pond and adjacent wetland habitat between 1984 and 2019 (Knowles, *pers. comm*., 2019). Of the species identified, 32 are SoCC, 4 of which are provincially protected under the NLESA and 2 of which are federally protected under the SARA. The Gray-Cheeked Thrush (*Catharus minimus*), which is provincially listed as 'Threatened' in Newfoundland, reportedly no longer occurs at Jones Pond. The Rusty Blackbird (*Euphagus carolinus*), which is designated as 'Vulnerable' in the province, used to breed on the pond margins but has only been observed at Jones Pond during Spring migration in recent years. Conversely, the federally and provincially listed Red Crossbill (*Loxia curvirostra*) reportedly appears to be increasing around the pond in recent years, particularly during years associated with good cone-crops (Knowles, *pers. comm*., 2019).

An inventory of all avian species observed by Knowles at Jones Pond and its adjacent wetland are provided in Table 3.2, along with their associated conservation statuses and legal designations, where applicable.

Table 3.2 Avian inventory from Jones Pond and adjacent wetland habitat (1984-2019).

Common Name	Scientific Name	SARA Designation	Provincial (NLESA) Designation	S-Rank
American Bittern	*Botaurus lentiginosus*			S4B,SUM
American Black Duck	*Anas rubripes*			S4
American Coot	*Fulica americana*			SNA
American Crow	*Corvus brachyrhynchos*			S5
American Goldfinch	*Spinus tristis*			S5
American Robin	*Turdus migratorius*			S5B,S5M
American Three-toed woodpecker	*Picoides dorsalis*			S3S4
American Wigeon	*Anas americana*			S3B,SUM
Bald Eagle	*Haliaeetus leucocephalus*			S4
Bank Swallow	*Riparia riparia*			S1S2B,SUM
Barn Swallow	*Hirundo rustica*			S2B,SUM
Belted Kingfisher	*Megaceryle alcyon*			S4B, S3N,SUM
Black-and-White Warbler	*Mniotilta varia*			S5B,S5M
Black-backed Woodpecker	*Picoides arcticus*			S4
Black-capped Chickadee	*Poecile atricapillus*			S5
Blackpoll Warbler	*Setophaga striata*			S5B,S5M
Blue Jay	*Cyanocitta cristata*			S5
Blue-winged Teal	*Anas discors*			SUB, S1M

Common Name	Scientific Name	SARA Designation	Provincial (NLESA) Designation	S-Rank
Bohemian Waxwing	*Bombycilla garrulus*			S4N,SUM
Boreal Chickadee	*Poecile hudsonicus*			S4
Boreal Owl	*Aegolius funereus*			S4
Brown Creeper	*Certhia americana*			S3
Bufflehead	*Bucephala albeola*			S2N,SUM
Canada Goose	*Anas platyrhynchos*			S3B,SUM
Cedar Waxwing	*Bombycilla cedrorum*			S4B,SUM
Common Goldeneye	*Bucephala clangula*			S4
Common Grackle	*Quiscalus quiscula*			S5B,S3?N,SUM
Common Loon	*Gavia immer*			S5B,S4N
Common Merganser	*Mergus merganser*			S4
Common Raven	*Corvus corax*			S5
Common Redpoll	*Acanthis flammea*			S2S3B,S4N,SUM
Common Tern	*Sterna hirundo*			S4B,SUM
Dark-eyed Junco	*Junco hyemalis*			S5
Dovekie	*Alle alle*			Not Available
Eastern Kingbird	*Tyrannus tyrannus*			SNA
Eurasian Wigeon	*Mareca penelope*			SNA
European Starling	*Sturnus vulgaris*			SNA
Evening Grosbeak	*Coccothraustes vespertinus*			S4
Fox Sparrow	*Passerella iliaca*			S5B,S5M
Gadwall	*Mareca strepera*			SNA
Glaucous Gull	*Larus hyperboreus*			S5N,S5M
Golden-crowned Kinglet	*Regulus satrapa*			S5B,S4N, SUM
Gray Jay	*Perisoreus canadensis*			S5
Gray-cheeked Thrush	*Catharus minimus*		Threatened	S2B,SUM
Great Black-backed Gull	*Larus marinus*			S4
Great Blue Heron	*Ardea herodias*			S2B,SUM
Great Horned Owl	*Bubo virginianus*			S4
Greater Scaup	*Aythya marila*			S4
Greater Yellowlegs	*Tringa melanoleuca*			S3B, S4M
Green-winged Teal	*Anas crecca*			S4B,SUM
Hairy Woodpecker	*Dryobates villosus*			S4
Hermit Thrush	*Catharus guttatus*			S5B,S5M
Herring Gull	*Larus argentatus*			S4
Hooded Merganser	*Lophodytes cucullatus*			SNA

Common Name	Scientific Name	SARA Designation	Provincial (NLESA) Designation	S-Rank
Iceland Gull	*Larus glaucoides*			S5N,S5M
Leach's Storm-Petrel	*Oceanodroma leucorhoa*			S4B,S4M
Lesser Black-backed Gull	*Larus fuscus*			S3N,SUM
Lesser Scaup	*Aythya affinis*			S3N,SUM
Lesser Yellowlegs	*Tringa flavipes*			S3M
Little Blue Heron	*Egretta caerulea*			Not Available
Long-tailed Duck	*Clangula hyemalis*			S5N,S5M
Mallard	*Anas platyrhynchos*			S3B,SUM
Merlin	*Falco columbarius*			S4S5B,SUM
Northern Flicker	*Colaptes auratus*			S4
Northern Goshawk	*Accipiter gentilis*			S3
Northern Harrier	*Circus hudsonius*			S3B,SUM
Northern Pintail	*Anas acuta*			S3B,SUM
Northern Shoveller	*Spatula clypeata*			SNA
Northern Waterthrush	*Parkesia noveboracensis*			S5B,S5M
Olive-sided Flycatcher	*Contopus cooperi*	Threatened	Threatened	S3B,SUM
Osprey	*Pandion haliaetus*			S4S5B,SUM
Palm Warbler	*Setophaga palmarum*			S5B,S5M
Pied-billed Grebe	*Podilymbus podiceps*			S1B,SUM
Pine Grosbeak	*Pinicola enucleator*			S5
Pine Siskin	*Spinus pinus*			S4S5
Purple Finch	*Haemorhous purpureus*			S5
Red Crossbill	*Loxia curvirostra*	Endangered	Endangered	S1S2
Red-breasted Merganser	*Mergus serrator*			S4B,S4M
Red-breasted Nuthatch	*Sitta canadensis*			S3
Ring-billed Gull	*Larus delawarensis*			S4B,SUM
Ring-necked Duck	*Aythya collaris*			S5B,S5M
Rough-legged Hawk	Buteo lagopus			S2S3
Ruby-crowned Kinglet	*Regulus calendula*			S5B,S5M
Ruffed Grouse	*Bonasa umbellus*			SNR
Rusty Blackbird	*Euphagus carolinus*		Vulnerable	S2S3B,SUM
Savannah Sparrow	*Passerculus sandwichensis*			S5B,S5M
Saw-whet Owl	*Aegolius acadicus*			S3?
Semipalmated Plover	*Charadrius semipalmatus*			S1B,S4M
Sharp-shinned Hawk	*Accipiter striatus*			S4
Snowy Owl	*Bubo scandiacus*			S3N,SUM
Solitary Sandpiper	*Tringa solitaria*			SNRM
Spotted Sandpiper	*Actitis macularius*			S4B,SUM
Surf Scoter	*Melanitta perspicillata*			S3S4N,SUM

Common Name	Scientific Name	SARA Designation	Provincial (NLESA) Designation	S-Rank
Tree Swallow	*Tachycineta bicolor*			S4B,SUM
Tufted Duck	*Aythya fuligula*			S1N,SUM
White-throated Sparrow	*Zonotrichia albicollis*			S5B,S5M
White-winged Crossbill	*Loxia leucoptera*			S5
White-winged Scoter	*Melanitta fusca*			S4N,SUM
Wilson's Snipe	*Gallinago delicata*			S5B,S5M
Wilson's Warbler	*Cardellina pusilla*			S5B,S5M
Wood Duck	*Aix sponsa*			SNA
Yellow Warbler	*Setophaga petechia*			S5B,S5M
Yellow-bellied Flycatcher	*Empidonax flaviventris*			S5B,S5M
Yellow-rumped Warbler	*Setophaga coronata*			S5B,S5M

3.2 Field and Mapping Results

An inventory of wetlands, waterbodies and waterways was compiled based on the results of the field program and desktop mapping. Finalized mapping is still in progress, and will be provided during future reporting. These results are described in the following subsections.

3.2.1 Wetland Inventory

A total of 150 wetlands were confirmed within the municipal boundaries for Logy Bay-Middle Cove-Outer Cove as a result of the wetland mapping and field surveys completed for this Project. Wetlands ranged between 0.024 ha and 27.355 ha in size. Approximately 184 ha of wetland habitat comprised the 1,713 ha Study Area located within the municipal boundaries for Logy Bay-Middle Cove-Outer Cove. Approximately 11% of land cover within the municipality is wetland habitat. The area determined for each wetland and the geographic coordinates of each wetland are included in Table 3.3. Wetland boundaries are depicted in Appendix C. It is important to reiterate that the wetland boundaries produced are based on a combination of partial field delineation and desktop mapping. While the boundaries are very reasonable estimates of the extent of wetlands present within the municipal boundaries, the precise extent of these wetlands could only be determined if all wetlands had been fully delineated. As previously mentioned, given the number and size of wetlands and the Study Area, full delineations were not part of the scope of work for this Project.

Table 3.3 Geographic Coordinates and Area of Wetlands Identified in the Study Area

Wetland ID	Area (hectares)	Area (m^2)	Easting	Northing
WL-01	0.716	7,155	326817	5280126
WL-01A	0.024	243	326855	5280075
WL-02	0.224	2,236	327003	5280156
WL-03	0.07	703	327027	5280094
WL-03A	0.045	446	327078	5280115

Wetland ID	Area (hectares)	Area (m^2)	Easting	Northing
WL-06	1.851	18,509	327013	5279734
WL-07	0.117	1,171	326892	5279501
WL-08	0.741	7,408	326750	5279328
WL-11	0.027	268	327488	5279144
WL-12	0.056	559	327516	5279175
WL-13	0.029	290	327953	5279104
WL-14	0.062	621	329405	5280205
WL-15	0.232	2,316	329430	5279881
WL-16	0.724	7,241	329304	5279921
WL-17	0.736	7,363	329106	5279824
WL-18	0.151	1,505	328965	5279692
WL-19	0.149	1,490	328949	5279514
WL-20	0.2	2,003	328989	5279407
WL-21	0.313	3,125	329361	5279675
WL-22	0.103	1,027	329464	5279692
WL-23	0.1	1,001	329351	5279494
WL-23	0.044	441	329352	5279551
WL-24	0.098	978	329448	5279561
WL-25	0.042	421	329442	5279458
WL-26	0.134	1,341	329435	5279318
WL-27	0.107	1,073	329608	5279362
WL-28	0.091	910	328576	5279002
WL-29	0.109	1,086	328495	5278987
WL-30	0.408	4,081	328376	5278965
WL-32	0.348	3478	329645	5279062
WL-33	0.034	337	329738	5279087
WL-34	0.261	2,607	329812	5279072
WL-35	0.06	598	329801	5278933
WL-38	3.284	32,842	329492	5278804
WL-39	0.284	2,839	329404	5278512
WL-40	0.327	3,268	329634	5278431
WL-41	0.093	934	329624	5278333
WL-42	0.315	3,151	329496	5278325
WL-43	4.054	40,541	329499	5277822
WL-44	0.367	3,665	329879	5278144
WL-45	1.918	19,179	329146	5277968
WL-46	0.111	1,110	328535	5277688
WL-47	0.509	5,089	328174	5277724
WL-48	1.008	10,082	328533	5277913
WL-49	0.101	1,009	328425	5278365

Wetland ID	Area (hectares)	Area (m^2)	Easting	Northing
WL-50	0.692	6,923	328507	5278454
WL-53	0.191	1,911	328792	5278796
WL-54	0.331	3,307	328826	5278864
WL-55	0.081	811	328884	5278922
WL-56	0.11	1,100	328908	5278953
WL-57	0.197	1,974	328327	5278861
WL-58	1.719	17,185	328285	5278646
WL-58A	0.391	3,912	328107	5278486
WL-59	0.071	709	328089	5278641
WL-60	1.282	12,819	327929	5278563
WL-61	1.027	10,266	327741	5278412
WL-63	0.732	7,320	327388	5278874
WL-64	0.741	7,409	326331	5278843
WL-65	0.108	1,076	325927	5278619
WL-65	0.343	3,433	326030	5278698
WL-65	0.149	1,492	326244	5278868
WL-66	0.327	3,268	325804	5278516
WL-68	0.266	2,664	325510	5278320
WL-68	0.151	1,510	325644	5278401
WL-70	0.121	1,213	326887	5278725
WL-71	15.119	151,190	326344	5278390
WL-72	0.581	5,808	326378	5278088
WL-72A	0.231	2,309	326375	5278251
WL-73	0.321	3,209	325765	5278147
WL-74	0.193	1,933	325693	5277896
WL-75	0.989	9,894	326002	5277886
WL-75A	0.146	1,464	326115	5277976
WL-75B	0.097	973	326168	5278029
WL-76	0.216	2,156	326676	5277984
WL-77	0.203	2,026	326757	5278035
WL-78	15.968	159,682	326707	5277742
WL-79	0.862	8,624	327356	5278125
WL-80	0.312	3,117	327130	5277940
WL-82	0.145	1,453	326942	5277757
WL-83	0.126	1,262	326902	5277708
WL-84	0.597	5,965	326965	5277698
WL-85	0.378	3,782	326906	5277605
WL-86	0.094	940.2	326889	5277589
WL-87	0.109	1,091	326262	5277178
WL-88	0.601	6,012	326467	5276849

Wetland ID	Area (hectares)	Area (m^2)	Easting	Northing
WL-89	4.135	41,346	326723	5277128
WL-91	11.928	119,275	326972	5276969
WL-92	2.05	20,501	326970	5276679
WL-93	0.692	6,915	326732	5276495
WL-94	1.179	11,786	327460	5277298
WL-95	0.753	7,534	327717	5277535
WL-96	0.093	932	327810	5277291
WL-97	0.209	2,092	328053	5277224
WL-98	0.982	9,819	327940	5277209
WL-99	0.338	3379	327782	5277107
WL-100	0.252	2,522	327380	5276921
WL-100A	1.76	17,599	327203	5276820
WL-101	1.67	16,703	327415	5276693
WL-102	1.97	19,700	327185	5276548
WL-103	4.022	40,222	327687	5276645
WL-104	0.094	938	327440	5276403
WL-105	3.475	34,751	327169	5276342
WL-106	0.213	2,130	326969	5276353
WL-107	0.078	784	327703	5276397
WL-108	1.797	17,967	328244	5276399
WL-109	0.478	4,784	328153	5276595
WL-110	8.569	85,688	328517	5276794
WL-111	0.614	6,142	328781	5276499
WL-112	1.547	15,473	328376	5277214
WL-113	0.836	8,355	328447	5277572
WL-114	5.192	51,918	328671	5277471
WL-115	2.125	21,251	329178	5277418
WL-116	0.437	4,369	329444	5277467
WL-116A	0.154	1,535	329380	5277414
WL-117	0.059	587	329536	5277464
WL-118	0.771	7,707	329584	5277117
WL-119	0.142	1416	328919	5277114
WL-120	0.144	1,437	329030	5277007
WL-120A	0.044	438	329019	5277094
WL-120B	0.045	446	329068	5277047
WL-121	0.119	1,185	329134	5276902
WL-122	0.342	3,421	329566	5276716
WL-123	0.438	4,377	329757	5276630
WL-124	0.085	853	329729	5276432
WL-125	0.113	1,134	329698	5276361

Wetland ID	Area (hectares)	Area (m^2)	Easting	Northing
WL-126	0.271	2,713	329400	5276351
WL-127	1.166	11,661	329289	5276444
WL-128	27.355	273,548	328915	5276009
WL-128	5.223	52,226	328346	5275898
WL-128A	0.238	2,375	328474	5275398
WL-128B	1.167	11,674	328307	5275205
WL-129	0.18	1,801	327864	5276163
WL-130	0.375	3,754	327886	5276121
WL-131	0.499	4,994	327305	5276082
WL-132	3.494	34,943	327668	5275930
WL-133	2.332	23,318	327657	5275546
WL-134	3.821	38,214	327862	5275289
WL-136	1.186	11,857	329566	5275779
WL-137	2.443	24,425	329858	5275829
WL-138	0.094	937	330093	5275978
WL-139	0.115	1,154	330142	5276049
WL-141	0.072	720	330190	5276115
WL-142	0.106	1,060	330400	5276115
WL-143	3.311	33,113	330366	5275899
WL-144	1.175	11,752	330448	5275683
WL-145	0.044	440	330538	5275607
WL-146	0.363	3,626	330515	5275443
WL-147	0.938	9,377	330058	5275531
WL-149	0.461	4,608	330173	5275239
WL-150	0.392	3,919	330277	5275135

3.2.2 Wetland Classes

Wetlands are broadly described into various classes based on vegetation, soil and hydrology, such as bogs, fens, marshes, swamps and wet meadows. It was not within our scope to classify every wetland within the Study Area, as wetlands were only partially delineated and often contained a complex of several classes. However, several general wetland classes were observed within the municipal boundaries. A general description of wetland classes observed in the Study Area and their ecological character, including information on vegetation, soil and hydrology indicators associated with the classes, are provided below.

3.2.2.1 Bogs

Bogs are peatlands characterized by their distinct hydrology, which is sourced primarily from precipitation such as snow, rain and fog. Bogs perform valuable functions, such as groundwater recharge, carbon sequestration, and stormwater retention. These wetlands are virtually unaffected by surface water and groundwater, and consequently, waters associate with bogs are low in dissolved minerals and quite acidic (pH 4.0-4.8 typical) (National Wetland Working Group, 1997; Rydin and

Jeglum, 2006). Acidity in bogs is further enhanced by the release of organic acids during the decomposition of *Sphagnum* moss, which is the dominant substrate of these peatlands (National Wetland Working Group, 1997). The various species of *Sphagnum* mosses that compose these wetlands have a high capacity to store water in both living and dead plant tissues; as a result of this, anaerobic conditions form, inhibiting the decomposition of the *Sphagnum*, resulting in an ever increasing peat layer and a water table at, or slightly below, the wetland surface. This process of bog formation, known as ombrotrophication, increasingly isolates the bog flora from groundwater influence (Rydin and Jeglum, 2006).

The bog communities encountered within the municipality were dominated by a diverse assemblage of shrubs typical to most bogs in Newfoundland. Dominant shrub species found in bogs in the region include Labrador tea (*Ledum groenlandicum*), sweet gale (*Myrica gale*), bog rosemary (*Andromeda polifolia*), wild raisin (*Viburnum nudum*), black crowberry (*Empetrum nigrum*), sheep laurel (*Kalmia angustifolia*) and bog laurel (*Kalmia polifolia*). Tree species such black spruce (*Picea mariana*), tamarack (*Larix laricina*) are also present, and are often stunted in their growth form. Herbaceous vegetation is typically dominated by *Sphagnum* mosses. Presence of varying amounts of graminoid (i.e., grasslike) species are also characteristic of bogs, with various species of sedges (*Carex* spp.), conttongrasses (*Eriophorum* spp.), beakrushes (*Rhyncospora* spp.) and deergrass (*Scirpus cespitosus*) forming 'lawns' in the wetter depressions and flats. Pitcher plant (*Sarracenia purpurea*) are commonly encountered. Lichens such as reindeer lichen are often interspersed with *Sphagnum* and ericaceous shrubs in the dryer bogs and on bog hummocks.

Figure 3.1 Bog Component of Wetland 91

3.2.2.2 Fens

Fens are peatlands that have a fluctuating water table rich in dissolved minerals derived from the influence of surrounding mineral soils (National Wetland Working Group, 1997). In contrast to bogs whose hydrology is sourced from direct precipitation, fen hydrology is sourced primarily from ground or surface water. Surface flow may be directed through channels, pools and other open water bodies. Fen vegetation is typically more diverse than in bogs, and is closely related to the depth of the water table and to water chemistry. Sedges and mosses dominate wetter fens, where the water table is above the soil surface. Trees, although shrubby, may include birch red maple (*Acer rubrum*), black spruce and tamarack.

Figure 3.2 Fen Component Observed in Wetland 71

3.2.2.3 Marshes

Marshes are defined by the Canadian Wetland Classification System (National Wetlands Working Group, 1997) as wetlands with shallow waters that fluctuate daily, seasonally, or annually due to events such as flooding, evapotranspiration, groundwater recharge, or seepage losses. Marshes receive water from many sources, including surface runoff, stream inflow, precipitation and groundwater discharge. This influx of water results in a high nutrient level in the soil (which ranges from mineral to organic) that supports a wide variety of vegetation, predominantly emergent aquatic macrophytes (i.e., rushes, reeds, grasses and sedges).

Figure 3.3 Wetland 64 Contained a Portion of Marsh Habitat Bordering Jones Pond

3.2.2.4 Swamps

Swamps are wetlands that typically comprise at least 30% of tall woody vegetation, which often results in ground cover composed of wood-rich peat. Swamps are influenced by minerotrophic groundwater, either on mineral or organic (i.e., peat) soils, and are not as wet as open bogs, fens, or marshes (National Wetlands Working Group, 1997). The following types of swamps were observed in the Study Area:

Floodplain Swamps: Floodplain swamps are generally composed of hydrophytic trees and border a stream or river channel. Due to their proximity to riverine areas, these wetlands often become seasonally flooded as a result of overflow from streams or rivers, bringing an influx of sediment and minerals to the wetland for a short period. Floodplain swamps typically contain shallow peat depths (National Wetlands Working Group, 1997).

Forested Swamps: Forested swamps are common in Newfoundland and develop in areas with high water tables at or near the soil surface. Common deciduous tree species found in forested swamps include red maple (*Acer rubrum*), white birch (*Betula papyrifera*) and yellow birch (*Betula alleghaniensis*). Dominant coniferous tree species include black spruce, balsam fir (*Abies balsamea*) and tamarack.

The shrub layer is less developed in forested swamps and contain mainly regenerating tree species. The herbaceous layer often consists of a variety of graminoids and forb species that have high tolerances for saturated, poorly drained soils. Histosols, depleted soils, and gleyed soils are common hydric soil indicators of forested swamps, while water tables, saturation and water stained leaves are common hydrologic indicators.

The treed swamps encountered within the municipality typically comprise an overstorey of balsam fir, black spruce, and tamarack, with the understorey often dominated by sheep laurel, cinnamon fern (*Osmunda cinnamomea*), blue-bead lily (*Clintonia borealis*), three-seeded sedge (*Carex trisperma*), and bunchberry (*Cornus canadensis*).

Shrub Swamps: Swamps that are dominated by woody vegetation less than 20 feet in height and a diameter at breast height (dbh) less than 6 inches are classified as shrub swamps. Some common shrub species include speckled alder (*Alnus incana*), various species of willow (*Salix* sp.), wild raisin (*Viburnum nudum* var. *cassionoides*), black holly (*Ilex verticillata*) and false holly (*Nemopanthus mucronatus*). The tree canopy is limited to absent in shrub swamp, but when it exists, may contain red maple, balsam fir, and yellow birch. The herb stratum may be very diverse and include species such as sensitive fern (*Onoclea sensibilis*), soft rush (*Juncus effusus*), creeping buttercup (*Ranunculus repens*), cinnamon fern (*Osmunda cinnamomea*), sedges and grasses.

Figure 3.4 Wetland 72 was Characterized as a Forested Swamp

3.2.2.5 Wet Meadow

Wet meadows are herb-dominated wetlands that are temporarily, as opposed to seasonally, flooded. Wet meadow soils are saturated for long periods during the growing season, but are seldom inundated with water. Wet meadows are quite often associated with disturbed areas (e.g., grazing or mowing associated with agricultural lands) which keeps these areas open. This repeated clearing prevents the succession of wet meadows to shrub or woodland (Swain, 2016). Vegetation is subsequently often characterized by graminoids, including sedges (e.g., tussock sedge: *Carex stricta* and wool grass: *Scirpus cyperinus*), grasses (e.g., Canada bluejoint: *Calamagrostis canadensis* and reed canary grass: *Phalaris arundinacea*), rushes (e.g., soft rush: *Juncus effusus*), and various flowering herbs. Shrubs present may include broad-leaved meadowsweet, willows, and speckled alder (Tiner, 1991).

Figure 3.5 Example of a Wet Meadow Observed in Wetland 60

3.2.3 Waterbodies and Waterways Inventory

A total of 21 waterbodies and 47 watercourses were confirmed within the municipal boundaries for Logy Bay-Middle Cove-Outer Cove municipal boundaries. Waterbodies ranged between 0.009 ha and 6.561 ha in size. Approximately 15 ha of the Study Area (<1%) is covered by waterbodies. Information for these waterbodies and waterways are presented in Table 3.4 and Table 3.5, respectively. The mid-point / centroid coordinates have been provided for the waterways. The locations of these environmental features are depicted in Appendix C.

Table 3.4 Waterbodies Identified within the Municipal Boundaries

Waterbody Name	Area (hectares)	Area (m^2)	Easting	Northing
Jones Pond	6.679	66,794	326429	5279073
Soldiers Brook Pond	3.561	35,611	326303	5277409
Stick Pond	1.603	16,032	327633	5276396
WB-01	0.042	423	328353	5278915
WB-02	0.017	170	328928	5278984
WB-03	0.014	136	328018	5278391
WB-04	0.054	544	325730	5277798
WB-05	0.186	1,862	326747	5277168
WB-06	0.353	3,526	326654	5277040
WB-07	0.121	1,209	327368	5276453
WB-08	0.278	2,776	328480	5276809
WB-09	0.033	334	328777	5276506
WB-10	0.045	446	328802	5277655
WB-11	0.049	486	329169	5278030
WB-12	0.062	616	329271	5277509
WB-13	0.062	620	329578	5277128
WB-14	0.009	92	328706	5277267
WB-15	0.034	341	326788	5277888
WB-16	0.265	2,652	327640	5275906
WB-17	0.312	3,122	329569	5275803
WB-18	1.078	10,781	329975	5275942

Table 3.5 Waterways Identified within the Municipal Boundaries

Waterway Name	Easting	Northing
Coakers River	328781	5276076
Drunken River	328712	5275765
Kennedy Brook	326445	5278525
North Pond Brook	326780	5280130
Outer Cove Brook	328118	5277251
Soldiers Brook	326884	5278053
Stick Pond Brook	327742	5276707
WC-01	327003	5280154
WC-02	327048	5280095
WC-03	326989	5279748
WC-04	326150	5278812

Waterway Name	Easting	Northing
WC-05	326327	5278856
WC-06	327542	5278655
WC-07	327371	5278470
WC-08	326904	5278477
WC-09	326534	5278423
WC-10	326389	5278223
WC-11	325953	5278090
WC-12	326012	5277958
WC-13	328341	5278981
WC-14	328365	5278708
WC-15	328006	5278375
WC-16	328443	5278374
WC-17	327609	5278727
WC-18	328735	5278808
WC-19	327991	5277584
WC-20	328106	5276320
WC-20	328421	5277644
WC-21	328651	5277464
WC-22	328733	5277456
WC-23	328858	5277731
WC-24	327302	5276641
WC-25	326871	5276900
WC-26	327136	5277072
WC-27	329794	5278633
WC-28	328480	5276860
WC-29	328662	5276685
WC-30	328070	5276206
WC-31	329606	5276792
WC-32	328557	5275876
WC-33	330193	5276106
WC-34	330154	5276014
WC-35	329905	5275855
WC-36	329737	5275654
WC-37	328707	5275443
WC-38	328529	5275563
WC-39	328348	5275285

3.2.4 Species at Risk

No federally or provincially protected SAR were detected during the field program. As indicated in the desktop review, several SAR have been reported to occur within 5 km proximity of the Study Area and could potentially occur within wetlands in the Study Area.

3.3 Review of Proposed Flood Zones

There have been two flood risk mapping studies completed for the Town. The *Town of Logy Bay – Middle Cove – Outer Cove Flood Risk Mapping Study* was completed by CBCL Limited in 2012 and included Kennedys River, Outer Cove Brook, Coakers River and Drukens River. This study was administered by the Department of Municipal Affairs and Environment Water Resources Management Division. In 2016 R.V. Anderson Associates Limited completed the *Town of Logy Bay - Middle Cove - Outer Cove Flood Risk Study* which examined Soldiers Brook. The 2016 study was administered by the Town.

CBCL completed a review of both the 2012 and 2016 studies and compared them to WRMD's most current requirements for flood risk mapping studies. The criteria outlined in the *Technical Document for Flood Risk Mapping Studies* which formed part of the *Request for Proposals Climate Change Flood Risk Mapping Study and the Development of a Flood Forecasting Service: Humber River Communities* issued by WRMD in 2018 was referenced. Table 3.6 summarizes the evaluation. Any items which differed from WRMD's *Technical Document for Flood Risk Mapping Studies* as issued in the 2018 RFP are presented in bold text.

It should be noted that WRMD's RFPs for flood risk mapping studies may continue to evolve. For instance WRMD's requirement in the 2018 RFP to produce velocity and hazard maps, were not included in the 2012 study requirements.

3.3.1 General Flood Zone Requirements

In addition to the requirements listed in the Provincial Standard for Flood Risk Mapping as Issued in 2018 RFP column in Table 3.6, CBCL also consulted WRMD with respect to modelling softwares and techniques. Generally, WRMD requires the US Army Corps of Engineers (USACE) Hydrologic Engineering Center's Hydrologic Modeling System (HEC-HMS) be used for the hydrologic analysis, and the Hydrologic Engineering Center's River Analysis System (HEC-RAS) be used for the hydraulic analysis, unless there is a specific issue that cannot be addressed by the respective software. In addition, WRMD will accept hydrologic modeling techniques, which differ from those listed, if they better address the modeling at hand.

Additionally, both the 1:20 and 1:100 AEP floods are required to be depicted on mapping to be in accordance with the DMAE requirements.

It is recommended that future flood risk mapping studies for the Town be conducted in accordance with WRMD's most current *Technical Document for Flood Risk Mapping Studies.*

Table 3.6 Comparison of Existing Flood Risk Mapping Studies to WRMD's RFP for Flood Risk Mapping

Item	Provincial Standard for Flood Risk Mapping as Issued in 2018 RFP	2012 Town of Logy Bay – Middle Cove – Outer Cove Flood Risk Mapping Study	2016 Town of Logy Bay-Middle Cove-Outer Cove Flood Risk Study
HYDROLOGIC ANALYSIS			
Stochastic Analysis	Single station frequency analysis Regional flood frequency analysis	Single station frequency analysis Regional flood frequency analysis	**None presented in report**
Hydrologic Modelling Software	HEC-geoHMS and HEC-HMS	HEC-geoHMS and HEC-HMS	HEC-HMS
Loss Method	SCS method Antecedent runoff condition (ARC) III Soil group: Based on soil type	SCS method **Antecedent runoff condition (ARC) II** Soil group: Based on soil type	SCS method **Antecedent runoff condition (ARC) II** **Soil group: C**
Transform Method	SCS Unit Hydrograph method	SCS Unit Hydrograph method	SCS Unit Hydrograph method
Routing Method	Muskingum-Cunge method	Muskingum-Cunge method	**Unknown**
Precipitation	Most up-to-date IDFs in the region for the 1:20 and 1:100 AEP rainfall events for current climate and climate change conditions* In the absence of site specific rainfall data and studies, the synthetic rainfall distribution to be used is the alternating block method	1:20 and 1:100 AEP City of St. John's hyetographs (1, 2, 6, 12, and 24 hour durations) for current climate conditions 1:20 and 1:100 AEP rain events based on climate change analysis by Dr. Joel Finnis of Memorial University of Newfoundland's Geography Department	1:100 AEP City of St. John's hyetographs (1, 2, 6, 12, and 24 hour durations) for current climate conditions **1:100 AEP City of St. John's hyetographs (1, 2, 6, 12 and 24 hour durations) for current climate + 20% for climate change conditions** **1:20 AEP current climate and climate change conditions were not examined**
Hydrologic Model Calibration	Based on recorded flow data	Based on recorded flow data	**None**
Sensitivity Analysis	±10%, ±20% and ±30% on SCS Curve Number and Manning's roughness coefficient	**±5% and ±10% on SCS Curve Number** **±5%, ±10% and ±25% on Manning's roughness coefficient**	**None**

Item	Provincial Standard for Flood Risk Mapping as Issued in 2018 RFP	2012 Town of Logy Bay – Middle Cove – Outer Cove Flood Risk Mapping Study	2016 Town of Logy Bay-Middle Cove-Outer Cove Flood Risk Study
HYDRAULIC ANALYSIS			
Hydraulic Modelling Software	HEC-geoRAS and HEC-RAS	HEC-geoRAS and HEC-RAS	HEC-RAS
Flows	1:20 and 1:100 AEP flows for current climate and current development condition	1:20 and 1:100 AEP flows for current climate and current development conditions	**None**
	1:20 and 1:100 AEP flows for current climate and fully developed condition	1:20 and 1:100 AEP flows for current climate and fully developed conditions	1:100 AEP flow for current climate and fully developed conditions **1:20 AEP for current climate was not examined**
	1:20 and 1:100 AEP flows for climate change and current development condition	1:20 and 1:100 AEP flows for climate change and current development conditions	**None**
	1:20 and 1:100 AEP flows for climate change and fully developed condition	**None**	1:100 AEP flow for climate change and fully developed conditions **1:20 AEP for climate change was not examined**
Hydraulic Model Calibration	Based on recorded water levels	Based on recorded water levels	**None**
Sensitivity Analysis	±10%, ±20% and ±30% on Manning's roughness coefficient	**±5%,** ±10% **and ±25%** on Manning's roughness coefficient	**None**
	±10%, ±20% and ±30% on peak discharge	**±5%,** ±10% **and ±25%** on peak discharge rates **±5%, ±10% and ±25% on expansion and contraction loss coefficients**	**None**

Item	Provincial Standard for Flood Risk Mapping as Issued in 2018 RFP	2012 Town of Logy Bay – Middle Cove – Outer Cove Flood Risk Mapping Study	2016 Town of Logy Bay-Middle Cove-Outer Cove Flood Risk Study
MAPPING			
Flood Zone Maps	1:20 and 1:100 AEP for current climate and current development conditions	1:20 and 1:100 AEP for current climate and current development conditions	**None**
	1:20 and 1:100 AEP for current climate and fully developed conditions	1:20 and 1:100 AEP for current climate and fully developed conditions	1:100 AEP for current climate and fully developed conditions **1:20 AEP for current climate was not examined**
	1:20 and 1:100 AEP for climate change and current development conditions	1:20 and 1:100 AEP for climate change and current development conditions	**None**
	1:20 and 1:100 AEP for climate change and fully developed conditions	**None**	1:100 AEP for climate change and fully developed conditions **1:20 AEP for current climate was not examined**
	Comparison of 1:20 and 1:100 AEP for current climate and current development to historical maps (if they exist)	**None**	**None**
	Comparison of 1:20 and 1:100 AEP for current climate and current	**None**	**None**

Item	Provincial Standard for Flood Risk Mapping as Issued in 2018 RFP	2012 Town of Logy Bay – Middle Cove – Outer Cove Flood Risk Mapping Study	2016 Town of Logy Bay-Middle Cove-Outer Cove Flood Risk Study
	development to climate change and current development		
Inundation Maps	Inundation maps for 1:20 and 1:100 AEP flows for current climate and current development	Inundation maps for 1:20 and 1:100 AEP flows for current climate and current development	**None**
Velocity Maps	Velocity maps for 1:20 and 1:100 AEP flows for current climate and current development	**None**	**None**
Flood Hazard Maps	Hazard maps for 1:20 and 1:100 AEP flows for current climate and current development	**None**	**None**
FLOOD FORECASTING			
Flood Forecasting Service	Evaluate and implement a flood forecasting service	**None**	**None**

* Although, WRMD prefers the use of updated IDF from the *Intensity-Duration-Frequency Curve Update for Newfoundland and Labrador* report, they have indicated that the City of St. John’s hyetographs are acceptable, and can be used, if they are determined to be more appropriate.

3.4 Ecological Buffers

The upland buffer area surrounding a given wetland, waterbody, or waterway is critical to the survival and functionality of these features, and their ongoing provision of ecosystem services. The Town, having such resources within their municipal boundaries, have the opportunity to conserve these resource lands for maximum benefit to the Town and the environment. In addition, the Town will have the opportunity to regulate activities within wetlands, waterbodies, and waterways, as well as, within their buffers. The Town will also have the opportunity to specify compensation for activities and developments that might impair the benefits that these features provide.

3.4.1 Technical Definition of Buffers

The technical definition of wetland buffer is defined variously across jurisdictions. Wetlands in Washington State – Volume 1 – A Synthesis of the Science (Sheldon et al., 2005) offers the following definition:

- *"Vegetated areas adjacent to wetlands, or other aquatic resources, that can reduce impacts from adjacent land uses through various physical, chemical, and/or biological processes."*

Buffer zones may serve a number of functions, to lesser or greater degrees, depending upon their dimensions, including:

- Maintenance of water quality and quantity;
- Flood mitigation;
- Erosion prevention;
- Habitat values for fish, wildlife and flora;
- Recreational opportunities; and
- Aesthetic values.

3.4.2 Determining Buffer Dimensions

A number of methods for applying buffer zones could be considered by the Town, each with their own advantages and disadvantages:

- ***Fixed Width:*** A fixed width buffering approach could be implemented for some or all of the wetlands and waterbodies within the municipality.
  - ***Advantages:***
    - Easily implemented;
  - ***Disadvantages:***
    - May or may not provide the necessary level of protection for all wetland functions.

- ***Variable Width, Function Based:*** Wetland buffers could conceivably be determined based upon the results of wetland function assessment techniques, most notably the Wetland Ecosystem Services Protocol for Atlantic Canada (WESP-AC). For example, wetlands scoring high for certain functions may be afforded additional buffering to protect or maintain these functions. The degree of additional buffering may vary, depending upon the function being examined.
  - ***Advantages:***

        - Could provide maximum protection of wetland functions, on a wetland-by-wetland basis;
        - Opportunity to be consistent with the City of St. John's approaches to wetland conservation (currently in progress), which may also be based on WESP-AC.
    - ***Disadvantages:***
        - More onerous to implement;
        - Minimal precedent exists in the Atlantic region for using this approach;
        - Requires additional study to conduct WESP-AC assessments on individual wetlands. Presumably, the Town would direct proponents of development projects to undertake such assessments, and to provide the results of the assessment to the Town along with their proposed development applications.

3.5 Conservation Recommendations & Environmental Mitigation

3.5.1 Recommended Buffers

Waterbodies and Waterways: A minimum fixed width buffer of 20 m is recommended around the periphery of all waterbodies. For permanent waterways (i.e., those with defined beds and banks) in excess of 2 m wide, a buffer of 20 m on either side (total 40 m plus width of waterway) is recommended. For permanent waterways less than 2 m wide, a fixed width buffer of 10 m on either side (total 20 m plus width of waterway) is recommended. No buffer is suggested for intermittent or ephemeral watercourses.

Hydrologically Isolated Wetlands <1000 m^2: For hydrologically isolated wetlands, no buffer requirement is suggested. Development applications may be considered for approval that involve wholly or partially infilling these wetlands. WESP-AC functional assessment should be conducted. Compensation should be required to offset losses in wetland area and function.

Hydrologically Isolated Wetlands 1000 -10,000 m^2: Due to the potential groundwater recharge function that these wetlands may provide, a minimum fixed width buffer of 20 m is recommended for all wetlands in this size category. Development applications may be considered for approval on a case-by-case basis, where those developments intrude into the buffer, but not into the wetland itself.

Hydrologically Isolated Wetlands >10,000 m^2: Due to the potential groundwater recharge function that these wetlands may provide, a minimum fixed width buffer of 20 m is recommended for all wetlands in this size category. Development applications involving impact to either the wetland or its buffer should not be considered for approval, except in exceptional circumstances.

Hydrologically Connected Wetlands: Where it is demonstrated by field assessment that a wetland (regardless of size) is hydrologically connected via a permanent surface flow to a waterbody or waterway, a fixed width buffer of a minimum of 20 m is recommended to be implemented. It is further recommended that a WESP-AC functional assessment be conducted for such wetlands, and that additional buffering be provided (as required) based on these results. Due to the potential flood attenuation, water quality maintenance, and habitat support functions that these wetlands may provide, development applications involving impact to either the wetland or its buffer should not be considered for approval.

3.5.2 Mitigation Measures – Waterbodies and Waterways

Suitable mitigation measures should be employed by development proponents, in order to reduce potential impacts to waterbodies and waterways, and their associated functions. Mitigation measures are provided in two major categories; 1. Those providing protection to fish habitat, and 2. Those providing protection to surface water and groundwater quality.

Fish Habitat: All applicable provincial and federal policies, regulations and Acts relevant to fish and protection of fish habitat should be followed such as the provincial *Environmental Protection Act*, federal *Fisheries Act*, and the federal *Species at Risk Act*. For any work to be completed in areas determined to be fish habitat, proponents should submit a Fisheries and Oceans Canada (DFO) *Request for Review* and subsequent DFO applications for *Fisheries Act* authorization, if required. Related to fish habitat, the mitigation measures that have been selected include:

- Any 'Harmful Alteration, Disruption or Destruction' (HADD) to fish and fish habitat, as defined in the *Fisheries Act*, shall be compensated for when required by DFO;
- The instream works timing window restrictions will be followed (e.g., allowable window is between June 1 and September 30, restricted window is October 1 to May 31). If work is required outside of this window, a request for an extension will need to be approved by DFO;
- Culverts and bridges will be designed to allow for fish passage for all watercourses crossings identified as having the potential for fish. Proponents of developments should endeavour to have these determinations completed by a qualified biologist during their project planning;
- All watercourse crossings for culverts should meet the objectives of the Department of Municipal Affairs and Environment *Guidelines for the Environmental Guidelines for Culverts* (MAE, 2018b);
- If sedimentation and erosion is an issue for a particular development site, potential impacts to fish and fish habitat further downstream of the development site should be assessed;
- Fish salvages should be conducted for any major watercourses alterations requiring work in the dry (i.e., dewatering) in areas identified as having potential for fish. The fish salvages can be conducted with an electrofisher and dip nets until no more fish are captured or seen. All captured fish will be relocated upstream or downstream of the construction area in suitable fish habitat. In addition:
    - Water from dewatered areas shall be pumped a minimum of 30 m from the watercourse to a location where sediment laden water will not enter the watercourse or wetlands;
    - To maintain the flow of water, clean water will be pumped and diverted from an upstream location around the dewatered construction site to a suitable downstream location, which will not cause an increase in instream sedimentation (e.g., over a splash pad or boulders/bedrock);

  - All pumps used for water intakes and for dewatering must have an intake screen size of 2.54 mm or less to prevent fish intake or impingement per *DFO Freshwater Intake End-of Pipe Fish Screen Guideline* or *Guideline Summary* (DFO, 1995); and
  - Once the area is dewatered, a check for missed fish will be conducted under or behind aquatic vegetation, boulders and woody debris.
- If blasting is to occur in or near a watercourse, approval from DFO will be required, and operations will be conducted in accordance with the *Guidelines for Use of Explosives in or Near Canadian Fisheries Waters* (Wright and Hopky, 1998).

Surface and Groundwater Quality: Mitigation measures that have been selected which are specifically applicable to surface water and groundwater quality include:

- As necessary, development proponents should prepare a *Sediment and Erosion Control Plan* that demonstrates due diligence and accepted best practices, which may include details on the following topics:
  - The use of sediment and erosion control measures such as silt fence or curtains;
  - Methods for containment of contact water during construction;
  - Methods for placement, spreading, and stabilization of reclaimed materials (grubbings) that prevent erosion and controls sedimentation; and
  - Removal of non-organic sediment and erosion control measures following construction, as necessary (grubbings, mulch, and hay may be left in place).
- All culverts will be designed following applicable legislation, guidelines and standards to maintain stream flows and flow between wetlands;
- Fueling and storage of gasoline and associated products (e.g., oils, greases, diesel, hydraulic and transmission fluids), will occur in a designated refueling /storage area at least 30 m from any waterbody or wetland;
- All maintenance of equipment will occur at a minimum of 30 m from any waterbody, waterway, or wetland;
- When possible, timing and staging for construction activities will be completed outside of extreme weather such as storms to reduce the potential of run-off;
- Any excess construction materials (asphalt, concrete, or other wastes) shall be disposed of in an approved location. Temporary storage areas for such waste, if necessary, shall be stored at least 30 m from waterbodies/waterways and 60 m from wells;
- Best management practices should be implemented to reduce erosion and promote groundwater recharge. Specifically, these include:
  - Employment of erosion control curtains and preservation of stumps and natural vegetation;
  - Management of exposed soil;
  - Storm water control and run-off reduction; and
  - Design criteria that preserves ephemeral streams and small wetlands, where possible.
- Implementation of surface water quality monitoring programs as required. This may include collection of background Total Suspended Solids (TSS) values in potentially affected areas prior to initiation of construction activities, after clearing and prior to grubbing. TSS samples should also be taken at the same time of year in similar site conditions, as TSS values can

vary on a seasonal and daily basis. Measured TSS values should be compared to appropriate guidelines for environmental protection, such as those by the Canadian Council of Ministers of the Environment (CCME);

- Appropriate approvals will be obtained for activities that have the potential to negatively impact waterbodies/waterways;
- Construction zones will have buffer zones and erosion control structures in place;
- Regular maintenance of drainage infrastructure should be conducted to ensure normal water flow. This shall occur under low flow conditions;
- Vehicles shall not ford watercourses; and
- Sedimentation and erosion control structures will stay in place until vegetation is established. Areas should be assessed in late spring or early summer of the year following construction. If banks and soils are fully established with successful vegetation re-growth, then the sediment erosion control measures may be removed. If erosion and sedimentation is still an issue, sediment erosion control will need to stay in place and then additional measures must be implemented to stabilize soils.

3.5.3 Mitigation Measures - Wetlands

Suitable mitigation measures should be employed by development proponents, in order to reduce potential impacts to wetlands and their associated functions. Relevant mitigation measures include, but are not limited to, the following:

- All wetland removals or alterations will be mitigated via wetland compensation activities, determined in consultation with the relevant provincial authorities;
- Where possible, clearing operations within wetlands should be conducted during winter months on frozen ground to protect the underlying vegetative mat and to reduce erosion and sedimentation of wetlands;
- Manual clearing will be conducted where ground conditions are not suitable for heavy equipment access;
- Sediment fencing will be erected around construction areas prior to commencement of any development activities;
- To minimize erosion and prevent sedimentation of wetlands to be preserved, buffers will be maintained adjacent to wetlands wherever practical, according to the Town's chosen dimensions – per criteria defined in Section 3.4;
- Erosion control measures (i.e., erosion control blankets, hydraulic mulches, turf reinforced mats and rip-rap) will be used to line ditches, swales, drainage channels, and steep banks to avoid erosion and siltation of down-gradient wetlands. These control measures will be installed prior to significant ground disturbance;
- Material will be stockpiled in such a way as to prevent erosion and sedimentation to any adjacent wetlands;
- Surface runoff and runoff from stockpiled material will be managed using standard sediment and erosion control practices;
- Cleared areas within and immediately adjacent to wetlands should be re-seeded or otherwise re-vegetated in order to reduce erosion;
- Whenever possible, work should be stopped during periods of inclement weather (e.g., high winds, high rainfall); and

- Where possible, quarried, crushed material will be used for building in and near wetlands with portions to be preserved, to minimize the risk of introducing or spreading non-native or invasive plant species.

3.6 Planning and Bylaw Considerations

Per the guidance of the *Planners Guide to Wetland Buffers for Local Governments* (Environmental Law Institute, 2008), when drafting a wetland buffer ordinance or bylaw, local governments should consider a number of key elements:

- Purpose of the Ordinance;
- Wetlands Covered;
- Definition of Buffer;
- Activities Prohibited/Permitted;
- Procedures for Review;
- Affirmative Requirements; and
- Monitoring, Reporting, and Enforcement.

The *Planners Guide to Wetland Buffers for Local Governments* has been attached to this document (Appendix D) for the Town's reference as they development specific development regulations pertaining to wetlands.

CHAPTER 4 CLOSURE

This report has been prepared for the sole benefit of the Town of Logy Bay-Middle Cove-Outer Cove. The report may not be relied upon by any other person or entity without the express written consent of CBCL Limited and the Town.

Any use which a third party makes of this report and any reliance on decisions made based on it, are the responsibility of such third parties. CBCL Limited accepts no responsibility for damages, if any, suffered by any third party as a result of decisions or actions made based on this report.

The conclusions presented represent the best judgement of the assessors based on the observed site conditions. Due to the nature of the investigation, the assessors cannot warrant against undiscovered environmental conditions or liabilities.

Should additional information become available, CBCL Limited requests that this information be brought to our attention so that we may re-assess the conclusions presented herein.

Respectfully submitted,

CBCL Limited

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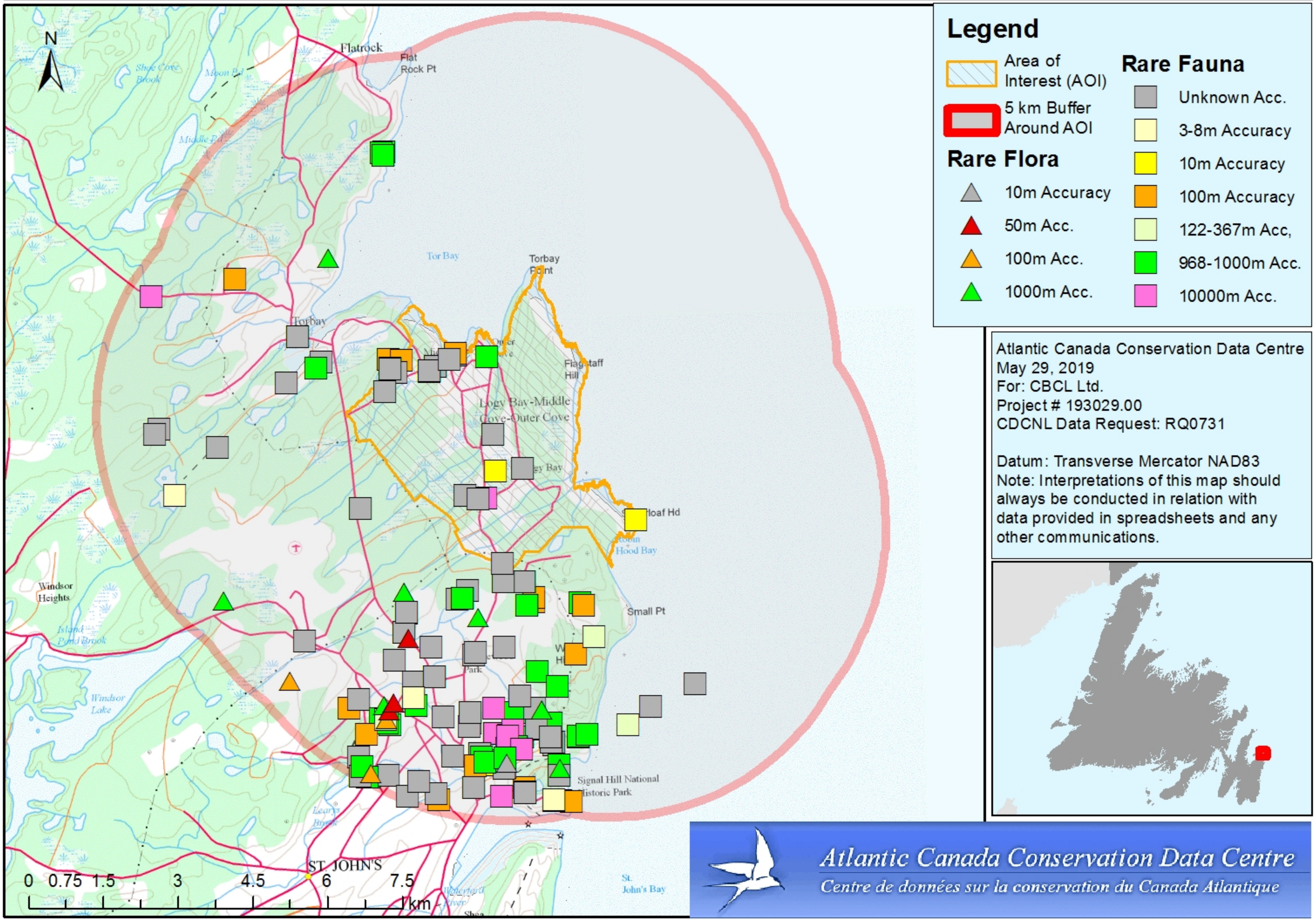
APPENDIX A

AC CDC Rare Species Data

GIS Scan of Rare and Provincially/Federally Listed Species for the Town of Logy Bay-Middle Cove-Outer Cove, Newfoundland and Labrador



GNAME	GCOMNAME	FAMILY	Observer	TotalNumber	Month	Day	Year	SRANK_2015	SRANK_2	NRANK	GRANK	GeneralStat	COSEWIC_ST	PROVINCIAL	SARA	DESCR_HABIT	SITE_NAME	Accuracy	SYNAME	CITATION	IDNUM
Falco sparverius	American Kestrel	Falconidae	golfman_otto_yah	1	11	21	2006	S2B,SUM	S2B	N5B	G5	Jndetermine	ate (Group 3, Low	0	0	0	Bally Haly Golf Course	0		Nf.Birds, Data Entry by WD	mstr1028200
Falco sparverius	American Kestrel	Falconidae	Todd Boland	1	3	20	2002	S2B,SUM	S2B	N5B	G5	Jndetermine	ate (Group 3, Low	0	0	0	Kings Bridge Road	0		Nf.Birds, Data Entry by WD	mstr1027947
Falco sparverius	American Kestrel	Falconidae	Bruce Mactavish	1	11	9	2002	S2B,SUM	S2B	N5B	G5	Jndetermine	ate (Group 3, Low	0	0	0	Macdonald Drive School	0		Nf.Birds, Data Entry by WD	mstr1028216
Riparia riparia	Bank Swallow	Hirundinidae	unknown	1	5	7	2000	S1S2B,SUM	S3B	N5B	G5	Secure	Threatened	0	0	0	Kenny's Pond, St. John's	1000		The Status of Bank Swallov	mstr1047963
Riparia riparia	Bank Swallow	Hirundinidae	G. Ryan	2	6	3	2006	S1S2B,SUM	S3B	N5B	G5	Secure	Threatened	0	0	0	NE. St. John's	10000		The Status of Bank Swallov	mstr1047992
Riparia riparia	Bank Swallow	Hirundinidae	T. Boland	1	10	21	2000	S1S2B,SUM	S3B	N5B	G5	Secure	Threatened	0	0	0	Outer Cove	1000		The Status of Bank Swallov	mstr1047999
Riparia riparia	Bank Swallow	Hirundinidae	D. Brown	1	8	26	2003	S1S2B,SUM	S3B	N5B	G5	Secure	Threatened	0	0	0	Quidi Vidi Lake, St. John's	1000		The Status of Bank Swallov	mstr1048010
Riparia riparia	Bank Swallow	Hirundinidae	Alvan Buckley, Ca	-99	5	28	2016	S1S2B,SUM	S3B	N5B	G5	Secure	Threatened	0	0	0	Virginia Lake	1000		Nf.birds, May 28, 2016	MSTR1051625
Riparia riparia	Bank Swallow	Hirundinidae	Bruce Mactavish	1	8	30	2016	S1S2B,SUM	S3B	N5B	G5	Secure	Threatened	0	0	0	Quidi Vidi Lake	10000		Nf.birds, August 30, 2016	MSTR1051632
Riparia riparia	Bank Swallow	Hirundinidae	Alvan Buckley	1	5	22	2017	S1S2B,SUM	S3B	N5B	G5	Secure	Threatened	0	0	0	QV Lake, near boathouse	1000		Nf.birds, May 22, 2017	MSTR1051636
Hirundo rustica	Barn Swallow	Hirundinidae	Jared Clarke	1	6	11	2003	S2B,SUM	S1S2B	N5B	G5	Secure	Threatened	0	0	0	Long Pond	0		Nf.Birds, Data Entry by WD	mstr1028002
Hirundo rustica	Barn Swallow	Hirundinidae	Jared Clarke	1	5	31	2004	S2B,SUM	S1S2B	N5B	G5	Secure	Threatened	0	0	0	Long Pond	0		Nf.Birds, Data Entry by WD	mstr1028005
Hirundo rustica	Barn Swallow	Hirundinidae	Anne Hughes	1	6	9	2008	S2B,SUM	S1S2B	N5B	G5	Secure	Threatened	0	0	0	Long Pond	0		Nf.Birds, Data Entry by WD	mstr1028027
Hirundo rustica	Barn Swallow	Hirundinidae	Anne Hughes	1	5	10	2009	S2B,SUM	S1S2B	N5B	G5	Secure	Threatened	0	0	0	Quidi Vidi Lake	0		Nf.Birds, Data Entry by WD	mstr1028134
Hirundo rustica	Barn Swallow	Hirundinidae	Anne Hughes	1	5	22	2011	S2B,SUM	S1S2B	N5B	G5	Secure	Threatened	0	0	0	Kent's Pond	0		Nf.Birds, Data Entry by WD	mstr1028206
Hirundo rustica	Barn Swallow	Hirundinidae	Anne Hughes	1	6	15	2000	S2B,SUM	S1S2B	N5B	G5	Secure	Threatened	0	0	0	Kenny's Pond	0		Nf.Birds, Data Entry by WD	mstr1028210
Hirundo rustica	Barn Swallow	Hirundinidae	Bruce Mactavish	1	6	3	2010	S2B,SUM	S1S2B	N5B	G5	Secure	Threatened	0	0	0	West End of Virginia Lake	0		Nf.Birds, Data Entry by WD	mstr1028260
Hirundo rustica	Barn Swallow	Hirundinidae	Lesley Sweetappl	2	6	8	2010	S2B,SUM	S1S2B	N5B	G5	Secure	Threatened	0	0	0	Virginia Lake	0		Nf.Birds, Data Entry by WD	mstr1028262
Hirundo rustica	Barn Swallow	Hirundinidae	Bruce Mactavish	1	5	29	2011	S2B,SUM	S1S2B	N5B	G5	Secure	Threatened	0	0	0	Lundrigan's Marsh, Virginia Lake	0		Nf.Birds, Data Entry by WD	mstr1028343
Hirundo rustica	Barn Swallow	Hirundinidae	Ken Knowles	4	5	1	2009	S2B,SUM	S1S2B	N5B	G5	Secure	Threatened	0	0	0	Stick Pond, Logy Bay	0		Nf.Birds, Data Entry by WD	mstr1028450
Hirundo rustica	Barn Swallow	Hirundinidae	Anne Hughes	1	5	14	2002	S2B,SUM	S1S2B	N5B	G5	Secure	Threatened	0	0	0	Outer Cove	0		Nf.Birds, Data Entry by WD	mstr1028505
Hirundo rustica	Barn Swallow	Hirundinidae	Ken Knowles	1	11	5	1998	S2B,SUM	S1S2B	N5B	G5	Secure	Threatened	0	0	0	Cliffs at Middle Cove	0		Nf.Birds, Data Entry by WD	mstr1028540
Hirundo rustica	Barn Swallow	Hirundinidae	Ken Knowles	2	9	23	2005	S2B,SUM	S1S2B	N5B	G5	Secure	Threatened	0	0	0	Jones Pond - Middle Cove	0		Nf.Birds, Data Entry by WD	mstr1028570
Hirundo rustica	Barn Swallow	Hirundinidae	Ken Knowles	4	5	9	2007	S2B,SUM	S1S2B	N5B	G5	Secure	Threatened	0	0	0	Jones Pond - Middle Cove	0		Nf.Birds, Data Entry by WD	mstr1029234
Chroicocephalus ridibund	Black-headed Gull	Laridae	iNaturalist user: le	0	1	1	2013	S1B, S3N,SUM	S1B,S3N	N3	G5	Sensitive	0	0	0	0	0	0		iNaturalist record export 20	MSTR1051843
Dolichonyx oryzivorus	Bobolink	Icteridae	B. Mactavish	0	9	24	1984	S1B,SUM	S2B	N5B	G5	May be at risl	Threatened	Vulnerable	0	0	Kent├ás Pond	1000		The Status of Bobolink (Do	mstr1047821
Dolichonyx oryzivorus	Bobolink	Icteridae	R. Burrows	0	6	2	1989	S1B,SUM	S2B	N5B	G5	May be at risl	Threatened	Vulnerable	0	0	Larry's Bog, St. John's	100		The Status of Bobolink (Do	mstr1047830
Dolichonyx oryzivorus	Bobolink	Icteridae	J. Green	0	6	25	1982	S1B,SUM	S2B	N5B	G5	May be at risl	Threatened	Vulnerable	0	0	Middle Cove	1000		The Status of Bobolink (Do	mstr1047837
Ophiogomphus colubrinus	Boreal Snake Tail/ Club	Gomphidae	Larson D.J.	0	7	23	1978	S3	S3?	N4N5	G5	Jndetermine	0	0	0	0	LongPond, St. Johns	0		2DDragonflydata.xls	mstr1035087
Somatochlora walshii	Brushed-tipped Emerald	Corduliidae	Ide F.P.	0	8	31	1944	S3S4	S4S5	N5	G5	Secure	0	0	0	0	Torbay	0		2DDragonflydata.xls	mstr1034956
Somatochlora walshii	Brushed-tipped Emerald	Corduliidae	Larson D.J.	0	7	11	1978	S3S4	S4S5	N5	G5	Secure	0	0	0	0	"Long Pond, St. Johns"	0		2DDragonflydata.xls	mstr1035058
Somatochlora walshii	Brushed-tipped Emerald	Corduliidae	Larson D.J.	0	7	23	1978	S3S4	S4S5	N5	G5	Secure	0	0	0	0	"Long Pond, St. Johns"	0		2DDragonflydata.xls	mstr1035059
Somatochlora walshii	Brush-tipped Emerald	Corduliidae	iNaturalist user: lo	0	7	16	2009	S3S4	S4S5	N5	G5	Secure	0	0	0	0	', Northeast Avalon, Newfoundland	10		iNaturalist record export 20	MSTR1051899
Chaetura pelagica	Chimney Swift	Apodidae	Todd Boland	1	5	31	1998	SNR	SNR	N5B	G5	grant/ Accide	Threatened	Threatened	Threatened	Lake	0	1000		Canadian Wildlife Service	mstr1009339
Chaetura pelagica	Chimney Swift	Apodidae	Anne Hughes, To	1	5	10	2009	SNR	SNR	N5B	G5	grant/ Accide	Threatened	Threatened	Threatened	0	Quidi Vidi Lake	1000		NF.Birds	mstr1022070
Chaetura pelagica	Chimney Swift	Apodidae	Bruce Mactavish	1	8	30	2016	SNR	SNR	N5B	G5	grant/ Accide	Threatened	Threatened	Threatened	0	Quidi Vidi Lake, on The Blvd	10000		NF.Birds, Aug 30, 2016	MSTR1050954
Chaetura pelagica	Chimney Swift	Apodidae	Seb from Chile, fr	1	9	7	2017	SNR	SNR	N5B	G5	grant/ Accide	Threatened	Threatened	Threatened	0	0	100		nf.birds, sept 7, 2017	MSTR1053224
Chordeiles minor	Common Nighthawk	Caprimulgid	Todd Boland	0	6	2	1998	SNA	SNA	N5B	G5	May be at risl	Special Concern	Threatened	Threatened	Lake	0	100		Canadian Wildlife Service	mstr1009369
Chordeiles minor	Common Nighthawk	Caprimulgid	Dave Brown	1	9	24	2002	SNA	SNA	N5B	G5	May be at risl	Special Concern	Threatened	Threatened	0	0	100		Canadian Wildlife Service	mstr1009366
Chordeiles minor	Common Nighthawk	Caprimulgid	Dave Brown	1	9	25	2002	SNA	SNA	N5B	G5	May be at risl	Special Concern	Threatened	Threatened	0	Dead Man's Pond, Signal Hill	100		Nf.Birds, Data Entry by WD	mstr1027372
Chordeiles minor	Common Nighthawk	Caprimulgid	Todd Boland	1	6	2	1998	SNA	SNA	N5B	G5	May be at risl	Special Concern	Threatened	Threatened	0	Quidi Vidi Lake	0		Nf.Birds, Data Entry by WD	mstr1028063
Chordeiles minor	Common Nighthawk	Caprimulgid	Bruce Mactavish	1	6	9	2008	SNA	SNA	N5B	G5	May be at risl	Special Concern	Threatened	Threatened	0	Tunis Court	0		Nf.Birds, Data Entry by WD	mstr1028054
Catharus minimus	Gray-cheeked Thrush	Turdidae	B. Mactavish, J. F	0	5	29	1988	S2B,SUM	S2S3B	N5B	G5	Secure	ındidate (Mid Prior	Threatened	0	0	St. John├ás	10000		Gray-Cheeked Thrush, SS/	mstr1042101
Catharus minimus	Gray-cheeked Thrush	Turdidae	B. S. Jackson	1	5	27	1980	S2B,SUM	S2S3B	N5B	G5	Secure	ındidate (Mid Prior	Threatened	0	0	Long Pond	1000		Gray-Cheeked Thrush, SS/	mstr1042102
Catharus minimus	Gray-cheeked Thrush	Turdidae	R. Burrows	1	5	28	1988	S2B,SUM	S2S3B	N5B	G5	Secure	ındidate (Mid Prior	Threatened	0	0	Long Pond	1000		Gray-Cheeked Thrush, SS/	mstr1042103
Catharus minimus	Gray-cheeked Thrush	Turdidae	R. Burrows	1	6	2	1990	S2B,SUM	S2S3B	N5B	G5	Secure	ındidate (Mid Prior	Threatened	0	0	Kents Pond, St. John's	1000		Gray-Cheeked Thrush, SS/	mstr1042104
Catharus minimus	Gray-cheeked Thrush	Turdidae	B Mactavish	2	5	25	1989	S2B,SUM	S2S3B	N5B	G5	Secure	ındidate (Mid Prior	Threatened	0	0	White Hills, St. John's	1000		Gray-Cheeked Thrush, SS/	mstr1042106
Phalacrocorax carbo	Great Cormorant	Phalacrocor	Chris Brown	3 or 4	1	25	2018	S3B,S3M,S3N	S3B	N4B,N4N	G5	Sensitive	0	0	0	0	0	1000		nf.birds, jan 25, 2018	MSTR1053288
Falco rusticolus	Gyrfalcon	Falconidae	Dave Brown	1	11	28	2004	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	Dump	1000		Nf.Birds, Data Entry by WD	mstr1028096
Falco rusticolus	Gyrfalcon	Falconidae	Jared Clarke	1	11	28	2004	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028288
Falco rusticolus	Gyrfalcon	Falconidae	Bruce Mactavish	1	2	20	2005	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028291
Falco rusticolus	Gyrfalcon	Falconidae	Bruce Mactavish	1	2	27	2005	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028294
Falco rusticolus	Gyrfalcon	Falconidae	Bruce Mactavish	1	3	6	2005	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028296
Falco rusticolus	Gyrfalcon	Falconidae	Paul Linegar	1	12	28	2006	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028316
Falco rusticolus	Gyrfalcon	Falconidae	Jared Clarke	1	12	11	2004	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	East of Virginia River Outflow	0		Nf.Birds, Data Entry by WD	mstr1028143
Falco rusticolus	Gyrfalcon	Falconidae	Karen Herzberg	1	2	1	2005	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	Near Virginia River End of Lake	0		Nf.Birds, Data Entry by WD	mstr1028100
Falco rusticolus	Gyrfalcon	Falconidae	Howard Clase	1	2	6	2004	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	Quidi Vidi	0		Nf.Birds, Data Entry by WD	mstr1028151
Falco rusticolus	Gyrfalcon	Falconidae	Bruce Mactavish	1	2	16	2004	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	Quidi Vidi	0		Nf.Birds, Data Entry by WD	mstr1028152
Falco rusticolus	Gyrfalcon	Falconidae	David Shepherd	1	4	14	2005	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	Quidi Vidi	0		Nf.Birds, Data Entry by WD	mstr1028169
Falco rusticolus	Gyrfalcon	Falconidae	Jared Clarke	1	1	20	2004	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	Quidi Vidi Lake	0		Nf.Birds, Data Entry by WD	mstr1028090
Falco rusticolus	Gyrfalcon	Falconidae	Bruce Mactavish	1	1	30	2004	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	Quidi Vidi Lake	0		Nf.Birds, Data Entry by WD	mstr1028091
Falco rusticolus	Gyrfalcon	Falconidae	Jared Clarke	1	2	29	2004	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	Quidi Vidi Lake	0		Nf.Birds, Data Entry by WD	mstr1028092
Falco rusticolus	Gyrfalcon	Falconidae	Bruce Mactavish	1	3	13	2004	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	Quidi Vidi Lake	0		Nf.Birds, Data Entry by WD	mstr1028094
Falco rusticolus	Gyrfalcon	Falconidae	Bruce Mactavish	1	3	20	2004	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	Quidi Vidi Lake	0		Nf.Birds, Data Entry by WD	mstr1028095
Falco rusticolus	Gyrfalcon	Falconidae	Jennifer Harding	1	1	12	2005	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	Quidi Vidi Lake	0		Nf.Birds, Data Entry by WD	mstr1028097
Falco rusticolus	Gyrfalcon	Falconidae	Bruce Mactavish	1	1	19	2005	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	On a pole.	Quidi Vidi Lake	0		Nf.Birds, Data Entry by WD	mstr1028098
Falco rusticolus	Gyrfalcon	Falconidae	Bruce Mactavish	1	1	28	2005	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	Quidi Vidi Lake	0		Nf.Birds, Data Entry by WD	mstr1028099
Falco rusticolus	Gyrfalcon	Falconidae	Bruce Mactavish	1	2	5	2005	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	Quidi Vidi Lake	0		Nf.Birds, Data Entry by WD	mstr1028101
Falco rusticolus	Gyrfalcon	Falconidae	Bruce Mactavish	1	3	19	2005	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	Quidi Vidi Lake	0		Nf.Birds, Data Entry by WD	mstr1028102
Falco rusticolus	Gyrfalcon	Falconidae	Bruce Mactavish	1	12	11	2005	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	East End of Lak	Quidi Vidi Lake	0		Nf.Birds, Data Entry by WD	mstr1028103

GNAME	GCOMNAME	FAMILY	Observer	TotalNumber	Month	Day	Year	SRANK_2015	SRANK_2	NRANK	GRANK	GeneralStat	COSEWIC_ST	PROVINCIAL	SARA	DESCR_HABIT	SITE_NAME	Accuracy	SYNAME	CITATION	IDNUM
Falco rusticolus	Gyrfalcon	Falconidae	Bruce Mactavish	1	11	9	2004	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	Pat's Ball Park next to Carpasian R	0		Nf.Birds, Data Entry by WD	mstr1027941
Falco rusticolus	Gyrfalcon	Falconidae	Bruce Mactavish	1	2	22	2008	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	West End of Quidi Vidi Lake	1000		Nf.Birds, Data Entry by WD	mstr1028117
Histrionicus histrionicus	Harlequin Duck	Anatidae	0	1	11	9	1990	S3B, S2N,SUM	S3B,S2N	N3N4	G4T4	Secure	Special Concern	Vulnerable	Special Concern	0	Middle Cove	0		The Osprey	mstr1006343
Histrionicus histrionicus	Harlequin Duck	Anatidae	0	1	11	10	1990	S3B, S2N,SUM	S3B,S2N	N3N4	G4T4	Secure	Special Concern	Vulnerable	Special Concern	0	Middle Cove	0		Montevecchi list	mstr1006344
Histrionicus histrionicus	Harlequin Duck	Anatidae	Howard Clase	1	9	28	1998	S3B, S2N,SUM	S3B,S2N	N3N4	G4T4	Secure	Special Concern	Vulnerable	Special Concern	0	Middle Cove	0		NF RBA	mstr1006345
Histrionicus histrionicus	Harlequin Duck	Anatidae	Ken Knowles	1	12	16	1998	S3B, S2N,SUM	S3B,S2N	N3N4	G4T4	Secure	Special Concern	Vulnerable	Special Concern	0	Middle Cove	0		NF RBA	mstr1006346
Histrionicus histrionicus	Harlequin Duck	Anatidae	0	1	11	27	1977	S3B, S2N,SUM	S3B,S2N	N3N4	G4T4	Secure	Special Concern	Vulnerable	Special Concern	0	St John's Narrows	0		Montevecchi list	mstr1005033
Histrionicus histrionicus	Harlequin Duck	Anatidae	0	1	11	27	1988	S3B, S2N,SUM	S3B,S2N	N3N4	G4T4	Secure	Special Concern	Vulnerable	Special Concern	0	St John's Narrows; Chain Rock	0		The Osprey	mstr1005034
Histrionicus histrionicus	Harlequin Duck	Anatidae	0	1	5	21	1988	S3B, S2N,SUM	S3B,S2N	N3N4	G4T4	Secure	Special Concern	Vulnerable	Special Concern	0	Cape Spear QV Lake	0		The Osprey	mstr1006208
Histrionicus histrionicus	Harlequin Duck	Anatidae	0	1	11	29	1995	S3B, S2N,SUM	S3B,S2N	N3N4	G4T4	Secure	Special Concern	Vulnerable	Special Concern	0	Outer Cove	0		Montevecchi list	mstr1006316
Histrionicus histrionicus	Harlequin Duck	Anatidae	Kem Knowles	1	3	18	2005	S3B, S2N,SUM	S3B,S2N	N3N4	G4T4	Secure	Special Concern	Vulnerable	Special Concern	0	Outer Cove	0		NF.Birds	mstr1006317
Histrionicus histrionicus	Harlequin Duck	Anatidae	Ken Knowles	1	9	28	1998	S3B, S2N,SUM	S3B,S2N	N3N4	G4T4	Secure	Special Concern	Vulnerable	Special Concern	0	Middle Cove	0		Nf.Birds, Data Entry by WD	mstr1028538
Histrionicus histrionicus	Harlequin Duck	Anatidae	Todd Boland	1	10	5	1998	S3B, S2N,SUM	S3B,S2N	N3N4	G4T4	Secure	Special Concern	Vulnerable	Special Concern	0	Middle Cove	0		Nf.Birds, Data Entry by WD	mstr1028539
Histrionicus histrionicus	Harlequin Duck	Anatidae	Todd Boland	3	12	15	1998	S3B, S2N,SUM	S3B,S2N	N3N4	G4T4	Secure	Special Concern	Vulnerable	Special Concern	0	Middle Cove	0		Nf.Birds, Data Entry by WD	mstr1028541
Histrionicus histrionicus	Harlequin Duck	Anatidae	Ken Knowles	3	12	16	1998	S3B, S2N,SUM	S3B,S2N	N3N4	G4T4	Secure	Special Concern	Vulnerable	Special Concern	0	Middle Cove Beach	0		Nf.Birds, Data Entry by WD	mstr1028572
Pagophila eburnea	Ivory Gull	Laridae	Hugh Whitney	1	1	0	2007	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	0	100		Dr. Hugh Whitney, NL Dep	mstr1020871
Pagophila eburnea	Ivory Gull	Laridae	0	1	3	24	2002	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Middle Cove	100		NF.Birds	mstr1006569
Pagophila eburnea	Ivory Gull	Laridae	0	1	3	19	2002	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Middle Cove	0		NF.Birds	mstr1006706
Pagophila eburnea	Ivory Gull	Laridae	0	1	3	19	2002	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Middle Cove	100		NF.Birds	mstr1006568
Pagophila eburnea	Ivory Gull	Laridae	0	1	1	16	1998	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Quidi Vidi;	1000		NF.Birds	mstr1006590
Pagophila eburnea	Ivory Gull	Laridae	0	1	1	15	1998	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	f Virginia River; Quidi Vidi Lake; St	1000		NF.Birds	mstr1006591
Pagophila eburnea	Ivory Gull	Laridae	0	1	1	12	1998	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Quidi Vidi ;	1000		NF.Birds	mstr1006592
Pagophila eburnea	Ivory Gull	Laridae	0	1	1	0	1998	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Quidi Vidi Gut	1000		NF.Birds	mstr1006593
Pagophila eburnea	Ivory Gull	Laridae	0	1	2	2	2002	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Quidi Vidi Gut;	1000		NF.Birds	mstr1006594
Pagophila eburnea	Ivory Gull	Laridae	0	1	2	5	2002	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Quidi Vidi Gut;	1000		NF.Birds	mstr1006595
Pagophila eburnea	Ivory Gull	Laridae	0	1	2	5	2002	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Quidi Vidi Gut;	1000		NF.Birds	mstr1006596
Pagophila eburnea	Ivory Gull	Laridae	0	1	1	0	1998	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Quidi Vidi Lake	1000		NF.Birds	mstr1006597
Pagophila eburnea	Ivory Gull	Laridae	0	1	1	12	1998	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Quidi Vidi Lake; St. John's	1000		NF.Birds	mstr1006598
Pagophila eburnea	Ivory Gull	Laridae	0	1	1	30	1998	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Quidi Vidi Lake; St. John's	1000		NF.Birds	mstr1006599
Pagophila eburnea	Ivory Gull	Laridae	Bruce Mactavish	1	1	30	1998	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	East End of Quidi Vidi Lake	1000		Nf.Birds, Data Entry by WD	mstr1028061
Pagophila eburnea	Ivory Gull	Laridae	Kenneth Knowles	-99	1	16	1998	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Quidi Vidi Lake at Chicken Proces	0		Nf.Birds, Data Entry by WD	mstr1028186
Pagophila eburnea	Ivory Gull	Laridae	Ken Knowles	1	3	19	2002	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Middle Cove	0		Nf.Birds, Data Entry by WD	mstr1028549
Pagophila eburnea	Ivory Gull	Laridae	Todd Boland	2	2	7	2002	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Near Quidi Vidi Brewery	0		Nf.Birds, Data Entry by WD	mstr1028148
Pagophila eburnea	Ivory Gull	Laridae	Bruce Mactavish	2	2	1	2002	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Quidi Vidi Gut	1000		Nf.Birds, Data Entry by WD	mstr1027889
Pagophila eburnea	Ivory Gull	Laridae	Howard Clase	1	1	12	1998	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Quidi Vidi Gut	1000		Nf.Birds, Data Entry by WD	mstr1027892
Pagophila eburnea	Ivory Gull	Laridae	Bruce Mactavish	2	2	5	2002	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Quidi Vidi Gut	1000		Nf.Birds, Data Entry by WD	mstr1028082
Pagophila eburnea	Ivory Gull	Laridae	Bruce Mactavish	2	2	9	2002	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Quidi Vidi Gut	1000		Nf.Birds, Data Entry by WD	mstr1028084
Pagophila eburnea	Ivory Gull	Laridae	Paul Linegar	1	1	20	2007	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Quidi Vidi Lake	0		Nf.Birds, Data Entry by WD	mstr1028110
Pagophila eburnea	Ivory Gull	Laridae	Bruce Mactavish	1	1	13	2009	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Quidi Vidi Lake	0		Nf.Birds, Data Entry by WD	mstr1028130
Pagophila eburnea	Ivory Gull	Laridae	Todd Boland	1	2	1	1998	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Quidi Vidi Lake/St. John's Harbour	0		Nf.Birds, Data Entry by WD	mstr1028062
Pagophila eburnea	Ivory Gull	Laridae	Bill Montevecchi	1	1	15	1998	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Virginia River at Quidi Vidi Lake	0		Nf.Birds, Data Entry by WD	mstr1028217
Pagophila eburnea	Ivory Gull	Laridae	Gene Herzberg	1	1	28	2007	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Virginia River Outlet	0		Nf.Birds, Data Entry by WD	mstr1028220
Pagophila eburnea	Ivory Gull	Laridae	Paul Linegar	1	2	1	2007	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Virginia River Outlet	0		Nf.Birds, Data Entry by WD	mstr1028221
Pagophila eburnea	Ivory Gull	Laridae	Ken Knowles	1	12	9	2016	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	0	1000		Nf.birds, December 9, 2016	MSTR1051374
Tringa flavipes	Lesser Yellowlegs	Scolopacida	Ed Hayden	2	8	11	2017	S3M	S3N	N5B	G5	Secure	0	0	0	0	0	1000		nf.birds, August 11, 2017	MSTR1053310
Tringa flavipes	Lesser Yellowlegs	Scolopacida	Gene Herzberg	1	8	25	2016	S3M	S3N	N5B	G5	Secure	0	0	0	0	0	1000		nf.birds, August 25, 2016	MSTR1053347
Tringa flavipes	Lesser Yellowlegs	Scolopacida	Gene Herzberg	2	9	17	2016	S3M	S3N	N5B	G5	Secure	0	0	0	0	0	1000		nf.birds, September 17, 20	MSTR1053358
Tringa flavipes	Lesser Yellowlegs	Scolopacida	Ed Hayden, Chris	1	4	25	2018	S3M	S3N	N5B	G5	Secure	0	0	0	0	0	1000		nf.birds, Apr 25, 2018	MSTR1053361
Tringa flavipes	Lesser Yellowlegs	Scolopacida	Alvan Buckley	2	4	25	2018	S3M	S3N	N5B	G5	Secure	0	0	0	0	0	1000		nf.birds, Apr 25, 2018	MSTR1053362
Tringa flavipes	Lesser Yellowlegs	Scolopacida	Bruce Mactavish	1	4	25	2018	S3M	S3N	N5B	G5	Secure	0	0	0	0	0	1000		nf.birds, Apr 25, 2018	MSTR1053363
Tringa flavipes	Lesser Yellowlegs	Scolopacida	Shawn Fitzpatrick	1	5	9	2018	S3M	S3N	N5B	G5	Secure	0	0	0	0	0	1000		nf.birds, May 9, 2018	MSTR1053365
Tringa flavipes	Lesser Yellowlegs	Scolopacida	Gene Herzberg	1	9	9	2018	S3M	S3N	N5B	G5	Secure	0	0	0	0	0	1000		nf.birds, Sept 9, 2018	MSTR1053389
Tringa flavipes	Lesser Yellowlegs	Scolopacida	Gene Herzberg	5	9	21	2018	S3M	S3N	N5B	G5	Secure	0	0	0	0	0	1000		nf.birds, Sept 21, 2018	MSTR1053391
Anas platyrhynchos	Mallard	Anatidae	iNaturalist user: le	0	12	25	2012	S3B,SUM	S3B	N5B,N5N	G5	Secure	0	0	0	0	0	0		iNaturalist record export 20	MSTR1052472
Anas platyrhynchos	Mallard	Anatidae	iNaturalist user: s	0	11	19	2017	S3B,SUM	S3B	N5B,N5N	G5	Secure	0	0	0	0	0	367		iNaturalist record export 20	MSTR1052480
Anas platyrhynchos	Mallard	Anatidae	iNaturalist user: g	0	7	18	2017	S3B,SUM	S3B	N5B,N5N	G5	Secure	0	0	0	0	0	4		iNaturalist record export 20	MSTR1052481
Anas platyrhynchos	Mallard	Anatidae	iNaturalist user: t	0	12	23	2017	S3B,SUM	S3B	N5B,N5N	G5	Secure	0	0	0	0	0	122		iNaturalist record export 20	MSTR1052483
Xanthoria parietina	Maritime Sunburst Liche	Teloschista	iNaturalist user: jp	0	10	21	2017	S1S3	SNR	NNR	G3G5	Secure	0	0	0	0	Division No. 1, CA-NF, CA	8		iNaturalist record export 20	MSTR1052491
Enallagma civile	Northern Bluet	Coenagrioni	Larson D.J.	0	8	26	1980	S2	S3S4	N5	G5	Jndetermine	0	0	0	0	estern Island Pond, Indian Meal Li	0		2DDragonflydata.xls	mstr1034971
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish	1	12	16	2007	S3	S3B	N5	G5	Secure	0	0	0	0	Bally Hall Golf Course	0		Nf.Birds, Data Entry by WD	mstr1028231
Accipiter gentilis	Northern Goshawk	Accipitridae	Doug Phelan	-99	1	13	2003	S3	S3B	N5	G5	Secure	0	0	0	0	Hally Golf Gourse - 100 Logy Bay	0		Nf.Birds, Data Entry by WD	mstr1028189
Accipiter gentilis	Northern Goshawk	Accipitridae	John Wells	1	10	11	2002	S3	S3B	N5	G5	Secure	0	0	0	0	Cuckold's Cove Trail, Signal Hill	0		Nf.Birds, Data Entry by WD	mstr1027954
Accipiter gentilis	Northern Goshawk	Accipitridae	Jared Clarke	1	3	21	2003	S3	S3B	N5	G5	Secure	0	0	0	0	Cuckold's Cove Trail, Signal Hill	0		Nf.Birds, Data Entry by WD	mstr1027955
Accipiter gentilis	Northern Goshawk	Accipitridae	Todd Boland	4	1	24	1998	S3	S3B	N5	G5	Secure	0	0	0	Dump	Dump	0		Nf.Birds, Data Entry by WD	mstr1028263
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish	2	2	13	1999	S3	S3B	N5	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028266
Accipiter gentilis	Northern Goshawk	Accipitridae	Todd Boland	1	3	28	1999	S3	S3B	N5	G5	Secure	0	0	0	Dump	Dump	0		Nf.Birds, Data Entry by WD	mstr1028267
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish	1	12	6	1999	S3	S3B	N5	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028268
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish	3	1	18	2000	S3	S3B	N5	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028269
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish	1	2	6	2000	S3	S3B	N5	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028270
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish	1	3	12	2002	S3	S3B	N5	G5	Secure	0	0	0	Dump	Dump	0		Nf.Birds, Data Entry by WD	mstr1028275

GNAME	GCOMNAME	FAMILY	Observer	TotalNumber	Month	Day	Year	SRANK_2015	SRANK_2	NRANK	GRANK	GeneralStat	COSEWIC_ST	PROVINCIAL	SARA	DESCR_HABIT	SITE_NAME	Accuracy	SYNAME	CITATION	IDNUM
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish	1	3	24	2002	S3	S3B	N5	G5	Secure	0	0	0	Dump	Dump	0		Nf.Birds, Data Entry by WD	mstr1028277
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish	1	11	5	2002	S3	S3B	N5	G5	Secure	0	0	0	Dump	Dump	0		Nf.Birds, Data Entry by WD	mstr1028281
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish ,	2	1	2	2003	S3	S3B	N5	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028282
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish	-99	1	1	2004	S3	S3B	N5	G5	Secure	0	0	0	Dump	Dump	0		Nf.Birds, Data Entry by WD	mstr1028285
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish	1	2	29	2004	S3	S3B	N5	G5	Secure	0	0	0	Dump	Dump	0		Nf.Birds, Data Entry by WD	mstr1028287
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish	1	1	9	2005	S3	S3B	N5	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028289
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish	1	2	20	2005	S3	S3B	N5	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028292
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish	1	2	27	2005	S3	S3B	N5	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028295
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish	1	3	6	2005	S3	S3B	N5	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028297
Accipiter gentilis	Northern Goshawk	Accipitridae	Jared Clarke	2	1	1	2006	S3	S3B	N5	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028304
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish	1	3	5	2006	S3	S3B	N5	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028311
Accipiter gentilis	Northern Goshawk	Accipitridae	Jared Clarke	1	12	10	2006	S3	S3B	N5	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028315
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish ,	1	2	25	2007	S3	S3B	N5	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028318
Accipiter gentilis	Northern Goshawk	Accipitridae	Jared Clarke	1	11	25	2007	S3	S3B	N5	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028323
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish	3	1	2	2008	S3	S3B	N5	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028326
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish ,	3	1	6	2008	S3	S3B	N5	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028328
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish	1	2	25	2008	S3	S3B	N5	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028331
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish	2	1	1	2009	S3	S3B	N5	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028333
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish	1	3	8	2009	S3	S3B	N5	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028334
Accipiter gentilis	Northern Goshawk	Accipitridae	Judith Blakeley	1	2	12	2002	S3	S3B	N5	G5	Secure	0	0	0	0	Indian Meal Line, Torbay	0		Nf.Birds, Data Entry by WD	mstr1028533
Accipiter gentilis	Northern Goshawk	Accipitridae	Todd Boland	1	3	20	2002	S3	S3B	N5	G5	Secure	0	0	0	0	King's Bridge Road	0		Nf.Birds, Data Entry by WD	mstr1027948
Accipiter gentilis	Northern Goshawk	Accipitridae	Howard Clase	1	5	16	2003	S3	S3B	N5	G5	Secure	0	0	0	0	Long Pond	100		Nf.Birds, Data Entry by WD	mstr1028814
Accipiter gentilis	Northern Goshawk	Accipitridae	Anne Hughes	1	7	15	2004	S3	S3B	N5	G5	Secure	0	0	0	0	Long Pond	100		Nf.Birds, Data Entry by WD	mstr1028010
Accipiter gentilis	Northern Goshawk	Accipitridae	Todd Boland	1	4	13	2008	S3	S3B	N5	G5	Secure	0	0	0	0	Long Pond	100		Nf.Birds, Data Entry by WD	mstr1028024
Accipiter gentilis	Northern Goshawk	Accipitridae	Anne Hughes	1	5	24	2008	S3	S3B	N5	G5	Secure	0	0	0	0	Long Pond	100		Nf.Birds, Data Entry by WD	mstr1028026
Accipiter gentilis	Northern Goshawk	Accipitridae	Brendan Kelly	1	6	21	2011	S3	S3B	N5	G5	Secure	0	0	0	0	Long Pond	100		Nf.Birds, Data Entry by WD	mstr1028041
Accipiter gentilis	Northern Goshawk	Accipitridae	Michael Parmente	1	1	7	2012	S3	S3B	N5	G5	Secure	0	0	0	0	Long Pond	100		Nf.Birds, Data Entry by WD	mstr1028042
Accipiter gentilis	Northern Goshawk	Accipitridae	Ken Knowles	1	1	24	2004	S3	S3B	N5	G5	Secure	0	0	0	0	Marine Drive	0		Nf.Birds, Data Entry by WD	mstr1028357
Accipiter gentilis	Northern Goshawk	Accipitridae	Ken Knowles	1	1	12	2002	S3	S3B	N5	G5	Secure	0	0	0	0	Middle Cove	0		Nf.Birds, Data Entry by WD	mstr1028547
Accipiter gentilis	Northern Goshawk	Accipitridae	Ken Knowles	1	3	14	2004	S3	S3B	N5	G5	Secure	0	0	0	0	Middle Cove	0		Nf.Birds, Data Entry by WD	mstr1028551
Accipiter gentilis	Northern Goshawk	Accipitridae	Ken Knowles	1	6	28	2011	S3	S3B	N5	G5	Secure	0	0	0	0	Middle Cove	0		Nf.Birds, Data Entry by WD	mstr1028563
Accipiter gentilis	Northern Goshawk	Accipitridae	Jared Clarke	1	1	16	2003	S3	S3B	N5	G5	Secure	0	0	0	0	Newfoundland Drive	0		Nf.Birds, Data Entry by WD	mstr1028247
Accipiter gentilis	Northern Goshawk	Accipitridae	Anne Hughes	2	6	24	2004	S3	S3B	N5	G5	Secure	0	0	0	0	North Side of Long Pond	0		Nf.Birds, Data Entry by WD	mstr1028009
Accipiter gentilis	Northern Goshawk	Accipitridae	Anne Hughes	1	3	24	2008	S3	S3B	N5	G5	Secure	0	0	0	0	North Side of Long Pond	1000		Nf.Birds, Data Entry by WD	mstr1028823
Accipiter gentilis	Northern Goshawk	Accipitridae	Dirk Hilbers	1	4	15	2003	S3	S3B	N5	G5	Secure	0	0	0	0	Pippy Park	0		Nf.Birds, Data Entry by WD	mstr1028183
Accipiter gentilis	Northern Goshawk	Accipitridae	Chris Brown	1	1	10	2003	S3	S3B	N5	G5	Secure	0	0	0	0	Pleasantville	0		Nf.Birds, Data Entry by WD	mstr1028197
Accipiter gentilis	Northern Goshawk	Accipitridae	Martin Renner	1	2	15	2000	S3	S3B	N5	G5	Secure	0	0	0	0	Quidi Vidi	0		Nf.Birds, Data Entry by WD	mstr1028144
Accipiter gentilis	Northern Goshawk	Accipitridae	Dave Brown	1	1	5	2002	S3	S3B	N5	G5	Secure	0	0	0	0	Quidi Vidi	0		Nf.Birds, Data Entry by WD	mstr1028147
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish	2	11	10	2009	S3	S3B	N5	G5	Secure	0	0	0	0	Quidi Vidi	0		Nf.Birds, Data Entry by WD	mstr1028174
Accipiter gentilis	Northern Goshawk	Accipitridae	Jytte Selno	1	2	11	2002	S3	S3B	N5	G5	Secure	0	0	0	0	Quidi Vidi Gut	1000		Nf.Birds, Data Entry by WD	mstr1027890
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish	1	1	12	2003	S3	S3B	N5	G5	Secure	0	0	0	0	Quidi Vidi Gut	1000		Nf.Birds, Data Entry by WD	mstr1027891
Accipiter gentilis	Northern Goshawk	Accipitridae	Dave Brown	1	1	15	2000	S3	S3B	N5	G5	Secure	0	0	0	0	Quidi Vidi Lake	0		Nf.Birds, Data Entry by WD	mstr1028065
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish	1	12	31	2007	S3	S3B	N5	G5	Secure	0	0	0	0	Signal Hill	0		Nf.Birds, Data Entry by WD	mstr1027956
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish,	2	1	5	2008	S3	S3B	N5	G5	Secure	0	0	0	0	Signall Hill	0		Nf.Birds, Data Entry by WD	mstr1027901
Accipiter gentilis	Northern Goshawk	Accipitridae	Judith Blakeley	1	2	10	2002	S3	S3B	N5	G5	Secure	0	0	0	Feeder	Torbay - Indian Meal Line	0		Nf.Birds, Data Entry by WD	mstr1028532
Accipiter gentilis	Northern Goshawk	Accipitridae	Jared Clarke	1	6	1	2004	S3	S3B	N5	G5	Secure	0	0	0	0	West End of Long Pond	0		Nf.Birds, Data Entry by WD	mstr1028006
Accipiter gentilis	Northern Goshawk	Accipitridae	John Wells	2	1	6	2003	S3	S3B	N5	G5	Secure	0	0	0	0	ıen's Compensation Building, Fores	0		Nf.Birds, Data Entry by WD	mstr1027970
Accipiter gentilis	Northern Goshawk	Accipitridae	Todd Boland	1	11	12	2000	S3	S3B	N5	G5	Secure	0	0	0	0	0	1000		Nf.Birds, Data Entry by WD	mstr1030071
Circus cyaneus	Northern Harrier	Accipitridae	Jytte Selno	1	9	30	2001	S3B,SUM	S3?B	N4N,N5B	G5	Secure	0	0	0	0	Cuckhold Cove Trail	1000		Nf.Birds, Data Entry by WD	mstr1028925
Circus cyaneus	Northern Harrier	Accipitridae	Gene & Karen He	2	11	18	2006	S3B,SUM	S3?B	N4N,N5B	G5	Secure	0	0	0	0	Long Pond	100		Nf.Birds, Data Entry by WD	mstr1028817
Circus cyaneus	Northern Harrier	Accipitridae	Ken Knowles	1	4	21	2001	S3B,SUM	S3?B	N4N,N5B	G5	Secure	0	0	0	0	Middle Cove	0		Nf.Birds, Data Entry by WD	mstr1028546
Circus cyaneus	Northern Harrier	Accipitridae	Doug Phelan	1	1	30	2002	S3B,SUM	S3?B	N4N,N5B	G5	Secure	0	0	0	0	Middle Cove	0		Nf.Birds, Data Entry by WD	mstr1028548
Surnia ulula	Northern Hawk-Owl	Strigidae	Todd Boland	1	11	2	1998	S3	S3	N5	G5	Secure	0	0	0	0	Sticks Pond	0		Nf.Birds, Data Entry by WD	mstr1028447
Anas acuta	Northern Pintail	Anatidae	iNaturalist user: s	0	12	7	2017	S3B,SUM	S3B	N5B,N5N	G5	Secure	0	0	0	0	0	968		iNaturalist record export 20	MSTR1052637
Aegolius acadicus	Northern Saw-Whet Ow	Strigidae	Ken Knowles	1	4	5	2010	S3?	S1?	N5B,N5N	G5	Jndetermined	0	0	0	0	liddle Cove - Jones Pond North Sic	0		Nf.Birds, Data Entry by WD	mstr1028571
Contopus cooperi	Olive-sided Flycatcher	Tyrannidae	Ken Knowles	1	6	12	2005	S3B,SUM	S3S4B	N5B	G4	At risk	Special Concern	Threatened	Threatened	0	rth side of Jones Pond in Middle Co	100		NF.Birds	mstr1006783
Contopus cooperi	Olive-sided Flycatcher	Tyrannidae	Ken Knowles	1	6	14	2004	S3B,SUM	S3S4B	N5B	G4	At risk	Special Concern	Threatened	Threatened	0	orth side of Jones Pond; Middle Co	100		NF.Birds	mstr1006785
Colias eurytheme	Orange Sulphur	Pieridae	Ross	0	0	0	0	S3	S3B	N5	G5	Secure	0	0	0	0	St. Johns	0		Ross Newfoundland Data.x	mstr1040895
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Todd Boland	1	3	9	2002	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	River outflow	Rennies River Outflow	10		NF.Birds	mstr1006817
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Dave Brown	1	12	11	2007	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	urban lake	0	100		Canadian Wildlife Service	mstr1009469
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Paul Lingear	1	10	2	2001	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	0	St. John's	10000		The Osprey	mstr1007003
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Vars. Obs.	1	0	0	2001	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	0	St. John's	10000		The Osprey	mstr1007005
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Jytte Selno	1	3	2	2003	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	0	St. John's	10000		NF.Birds	mstr1007007
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Bruce Mactavish	1	1	12	2003	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	0	St. John's	10000		The Osprey	mstr1007008
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Vars. Obs.	1	12	26	2003	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	0	St. John's	10000		The Osprey	mstr1007010
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Jared Clarke	1	1	26	2008	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	urban lake	0	1000		Canadian Wildlife Service	mstr1009471
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Dave Brown	1	1	5	2002	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	0	Quidi Vidi Lake	100		NF.Birds	mstr1006863
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Doug Phelan	1	1	7	2002	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	0	Quidi Vidi Lake	100		NF.Birds	mstr1006896
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Dwayne Sabine	1	1	13	2004	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	0	Virginia River Trail	1000		Canadian Wildlife Service	mstr1006979
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Bruce Mactavish	1	3	10	2007	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	freshwater lake	0	1000		Canadian Wildlife Service	mstr1009239

GNAME	GCOMNAME	FAMILY	Observer	TotalNumber	Month	Day	Year	SRANK_2015	SRANK_2	NRANK	GRANK	GeneralStat	COSEWIC_ST	PROVINCIAL	SARA	DESCR_HABIT	SITE_NAME	Accuracy	SYNAME	CITATION	IDNUM
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Bruce Mactavish	1	3	8	2007	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	freshwater lake	0	1000		Canadian Wildlife Service	mstr1009240
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Bruce Mactavish	1	1	22	2007	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	freshwater lake	0	1000		Canadian Wildlife Service	mstr1009242
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Bruce Mactavish	1	1	14	2007	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	freshwater lake	0	1000		Canadian Wildlife Service	mstr1009244
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Jared Clarke	1	11	25	2007	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	municpal dump	0	1000		Canadian Wildlife Service	mstr1009466
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	John Wells	2	3	11	2007	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	municipal landfil	0	100		Canadian Wildlife Service	mstr1009238
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Jared Clarke	1	2	25	2007	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	municipal landfil	0	100		Canadian Wildlife Service	mstr1009241
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Peter Thomas	1	9	20	2006	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	0	Sugarloaf Head; St. John's	10		Canadian Wildlife Service	mstr1006815
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Bruce Mactavish	1	3	4	2011	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	west end of Quic	Quidi Vidi Lake, West End	10		Bruce Mactavish, NF.birds,	mstr1021740
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Ed Hayden	1	3	19	2016	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	0	h Cove (Fr. Troy's Trail south of Fla	1000		NF.Birds, March 20, 2016	MSTR1050880
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Frank King	1	3	26	2016	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	0	h Cove (Fr. Troy's Trail south of Fla	1000		NF.Birds, March 28, 2016	MSTR1050883
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Ed Hayden	2	4	24	2016	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	0	h Cove (Fr. Troy's Trail south of Fla	1000		NF.Birds, April 24, 2016	MSTR1050893
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Frank King	1	12	12	2016	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	0	0	1000		Nf.birds, December 12, 201	MSTR1051372
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Chris Brown	1	1	7	2017	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	0	0	1000		Nf.birds, January 7, 2017	MSTR1051387
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Lancy Cheng	1	9	29	2017	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	0	0	1000		nf.birds, sept 29, 2017	MSTR1053263
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Chris Brown	1	1	25	2018	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	0	0	1000		nf.birds, jan 25, 2018	MSTR1053287
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Shawn Inikon	1	2	10	2018	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	0	0	10000		nf.birds, feb 10, 2018	MSTR1053295
Ursus maritimus	Polar Bear	Ursidae	Ian Stirling	1	5	9	1993	SNA	SNA	N3N4	G3G4	Sensitive	Special Concern	Vulnerable	Special Concern	0	0	0		DFO	mstr1033422
Loxia curvirostra	Red Crossbill	Fringillidae	R. Blacquiere	1	5	3	1977	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	boreal forest	Old Bauline Line near Torbay	10000		Nest Record Card	mstr1007488
Loxia curvirostra	Red Crossbill	Fringillidae	0	1	5	5	1967	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	urban forest	Kents Pond; St. John's	1000		Nest Record Card	mstr1007457
Loxia curvirostra	Red Crossbill	Fringillidae	0	1	8	13	2004	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	0	East End; St. John's	100		NF.Birds	mstr1007438
Loxia curvirostra	Red Crossbill	Fringillidae	Charlie Butler	0	5	6	2012	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	at feeder	Torbay	100		Email communication, Char	mstr1030927
Loxia curvirostra	Red Crossbill	Fringillidae	Dave Brown	2	3	30	2000	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	0	45 Smithville Crescent	0		Nf.Birds, Data Entry by WD	mstr1027985
Loxia curvirostra	Red Crossbill	Fringillidae	Jared Clarke	1	5	25	2003	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	0	Cape Spear - Lundrigan's Marsh	0		Nf.Birds, Data Entry by WD	mstr1028341
Loxia curvirostra	Red Crossbill	Fringillidae	Judith Blakeley	24	12	26	2007	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	0	Convent Road, Torbay	0		Nf.Birds, Data Entry by WD	mstr1028573
Loxia curvirostra	Red Crossbill	Fringillidae	Libby Creelman	-99	8	13	2004	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	0	East End	0		Nf.Birds, Data Entry by WD	mstr1028240
Loxia curvirostra	Red Crossbill	Fringillidae	Paul Linegar	-99	11	19	2006	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	0	Long Pond	100		Nf.Birds, Data Entry by WD	mstr1028020
Loxia curvirostra	Red Crossbill	Fringillidae	Todd Boland	10	4	7	2007	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	0	Long Pond	100		Nf.Birds, Data Entry by WD	mstr1028818
Loxia curvirostra	Red Crossbill	Fringillidae	Michael Parmente	1	4	13	2007	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	0	Long Pond	100		Nf.Birds, Data Entry by WD	mstr1028819
Loxia curvirostra	Red Crossbill	Fringillidae	Clyde Thornhill	-99	4	22	2007	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	In larch trees	Long Pond	100		Nf.Birds, Data Entry by WD	mstr1028820
Loxia curvirostra	Red Crossbill	Fringillidae	Anne Hughes	5	1	22	2009	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	In larch trees	Long Pond	100		Nf.Birds, Data Entry by WD	mstr1028029
Loxia curvirostra	Red Crossbill	Fringillidae	Ken Knowles	1	5	14	2009	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	0	Middle Cove	0		Nf.Birds, Data Entry by WD	mstr1028552
Loxia curvirostra	Red Crossbill	Fringillidae	Ken Knowles	-99	6	18	2009	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	0	Middle Cove	0		Nf.Birds, Data Entry by WD	mstr1028553
Loxia curvirostra	Red Crossbill	Fringillidae	Ken Knowles	2	6	25	2011	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	0	Middle Cove	0		Nf.Birds, Data Entry by WD	mstr1028561
Loxia curvirostra	Red Crossbill	Fringillidae	Ken Knowles	2	6	28	2011	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	0	Middle Cove	0		Nf.Birds, Data Entry by WD	mstr1028564
Loxia curvirostra	Red Crossbill	Fringillidae	Ken Knowles	1	7	11	2011	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	0	Middle Cove	0		Nf.Birds, Data Entry by WD	mstr1028566
Loxia curvirostra	Red Crossbill	Fringillidae	Ken Knowles	7	1	4	2009	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	0	Middle Cove Road	0		Nf.Birds, Data Entry by WD	mstr1028535
Loxia curvirostra	Red Crossbill	Fringillidae	Ken Knowles	7	2	7	2009	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	0	Middle Cove Road	0		Nf.Birds, Data Entry by WD	mstr1028536
Loxia curvirostra	Red Crossbill	Fringillidae	Paul Linegar	10	2	27	2008	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	In larch trees	Quidi Vidi	0		Nf.Birds, Data Entry by WD	mstr1028154
Loxia curvirostra	Red Crossbill	Fringillidae	Dave Fifield	1	3	19	2000	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	0	Sycamore Place	0		Nf.Birds, Data Entry by WD	mstr1027966
Loxia curvirostra	Red Crossbill	Fringillidae	Judith Blakeley	3	1	25	2009	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	0	Torbay	0		Nf.Birds, Data Entry by WD	mstr1028577
Loxia curvirostra	Red Crossbill	Fringillidae	Judith Blakeley	-99	4	25	2009	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	0	Torbay	0		Nf.Birds, Data Entry by WD	mstr1028579
Loxia curvirostra	Red Crossbill	Fringillidae	Judith Blakeley	10	5	13	2009	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	0	Torbay	0		Nf.Birds, Data Entry by WD	mstr1028580
Loxia curvirostra	Red Crossbill	Fringillidae	Judith Blakeley	2	4	14	2012	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	0	Torbay	0		Nf.Birds, Data Entry by WD	mstr1028582
Buteo lagopus	Rough-Legged Hawk	Accipitridae	Bruce Mactavish	1	3	24	2002	S2S3	S3B	N5B,N5N	G5	Secure	0	0	0	0	Dump	1000		Nf.Birds, Data Entry by WD	mstr1027796
Buteo lagopus	Rough-Legged Hawk	Accipitridae	Bruce Mactavish	1	1	11	2004	S2S3	S3B	N5B,N5N	G5	Secure	0	0	0	0	Dump	1000		Nf.Birds, Data Entry by WD	mstr1027801
Buteo lagopus	Rough-Legged Hawk	Accipitridae	Bruce Mactavish	1	3	6	2005	S2S3	S3B	N5B,N5N	G5	Secure	0	0	0	0	Dump	1000		Nf.Birds, Data Entry by WD	mstr1027807
Buteo lagopus	Rough-Legged Hawk	Accipitridae	Jared Clarke	1	1	1	2006	S2S3	S3B	N5B,N5N	G5	Secure	0	0	0	0	Dump	1000		Nf.Birds, Data Entry by WD	mstr1027808
Buteo lagopus	Rough-Legged Hawk	Accipitridae	Jared Clarke	1	2	5	2006	S2S3	S3B	N5B,N5N	G5	Secure	0	0	0	0	Dump	1000		Nf.Birds, Data Entry by WD	mstr1027809
Buteo lagopus	Rough-Legged Hawk	Accipitridae	Bruce Mactavish ,	1	1	11	2009	S2S3	S3B	N5B,N5N	G5	Secure	0	0	0	0	Dump	1000		Nf.Birds, Data Entry by WD	mstr1027820
Buteo lagopus	Rough-Legged Hawk	Accipitridae	John Wells	1	1	23	2011	S2S3	S3B	N5B,N5N	G5	Secure	0	0	0	0	Quidi Vidi Lake	0		Nf.Birds, Data Entry by WD	mstr1028137
Buteo lagopus	Rough-Legged Hawk	Accipitridae	Jytte Selno	1	4	18	2001	S2S3	S3B	N5B,N5N	G5	Secure	0	0	0	0	Signal Hill Road	0		Nf.Birds, Data Entry by WD	mstr1027925
Buteo lagopus	Rough-Legged Hawk	Accipitridae	Howard Clase	1	3	8	2005	S2S3	S3B	N5B,N5N	G5	Secure	0	0	0	0	Torbay Road	0		Nf.Birds, Data Entry by WD	mstr1028254
Buteo lagopus	Rough-Legged Hawk	Accipitridae	Bill Tucker	1	3	1	2003	S2S3	S3B	N5B,N5N	G5	Secure	0	0	0	0	Tracey Place	0		Nf.Birds, Data Entry by WD	mstr1028233
Euphagus carolinus	Rusty Blackbird	Icteridae	Brian Dalzell	1	3	18	2000	S2S3B,SUM	S3B	N4B	G4	Secure	Special Concern	Vulnerable	Special Concern	0	St. John's; Fox Avenue	100		NatureNB	mstr1007567
Euphagus carolinus	Rusty Blackbird	Icteridae	Ken Knowles	1	6	12	2000	S2S3B,SUM	S3B	N4B	G4	Secure	Special Concern	Vulnerable	Special Concern	0	Middle Cove	100		NF.Birds	mstr1007573
Euphagus carolinus	Rusty Blackbird	Icteridae	Jared Clarke	1	4	27	2003	S2S3B,SUM	S3B	N4B	G4	Secure	Special Concern	Vulnerable	Special Concern	0	Lundrigan's Marsh	100		NF.Birds	mstr1007570
Euphagus carolinus	Rusty Blackbird	Icteridae	Ken Knowles	1	5	19	2002	S2S3B,SUM	S3B	N4B	G4	Secure	Special Concern	Vulnerable	Special Concern	0	Lundrigan's Marsh	100		NF.Birds	mstr1007572
Euphagus carolinus	Rusty Blackbird	Icteridae	Ken Knowles	1	6	12	2000	S2S3B,SUM	S3B	N4B	G4	Secure	Special Concern	Vulnerable	Special Concern	0	Jones Pond	1000		Nf.Birds, Data Entry by WD	mstr1028568
Euphagus carolinus	Rusty Blackbird	Icteridae	Marion Gregory	1	3	18	2000	S2S3B,SUM	S3B	N4B	G4	Secure	Special Concern	Vulnerable	Special Concern	0	Fox Avenue	0		Nf.Birds, Data Entry by WD	mstr1028213
Euphagus carolinus	Rusty Blackbird	Icteridae	Ken Knowles	1	6	12	2000	S2S3B,SUM	S3B	N4B	G4	Secure	Special Concern	Vulnerable	Special Concern	0	Kenny's Pond	0		Nf.Birds, Data Entry by WD	mstr1028209
Euphagus carolinus	Rusty Blackbird	Icteridae	John Wells	1	5	17	2000	S2S3B,SUM	S3B	N4B	G4	Secure	Special Concern	Vulnerable	Special Concern	0	Long Pond	100		Nf.Birds, Data Entry by WD	mstr1027992
Euphagus carolinus	Rusty Blackbird	Icteridae	Ken Knowles	1	5	19	2002	S2S3B,SUM	S3B	N4B	G4	Secure	Special Concern	Vulnerable	Special Concern	0	Lundrigan's Marsh	0		Nf.Birds, Data Entry by WD	mstr1028339
Euphagus carolinus	Rusty Blackbird	Icteridae	Jared Clarke	1	4	27	2003	S2S3B,SUM	S3B	N4B	G4	Secure	Special Concern	Vulnerable	Special Concern	0	Lundrigan's Marsh	0		Nf.Birds, Data Entry by WD	mstr1028340
Asio flammeus	Short-eared Owl	Strigidae	Todd Boland	1	2	25	2004	S3B,SUM	S3B	N3N,N4B	G5	Secure	Special Concern	Vulnerable	Special Concern	urban	0	100		Canadian Wildlife Service	mstr1009227
Asio flammeus	Short-eared Owl	Strigidae	Todd Boland	1	4	6	1998	S3B,SUM	S3B	N3N,N4B	G5	Secure	Special Concern	Vulnerable	Special Concern	0	0	10000		Canadian Wildlife Service	mstr1009284
Asio flammeus	Short-eared Owl	Strigidae	John Wells	1	1	7	2008	S3B,SUM	S3B	N3N,N4B	G5	Secure	Special Concern	Vulnerable	Special Concern	scrub	0	100		Canadian Wildlife Service	mstr1009456
Asio flammeus	Short-eared Owl	Strigidae	Bruce Mactavish	1	12	6	2003	S3B,SUM	S3B	N3N,N4B	G5	Secure	Special Concern	Vulnerable	Special Concern	0	en Long Pond Road and Pine Bud A	0		Nf.Birds, Data Entry by WD	mstr1027943
Asio flammeus	Short-eared Owl	Strigidae	John Wells	1	1	7	2008	S3B,SUM	S3B	N3N,N4B	G5	Secure	Special Concern	Vulnerable	Special Concern	0	Near the Geo Centre	0		Nf.Birds, Data Entry by WD	mstr1027928
Asio flammeus	Short-eared Owl	Strigidae	Todd Bolan	1	4	6	1998	S3B,SUM	S3B	N3N,N4B	G5	Secure	Special Concern	Vulnerable	Special Concern	0	Torbay Road	0		Nf.Birds, Data Entry by WD	mstr1028252
Asio flammeus	Short-eared Owl	Strigidae	Chris Brown	1	5	28	2002	S3B,SUM	S3B	N3N,N4B	G5	Secure	Special Concern	Vulnerable	Special Concern	0	oad side of the Airport near the PA	0		Nf.Birds, Data Entry by WD	mstr1028256

GNAME	GCOMNAME	FAMILY	Observer	TotalNumber	Month	Day	Year	SRANK_2015	SRANK_2	NRANK	GRANK	GeneralStat	COSEWIC_ST	PROVINCIAL	SARA	DESCR_HABIT	SITE_NAME	Accuracy	SYNAME	CITATION	IDNUM
Asio flammeus	Short-eared Owl	Strigidae	iNaturalist user: h	0	7	10	2016	S3B,SUM	S3B	N3N,N4B	G5	Secure	Special Concern	Vulnerable	Special Concern	0	0	0		iNaturalist record export 20	MSTR1052848
Bubo scandiacus	Snowy Owl	Strigidae	golfman_otto@ya	1	12	5	2008	S3N,SUM	SNA	N5B,N5N	G5	Secure	0	0	0	0	115 Forest Road	0		Nf.Birds, Data Entry by WD	mstr1027971
Bubo scandiacus	Snowy Owl	Strigidae	Wayne Tucker	1	11	12	2001	S3N,SUM	SNA	N5B,N5N	G5	Secure	0	0	0	0	23 Oakridge Drive	0		Nf.Birds, Data Entry by WD	mstr1028258
Bubo scandiacus	Snowy Owl	Strigidae	John Pratt	1	11	11	2001	S3N,SUM	SNA	N5B,N5N	G5	Secure	0	0	0	0	Bally Hally Estates Area	0		Nf.Birds, Data Entry by WD	mstr1028199
Bubo scandiacus	Snowy Owl	Strigidae	golfman_otto@ya	1	2	21	2010	S3N,SUM	SNA	N5B,N5N	G5	Secure	0	0	0	0	Bally Hally Golf Course	0		Nf.Birds, Data Entry by WD	mstr1028192
Bubo scandiacus	Snowy Owl	Strigidae	Doug Phalen	1	11	26	2001	S3N,SUM	SNA	N5B,N5N	G5	Secure	0	0	0	0	of Newfoundland Drive & Logy Ba	0		Nf.Birds, Data Entry by WD	mstr1028232
Bubo scandiacus	Snowy Owl	Strigidae	Ken Knowles	1	3	22	2012	S3N,SUM	SNA	N5B,N5N	G5	Secure	0	0	0	0	Queen of Peace Church, Torbay I	0		Nf.Birds, Data Entry by WD	mstr1028255
Bubo scandiacus	Snowy Owl	Strigidae	Todd Boland	1	3	26	1999	S3N,SUM	SNA	N5B,N5N	G5	Secure	0	0	0	0	ove - White Hills Behind Fisheries	0		Nf.Birds, Data Entry by WD	mstr1028504
Bubo scandiacus	Snowy Owl	Strigidae	Cal King	1	5	12	2002	S3N,SUM	SNA	N5B,N5N	G5	Secure	0	0	0	0	oad side of the Airport near the PA	0		Nf.Birds, Data Entry by WD	mstr1028448
Bubo scandiacus	Snowy Owl	Strigidae	Chris Brown	1	5	28	2002	S3N,SUM	SNA	N5B,N5N	G5	Secure	0	0	0	0	oad side of the Airport near the PA	0		Nf.Birds, Data Entry by WD	mstr1028449
Bubo scandiacus	Snowy Owl	Strigidae	Jared Clarke	1	11	23	2001	S3N,SUM	SNA	N5B,N5N	G5	Secure	0	0	0	0	Window at Sobey's on Torbay Roa	0		Nf.Birds, Data Entry by WD	mstr1028198
Bubo scandiacus	Snowy Owl	Strigidae	Wayne Tucker	1	11	12	2001	S3N,SUM	SNA	N5B,N5N	G5	Secure	0	0	0	0	uth Face on Roof of 23 Oakridge D	0		Nf.Birds, Data Entry by WD	mstr1028259
Aythya fuligula	Tufted Duck	Anatidae	iNaturalist user: s	0	12	13	2017	S1N,SUM	SNA	NNA	G5	grant/ Accide	0	0	0	0	i Vidi Lake, St. John's, NL A1A, Ca	968		iNaturalist record export 20	MSTR1052200
Aythya fuligula	Tufted Duck	Anatidae	iNaturalist user: p	0	3	5	2008	S1N,SUM	SNA	NNA	G5	grant/ Accide	0	0	0	0	Quidi Vidi, St. John's, NL, Canada	0		iNaturalist record export 20	MSTR1052966
Aythya fuligula	Tufted Duck	Anatidae	iNaturalist user: u	0	10	9	2017	S1N,SUM	SNA	NNA	G5	grant/ Accide	0	0	0	0	Pond Walk, St. John's, NL A1A 0E4	3		iNaturalist record export 20	MSTR1052968
Aythya fuligula	Tufted Duck	Anatidae	iNaturalist user: s	0	11	17	2017	S1N,SUM	SNA	NNA	G5	grant/ Accide	0	0	0	0	i Vidi Lake, St. John's, NL A1A, Ca	968		iNaturalist record export 20	MSTR1052971
Aythya fuligula	Tufted Duck	Anatidae	iNaturalist user: s	0	11	21	2017	S1N,SUM	SNA	NNA	G5	grant/ Accide	0	0	0	0	i Vidi Lake, St. John's, NL A1A, Ca	968		iNaturalist record export 20	MSTR1052972
Aythya fuligula	Tufted Duck	Anatidae	iNaturalist user: s	0	12	8	2017	S1N,SUM	SNA	NNA	G5	grant/ Accide	0	0	0	0	nts Pond, St. John's, NL A1B, Cana	314		iNaturalist record export 20	MSTR1052974

GNAME	GCOMNAME	OBSERVER	MONTH	DAY	YEAR	SRANK_2005	SRANK_2010	SRANK_2015	NRANK	GRANK	FAMILY	PROV_END_A	COSEWIC	DESCR_HABIT/	ACCURACY_ME	SYNAME	SITE_NAME	SURVEYSITE	ACRONYMS_O	COLLECTION	SOURCES	IDNUM	EST_NF_ID
Sparganium fluctuans	floating burreed	Robinson, B.L. & H. Schre	0	0	0	S2	S2	S2S3	NNR	G5	Typhaceae	0	0	0	1000	Sparganium and	Virginia Waters	Virginia Waters	GH; CAN	200	Bouchard, A. Da	SP26251	750759
Fraxinus nigra	blach ash	Inkpen	0	0	0	S3	S3	S3	NNR	G5	Oleaceae	0	0	(cultivated?).	1000	0	St John's	St John's; Windsor La	NFLD	11	Bouchard, A. Da	SP24369	749513
Potamogeton amplifolius	broadleaf pondweed	Ayre, A.M.	0	0	1929	S2	S2	S2S3	NNR	G5	Potamogetonace	0	0	0	1000	0	Quidi Vidi	Quidi Vidi	NFLD	s.n.	Bouchard, A. Da	SP26202	750722
Juncus militaris	bayonet rush, jointed bog rush	Maunder, John E.	8	22	1967	S3	S3	S3	N4	G4	Juncaceae	0	0	Dry, grassy area	10	0	Rennies River	St. John's, Rennies R	NFM	0	Herbarium of the	SP43691	750396
Amelanchier fernaldii	Fernald's chuckleypear, St. Lawrence s	Maunder, John E.	6	6	1967	S1	S1	S1	NNR	G2G4Q	Rosaceae	0	Candidate (Priority 3)	Dry, open woods	1000	Amelanchier sar	Kent's Pond	St. John's, Kent's Por	NFM	0	Herbarium Data	SP22199	749723
Carex rostrata	beaked sedge	Maunder, John E.	9	20	1967	S?	S3S5	S3S4	NNR	G5	Cyperaceae	0	0	Side of pond, we	100	Carex rostrata va	Long Pond	St. John's, Long Ponc	NFM	0	Herbarium Data	SP22232	750220
Prunella vulgaris	common selfheal, heal all, healall, selfh	Maunder, John E.	7	0	1967	0	S3S4	S3S5	N5	G5	Lamiaceae	0	0	0	100	0	Kent's Pond	St. John's, Kent's Por	NFM	0	Herbarium Data	SP22125	749477
Sparganium natans	small burreed, least burreed	Peter J. Scott	8	8	1968	S3S4	S3S4	S3S4	NNR	G5	Typhaceae	0	0	In water, just the	100	Sparganium min	Penetanguishen	St. John's, end of Firc	NFLD	566	Jane Ayre Herba	SP21916	750761
Carex viridula subsp. brachyrrhyncha var. sa	rocky shore sedge	Olsen, O.A.	8	3	1973	S1	S1	S1	N1	G5T1	Cyperaceae	0	Candidate (Priority 3)	0	1000	Carex saxilittoral	Memorial Univer	St.John's, M.U.N. Ca	NFM	CW 028	Herbarium Data	SP42694	750260
Ribes hirtellum	swamp gooseberry, smooth gooseberry	Botanical Garden	0	0	1999	S?	S3S4	S3S4	NNR	G5	Grossulariaceae	0	0	Wetland/riparian	1000	Grossularia hirte	Juniper Ponds / I	St. Johns Outer Ring	0	0	MUN Botanical (	SP21765	749438
Persicaria amphibia	water smartweed	Botanical Garden	0	0	1999	S2	S2	S2	N5	G5T5	Polygonaceae	0	0	Bog habitat.	1000	Polygonum amp	Juniper Ponds / I	St. Johns Outer Ring	0	0	MUN Botanical (	SP21832	749560
Festuca rubra	red fescue	Claudia Hanel, Clase, H. a	6	22	2002	0	S5	S2S3	NNR	G5	Poaceae	0	0	Trailside; mesic	1000	Festuca rubra su	Gallows Cove ar	Avalon Peninsula, To	NFM	CH 020622-1	0	SP21497	750609
Poa pratensis	Kentucky bluegrass	Claudia Hanel, Clase, H. a	6	22	2002	0	S3	S3	N5	G5	Poaceae	0	0	Trailside; mesic	1000	Poa crocata; P. s	Gallows Cove ar	Avalon Peninsula, To	NFM	CH 020622-4	0	SP21500	750679
Eleocharis ovata	ovate spikerush	Ayre, A.M.	0	0	1.9E+07	S1	S1	S1	NNR	G5	Cyperaceae	0	0	Marsh.	1000	Scirpus ovatus; I	Quidi Vidi	Quidi Vidi.	GH; NFLD	s.n.	Bouchard, A. Da	SP25534	750313
Arabis alpina	alpine rockcress	Maunder, John E.	6	14	1968	S3	S3	S3	NNR	G5	Brassicaceae	0	0	0	50	Arabis alpina for	0	St. John's, in garden a	NFM	0	Herbarium Data	SP47657	749021
Fraxinus nigra	blach ash	Maunder, John E.	7	18	1967	S3	S3	S3	NNR	G5	Oleaceae	0	0	0	50	0	0	St. John's, Kenny's Pc	NFM	0	Herbarium Data	SP50050	749513
Aralia hispida	Bristly sarsaparilla	Maunder, John E.	9	20	1967	S?	S4S5	S3S4	NNR	G5	Araliaceae	0	0	0	50	0	0	St. John's, Torbay roa	NFM	0	Herbarium Data	SP49265	748713

GNAME	GCOMNAME	FAMILY	Observer	TotalNumber	Month	Day	Year	SRANK_2015	SRANK_2	NRANK	GRANK	GeneralStat	COSEWIC_ST	PROVINCIAL	SARA	DESCR_HABIT	SITE_NAME	Accuracy	SYNAME	CITATION	IDNUM
Falco sparverius	American Kestrel	Falconidae	golfman_otto_yah	1	11	21	2006	S2B,SUM	S2B	N5B	G5	Undetermined	ate (Group 3, Low	0	0	0	Bally Haly Golf Course	0		Nf.Birds, Data Entry by WD	mstr1028200
Falco sparverius	American Kestrel	Falconidae	Todd Boland	1	3	20	2002	S2B,SUM	S2B	N5B	G5	Undetermined	ate (Group 3, Low	0	0	0	Kings Bridge Road	0		Nf.Birds, Data Entry by WD	mstr1027947
Falco sparverius	American Kestrel	Falconidae	Bruce Mactavish	1	11	9	2002	S2B,SUM	S2B	N5B	G5	Undetermined	ate (Group 3, Low	0	0	0	Macdonald Drive School	0		Nf.Birds, Data Entry by WD	mstr1028216
Riparia riparia	Bank Swallow	Hirundinidae	unknown	1	5	7	2000	S1S2B,SUM	S3B	N5B	G5	Secure	Threatened	0	0	0	Kenny's Pond, St. John's	1000		The Status of Bank Swallow	mstr1047963
Riparia riparia	Bank Swallow	Hirundinidae	G. Ryan	2	6	3	2006	S1S2B,SUM	S3B	N5B	G5	Secure	Threatened	0	0	0	NE. St. John's	10000		The Status of Bank Swallow	mstr1047992
Riparia riparia	Bank Swallow	Hirundinidae	T. Boland	1	10	21	2000	S1S2B,SUM	S3B	N5B	G5	Secure	Threatened	0	0	0	Outer Cove	1000		The Status of Bank Swallow	mstr1047999
Riparia riparia	Bank Swallow	Hirundinidae	D. Brown	1	8	26	2003	S1S2B,SUM	S3B	N5B	G5	Secure	Threatened	0	0	0	Quidi Vidi Lake, St. John's	1000		The Status of Bank Swallow	mstr1048010
Riparia riparia	Bank Swallow	Hirundinidae	Alvan Buckley, Ca	-99	5	28	2016	S1S2B,SUM	S3B	N5B	G5	Secure	Threatened	0	0	0	Virginia Lake	1000		Nf.birds, May 28, 2016	MSTR1051625
Riparia riparia	Bank Swallow	Hirundinidae	Bruce Mactavish	1	8	30	2016	S1S2B,SUM	S3B	N5B	G5	Secure	Threatened	0	0	0	Quidi Vidi Lake	10000		Nf.birds, August 30, 2016	MSTR1051632
Riparia riparia	Bank Swallow	Hirundinidae	Alvan Buckley	1	5	22	2017	S1S2B,SUM	S3B	N5B	G5	Secure	Threatened	0	0	0	QV Lake, near boathouse	1000		Nf.birds, May 22, 2017	MSTR1051636
Hirundo rustica	Barn Swallow	Hirundinidae	Jared Clarke	1	6	11	2003	S2B,SUM	S1S2B	N5B	G5	Secure	Threatened	0	0	0	Long Pond	0		Nf.Birds, Data Entry by WD	mstr1028002
Hirundo rustica	Barn Swallow	Hirundinidae	Jared Clarke	1	5	31	2004	S2B,SUM	S1S2B	N5B	G5	Secure	Threatened	0	0	0	Long Pond	0		Nf.Birds, Data Entry by WD	mstr1028005
Hirundo rustica	Barn Swallow	Hirundinidae	Anne Hughes	1	6	9	2008	S2B,SUM	S1S2B	N5B	G5	Secure	Threatened	0	0	0	Long Pond	0		Nf.Birds, Data Entry by WD	mstr1028027
Hirundo rustica	Barn Swallow	Hirundinidae	Anne Hughes	1	5	10	2009	S2B,SUM	S1S2B	N5B	G5	Secure	Threatened	0	0	0	Quidi Vidi Lake	0		Nf.Birds, Data Entry by WD	mstr1028134
Hirundo rustica	Barn Swallow	Hirundinidae	Anne Hughes	1	5	22	2011	S2B,SUM	S1S2B	N5B	G5	Secure	Threatened	0	0	0	Kent's Pond	0		Nf.Birds, Data Entry by WD	mstr1028206
Hirundo rustica	Barn Swallow	Hirundinidae	Anne Hughes	1	6	15	2000	S2B,SUM	S1S2B	N5B	G5	Secure	Threatened	0	0	0	Kenny's Pond	0		Nf.Birds, Data Entry by WD	mstr1028210
Hirundo rustica	Barn Swallow	Hirundinidae	Bruce Mactavish	1	6	3	2010	S2B,SUM	S1S2B	N5B	G5	Secure	Threatened	0	0	0	West End of Virginia Lake	0		Nf.Birds, Data Entry by WD	mstr1028260
Hirundo rustica	Barn Swallow	Hirundinidae	Lesley Sweetappl	2	6	8	2010	S2B,SUM	S1S2B	N5B	G5	Secure	Threatened	0	0	0	Virginia Lake	0		Nf.Birds, Data Entry by WD	mstr1028262
Hirundo rustica	Barn Swallow	Hirundinidae	Bruce Mactavish	1	5	29	2011	S2B,SUM	S1S2B	N5B	G5	Secure	Threatened	0	0	0	Lundrigan's Marsh, Virginia Lake	0		Nf.Birds, Data Entry by WD	mstr1028343
Hirundo rustica	Barn Swallow	Hirundinidae	Ken Knowles	4	5	1	2009	S2B,SUM	S1S2B	N5B	G5	Secure	Threatened	0	0	0	Stick Pond, Logy Bay	0		Nf.Birds, Data Entry by WD	mstr1028450
Hirundo rustica	Barn Swallow	Hirundinidae	Anne Hughes	1	5	14	2002	S2B,SUM	S1S2B	N5B	G5	Secure	Threatened	0	0	0	Outer Cove	0		Nf.Birds, Data Entry by WD	mstr1028505
Hirundo rustica	Barn Swallow	Hirundinidae	Ken Knowles	1	11	5	1998	S2B,SUM	S1S2B	N5B	G5	Secure	Threatened	0	0	0	Cliffs at Middle Cove	0		Nf.Birds, Data Entry by WD	mstr1028540
Hirundo rustica	Barn Swallow	Hirundinidae	Ken Knowles	2	9	23	2005	S2B,SUM	S1S2B	N5B	G5	Secure	Threatened	0	0	0	Jones Pond - Middle Cove	0		Nf.Birds, Data Entry by WD	mstr1028570
Hirundo rustica	Barn Swallow	Hirundinidae	Ken Knowles	4	5	9	2007	S2B,SUM	S1S2B	N5B	G5	Secure	Threatened	0	0	0	Jones Pond - Middle Cove	0		Nf.Birds, Data Entry by WD	mstr1029234
Chroicocephalus ridibundus	Black-headed Gull	Laridae	iNaturalist user: le	0	1	1	2013	S1B, S3N,SUM	S1B,S3N	N3	G5	Sensitive	0	0	0	0	0	0		iNaturalist record export 20	MSTR1051843
Dolichonyx oryzivorus	Bobolink	Icteridae	B. Mactavish	0	9	24	1984	S1B,SUM	S2B	N5B	G5	May be at risk	Threatened	Vulnerable	0	0	Kent├âs Pond	1000		The Status of Bobolink (Do	mstr1047821
Dolichonyx oryzivorus	Bobolink	Icteridae	R. Burrows	0	6	2	1989	S1B,SUM	S2B	N5B	G5	May be at risk	Threatened	Vulnerable	0	0	Larry's Bog, St. John's	100		The Status of Bobolink (Do	mstr1047830
Dolichonyx oryzivorus	Bobolink	Icteridae	J. Green	0	6	25	1982	S1B,SUM	S2B	N5B	G5	May be at risk	Threatened	Vulnerable	0	0	Middle Cove	1000		The Status of Bobolink (Do	mstr1047837
Ophiogomphus colubrinus	Boreal Snake Tail/ Club	Gomphidae	Larson D.J.	0	7	23	1978	S3	S3?	N4N5	G5	Undetermined	0	0	0	0	LongPond, St. Johns	0		2DDragonflydata.xls	mstr1035087
Somatochlora walshii	Brushed-tipped Emerald	Corduliidae	Ide F.P.	0	8	31	1944	S3S4	S4S5	N5	G5	Secure	0	0	0	0	Torbay	0		2DDragonflydata.xls	mstr1034956
Somatochlora walshii	Brushed-tipped Emerald	Corduliidae	Larson D.J.	0	7	11	1978	S3S4	S4S5	N5	G5	Secure	0	0	0	0	"Long Pond, St. Johns"	0		2DDragonflydata.xls	mstr1035058
Somatochlora walshii	Brushed-tipped Emerald	Corduliidae	Larson D.J.	0	7	23	1978	S3S4	S4S5	N5	G5	Secure	0	0	0	0	"Long Pond, St. Johns"	0		2DDragonflydata.xls	mstr1035059
Somatochlora walshii	Brush-tipped Emerald	Corduliidae	iNaturalist user: lc	0	7	16	2009	S3S4	S4S5	N5	G5	Secure	0	0	0	0	, Northeast Avalon, Newfoundland	10		iNaturalist record export 20	MSTR1051899
Chaetura pelagica	Chimney Swift	Apodidae	Todd Boland	1	5	31	1998	SNR	SNR	N5B	G5	grant/ Accide	Threatened	Threatened	Threatened	Lake	0	1000		Canadian Wildlife Service	mstr1009339
Chaetura pelagica	Chimney Swift	Apodidae	Anne Hughes, To	1	5	10	2009	SNR	SNR	N5B	G5	grant/ Accide	Threatened	Threatened	Threatened	0	Quidi Vidi Lake	1000		NF.Birds	mstr1022070
Chaetura pelagica	Chimney Swift	Apodidae	Bruce Mactavish	1	8	30	2016	SNR	SNR	N5B	G5	grant/ Accide	Threatened	Threatened	Threatened	0	Quidi Vidi Lake, on The Blvd	10000		NF.Birds, Aug 30, 2016	MSTR1050954
Chaetura pelagica	Chimney Swift	Apodidae	Seb from Chile, fr	1	9	7	2017	SNR	SNR	N5B	G5	grant/ Accide	Threatened	Threatened	Threatened	0	0	100		nf.birds, sept 7, 2017	MSTR1053224
Chordeiles minor	Common Nighthawk	Caprimulgid	Todd Boland	0	6	2	1998	SNA	SNA	N5B	G5	May be at risk	Special Concern	Threatened	Threatened	Lake	0	100		Canadian Wildlife Service	mstr1009369
Chordeiles minor	Common Nighthawk	Caprimulgid	Dave Brown	1	9	24	2002	SNA	SNA	N5B	G5	May be at risk	Special Concern	Threatened	Threatened	0	0	100		Canadian Wildlife Service	mstr1009366
Chordeiles minor	Common Nighthawk	Caprimulgid	Dave Brown	1	9	25	2002	SNA	SNA	N5B	G5	May be at risk	Special Concern	Threatened	Threatened	0	Dead Man's Pond, Signal Hill	100		Nf.Birds, Data Entry by WD	mstr1027372
Chordeiles minor	Common Nighthawk	Caprimulgid	Todd Boland	1	6	2	1998	SNA	SNA	N5B	G5	May be at risk	Special Concern	Threatened	Threatened	0	Quidi Vidi Lake	0		Nf.Birds, Data Entry by WD	mstr1028063
Chordeiles minor	Common Nighthawk	Caprimulgid	Bruce Mactavish	1	6	9	2008	SNA	SNA	N5B	G5	May be at risk	Special Concern	Threatened	Threatened	0	Tunis Court	0		Nf.Birds, Data Entry by WD	mstr1028054
Catharus minimus	Gray-cheeked Thrush	Turdidae	B. Mactavish, J. F	0	5	29	1988	S2B,SUM	S2S3B	N5B	G5	Secure	ndidate (Mid Prior	Threatened	0	0	St. John├âs	10000		Gray-Cheeked Thrush, SS/	mstr1042101
Catharus minimus	Gray-cheeked Thrush	Turdidae	B. S. Jackson	1	5	27	1980	S2B,SUM	S2S3B	N5B	G5	Secure	ndidate (Mid Prior	Threatened	0	0	Long Pond	1000		Gray-Cheeked Thrush, SS/	mstr1042102
Catharus minimus	Gray-cheeked Thrush	Turdidae	R. Burrows	1	5	28	1988	S2B,SUM	S2S3B	N5B	G5	Secure	ndidate (Mid Prior	Threatened	0	0	Long Pond	1000		Gray-Cheeked Thrush, SS/	mstr1042103
Catharus minimus	Gray-cheeked Thrush	Turdidae	R. Burrows	1	6	2	1990	S2B,SUM	S2S3B	N5B	G5	Secure	ndidate (Mid Prior	Threatened	0	0	Kents Pond, St. John's	1000		Gray-Cheeked Thrush, SS/	mstr1042104
Catharus minimus	Gray-cheeked Thrush	Turdidae	B Mactavish	2	5	25	1989	S2B,SUM	S2S3B	N5B	G5	Secure	ndidate (Mid Prior	Threatened	0	0	White Hills, St. John's	1000		Gray-Cheeked Thrush, SS/	mstr1042106
Phalacrocorax carbo	Great Cormorant	Phalacrocor	Chris Brown	3 or 4	1	25	2018	S3B,S3M,S3N	S3B	N4B,N4N	G5	Sensitive	0	0	0	0	0	1000		nf.birds, jan 25, 2018	MSTR1053288
Falco rusticolus	Gyrfalcon	Falconidae	Dave Brown	1	11	28	2004	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	Dump	1000		Nf.Birds, Data Entry by WD	mstr1028096
Falco rusticolus	Gyrfalcon	Falconidae	Jared Clarke	1	11	28	2004	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028288
Falco rusticolus	Gyrfalcon	Falconidae	Bruce Mactavish	1	2	20	2005	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028291
Falco rusticolus	Gyrfalcon	Falconidae	Bruce Mactavish	1	2	27	2005	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028294
Falco rusticolus	Gyrfalcon	Falconidae	Bruce Mactavish	1	3	6	2005	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028296
Falco rusticolus	Gyrfalcon	Falconidae	Paul Linegar	1	12	28	2006	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028316
Falco rusticolus	Gyrfalcon	Falconidae	Jared Clarke	1	12	11	2004	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	East of Virginia River Outflow	0		Nf.Birds, Data Entry by WD	mstr1028143
Falco rusticolus	Gyrfalcon	Falconidae	Karen Herzberg	1	2	1	2005	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	Near Virginia River End of Lake	0		Nf.Birds, Data Entry by WD	mstr1028100
Falco rusticolus	Gyrfalcon	Falconidae	Howard Clase	1	2	6	2004	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	Quidi Vidi	0		Nf.Birds, Data Entry by WD	mstr1028151
Falco rusticolus	Gyrfalcon	Falconidae	Bruce Mactavish	1	2	16	2004	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	Quidi Vidi	0		Nf.Birds, Data Entry by WD	mstr1028152
Falco rusticolus	Gyrfalcon	Falconidae	David Shepherd	1	4	14	2005	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	Quidi Vidi	0		Nf.Birds, Data Entry by WD	mstr1028169
Falco rusticolus	Gyrfalcon	Falconidae	Jared Clarke	1	1	20	2004	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	Quidi Vidi Lake	0		Nf.Birds, Data Entry by WD	mstr1028090
Falco rusticolus	Gyrfalcon	Falconidae	Bruce Mactavish	1	1	30	2004	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	Quidi Vidi Lake	0		Nf.Birds, Data Entry by WD	mstr1028091
Falco rusticolus	Gyrfalcon	Falconidae	Jared Clarke	1	2	29	2004	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	Quidi Vidi Lake	0		Nf.Birds, Data Entry by WD	mstr1028092
Falco rusticolus	Gyrfalcon	Falconidae	Bruce Mactavish	1	3	13	2004	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	Quidi Vidi Lake	0		Nf.Birds, Data Entry by WD	mstr1028094
Falco rusticolus	Gyrfalcon	Falconidae	Bruce Mactavish	1	3	20	2004	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	Quidi Vidi Lake	0		Nf.Birds, Data Entry by WD	mstr1028095
Falco rusticolus	Gyrfalcon	Falconidae	Jennifer Harding	1	1	12	2005	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	Quidi Vidi Lake	0		Nf.Birds, Data Entry by WD	mstr1028097
Falco rusticolus	Gyrfalcon	Falconidae	Bruce Mactavish	1	1	19	2005	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	On a pole.	Quidi Vidi Lake	0		Nf.Birds, Data Entry by WD	mstr1028098
Falco rusticolus	Gyrfalcon	Falconidae	Bruce Mactavish	1	1	28	2005	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	Quidi Vidi Lake	0		Nf.Birds, Data Entry by WD	mstr1028099
Falco rusticolus	Gyrfalcon	Falconidae	Bruce Mactavish	1	2	5	2005	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	Quidi Vidi Lake	0		Nf.Birds, Data Entry by WD	mstr1028101
Falco rusticolus	Gyrfalcon	Falconidae	Bruce Mactavish	1	3	19	2005	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	Quidi Vidi Lake	0		Nf.Birds, Data Entry by WD	mstr1028102
Falco rusticolus	Gyrfalcon	Falconidae	Bruce Mactavish	1	12	11	2005	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	East End of Lake	Quidi Vidi Lake	0		Nf.Birds, Data Entry by WD	mstr1028103

GNAME	GCOMNAME	FAMILY	Observer	TotalNumber	Month	Day	Year	SRANK_2015	SRANK_2	NRANK	GRANK	GeneralStat	COSEWIC_ST	PROVINCIAL	SARA	DESCR_HABIT	SITE_NAME	Accuracy	SYNAME	CITATION	IDNUM
Falco rusticolus	Gyrfalcon	Falconidae	Bruce Mactavish	1	11	9	2004	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	Pat's Ball Park next to Carpasian R	0		Nf.Birds, Data Entry by WD	mstr1027941
Falco rusticolus	Gyrfalcon	Falconidae	Bruce Mactavish	1	2	22	2008	S2S3N,SUM	S2S3N	N4B,N4N	G5	Secure	0	0	0	0	West End of Quidi Vidi Lake	1000		Nf.Birds, Data Entry by WD	mstr1028117
Histrionicus histrionicus	Harlequin Duck	Anatidae	0	1	11	9	1990	S3B, S2N,SUM	S3B,S2N	N3N4	G4T4	Secure	Special Concern	Vulnerable	Special Concern	0	Middle Cove	0		The Osprey	mstr1006343
Histrionicus histrionicus	Harlequin Duck	Anatidae	0	1	11	10	1990	S3B, S2N,SUM	S3B,S2N	N3N4	G4T4	Secure	Special Concern	Vulnerable	Special Concern	0	Middle Cove	0		Montevecchi list	mstr1006344
Histrionicus histrionicus	Harlequin Duck	Anatidae	Howard Clase	1	9	28	1998	S3B, S2N,SUM	S3B,S2N	N3N4	G4T4	Secure	Special Concern	Vulnerable	Special Concern	0	Middle Cove	0		NF RBA	mstr1006345
Histrionicus histrionicus	Harlequin Duck	Anatidae	Ken Knowles	1	12	16	1998	S3B, S2N,SUM	S3B,S2N	N3N4	G4T4	Secure	Special Concern	Vulnerable	Special Concern	0	Middle Cove	0		NF RBA	mstr1006346
Histrionicus histrionicus	Harlequin Duck	Anatidae	0	1	11	27	1977	S3B, S2N,SUM	S3B,S2N	N3N4	G4T4	Secure	Special Concern	Vulnerable	Special Concern	0	St John's Narrows	0		Montevecchi list	mstr1005033
Histrionicus histrionicus	Harlequin Duck	Anatidae	0	1	11	27	1988	S3B, S2N,SUM	S3B,S2N	N3N4	G4T4	Secure	Special Concern	Vulnerable	Special Concern	0	St John's Narrows; Chain Rock	0		The Osprey	mstr1005034
Histrionicus histrionicus	Harlequin Duck	Anatidae	0	1	5	21	1988	S3B, S2N,SUM	S3B,S2N	N3N4	G4T4	Secure	Special Concern	Vulnerable	Special Concern	0	Cape Spear QV Lake	0		The Osprey	mstr1006208
Histrionicus histrionicus	Harlequin Duck	Anatidae	0	1	11	29	1995	S3B, S2N,SUM	S3B,S2N	N3N4	G4T4	Secure	Special Concern	Vulnerable	Special Concern	0	Outer Cove	0		Montevecchi list	mstr1006316
Histrionicus histrionicus	Harlequin Duck	Anatidae	Kem Knowles	1	3	18	2005	S3B, S2N,SUM	S3B,S2N	N3N4	G4T4	Secure	Special Concern	Vulnerable	Special Concern	0	Outer Cove	0		NF.Birds	mstr1006317
Histrionicus histrionicus	Harlequin Duck	Anatidae	Ken Knowles	1	9	28	1998	S3B, S2N,SUM	S3B,S2N	N3N4	G4T4	Secure	Special Concern	Vulnerable	Special Concern	0	Middle Cove	0		Nf.Birds, Data Entry by WD	mstr1028538
Histrionicus histrionicus	Harlequin Duck	Anatidae	Todd Boland	1	10	5	1998	S3B, S2N,SUM	S3B,S2N	N3N4	G4T4	Secure	Special Concern	Vulnerable	Special Concern	0	Middle Cove	0		Nf.Birds, Data Entry by WD	mstr1028539
Histrionicus histrionicus	Harlequin Duck	Anatidae	Todd Boland	3	12	15	1998	S3B, S2N,SUM	S3B,S2N	N3N4	G4T4	Secure	Special Concern	Vulnerable	Special Concern	0	Middle Cove	0		Nf.Birds, Data Entry by WD	mstr1028541
Histrionicus histrionicus	Harlequin Duck	Anatidae	Ken Knowles	3	12	16	1998	S3B, S2N,SUM	S3B,S2N	N3N4	G4T4	Secure	Special Concern	Vulnerable	Special Concern	0	Middle Cove Beach	0		Nf.Birds, Data Entry by WD	mstr1028572
Pagophila eburnea	Ivory Gull	Laridae	Hugh Whitney	1	1	0	2007	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	0	100		Dr. Hugh Whitney, NL Dep	mstr1020871
Pagophila eburnea	Ivory Gull	Laridae	0	1	3	24	2002	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Middle Cove	100		NF.Birds	mstr1006569
Pagophila eburnea	Ivory Gull	Laridae	0	1	3	19	2002	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Middle Cove	0		NF.Birds	mstr1006706
Pagophila eburnea	Ivory Gull	Laridae	0	1	3	19	2002	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Middle Cove	100		NF.Birds	mstr1006568
Pagophila eburnea	Ivory Gull	Laridae	0	1	1	16	1998	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Quidi Vidi;	1000		NF.Birds	mstr1006590
Pagophila eburnea	Ivory Gull	Laridae	0	1	1	15	1998	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	f Virginia River; Quidi Vidi Lake; St	1000		NF.Birds	mstr1006591
Pagophila eburnea	Ivory Gull	Laridae	0	1	1	12	1998	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Quidi Vidi ;	1000		NF.Birds	mstr1006592
Pagophila eburnea	Ivory Gull	Laridae	0	1	1	0	1998	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Quidi Vidi Gut	1000		NF.Birds	mstr1006593
Pagophila eburnea	Ivory Gull	Laridae	0	1	2	2	2002	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Quidi Vidi Gut;	1000		NF.Birds	mstr1006594
Pagophila eburnea	Ivory Gull	Laridae	0	1	2	5	2002	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Quidi Vidi Gut;	1000		NF.Birds	mstr1006595
Pagophila eburnea	Ivory Gull	Laridae	0	1	2	5	2002	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Quidi Vidi Gut;	1000		NF.Birds	mstr1006596
Pagophila eburnea	Ivory Gull	Laridae	0	1	1	0	1998	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Quidi Vidi Lake	1000		NF.Birds	mstr1006597
Pagophila eburnea	Ivory Gull	Laridae	0	1	1	12	1998	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Quidi Vidi Lake; St. John's	1000		NF.Birds	mstr1006598
Pagophila eburnea	Ivory Gull	Laridae	0	1	1	30	1998	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Quidi Vidi Lake; St. John's	1000		NF.Birds	mstr1006599
Pagophila eburnea	Ivory Gull	Laridae	Bruce Mactavish	1	1	30	1998	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	East End of Quidi Vidi Lake	1000		Nf.Birds, Data Entry by WD	mstr1028061
Pagophila eburnea	Ivory Gull	Laridae	Kenneth Knowles	-99	1	16	1998	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Quidi Vidi Lake at Chicken Proces	0		Nf.Birds, Data Entry by WD	mstr1028186
Pagophila eburnea	Ivory Gull	Laridae	Ken Knowles	1	3	19	2002	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Middle Cove	0		Nf.Birds, Data Entry by WD	mstr1028549
Pagophila eburnea	Ivory Gull	Laridae	Todd Boland	2	2	7	2002	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Near Quidi Vidi Brewery	0		Nf.Birds, Data Entry by WD	mstr1028148
Pagophila eburnea	Ivory Gull	Laridae	Bruce Mactavish	2	2	1	2002	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Quidi Vidi Gut	1000		Nf.Birds, Data Entry by WD	mstr1027889
Pagophila eburnea	Ivory Gull	Laridae	Howard Clase	1	1	12	1998	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Quidi Vidi Gut	1000		Nf.Birds, Data Entry by WD	mstr1027892
Pagophila eburnea	Ivory Gull	Laridae	Bruce Mactavish	2	2	5	2002	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Quidi Vidi Gut	1000		Nf.Birds, Data Entry by WD	mstr1028082
Pagophila eburnea	Ivory Gull	Laridae	Bruce Mactavish	2	2	9	2002	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Quidi Vidi Gut	1000		Nf.Birds, Data Entry by WD	mstr1028084
Pagophila eburnea	Ivory Gull	Laridae	Paul Linegar	1	1	20	2007	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Quidi Vidi Lake	0		Nf.Birds, Data Entry by WD	mstr1028110
Pagophila eburnea	Ivory Gull	Laridae	Bruce Mactavish	1	1	13	2009	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Quidi Vidi Lake	0		Nf.Birds, Data Entry by WD	mstr1028130
Pagophila eburnea	Ivory Gull	Laridae	Todd Boland	1	2	1	1998	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Quidi Vidi Lake/St. John's Harbour	0		Nf.Birds, Data Entry by WD	mstr1028062
Pagophila eburnea	Ivory Gull	Laridae	Bill Montevecchi	1	1	15	1998	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Virginia River at Quidi Vidi Lake	0		Nf.Birds, Data Entry by WD	mstr1028217
Pagophila eburnea	Ivory Gull	Laridae	Gene Herzberg	1	1	28	2007	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Virginia River Outlet	0		Nf.Birds, Data Entry by WD	mstr1028220
Pagophila eburnea	Ivory Gull	Laridae	Paul Linegar	1	2	1	2007	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	Virginia River Outlet	0		Nf.Birds, Data Entry by WD	mstr1028221
Pagophila eburnea	Ivory Gull	Laridae	Ken Knowles	1	12	9	2016	S1N,SUM	S2N	N3B,N4N	G5	At risk	Endangered	Endangered	Endangered	0	0	1000		Nf.birds, December 9, 2016	MSTR1051374
Tringa flavipes	Lesser Yellowlegs	Scolopacida	Ed Hayden	2	8	11	2017	S3M	S3N	N5B	G5	Secure	0	0	0	0	0	1000		nf.birds, August 11, 2017	MSTR1053310
Tringa flavipes	Lesser Yellowlegs	Scolopacida	Gene Herzberg	1	8	25	2016	S3M	S3N	N5B	G5	Secure	0	0	0	0	0	1000		nf.birds, August 25, 2016	MSTR1053347
Tringa flavipes	Lesser Yellowlegs	Scolopacida	Gene Herzberg	2	9	17	2016	S3M	S3N	N5B	G5	Secure	0	0	0	0	0	1000		nf.birds, September 17, 20	MSTR1053358
Tringa flavipes	Lesser Yellowlegs	Scolopacida	Ed Hayden, Chris	1	4	25	2018	S3M	S3N	N5B	G5	Secure	0	0	0	0	0	1000		nf.birds, Apr 25, 2018	MSTR1053361
Tringa flavipes	Lesser Yellowlegs	Scolopacida	Alvan Buckley	2	4	25	2018	S3M	S3N	N5B	G5	Secure	0	0	0	0	0	1000		nf.birds, Apr 25, 2018	MSTR1053362
Tringa flavipes	Lesser Yellowlegs	Scolopacida	Bruce Mactavish	1	4	25	2018	S3M	S3N	N5B	G5	Secure	0	0	0	0	0	1000		nf.birds, Apr 25, 2018	MSTR1053363
Tringa flavipes	Lesser Yellowlegs	Scolopacida	Shawn Fitzpatrick	1	5	9	2018	S3M	S3N	N5B	G5	Secure	0	0	0	0	0	1000		nf.birds, May 9, 2018	MSTR1053365
Tringa flavipes	Lesser Yellowlegs	Scolopacida	Gene Herzberg	1	9	9	2018	S3M	S3N	N5B	G5	Secure	0	0	0	0	0	1000		nf.birds, Sept 9, 2018	MSTR1053389
Tringa flavipes	Lesser Yellowlegs	Scolopacida	Gene Herzberg	5	9	21	2018	S3M	S3N	N5B	G5	Secure	0	0	0	0	0	1000		nf.birds, Sept 21, 2018	MSTR1053391
Anas platyrhynchos	Mallard	Anatidae	iNaturalist user: le	0	12	25	2012	S3B,SUM	S3B	N5B,N5N	G5	Secure	0	0	0	0	0	0		iNaturalist record export 20	MSTR1052472
Anas platyrhynchos	Mallard	Anatidae	iNaturalist user: s	0	11	19	2017	S3B,SUM	S3B	N5B,N5N	G5	Secure	0	0	0	0	0	367		iNaturalist record export 20	MSTR1052480
Anas platyrhynchos	Mallard	Anatidae	iNaturalist user: g	0	7	18	2017	S3B,SUM	S3B	N5B,N5N	G5	Secure	0	0	0	0	0	4		iNaturalist record export 20	MSTR1052481
Anas platyrhynchos	Mallard	Anatidae	iNaturalist user: to	0	12	23	2017	S3B,SUM	S3B	N5B,N5N	G5	Secure	0	0	0	0	0	122		iNaturalist record export 20	MSTR1052483
Xanthoria parietina	Maritime Sunburst Liche	Teloschistac	iNaturalist user: jp	0	10	21	2017	S1S3	SNR	NNR	G3G5	Secure	0	0	0	0	Division No. 1, CA-NF, CA	8		iNaturalist record export 20	MSTR1052491
Enallagma civile	Northern Bluet	Coenagrioni	Larson D.J.	0	8	26	1980	S2	S3S4	N5	G5	Undetermine	0	0	0	0	estern Island Pond, Indian Meal Li	0		2DDragonflydata.xls	mstr1034971
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish	1	12	16	2007	S3	S3B	N5	G5	Secure	0	0	0	0	Bally Hall Golf Course	0		Nf.Birds, Data Entry by WD	mstr1028231
Accipiter gentilis	Northern Goshawk	Accipitridae	Doug Phelan	-99	1	13	2003	S3	S3B	N5	G5	Secure	0	0	0	0	Hally Golf Gourse - 100 Logy Bay	0		Nf.Birds, Data Entry by WD	mstr1028189
Accipiter gentilis	Northern Goshawk	Accipitridae	John Wells	1	10	11	2002	S3	S3B	N5	G5	Secure	0	0	0	0	Cuckold's Cove Trail, Signal Hill	0		Nf.Birds, Data Entry by WD	mstr1027954
Accipiter gentilis	Northern Goshawk	Accipitridae	Jared Clarke	1	3	21	2003	S3	S3B	N5	G5	Secure	0	0	0	0	Cuckold's Cove Trail, Signal Hill	0		Nf.Birds, Data Entry by WD	mstr1027955
Accipiter gentilis	Northern Goshawk	Accipitridae	Todd Boland	4	1	24	1998	S3	S3B	N5	G5	Secure	0	0	0	Dump	Dump	0		Nf.Birds, Data Entry by WD	mstr1028263
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish	2	2	13	1999	S3	S3B	N5	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028266
Accipiter gentilis	Northern Goshawk	Accipitridae	Todd Boland	1	3	28	1999	S3	S3B	N5	G5	Secure	0	0	0	Dump	Dump	0		Nf.Birds, Data Entry by WD	mstr1028267
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish	1	12	6	1999	S3	S3B	N5	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028268
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish	3	1	18	2000	S3	S3B	N5	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028269
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish ,	1	2	6	2000	S3	S3B	N5	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028270
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish	1	3	12	2002	S3	S3B	N5	G5	Secure	0	0	0	Dump	Dump	0		Nf.Birds, Data Entry by WD	mstr1028275

GNAME	GCOMNAME	FAMILY	Observer	TotalNumber	Month	Day	Year	SRANK_2015	SRANK_2	NRANK	GRANK	GeneralStat	COSEWIC_ST	PROVINCIAL	SARA	DESCR_HABIT	SITE_NAME	Accuracy	SYNAME	CITATION	IDNUM
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish	1	3	24	2002	S3	S3B	N5	G5	Secure	0	0	0	Dump	Dump	0		Nf.Birds, Data Entry by WD	mstr1028277
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish	1	11	5	2002	S3	S3B	N5	G5	Secure	0	0	0	Dump	Dump	0		Nf.Birds, Data Entry by WD	mstr1028281
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish ,	2	1	2	2003	S3	S3B	N5	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028282
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish	-99	1	1	2004	S3	S3B	N5	G5	Secure	0	0	0	Dump	Dump	0		Nf.Birds, Data Entry by WD	mstr1028285
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish	1	2	29	2004	S3	S3B	N5	G5	Secure	0	0	0	Dump	Dump	0		Nf.Birds, Data Entry by WD	mstr1028287
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish	1	1	9	2005	S3	S3B	N5	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028289
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish	1	2	20	2005	S3	S3B	N5	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028292
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish	1	2	27	2005	S3	S3B	N5	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028295
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish	1	3	6	2005	S3	S3B	N5	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028297
Accipiter gentilis	Northern Goshawk	Accipitridae	Jared Clarke	2	1	1	2006	S3	S3B	N5	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028304
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish	1	3	5	2006	S3	S3B	N5	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028311
Accipiter gentilis	Northern Goshawk	Accipitridae	Jared Clarke	1	12	10	2006	S3	S3B	N5	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028315
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish ,	1	2	25	2007	S3	S3B	N5	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028318
Accipiter gentilis	Northern Goshawk	Accipitridae	Jared Clarke	1	11	25	2007	S3	S3B	N5	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028323
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish	3	1	2	2008	S3	S3B	N5	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028326
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish ,	3	1	6	2008	S3	S3B	N5	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028328
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish	1	2	25	2008	S3	S3B	N5	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028331
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish	2	1	1	2009	S3	S3B	N5	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028333
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish	1	3	8	2009	S3	S3B	N5	G5	Secure	0	0	0	0	Dump	0		Nf.Birds, Data Entry by WD	mstr1028334
Accipiter gentilis	Northern Goshawk	Accipitridae	Judith Blakeley	1	2	12	2002	S3	S3B	N5	G5	Secure	0	0	0	0	Indian Meal Line, Torbay	0		Nf.Birds, Data Entry by WD	mstr1028533
Accipiter gentilis	Northern Goshawk	Accipitridae	Todd Boland	1	3	20	2002	S3	S3B	N5	G5	Secure	0	0	0	0	King's Bridge Road	0		Nf.Birds, Data Entry by WD	mstr1027948
Accipiter gentilis	Northern Goshawk	Accipitridae	Howard Clase	1	5	16	2003	S3	S3B	N5	G5	Secure	0	0	0	0	Long Pond	100		Nf.Birds, Data Entry by WD	mstr1028814
Accipiter gentilis	Northern Goshawk	Accipitridae	Anne Hughes	1	7	15	2004	S3	S3B	N5	G5	Secure	0	0	0	0	Long Pond	100		Nf.Birds, Data Entry by WD	mstr1028010
Accipiter gentilis	Northern Goshawk	Accipitridae	Todd Boland	1	4	13	2008	S3	S3B	N5	G5	Secure	0	0	0	0	Long Pond	100		Nf.Birds, Data Entry by WD	mstr1028024
Accipiter gentilis	Northern Goshawk	Accipitridae	Anne Hughes	1	5	24	2008	S3	S3B	N5	G5	Secure	0	0	0	0	Long Pond	100		Nf.Birds, Data Entry by WD	mstr1028026
Accipiter gentilis	Northern Goshawk	Accipitridae	Brendan Kelly	1	6	21	2011	S3	S3B	N5	G5	Secure	0	0	0	0	Long Pond	100		Nf.Birds, Data Entry by WD	mstr1028041
Accipiter gentilis	Northern Goshawk	Accipitridae	Michael Parmente	1	1	7	2012	S3	S3B	N5	G5	Secure	0	0	0	0	Long Pond	100		Nf.Birds, Data Entry by WD	mstr1028042
Accipiter gentilis	Northern Goshawk	Accipitridae	Ken Knowles	1	1	24	2004	S3	S3B	N5	G5	Secure	0	0	0	0	Marine Drive	0		Nf.Birds, Data Entry by WD	mstr1028357
Accipiter gentilis	Northern Goshawk	Accipitridae	Ken Knowles	1	1	12	2002	S3	S3B	N5	G5	Secure	0	0	0	0	Middle Cove	0		Nf.Birds, Data Entry by WD	mstr1028547
Accipiter gentilis	Northern Goshawk	Accipitridae	Ken Knowles	1	3	14	2004	S3	S3B	N5	G5	Secure	0	0	0	0	Middle Cove	0		Nf.Birds, Data Entry by WD	mstr1028551
Accipiter gentilis	Northern Goshawk	Accipitridae	Ken Knowles	1	6	28	2011	S3	S3B	N5	G5	Secure	0	0	0	0	Middle Cove	0		Nf.Birds, Data Entry by WD	mstr1028563
Accipiter gentilis	Northern Goshawk	Accipitridae	Jared Clarke	1	1	16	2003	S3	S3B	N5	G5	Secure	0	0	0	0	Newfoundland Drive	0		Nf.Birds, Data Entry by WD	mstr1028247
Accipiter gentilis	Northern Goshawk	Accipitridae	Anne Hughes	2	6	24	2004	S3	S3B	N5	G5	Secure	0	0	0	0	North Side of Long Pond	0		Nf.Birds, Data Entry by WD	mstr1028009
Accipiter gentilis	Northern Goshawk	Accipitridae	Anne Hughes	1	3	24	2008	S3	S3B	N5	G5	Secure	0	0	0	0	North Side of Long Pond	1000		Nf.Birds, Data Entry by WD	mstr1028823
Accipiter gentilis	Northern Goshawk	Accipitridae	Dirk Hilbers	1	4	15	2003	S3	S3B	N5	G5	Secure	0	0	0	0	Pippy Park	0		Nf.Birds, Data Entry by WD	mstr1028183
Accipiter gentilis	Northern Goshawk	Accipitridae	Chris Brown	1	1	10	2003	S3	S3B	N5	G5	Secure	0	0	0	0	Pleasantville	0		Nf.Birds, Data Entry by WD	mstr1028197
Accipiter gentilis	Northern Goshawk	Accipitridae	Martin Renner	1	2	15	2000	S3	S3B	N5	G5	Secure	0	0	0	0	Quidi Vidi	0		Nf.Birds, Data Entry by WD	mstr1028144
Accipiter gentilis	Northern Goshawk	Accipitridae	Dave Brown	1	1	5	2002	S3	S3B	N5	G5	Secure	0	0	0	0	Quidi Vidi	0		Nf.Birds, Data Entry by WD	mstr1028147
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish	2	11	10	2009	S3	S3B	N5	G5	Secure	0	0	0	0	Quidi Vidi	0		Nf.Birds, Data Entry by WD	mstr1028174
Accipiter gentilis	Northern Goshawk	Accipitridae	Jytte Selno	1	2	11	2002	S3	S3B	N5	G5	Secure	0	0	0	0	Quidi Vidi Gut	1000		Nf.Birds, Data Entry by WD	mstr1027890
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish	1	1	12	2003	S3	S3B	N5	G5	Secure	0	0	0	0	Quidi Vidi Gut	1000		Nf.Birds, Data Entry by WD	mstr1027891
Accipiter gentilis	Northern Goshawk	Accipitridae	Dave Brown	1	1	15	2000	S3	S3B	N5	G5	Secure	0	0	0	0	Quidi Vidi Lake	0		Nf.Birds, Data Entry by WD	mstr1028065
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish	1	12	31	2007	S3	S3B	N5	G5	Secure	0	0	0	0	Signal Hill	0		Nf.Birds, Data Entry by WD	mstr1027956
Accipiter gentilis	Northern Goshawk	Accipitridae	Bruce Mactavish,	2	1	5	2008	S3	S3B	N5	G5	Secure	0	0	0	0	Signall Hill	0		Nf.Birds, Data Entry by WD	mstr1027901
Accipiter gentilis	Northern Goshawk	Accipitridae	Judith Blakeley	1	2	10	2002	S3	S3B	N5	G5	Secure	0	0	0	Feeder	Torbay - Indian Meal Line	0		Nf.Birds, Data Entry by WD	mstr1028532
Accipiter gentilis	Northern Goshawk	Accipitridae	Jared Clarke	1	6	1	2004	S3	S3B	N5	G5	Secure	0	0	0	0	West End of Long Pond	0		Nf.Birds, Data Entry by WD	mstr1028006
Accipiter gentilis	Northern Goshawk	Accipitridae	John Wells	2	1	6	2003	S3	S3B	N5	G5	Secure	0	0	0	0	ıen's Compensation Building, Fores	0		Nf.Birds, Data Entry by WD	mstr1027970
Accipiter gentilis	Northern Goshawk	Accipitridae	Todd Boland	1	11	12	2000	S3	S3B	N5	G5	Secure	0	0	0	0	0	1000		Nf.Birds, Data Entry by WD	mstr1030071
Circus cyaneus	Northern Harrier	Accipitridae	Jytte Selno	1	9	30	2001	S3B,SUM	S3?B	N4N,N5B	G5	Secure	0	0	0	0	Cuckhold Cove Trail	1000		Nf.Birds, Data Entry by WD	mstr1028925
Circus cyaneus	Northern Harrier	Accipitridae	Gene & Karen He	2	11	18	2006	S3B,SUM	S3?B	N4N,N5B	G5	Secure	0	0	0	0	Long Pond	100		Nf.Birds, Data Entry by WD	mstr1028817
Circus cyaneus	Northern Harrier	Accipitridae	Ken Knowles	1	4	21	2001	S3B,SUM	S3?B	N4N,N5B	G5	Secure	0	0	0	0	Middle Cove	0		Nf.Birds, Data Entry by WD	mstr1028546
Circus cyaneus	Northern Harrier	Accipitridae	Doug Phelan	1	1	30	2002	S3B,SUM	S3?B	N4N,N5B	G5	Secure	0	0	0	0	Middle Cove	0		Nf.Birds, Data Entry by WD	mstr1028548
Surnia ulula	Northern Hawk-Owl	Strigidae	Todd Boland	1	11	2	1998	S3	S3	N5	G5	Secure	0	0	0	0	Sticks Pond	0		Nf.Birds, Data Entry by WD	mstr1028447
Anas acuta	Northern Pintail	Anatidae	iNaturalist user: s	0	12	7	2017	S3B,SUM	S3B	N5B,N5N	G5	Secure	0	0	0	0	0	968		iNaturalist record export 20	MSTR1052637
Aegolius acadicus	Northern Saw-Whet Ow	Strigidae	Ken Knowles	1	4	5	2010	S3?	S1?	N5B,N5N	G5	Jndetermined	0	0	0	0	liddle Cove - Jones Pond North Sic	0		Nf.Birds, Data Entry by WD	mstr1028571
Contopus cooperi	Olive-sided Flycatcher	Tyrannidae	Ken Knowles	1	6	12	2005	S3B,SUM	S3S4B	N5B	G4	At risk	Special Concern	Threatened	Threatened	0	rth side of Jones Pond in Middle Co	100		NF.Birds	mstr1006783
Contopus cooperi	Olive-sided Flycatcher	Tyrannidae	Ken Knowles	1	6	14	2004	S3B,SUM	S3S4B	N5B	G4	At risk	Special Concern	Threatened	Threatened	0	orth side of Jones Pond; Middle Co	100		NF.Birds	mstr1006785
Colias eurytheme	Orange Sulphur	Pieridae	Ross	0	0	0	0	S3	S3B	N5	G5	Secure	0	0	0	0	St. Johns	0		Ross Newfoundland Data.x	mstr1040895
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Todd Boland	1	3	9	2002	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	River outflow	Rennies River Outflow	10		NF.Birds	mstr1006817
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Dave Brown	1	12	11	2007	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	urban lake	0	100		Canadian Wildlife Service	mstr1009469
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Paul Lingear	1	10	2	2001	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	0	St. John's	10000		The Osprey	mstr1007003
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Vars. Obs.	1	0	0	2001	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	0	St. John's	10000		The Osprey	mstr1007005
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Jytte Selno	1	3	2	2003	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	0	St. John's	10000		NF.Birds	mstr1007007
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Bruce Mactavish	1	1	12	2003	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	0	St. John's	10000		The Osprey	mstr1007008
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Vars. Obs.	1	12	26	2003	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	0	St. John's	10000		The Osprey	mstr1007010
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Jared Clarke	1	1	26	2008	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	urban lake	0	1000		Canadian Wildlife Service	mstr1009471
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Dave Brown	1	1	5	2002	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	0	Quidi Vidi Lake	100		NF.Birds	mstr1006863
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Doug Phelan	1	1	7	2002	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	0	Quidi Vidi Lake	100		NF.Birds	mstr1006896
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Dwayne Sabine	1	1	13	2004	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	0	Virginia River Trail	1000		Canadian Wildlife Service	mstr1006979
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Bruce Mactavish	1	3	10	2007	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	freshwater lake	0	1000		Canadian Wildlife Service	mstr1009239

GNAME	GCOMNAME	FAMILY	Observer	TotalNumber	Month	Day	Year	SRANK_2015	SRANK_	NRANK	GRANK	GeneralStat	COSEWIC_ST	PROVINCIAL	SARA	DESCR_HABIT	SITE_NAME	Accuracy	SYNAME	CITATION	IDNUM
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Bruce Mactavish	1	3	8	2007	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	freshwater lake	0	1000		Canadian Wildlife Service	mstr1009240
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Bruce Mactavish	1	1	22	2007	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	freshwater lake	0	1000		Canadian Wildlife Service	mstr1009242
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Bruce Mactavish	1	1	14	2007	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	freshwater lake	0	1000		Canadian Wildlife Service	mstr1009244
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Jared Clarke	1	11	25	2007	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	municpal dump	0	1000		Canadian Wildlife Service	mstr1009466
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	John Wells	2	3	11	2007	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	municipal landfil	0	100		Canadian Wildlife Service	mstr1009238
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Jared Clarke	1	2	25	2007	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	municipal landfil	0	100		Canadian Wildlife Service	mstr1009241
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Peter Thomas	1	9	20	2006	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	0	Sugarloaf Head; St. John's	10		Canadian Wildlife Service	mstr1006815
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Bruce Mactavish	1	3	4	2011	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	west end of Quic	Quidi Vidi Lake, West End	10		Bruce Mactavish, NF.birds,	mstr1021740
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Ed Hayden	1	3	19	2016	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	0	h Cove (Fr. Troy's Trail south of Fla	1000		NF.Birds, March 20, 2016	MSTR1050880
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Frank King	1	3	26	2016	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	0	h Cove (Fr. Troy's Trail south of Fla	1000		NF.Birds, March 28, 2016	MSTR1050883
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Ed Hayden	2	4	24	2016	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	0	h Cove (Fr. Troy's Trail south of Fla	1000		NF.Birds, April 24, 2016	MSTR1050893
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Frank King	1	12	12	2016	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	0	0	1000		Nf.birds, December 12, 201	MSTR1051372
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Chris Brown	1	1	7	2017	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	0	0	1000		Nf.birds, January 7, 2017	MSTR1051387
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Lancy Cheng	1	9	29	2017	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	0	0	1000		nf.birds, sept 29, 2017	MSTR1053263
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Chris Brown	1	1	25	2018	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	0	0	1000		nf.birds, jan 25, 2018	MSTR1053287
Falco peregrinus subsp. a	Peregrine Falcon	Falconidae	Shawn Inikon	1	2	10	2018	S3M, S2N	S2M	N3B	G4T4	Sensitive	Special Concern	Vulnerable	Concern (anatum/t	0	0	10000		nf.birds, feb 10, 2018	MSTR1053295
Ursus maritimus	Polar Bear	Ursidae	Ian Stirling	1	5	9	1993	SNA	SNA	N3N4	G3G4	Sensitive	Special Concern	Vulnerable	Special Concern	0	0	0		DFO	mstr1033422
Loxia curvirostra	Red Crossbill	Fringillidae	R. Blacquiere	1	5	3	1977	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	boreal forest	Old Bauline Line near Torbay	10000		Nest Record Card	mstr1007488
Loxia curvirostra	Red Crossbill	Fringillidae	0	1	5	5	1967	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	urban forest	Kents Pond; St. John's	1000		Nest Record Card	mstr1007457
Loxia curvirostra	Red Crossbill	Fringillidae	0	1	8	13	2004	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	0	East End; St. John's	100		NF.Birds	mstr1007438
Loxia curvirostra	Red Crossbill	Fringillidae	Charlie Butler	0	5	6	2012	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	at feeder	Torbay	100		Email communication, Char	mstr1030927
Loxia curvirostra	Red Crossbill	Fringillidae	Dave Brown	2	3	30	2000	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	0	45 Smithville Crescent	0		Nf.Birds, Data Entry by WD	mstr1027985
Loxia curvirostra	Red Crossbill	Fringillidae	Jared Clarke	1	5	25	2003	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	0	Cape Spear - Lundrigan's Marsh	0		Nf.Birds, Data Entry by WD	mstr1028341
Loxia curvirostra	Red Crossbill	Fringillidae	Judith Blakeley	24	12	26	2007	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	0	Convent Road, Torbay	0		Nf.Birds, Data Entry by WD	mstr1028573
Loxia curvirostra	Red Crossbill	Fringillidae	Libby Creelman	-99	8	13	2004	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	0	East End	0		Nf.Birds, Data Entry by WD	mstr1028240
Loxia curvirostra	Red Crossbill	Fringillidae	Paul Linegar	-99	11	19	2006	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	0	Long Pond	100		Nf.Birds, Data Entry by WD	mstr1028020
Loxia curvirostra	Red Crossbill	Fringillidae	Todd Boland	10	4	7	2007	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	0	Long Pond	100		Nf.Birds, Data Entry by WD	mstr1028818
Loxia curvirostra	Red Crossbill	Fringillidae	Michael Parmente	1	4	13	2007	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	0	Long Pond	100		Nf.Birds, Data Entry by WD	mstr1028819
Loxia curvirostra	Red Crossbill	Fringillidae	Clyde Thornhill	-99	4	22	2007	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	In larch trees	Long Pond	100		Nf.Birds, Data Entry by WD	mstr1028820
Loxia curvirostra	Red Crossbill	Fringillidae	Anne Hughes	5	1	22	2009	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	In larch trees	Long Pond	100		Nf.Birds, Data Entry by WD	mstr1028029
Loxia curvirostra	Red Crossbill	Fringillidae	Ken Knowles	1	5	14	2009	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	0	Middle Cove	0		Nf.Birds, Data Entry by WD	mstr1028552
Loxia curvirostra	Red Crossbill	Fringillidae	Ken Knowles	-99	6	18	2009	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	0	Middle Cove	0		Nf.Birds, Data Entry by WD	mstr1028553
Loxia curvirostra	Red Crossbill	Fringillidae	Ken Knowles	2	6	25	2011	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	0	Middle Cove	0		Nf.Birds, Data Entry by WD	mstr1028561
Loxia curvirostra	Red Crossbill	Fringillidae	Ken Knowles	2	6	28	2011	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	0	Middle Cove	0		Nf.Birds, Data Entry by WD	mstr1028564
Loxia curvirostra	Red Crossbill	Fringillidae	Ken Knowles	1	7	11	2011	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	0	Middle Cove	0		Nf.Birds, Data Entry by WD	mstr1028566
Loxia curvirostra	Red Crossbill	Fringillidae	Ken Knowles	7	1	4	2009	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	0	Middle Cove Road	0		Nf.Birds, Data Entry by WD	mstr1028535
Loxia curvirostra	Red Crossbill	Fringillidae	Ken Knowles	7	2	7	2009	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	0	Middle Cove Road	0		Nf.Birds, Data Entry by WD	mstr1028536
Loxia curvirostra	Red Crossbill	Fringillidae	Paul Linegar	10	2	27	2008	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	In larch trees	Quidi Vidi	0		Nf.Birds, Data Entry by WD	mstr1028154
Loxia curvirostra	Red Crossbill	Fringillidae	Dave Fifield	1	3	19	2000	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	0	Sycamore Place	0		Nf.Birds, Data Entry by WD	mstr1027966
Loxia curvirostra	Red Crossbill	Fringillidae	Judith Blakeley	3	1	25	2009	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	0	Torbay	0		Nf.Birds, Data Entry by WD	mstr1028577
Loxia curvirostra	Red Crossbill	Fringillidae	Judith Blakeley	-99	4	25	2009	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	0	Torbay	0		Nf.Birds, Data Entry by WD	mstr1028579
Loxia curvirostra	Red Crossbill	Fringillidae	Judith Blakeley	10	5	13	2009	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	0	Torbay	0		Nf.Birds, Data Entry by WD	mstr1028580
Loxia curvirostra	Red Crossbill	Fringillidae	Judith Blakeley	2	4	14	2012	S1S2	S2S3	N5	G5	At Risk	Threatened	Endangered	Endangered	0	Torbay	0		Nf.Birds, Data Entry by WD	mstr1028582
Buteo lagopus	Rough-Legged Hawk	Accipitridae	Bruce Mactavish	1	3	24	2002	S2S3	S3B	N5B,N5N	G5	Secure	0	0	0	0	Dump	1000		Nf.Birds, Data Entry by WD	mstr1027796
Buteo lagopus	Rough-Legged Hawk	Accipitridae	Bruce Mactavish	1	1	11	2004	S2S3	S3B	N5B,N5N	G5	Secure	0	0	0	0	Dump	1000		Nf.Birds, Data Entry by WD	mstr1027801
Buteo lagopus	Rough-Legged Hawk	Accipitridae	Bruce Mactavish	1	3	6	2005	S2S3	S3B	N5B,N5N	G5	Secure	0	0	0	0	Dump	1000		Nf.Birds, Data Entry by WD	mstr1027807
Buteo lagopus	Rough-Legged Hawk	Accipitridae	Jared Clarke	1	1	1	2006	S2S3	S3B	N5B,N5N	G5	Secure	0	0	0	0	Dump	1000		Nf.Birds, Data Entry by WD	mstr1027808
Buteo lagopus	Rough-Legged Hawk	Accipitridae	Jared Clarke	1	2	5	2006	S2S3	S3B	N5B,N5N	G5	Secure	0	0	0	0	Dump	1000		Nf.Birds, Data Entry by WD	mstr1027809
Buteo lagopus	Rough-Legged Hawk	Accipitridae	Bruce Mactavish ,	1	1	11	2009	S2S3	S3B	N5B,N5N	G5	Secure	0	0	0	0	Dump	1000		Nf.Birds, Data Entry by WD	mstr1027820
Buteo lagopus	Rough-Legged Hawk	Accipitridae	John Wells	1	1	23	2011	S2S3	S3B	N5B,N5N	G5	Secure	0	0	0	0	Quidi Vidi Lake	0		Nf.Birds, Data Entry by WD	mstr1028137
Buteo lagopus	Rough-Legged Hawk	Accipitridae	Jytte Selno	1	4	18	2001	S2S3	S3B	N5B,N5N	G5	Secure	0	0	0	0	Signal Hill Road	0		Nf.Birds, Data Entry by WD	mstr1027925
Buteo lagopus	Rough-Legged Hawk	Accipitridae	Howard Clase	1	3	8	2005	S2S3	S3B	N5B,N5N	G5	Secure	0	0	0	0	Torbay Road	0		Nf.Birds, Data Entry by WD	mstr1028254
Buteo lagopus	Rough-Legged Hawk	Accipitridae	Bill Tucker	1	3	1	2003	S2S3	S3B	N5B,N5N	G5	Secure	0	0	0	0	Tracey Place	0		Nf.Birds, Data Entry by WD	mstr1028233
Euphagus carolinus	Rusty Blackbird	Icteridae	Brian Dalzell	1	3	18	2000	S2S3B,SUM	S3B	N4B	G4	Secure	Special Concern	Vulnerable	Special Concern	0	St. John's; Fox Avenue	100		NatureNB	mstr1007567
Euphagus carolinus	Rusty Blackbird	Icteridae	Ken Knowles	1	6	12	2000	S2S3B,SUM	S3B	N4B	G4	Secure	Special Concern	Vulnerable	Special Concern	0	Middle Cove	100		NF.Birds	mstr1007573
Euphagus carolinus	Rusty Blackbird	Icteridae	Jared Clarke	1	4	27	2003	S2S3B,SUM	S3B	N4B	G4	Secure	Special Concern	Vulnerable	Special Concern	0	Lundrigan's Marsh	100		NF.Birds	mstr1007570
Euphagus carolinus	Rusty Blackbird	Icteridae	Ken Knowles	1	5	19	2002	S2S3B,SUM	S3B	N4B	G4	Secure	Special Concern	Vulnerable	Special Concern	0	Lundrigan's Marsh	100		NF.Birds	mstr1007572
Euphagus carolinus	Rusty Blackbird	Icteridae	Ken Knowles	1	6	12	2000	S2S3B,SUM	S3B	N4B	G4	Secure	Special Concern	Vulnerable	Special Concern	0	Jones Pond	1000		Nf.Birds, Data Entry by WD	mstr1028568
Euphagus carolinus	Rusty Blackbird	Icteridae	Marion Gregory	1	3	18	2000	S2S3B,SUM	S3B	N4B	G4	Secure	Special Concern	Vulnerable	Special Concern	0	Fox Avenue	0		Nf.Birds, Data Entry by WD	mstr1028213
Euphagus carolinus	Rusty Blackbird	Icteridae	Ken Knowles	1	6	12	2000	S2S3B,SUM	S3B	N4B	G4	Secure	Special Concern	Vulnerable	Special Concern	0	Kenny's Pond	0		Nf.Birds, Data Entry by WD	mstr1028209
Euphagus carolinus	Rusty Blackbird	Icteridae	John Wells	1	5	17	2000	S2S3B,SUM	S3B	N4B	G4	Secure	Special Concern	Vulnerable	Special Concern	0	Long Pond	100		Nf.Birds, Data Entry by WD	mstr1027992
Euphagus carolinus	Rusty Blackbird	Icteridae	Ken Knowles	1	5	19	2002	S2S3B,SUM	S3B	N4B	G4	Secure	Special Concern	Vulnerable	Special Concern	0	Lundrigan's Marsh	0		Nf.Birds, Data Entry by WD	mstr1028339
Euphagus carolinus	Rusty Blackbird	Icteridae	Jared Clarke	1	4	27	2003	S2S3B,SUM	S3B	N4B	G4	Secure	Special Concern	Vulnerable	Special Concern	0	Lundrigan's Marsh	0		Nf.Birds, Data Entry by WD	mstr1028340
Asio flammeus	Short-eared Owl	Strigidae	Todd Boland	1	2	25	2004	S3B,SUM	S3B	N3N,N4B	G5	Secure	Special Concern	Vulnerable	Special Concern	urban	0	100		Canadian Wildlife Service	mstr1009227
Asio flammeus	Short-eared Owl	Strigidae	Todd Boland	1	4	6	1998	S3B,SUM	S3B	N3N,N4B	G5	Secure	Special Concern	Vulnerable	Special Concern	0	0	10000		Canadian Wildlife Service	mstr1009284
Asio flammeus	Short-eared Owl	Strigidae	John Wells	1	1	7	2008	S3B,SUM	S3B	N3N,N4B	G5	Secure	Special Concern	Vulnerable	Special Concern	scrub	0	100		Canadian Wildlife Service	mstr1009456
Asio flammeus	Short-eared Owl	Strigidae	Bruce Mactavish	1	12	6	2003	S3B,SUM	S3B	N3N,N4B	G5	Secure	Special Concern	Vulnerable	Special Concern	0	en Long Pond Road and Pine Bud /	0		Nf.Birds, Data Entry by WD	mstr1027943
Asio flammeus	Short-eared Owl	Strigidae	John Wells	1	1	7	2008	S3B,SUM	S3B	N3N,N4B	G5	Secure	Special Concern	Vulnerable	Special Concern	0	Near the Geo Centre	0		Nf.Birds, Data Entry by WD	mstr1027928
Asio flammeus	Short-eared Owl	Strigidae	Todd Bolan	1	4	6	1998	S3B,SUM	S3B	N3N,N4B	G5	Secure	Special Concern	Vulnerable	Special Concern	0	Torbay Road	0		Nf.Birds, Data Entry by WD	mstr1028252
Asio flammeus	Short-eared Owl	Strigidae	Chris Brown	1	5	28	2002	S3B,SUM	S3B	N3N,N4B	G5	Secure	Special Concern	Vulnerable	Special Concern	0	oad side of the Airport near the PA	0		Nf.Birds, Data Entry by WD	mstr1028256

GNAME	GCOMNAME	FAMILY	Observer	TotalNumber	Month	Day	Year	SRANK_2015	SRANK_2	NRANK	GRANK	GeneralStat	COSEWIC_ST	PROVINCIAL	SARA	DESCR_HABIT	SITE_NAME	Accuracy	SYNAME	CITATION	IDNUM
Asio flammeus	Short-eared Owl	Strigidae	iNaturalist user: h	0	7	10	2016	S3B,SUM	S3B	N3N,N4B	G5	Secure	Special Concern	Vulnerable	Special Concern	0	0	0		iNaturalist record export 20	MSTR1052848
Bubo scandiacus	Snowy Owl	Strigidae	golfman_otto@ya	1	12	5	2008	S3N,SUM	SNA	N5B,N5N	G5	Secure	0	0	0	0	115 Forest Road	0		Nf.Birds, Data Entry by WD	mstr1027971
Bubo scandiacus	Snowy Owl	Strigidae	Wayne Tucker	1	11	12	2001	S3N,SUM	SNA	N5B,N5N	G5	Secure	0	0	0	0	23 Oakridge Drive	0		Nf.Birds, Data Entry by WD	mstr1028258
Bubo scandiacus	Snowy Owl	Strigidae	John Pratt	1	11	11	2001	S3N,SUM	SNA	N5B,N5N	G5	Secure	0	0	0	0	Bally Hally Estates Area	0		Nf.Birds, Data Entry by WD	mstr1028199
Bubo scandiacus	Snowy Owl	Strigidae	golfman_otto@ya	1	2	21	2010	S3N,SUM	SNA	N5B,N5N	G5	Secure	0	0	0	0	Bally Hally Golf Course	0		Nf.Birds, Data Entry by WD	mstr1028192
Bubo scandiacus	Snowy Owl	Strigidae	Doug Phalen	1	11	26	2001	S3N,SUM	SNA	N5B,N5N	G5	Secure	0	0	0	0	of Newfoundland Drive & Logy Ba	0		Nf.Birds, Data Entry by WD	mstr1028232
Bubo scandiacus	Snowy Owl	Strigidae	Ken Knowles	1	3	22	2012	S3N,SUM	SNA	N5B,N5N	G5	Secure	0	0	0	0	Queen of Peace Church, Torbay I	0		Nf.Birds, Data Entry by WD	mstr1028255
Bubo scandiacus	Snowy Owl	Strigidae	Todd Boland	1	3	26	1999	S3N,SUM	SNA	N5B,N5N	G5	Secure	0	0	0	0	ove - White Hills Behind Fisheries	0		Nf.Birds, Data Entry by WD	mstr1028504
Bubo scandiacus	Snowy Owl	Strigidae	Cal King	1	5	12	2002	S3N,SUM	SNA	N5B,N5N	G5	Secure	0	0	0	0	oad side of the Airport near the PA	0		Nf.Birds, Data Entry by WD	mstr1028448
Bubo scandiacus	Snowy Owl	Strigidae	Chris Brown	1	5	28	2002	S3N,SUM	SNA	N5B,N5N	G5	Secure	0	0	0	0	oad side of the Airport near the PA	0		Nf.Birds, Data Entry by WD	mstr1028449
Bubo scandiacus	Snowy Owl	Strigidae	Jared Clarke	1	11	23	2001	S3N,SUM	SNA	N5B,N5N	G5	Secure	0	0	0	0	Window at Sobey's on Torbay Road	0		Nf.Birds, Data Entry by WD	mstr1028198
Bubo scandiacus	Snowy Owl	Strigidae	Wayne Tucker	1	11	12	2001	S3N,SUM	SNA	N5B,N5N	G5	Secure	0	0	0	0	uth Face on Roof of 23 Oakridge D	0		Nf.Birds, Data Entry by WD	mstr1028259
Aythya fuligula	Tufted Duck	Anatidae	iNaturalist user: s	0	12	13	2017	S1N,SUM	SNA	NNA	G5	grant/ Accide	0	0	0	0	i Vidi Lake, St. John's, NL A1A, Ca	968		iNaturalist record export 20	MSTR1052200
Aythya fuligula	Tufted Duck	Anatidae	iNaturalist user: p	0	3	5	2008	S1N,SUM	SNA	NNA	G5	grant/ Accide	0	0	0	0	Quidi Vidi, St. John's, NL, Canada	0		iNaturalist record export 20	MSTR1052966
Aythya fuligula	Tufted Duck	Anatidae	iNaturalist user: u	0	10	9	2017	S1N,SUM	SNA	NNA	G5	grant/ Accide	0	0	0	0	Pond Walk, St. John's, NL A1A 0E4	3		iNaturalist record export 20	MSTR1052968
Aythya fuligula	Tufted Duck	Anatidae	iNaturalist user: s	0	11	17	2017	S1N,SUM	SNA	NNA	G5	grant/ Accide	0	0	0	0	i Vidi Lake, St. John's, NL A1A, Ca	968		iNaturalist record export 20	MSTR1052971
Aythya fuligula	Tufted Duck	Anatidae	iNaturalist user: s	0	11	21	2017	S1N,SUM	SNA	NNA	G5	grant/ Accide	0	0	0	0	i Vidi Lake, St. John's, NL A1A, Ca	968		iNaturalist record export 20	MSTR1052972
Aythya fuligula	Tufted Duck	Anatidae	iNaturalist user: s	0	12	8	2017	S1N,SUM	SNA	NNA	G5	grant/ Accide	0	0	0	0	nts Pond, St. John's, NL A1B, Cana	314		iNaturalist record export 20	MSTR1052974

GNAME	GCOMNAME	OBSERVER	MONTH	DAY	YEAR	SRANK_2005	SRANK_2010	SRANK_2015	NRANK	GRANK	FAMILY	PROV_END_A	COSEWIC	DESCR_HABIT/	ACCURACY_MI	SYNAME	SITE_NAME	SURVEYSITE	ACRONYMS_O	COLLECTION	SOURCES	IDNUM	EST_NF_ID
Sparganium fluctuans	floating burreed	Robinson, B.L. & H. Schre	0	0	0	S2	S2	S2S3	NNR	G5	Typhaceae	0	0	0	1000	Sparganium and	Virginia Waters	Virginia Waters	GH; CAN	200	Bouchard, A. Da	SP26251	750759
Fraxinus nigra	blach ash	Inkpen	0	0	0	S3	S3	S3	NNR	G5	Oleaceae	0	0	(cultivated?).	1000	0	St John's	St John's; Windsor La	NFLD	11	Bouchard, A. Da	SP24369	749513
Potamogeton amplifolius	broadleaf pondweed	Ayre, A.M.	0	0	1929	S2	S2	S2S3	NNR	G5	Potamogetonace	0	0	0	1000	0	Quidi Vidi	Quidi Vidi	NFLD	s.n.	Bouchard, A. Da	SP26202	750722
Juncus militaris	bayonet rush, jointed bog rush	Maunder, John E.	8	22	1967	S3	S3	S3	N4	G4	Juncaceae	0	0	Dry, grassy area	10	0	Rennies River	St. John's, Rennies R	NFM	0	Herbarium of the	SP43691	750396
Amelanchier fernaldii	Fernald's chuckleypear, St. Lawrence s	Maunder, John E.	6	6	1967	S1	S1	S1	NNR	G2G4Q	Rosaceae	0	Candidate (Priority 3)	Dry, open woods	1000	Amelanchier sar	Kent's Pond	St. John's, Kent's Por	NFM	0	Herbarium Data	SP22199	749723
Carex rostrata	beaked sedge	Maunder, John E.	9	20	1967	S?	S3S5	S3S4	NNR	G5	Cyperaceae	0	0	Side of pond, we	100	Carex rostrata va	Long Pond	St. John's, Long Ponc	NFM	0	Herbarium Data	SP22232	750220
Prunella vulgaris	common selfheal, heal all, healall, selfh	Maunder, John E.	7	0	1967	0	S3S4	S3S5	N5	G5	Lamiaceae	0	0	0	100	0	Kent's Pond	St. John's, Kent's Por	NFM	0	Herbarium Data	SP22125	749477
Sparganium natans	small burreed, least burreed	Peter J. Scott	8	8	1968	S3S4	S3S4	S3S4	NNR	G5	Typhaceae	0	0	In water, just the	100	Sparganium min	Penetanguishen	St. John's, end of Firc	NFLD	566	Jane Ayre Herba	SP21916	750761
Carex viridula subsp. brachyrrhyncha var. sa	rocky shore sedge	Olsen, O.A.	8	3	1973	S1	S1	S1	N1	G5T1	Cyperaceae	0	Candidate (Priority 3)	0	1000	Carex saxilittoral	Memorial Univer	St.John's, M.U.N. Ca	NFM	CW 028	Herbarium Data	SP42694	750260
Ribes hirtellum	swamp gooseberry, smooth gooseberry	Botanical Garden	0	0	1999	S?	S3S4	S3S4	NNR	G5	Grossulariaceae	0	0	Wetland/riparian	1000	Grossularia hirte	Juniper Ponds /	St. Johns Outer Ring	0	0	MUN Botanical (	SP21765	749438
Persicaria amphibia	water smartweed	Botanical Garden	0	0	1999	S2	S2	S2	N5	G5T5	Polygonaceae	0	0	Bog habitat.	1000	Polygonum amp	Juniper Ponds /	St. Johns Outer Ring	0	0	MUN Botanical (	SP21832	749560
Festuca rubra	red fescue	Claudia Hanel, Clase, H. a	6	22	2002	0	S5	S2S3	NNR	G5	Poaceae	0	0	Trailside; mesic	1000	Festuca rubra su	Gallows Cove ar	Avalon Peninsula, To	NFM	CH 020622-1	0	SP21497	750609
Poa pratensis	Kentucky bluegrass	Claudia Hanel, Clase, H. a	6	22	2002	0	S3	S3	N5	G5	Poaceae	0	0	Trailside; mesic	1000	Poa crocata; P. s	Gallows Cove ar	Avalon Peninsula, To	NFM	CH 020622-4	0	SP21500	750679
Eleocharis ovata	ovate spikerush	Ayre, A.M.	0	0	1.9E+07	S1	S1	S1	NNR	G5	Cyperaceae	0	0	Marsh.	1000	Scirpus ovatus; I	Quidi Vidi	Quidi Vidi.	GH; NFLD	s.n.	Bouchard, A. Da	SP25534	750313
Arabis alpina	alpine rockcress	Maunder, John E.	6	14	1968	S3	S3	S3	NNR	G5	Brassicaceae	0	0	0	50	Arabis alpina for	0	St. John's, in garden a	NFM	0	Herbarium Data	SP47657	749021
Fraxinus nigra	blach ash	Maunder, John E.	7	18	1967	S3	S3	S3	NNR	G5	Oleaceae	0	0	0	50	0	0	St. John's, Kenny's Po	NFM	0	Herbarium Data	SP50050	749513
Aralia hispida	Bristly sarsaparilla	Maunder, John E.	9	20	1967	S?	S4S5	S3S4	NNR	G5	Araliaceae	0	0	0	50	0	0	St. John's, Torbay roa	NFM	0	Herbarium Data	SP49265	748713

APPENDIX B

Species Descriptions

Bobolink

The Bobolink (*Dolichonyx oryzivorus)* is a ground-nesting species of migratory bird that inhabits hayfields, moist meadows and other areas that are dominated by a mixture of tall grasses both during the breeding season and throughout migration. Bobolinks feed primarily on seeds, grains, insects and spiders. Before migrating south, Bobolinks move to coastal areas and freshwater marshes to molt. Population numbers of the Bobolink have sharply declined throughout its eastern range in recent decades, primarily due to a loss of meadows and agricultural land, i.e., suitable breeding habitat. While wetlands do not provide suitable breeding habitat for Bobolinks, they could potentially utilize coastal wetlands or freshwater marshes within the Study Area prior to migration (Cornell University, 2017a).

Chimney Swift

The Chimney Swift (*Chaetura pelagica*) is a small bird with dark brown, slightly iridescent plumage and a brownish-grey throat. An aerial insectivore, the Chimney Swift is a long-distance migrant, breeding in central and eastern Canada and wintering in South America. Chimney Swifts forage over a variety of habitats including forests, open country, lakes, ponds, and both suburban and urban areas (Steeves et al., 2014). They are often seen near bodies of water due to the abundant insects. Range-wide declines of Chimney Swifts in the Maritimes are evident from breeding bird surveys, which have indicated that the species is disappearing in many areas where it was once detected (Stewart et al., 2015). Prior to the colonization of North America by Europeans, Chimney Swifts nested mainly in the trunks of large, hollow trees, and occasionally on cave walls or in rocky crevices. This habitat type became increasingly rare due to land clearing activities, and today most Chimney Swifts nest in house chimneys. They are now mainly associated with urban and rural areas where the birds can find chimneys to use as nesting and roosting sites (Steeves et al., 2014). Subsequently, the wetlands identified within the municipality would not provide suitable nesting habitat for Chimney Swifts.

Common Nighthawk

The Common Nighthawk (*Chordeiles minor)* is a ground-nesting species of bird that requires open ground or clearings for nesting. The Common Nighthawk uses a wide variety of habitats including dunes, beaches, logged forests, open woodlands, grasslands, rock outcroppings, wetlands, barren ground and even gravel rooftops during breeding season. They are aerial insectivores which forage for flying insects at dusk or dawn, in open areas usually near a waterbody. From late August to early October, migrating flocks of nighthawks can number in the hundreds en-route to wintering grounds in South America (Environment Canada, 2016). It is possible that Common Nighthawks could use wetlands (e.g., bogs, marshes, lakeshores and riverbanks) within the Study Area.

Gray-Cheeked Thrush

The Gray-cheeked Thrush (*Catharus minimus minumus*) is a small songbird that is slightly larger than other thrushes, with grayish upperparts and face. This species breeds and forages in dense low coniferous boreal forests across North America, as well as in northeastern Siberia. The subspecies (*C. m. minimus*), which breeds on the Island of Newfoundland, has brownish-olive upperparts, grayish-brown to brownish olive flanks, a cream washed breast, and a lower mandible having an extensive pale base and a bright yellow tinge, and may show some chestnut edging on wings and tail (Lowther et al., 2001 *in*

Endangered Species and Biodiversity Section, 2010). This subspecies occurs at low densities in suitable habitat throughout much of Newfoundland and Labrador, where they are reported to be most common on the Northern Peninsula and northeast coast. The population appears to have undergone a strong decline in the past several decades across Canada. This decline may be due to loss of habitat, nest predation, and mortality during migration and overwintering (Endangered Species and Biodiversity Section, 2010). Since Gray-cheeked Thrush prefer to nest and forage in forest habitat, it is possible that they could utilize forested wetlands within the Study Area to breed.

Harlequin Duck

The Harlequin Duck is a small, long-lived subarctic sea duck with distinctive breeding plumage. Two populations occur in Canada, with the eastern population breeding in Québec, Newfoundland and Labrador, New Brunswick, and Nunavut. They breed along clear, fast-flowing rivers and streams, sometimes in tree cavities, but mostly on the ground near water. They winter along the coast in marine areas near rocky shorelines or sub-tidal ledges with plentiful amphipods, along the eastern seaboard of the U.S.A., the Atlantic Provinces, and Greenland (COSEWIC, 2013a). They are often found near shore in turbulent waters where there are low levels of sea ice. It is possible that Harlequin Ducks could breed along rivers or streams running through wetlands within the Study Area.

Ivory Gull

The Ivory Gull (*Pagophila eburnea*) is a small, black-legged seabird, the only gull with all-white adult plumage. Immature birds have a black face and chin, and black spots speckled along the wings and tail. This gull breeds in high-Arctic coastal areas, within Canada only in the Nunavut Territory, and winters primarily in Arctic seas, generally along the southern edge of the pack ice, though it may be seen along the Atlantic coast, including the coasts of Newfoundland and Labrador. They require breeding sites that are safe from terrestrial predators, particularly the arctic fox. They nest in colonies near marine waters that are safe from terrestrial predators and are partially free of ice in late May and early June; colonies are found concentrated around Jones and Lancaster Sounds, with colonies occurring on southeastern Ellesmere Island, eastern Devon Island, and the Brodeur Peninsula of northern Baffin Island (Environment Canada, 2013). Given its habitat preferences, the Ivory Gull is not anticipated to utilize wetland habitat within the Study Area.

Olive-Sided Flycatcher

The Olive-Sided Flycatcher (*Contopus cooperi*) is a small migratory insectivorous bird which inhabits coniferous forest edges, early post-fire landscapes, and openings such as meadows, rivers, bogs, swamps and ponds. Olive-sided Flycatchers feed on flying insects, especially bees, and are often seen perched on the tops of tall trees or snags in open woodland habitat. They typically nest in spruce trees. They breed throughout much of Canada during the summer months and overwinters in Central and South America (Cornell University, 2017b). Olive-sided Flycatchers could use wetland habitat located within the Study Area for breeding and foraging.

Peregrine Falcon

The American Peregrine Falcon is a medium to large falcon with long, pointed wings. A long-distance migrant, the Peregrine Falcon is one of the fastest birds in the world and has become a conservation success story after reintroductions and the banning of DDT saved this species from extinction (COSEWIC, 2007).

Formerly treated as two separate subspecies, the *anatum* and *tundrius* Peregrine Falcons are now thought to be separated only geographically, not genetically, and are therefore treated as a single unit. This species' preferred foraging habitat includes lakeshores, river valleys, river mouths, urban areas and open fields. Usually nesting on open cliffs, or cut banks, (sometimes on tall buildings in urban areas), the peregrine's main food source includes pigeons, waterfowl, shorebirds, larger songbirds and some small mammals. They are known to nest on tiny ledges on sheer cliffs along the coast of Labrador from Table Bay to Cape Chidley, and along a number of the Labrador rivers (COSEWIC, 2007). Subsequently, suitable nesting habitat is not present in wetlands in the Study Area.

Polar Bear

The polar bear (*Ursus maritimus*) is a large white bear occurring throughout the Arctic. Male polar bears tend to be larger than females, and can weigh up to 800 kg, reaching 2.8 m in length from nose to tail (DeMaster and Stirling, 1981 *in* COSEWIC, 2008a). An apex predator, the polar bear depends on the availability of sea ice to enable it to hunt seals.

Polar bears range along the entire northern Labrador coast, with southerly winter movements extending as far as the Straight of Belle Isle and occasionally to Newfoundland, and with summer movements extending northward to Baffin Island. COSEWIC have noted that, a few polar bears can regularly appear as far south as the island of Newfoundland, but not specifically noted in the study area (COSEWIC, 2008a).The total population in Canada likely exceeds 10,000 mature individuals. Climate change-related reductions in the extent and duration of sea ice coverage in the Canadian Arctic, is the main threat to this species.

The Newfoundland and Labrador Government is currently working with representatives of Torngat Wildlife and Plants Co-Management Board (TWPCB), Canadian Wildlife Service (CWS), and the Nunatsiavut Government (NG) to develop a Polar Bear Management Plan for Newfoundland and Labrador (Polar Bear SARA Management Plan Progress Report, 2019) to ensure the long-term persistence of polar bears as a self-sustaining species throughout its range in Newfoundland and Labrador.

Red Crossbill

The Red Crossbill is a small (15 cm) member of the finch family (Fringillidae) which has unique curved and crossed mandibles, muscular hinged jaws, and strong clasping feet for prying open conifer seed cones. Adult male Red Crossbills are dull red, females are greyish-olive, and juveniles are dull grey to brownish and heavily streaked. One of ten recognized forms of Red Crossbill in North America, the *percna* subspecies has a comparatively larger bill. The *percna* subspecies is endemic to Canada, and has been confirmed to breed only on the island of Newfoundland and on Anticosti Island. Red Crossbills are reliant throughout their range on mature cone-producing forests, mostly of white and red pine. In Newfoundland, these pines are rare, and Red Crossbills rely on mature black spruce, and to a lesser extent, balsam fir and white spruce forests. The *percna* subspecies is now rare and declining in

Newfoundland (COSEWIC, 2016b). Threats included competition form introduced red squirrels, logging activities, and a fungal disease affecting red pine (COSEWIC, 2016). Red Crossbills may be found in wetlands with coniferous forest in the Study Area.

Rusty Blackbird

The Rusty Blackbird (*Euphagus carolinus*) is a medium-sized songbird, both sexes of which have pale yellow eyes and a black, slightly curved bill. It occurs across much of Canada, which encompasses the majority of its breeding range. It breeds almost entirely within the boreal forest, usually in coniferous-dominated forests adjacent to wetlands, such as slow-moving streams, peat bogs, sedge meadows, marshes, swamps and beaver ponds (COSEWIC, 2017). It is also known to feed extensively on aquatic invertebrates within the riparian zones of shallow, slow moving rivers. Rusty Blackbird may utilize wetland habitat or habitat directly adjacent to wetlands within the Study Area.

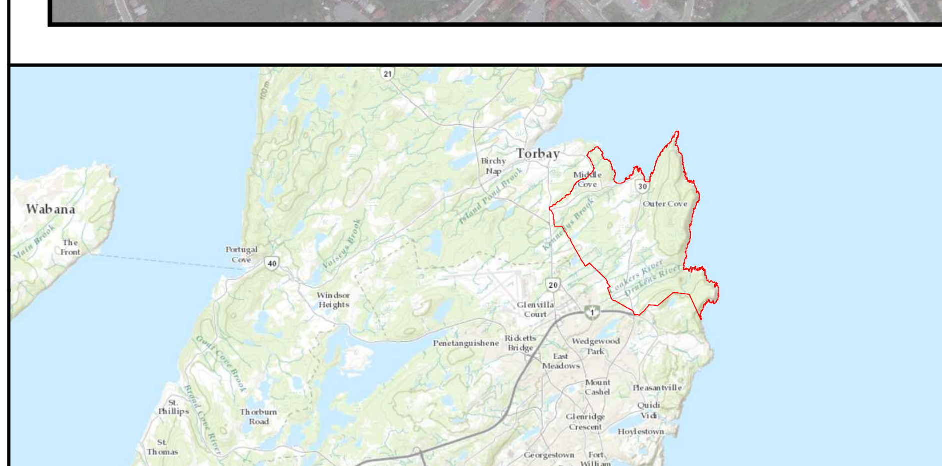
Short-eared Owl

The Short-eared Owl (*Asio flammeus*) is a medium-sized (34 to 42 cm), cryptically coloured owl with a blend of beige, brown, and black streaks, which is conspicuous only when in flight. They also have short, inconspicuous ear tufts, narrow brown streaks on the abdomen, yellow eyes, and a black patch near the wrist under the wing. Short-eared Owls are often active at dawn and dusk. They have a characteristic moth-like foraging flight, characterized by deep wing-beats, occasional hovering, and the habit of quartering low over patches of grassland or marsh (COSEWIC, 2008b).

The species prefers relatively open areas, including grasslands, wet meadows, marshes, fields, airports, forest clearings, muskegs and open bogs and can be found throughout Nova Scotia. In Newfoundland and Labrador, it is found primarily in coastal areas, grasslands, and other open habitats, but moves in response to changes in the abundance of small mammal prey species. Short-eared Owls breed in a large number of open habitats including grasslands, Arctic tundra, taiga, bogs, marshes, old pastures, and sand-sage (COSEWIC, 2008b). In the Canadian Maritime provinces, Short-eared Owls breed primarily in well-drained grasslands near coastal wetlands (Erskine, 1992; Schmelzer, 2005). Short-eared Owls may therefore utilize wetland habitat, or habitat directly adjacent to wetlands in the Study Area.

APPENDIX C

Wetlands, Waterbodies, and Waterways Mapping



- Municipal Road Network
- Municipal Boundary
- Watercourses
- Waterbodies
- Wetlands

Landuse Zone

- Open space / Conservation

Appendix C
Logy Bay - Middle Cove - Outer Cove

Wetlands, Waterbodies, and Waterways

Drawn By: MD	Checked By: IB
Approved By: IB	CBCL Project #: 193029.00
Date: 2019-11-15	Scale @ 11'x17' 1:10,500
Coordinate System: NAD 1983 MTM 1	

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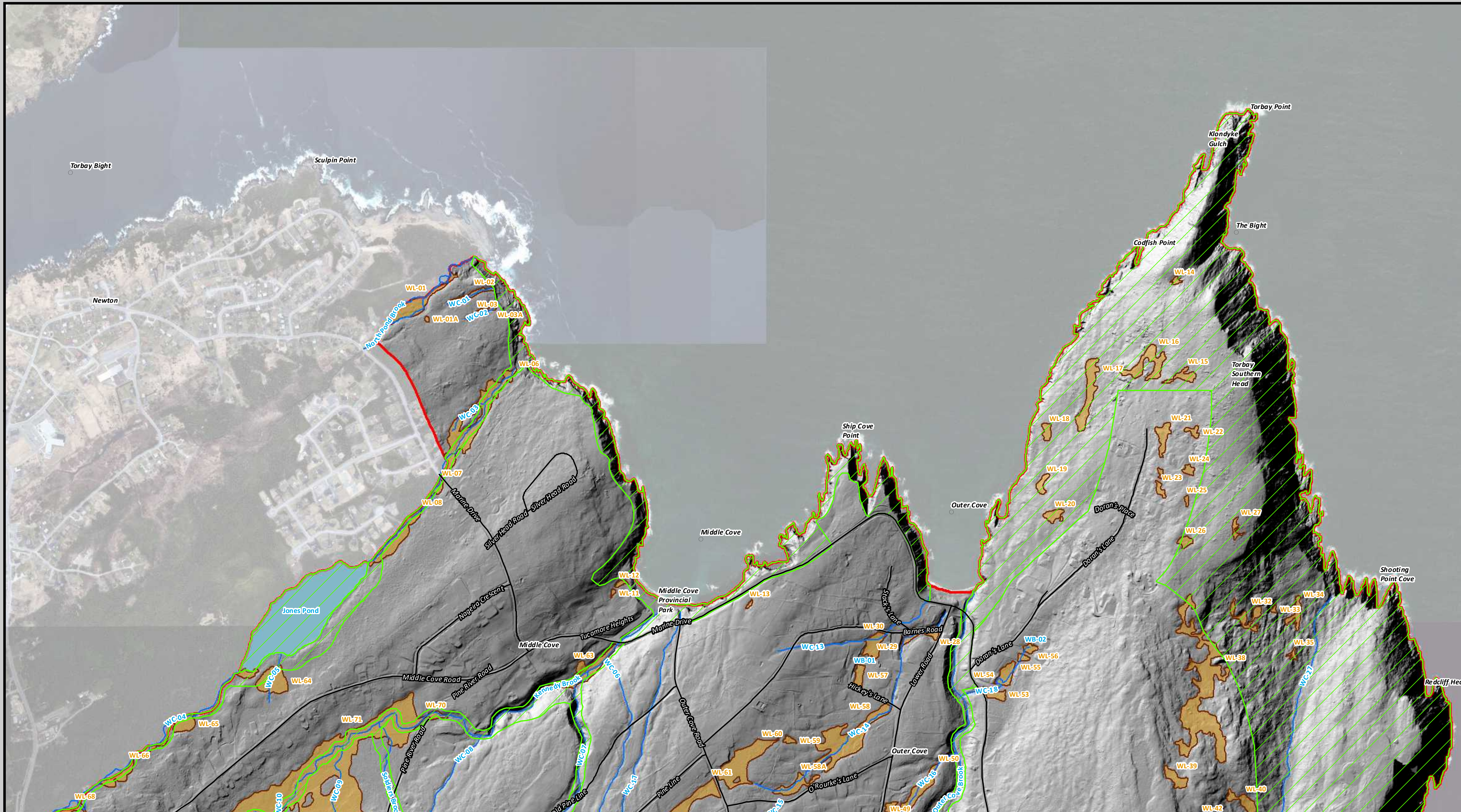

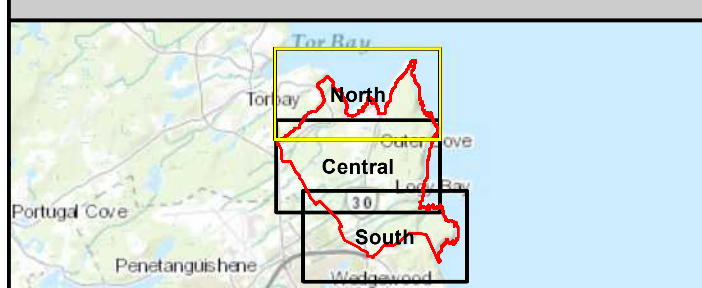

- Municipal Road Network
- Municipal Boundary
- Watercourses
- Waterbodies
- Wetlands

Landuse Zone

- Open space / Conservation

Drawn By: MD	Checked By: IB
Approved By: IB	CBCL Project #: 193029.00
Date: 2019-11-15	Scale @ 11'x17' 1:12,500
Coordinate System: NAD 1983 MTM 1	

0 160 320 480 640 m

Appendix C
Logy Bay - Middle Cove - Outer Cove

Wetlands, Waterbodies, and Waterways

North
Sheet 1 of 3

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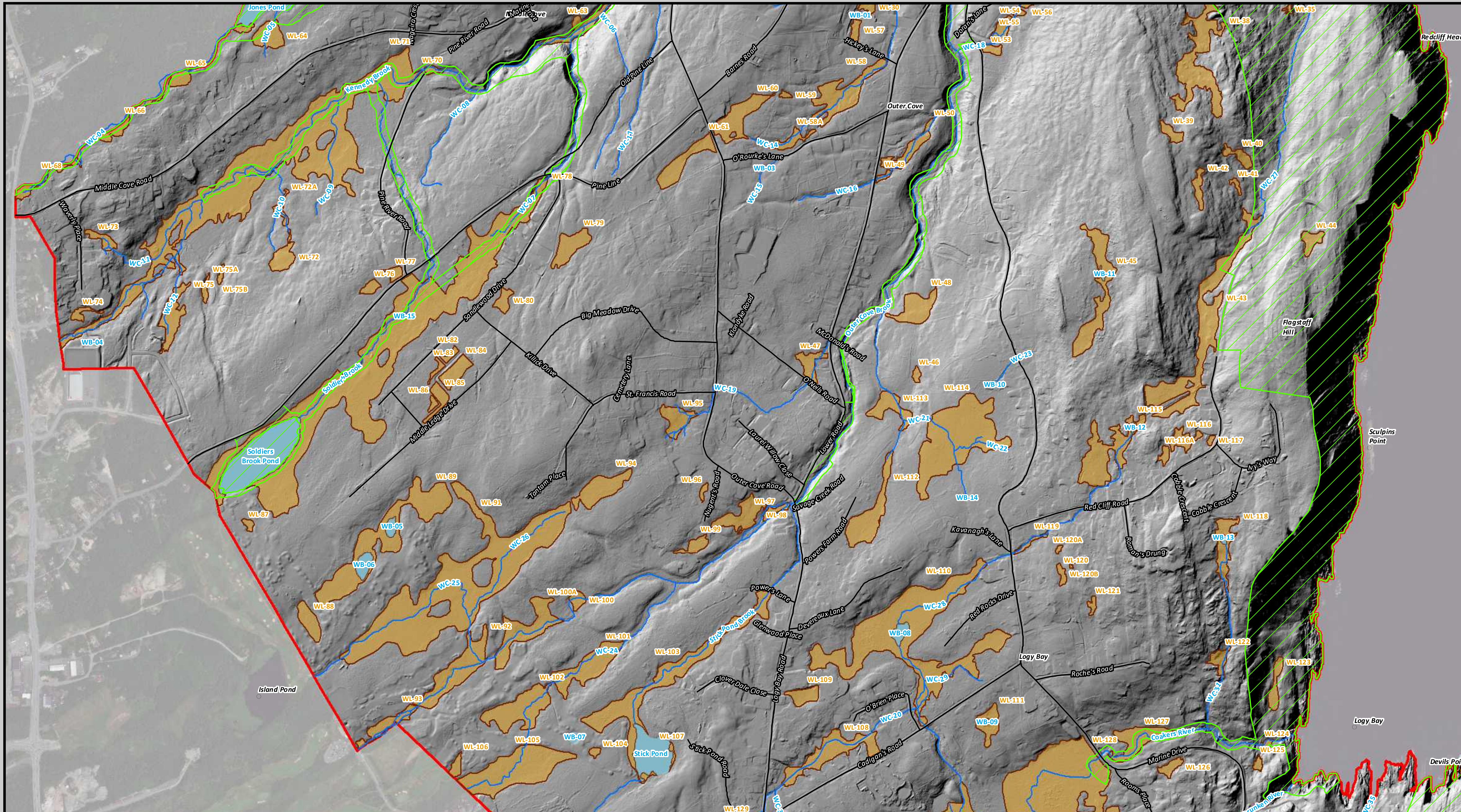

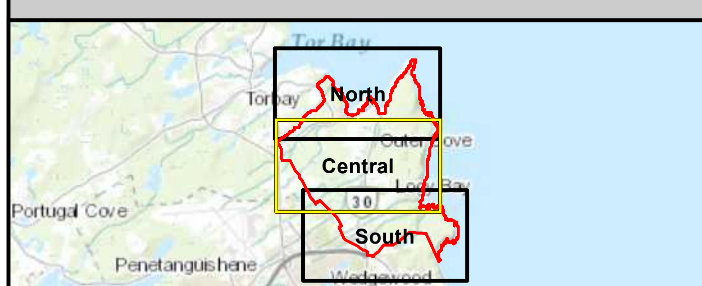

Municipal Road Network
Municipal Boundary
Watercourses
Waterbodies
Wetlands

Landuse Zone

Open space / Conservation

Drawn By: MD	Checked By: IB
Approved By: IB	CBCL Project #: 193029.00
Date: 2019-11-15	Scale @ 11'x17' 1:12,500
Coordinate System: NAD 1983 MTM 1	

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Appendix C
Logy Bay - Middle Cove - Outer Cove

Wetlands, Waterbodies, and Waterways

Central
Sheet 2 of 3

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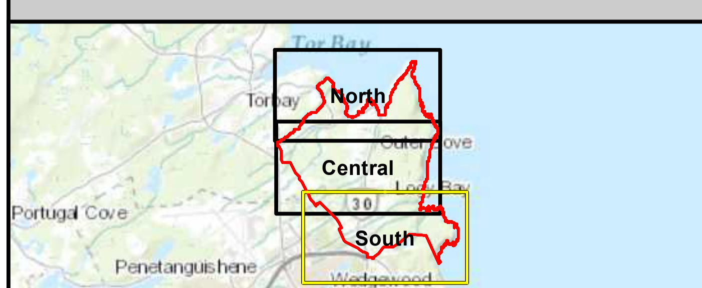

Municipal Road Network
Municipal Boundary
Watercourses
Waterbodies
Wetlands

Landuse Zone

Open space / Conservation

Drawn By: MD	Checked By: IB
Approved By: IB	CBCL Project #: 193029.00
Date: 2019-11-15	Scale @ 11'x17' 1:12,500
Coordinate System: NAD 1983 MTM 1	

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Appendix C
Logy Bay - Middle Cove - Outer Cove

Wetlands, Waterbodies, and Waterways

South
Sheet 3 of 3

Z:\193029.00 LB-MC-OC WETLANDS and WATERWAYS\GIS\193029.00 MXD-007 LBMCOC FINAL REPORT - RESULTS.mxd

APPENDIX D

Planners Guide to Wetland Buffers for Local Governments

ENVIRONMENTAL LAW INSTITUTE

Planner's Guide to Wetland Buffers for Local Governments

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Planner's Guide to Wetland Buffers for Local Governments

March 2008
Environmental Law Institute

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Planner's Guide to Wetland Buffers for Local Governments

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Cover photo by Amy Maxwell.

Planner's Guide to Wetland Buffers for Local Governments

America's local governments know their lands and are familiar with their critical role as the primary regulators of land use and development activities. Many local governments also know their waters and wetlands, and most have authority to regulate land uses in order to conserve and protect these important community assets. While many publications assist local governing boards with land use planning and zoning, this publication compiles the scientific literature on wetland buffers (the lands adjacent to wetland areas) and identifies the techniques used and legislative choices made by local governments across the United States to protect these lands.

This guide for planners is based on detailed examination of approximately 50 enacted wetland buffer ordinances and nine model ordinances, and upon several hundred scientific studies and analyses of buffer performance. This guide identifies both the state-of-the-art and the range of current practice in the protection of wetland buffers by local governments. Local governments considering enacting or amending a wetland buffer ordinance will find here what they need to know to manage land use and development in these important areas.

Why Should Local Governments Adopt Wetland Buffer Controls?

The term "wetlands" encompasses a variety of landscape features that contain or convey water and support unique plants and wildlife. Wetlands often serve as a transitional zone between dry lands and areas dominated by water, including ponds and rivers, oceans and estuaries, and their floodplains and tributaries. Federal regulations define wetlands as "areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas." (40 C.F.R. §230.3(t)) An extensive body of scientific literature, classification systems (Cowardin et. al. 1979) and legal opinions make important distinctions in wetland types and delineation methods.

Wetlands form part of the natural system of land and water that helps to make human communities livable. Many wetlands help control flooding and reduce damage from storm surges. They trap sediments and pollutants that otherwise might enter waterways. They help to recharge groundwater in some areas, and in tidal zones they provide nurseries for shellfish and fish. They also serve as habitat for birds, amphibians, and other wildlife and provide scarce natural areas in urban and suburban environments.

Attention to these functions is essential to governance of the community's land uses, public health, safety, and welfare. But these functions cannot be sustained without care for the uplands adjacent to wetlands—wetland buffers.

Well-designed buffers protect and maintain wetland functions by removing sediments and associated pollutants from surface water runoff, removing, detaining, or detoxifying nutrients and contaminants from upland sources, influencing the temperature and microclimate of a water body, and providing organic matter to the wetland. Buffers also maintain habitat for aquatic, semi-aquatic, and terrestrial wildlife, and can serve as corridors among local habitat patches, facilitating movement of wildlife through the landscape.

> Wetland buffers in urban areas are particularly important in helping to moderate the impacts of altered hydrologic regimes and flooding.
>
> —City of Boulder, 2007

Local government interests in wetland buffer lands often include concern for management of stormwater, avoidance of hazards from flooding, protection of water supplies, and protection of property from future hazards that may be associated with global climate change. Protection of vegetated buffers may reduce the severity of water fluctuations and flooding due to storms (FIFMTF 1996) as buffers may increase the flood storage capacity of wetlands by better attenuating storm runoff before it reaches the wetland (Wenger 1999).

As many as 5,000 local governments have taken some actions to protect at least some wetlands within their borders (Kusler 2003). Some local governments regulate activities in wetlands, and all local governments have clear jurisdiction over actions on the buffer lands that surround wetlands. In many important ways, local governments are better situated than state and federal environmental authorities to control activities on the lands that surround wetland resource areas, because they are not just concerned with wetland functions, but also with surrounding land uses and the benefits wetlands provide for their communities.

Federal regulations require developers and others to obtain permits from the U.S. Army Corps of Engineers to dredge or fill many wetlands. But many activities that affect small acreages, or that involve particular kinds of construction or development activities, are authorized under generic "general permits" or "nationwide permits" with minimal scrutiny and standard conditions. Further, some wetlands that are isolated or that lack sufficient connection to navigable waters and tributaries may be totally unregulated federally under recent Supreme Court decisions (*SWANCC v. U.S. Army Corps of Engineers* (2001) and *Rapanos v. United States* (2006)). And while about a third of the states have regulatory programs affecting one or more types of wetland, coverage varies substantially by wetland type, acreage, activity, and potential impact.

Where federal and state regulatory programs do not apply, local governments remain the sole source of protective authority. And even where federal or state programs provide for review and permitting of activities in wetlands, local governments still have an interest in ensuring the compatibility of the land use that occurs on and around these lands in order to maintain control of their patterns of development, community character, tax base, demand for services, and response to hazards (McElfish 2004).

The functions and services that wetlands provide may diminish if wetlands are surrounded by parking lots, buildings, and pollution-generating or other incompatible land uses that reduce their hydrologic functions, alter vegetation, and degrade habitat values. Relying on regulations and conservation measures that deal only with the wetland is like trying to operate a municipal swimming pool without any attention to the pipes, the deck, the lifeguard stations, and the condition of areas draining into the water. Such an approach is like operating a roadway with no shoulders, no sidewalks, no signals, no management of the right-of-way, and no provision for the water sheeting onto the road surface.

Wetland Buffers and Climate Change

Wetland buffers will enable local communities to protect themselves from known hazards associated with global climate change. In some regions, climate change will produce more extreme storm events, increase the number and intensity of floods, and alter the infiltration and conveyance capacity of stormwater and natural wetland systems. Sea level rise will threaten coastal communities, which depend upon the storm-buffering effects of coastal wetlands. Climate change will also change the volume and timing of snowmelt, alter groundwater supplies, and produce drought effects, making healthy wetland function even more critical for water supply and watershed resilience. An ordinance that protects wetland buffers will moderate the effects of drought and protect private and public property.

The upland area surrounding the wetland is essential to its survival and functionality. If a wetland area cannot absorb the stormwater it normally absorbs, the chances of flooding will increase further downstream; if the wetland cannot serve as home for wetland species and vegetation, community values and quality of life will be impaired. Local governments that have wetlands within their boundaries have the opportunity to conserve these resource lands and to control or compensate for activities and development that might impair their benefits to the community and the environment.

Elements of Wetland Buffer Ordinances

Local governments should address the following elements when drafting a wetland buffer ordinance or bylaw:

- ☐ Purpose of the Ordinance
- ☐ Wetlands Covered
- ☐ Definition of Buffer
- ☐ Activities Prohibited/Permitted
- ☐ Procedures for Review

- ☐ Affirmative Requirements
- ☐ Monitoring, Reporting, and Enforcement

Within each of these elements, local governments have used many approaches to achieve wetland buffer protection. Alternative approaches allow governments to address particular environmental concerns, property development issues, differing land uses, and practical and political constraints. Each element is discussed below, together with examples from local governments that have employed the alternatives. (All citations are to the relevant section numbers of the local ordinances referenced.)

☐ Purpose of the Ordinance

The ordinance should have an explicit statement of the purposes for which it is enacted. First, such a statement makes the scope of the ordinance clear. It informs the elected decision maker's choice about the type of regulatory approach that will accomplish the desired outcome, and it avoids both regulatory overreach and under reach (failure to include sufficient protection measures to achieve objectives). The purpose definition is particularly important in determining the size of a wetland buffer and defining the activities that will be prohibited, conditionally permitted, exempted, or authorized by right under the ordinance. It will define the extent to which the ordinance regulates the wetland area and the buffer, or whether it is primarily aimed at the buffer while leaving wetland regulation to federal or state oversight alone.

Second, the statement of purpose aids in the interpretation of the ordinance by those charged with carrying it out, such as zoning administrators and permitting authorities, inspectors, and code enforcement officers. It also assists landowners, developers, and citizens in understanding the ordinance and in conforming their proposals and activities to its provisions. This is particularly useful where the ordinance includes provisions that require application of performance standards, mitigation of authorized impacts on the buffer, and use of alternative design solutions.

Third, the statement of purpose defines the legal authority upon which the ordinance rests and so helps courts and administrative bodies sustain both its legality and its application to specific actions. The ordinance may draw on explicit state authorizations, such as in those states that authorize local governments to adopt wetland regulations or critical area protections; or it may draw on a broader array of public health, safety, and welfare justifications supported by the local government's police power. The ordinance may aim at a specific subset of issues within the local government's authority, such as prevention and control of flooding, prevention of water pollution, or protection of habitat, open space, recreation, and other issues. Where applicable, the ordinance may draw on "home rule" authority to supplement other legal authorizations.

Type of Ordinance

Defining the purpose of the ordinance will help the local government and its legal advisors determine the type of ordinance that will be most useful. Most local wetland buffer ordinances are part of the zoning code or land development regulations. In some cases they are contained in a separate natural resources code, or they implement state-enacted wetlands or critical areas laws. A few are included in subdivision regulations together with setback and dimension requirements. Some wetland buffers are part of local erosion control or stormwater management regulations. The local government may include buffer protection as part of an ordinance that specifies protections for the wetland itself, or it may adopt an ordinance regulating the buffer area while relying on federal or state provisions to address activities within the wetland.

Purposes for wetland buffer ordinances include natural resource protection, hazard avoidance, and public health and safety, among others. Commerce City, Colorado, specifies that its ordinance, which covers a number of resource concerns, is designed "to protect significant natural, historical, and agricultural resource features on the development site." (§21-43(b)(1)) Bay County, Florida's, ordinance declares that "wetlands are a valuable natural resource worthy of protection," and that its ordinance establishing a setback distance from wetlands is intended:

> to provide a buffer between wetlands and development, preserve water quality, limit sediment discharges, erosion, and uncontrolled stormwater discharges, and provide wildlife habitat. (§1909)

Some ordinances specify concern for mitigation of hazards and protection of property. The purpose of Schaumburg, Illinois' wetlands, streams, and aquatic resources protection ordinance:

> shall be to protect persons and property within and adjacent to wetlands from potentially hazardous geological and hydrological conditions; prevent environmental degradation of the land and water; and ensure that development enhances rather than detracts from or ignores the natural topography, resources, amenities, and fragile environment of wetlands within the village. (§154.196)

Belle Isle, Florida, finds that "the preservation and protection of property rights of the people of the city require that mechanisms be established which will provide for the orderly regulation and preservation of environmentally significant and productive wetlands." (§48-62(a)(3))

Very comprehensive statements of purposes are found in the LaPorte, Indiana, ordinance, "to require planning to avoid or minimize damage to wetlands and lakes; to require that activities not dependent upon a wetland or shoreline be located at other sites;…to make certain that activities affecting wetlands and lakes must not threaten public safety or cause nuisances by: blocking flood flows, destroying flood storage areas, or destroying storm barriers, thereby raising flood heights or velocities on other land and increasing flood damages; causing water pollution through any means [including application of pesticides, increasing erosion, or increasing runoff of sediment and surface water]; and that activities in or affecting wetlands do not destroy natural wetland functions important to the general welfare [listing habitat, groundwater recharge, education and research, public rights in waters and recreation, and aesthetic and property values.]" (§82-563 to -565)

A model ordinance prepared by the Northeast Ohio Areawide Coordinating Agency provides a significant list of purposes that can be used by local governments considering their own ordinances:

> Establish consistent, technically feasible and operationally practical standards to achieve a level of storm water quantity and quality control that will minimize damage to public and private property and degradation of water resources, and will promote and maintain the health, safety, and welfare of the residents of the Community. Preserve to the maximum extent practicable the natural drainage characteristics of the community and building sites and minimize the need to construct, repair, and replace enclosed storm drain systems. Preserve to the maximum extent practicable natural infiltration and ground water recharge, and maintain subsurface flow that replenishes water resources, wetlands, and wells. Prevent unnecessary stripping of vegetation and loss of soil, especially adjacent to water resources and wetlands. Reduce the need for costly maintenance and repairs to roads, embankments, sewage systems, ditches, water resources, wetlands, and storm water management practices that are the result of inadequate storm water control due to the loss of riparian areas and wetlands. Reduce the long-term expense of remedial projects needed to address problems caused by inadequate storm water control.
>
> The specific purpose and intent of this part of these regulations is to regulate uses and developments within wetland setbacks that would impair the ability of wetland areas to: Reduce flood impacts by absorbing peak flows, slowing the velocity of floodwaters, and regulating base flow. Assist in stabilizing the banks of watercourses to reduce bank erosion and the downstream transport of sediments eroded from watercourse banks. Reduce pollutants in watercourses during periods of high flows by filtering, settling, and transforming pollutants already present in watercourses. Reduce pollutants in watercourses by filtering, settling, transforming and absorbing pollutants in runoff before they enter watercourses. Provide watercourse habitats with shade and food. Provide habitat to a wide array of aquatic organisms, wildlife, many of which are on Ohio's Endangered and/or Threatened Species listings, by maintaining diverse and connected riparian and wetland vegetation. Benefit the Community economically by minimizing encroach-

> ment on wetlands and watercourse channels and the need for costly engineering solutions such as dams, retention basins, and rip rap to protect structures and reduce property damage and threats to the safety of residents; and by contributing to the scenic beauty and environment of the Community, and thereby preserving the character of the Community, the quality of life of the residents of the Community, and corresponding property values.

Nashua, New Hampshire's, purpose statement is:

> in the interest of public health, safety and general welfare, to: Insure the protection of valuable wetland resources; prevent the harmful filling, draining, sedimentation, or alteration of wetlands; Prevent the destruction or significant degradation of wetlands which provide flood and storm control by the hydrologic absorption and storage capacity of the wetland; Protect fish and wildlife habitats by providing breeding, nesting, and feeding grounds for many forms of plant and animal life including rare, threatened, or endangered species; Protect subsurface water resources and provide for the recharging of ground water supplies; Provide pollution treatment to maintain water quality; Prevent expenditures of municipal funds for the purpose of providing and/maintaining essential services and utilities which might be required as a result of misuse or abuse of wetlands; Provide for those compatible land uses in and adjacent to wetland or surface waters which serve to enhance, preserve, and protect wetland areas as natural resources. (§16-571)

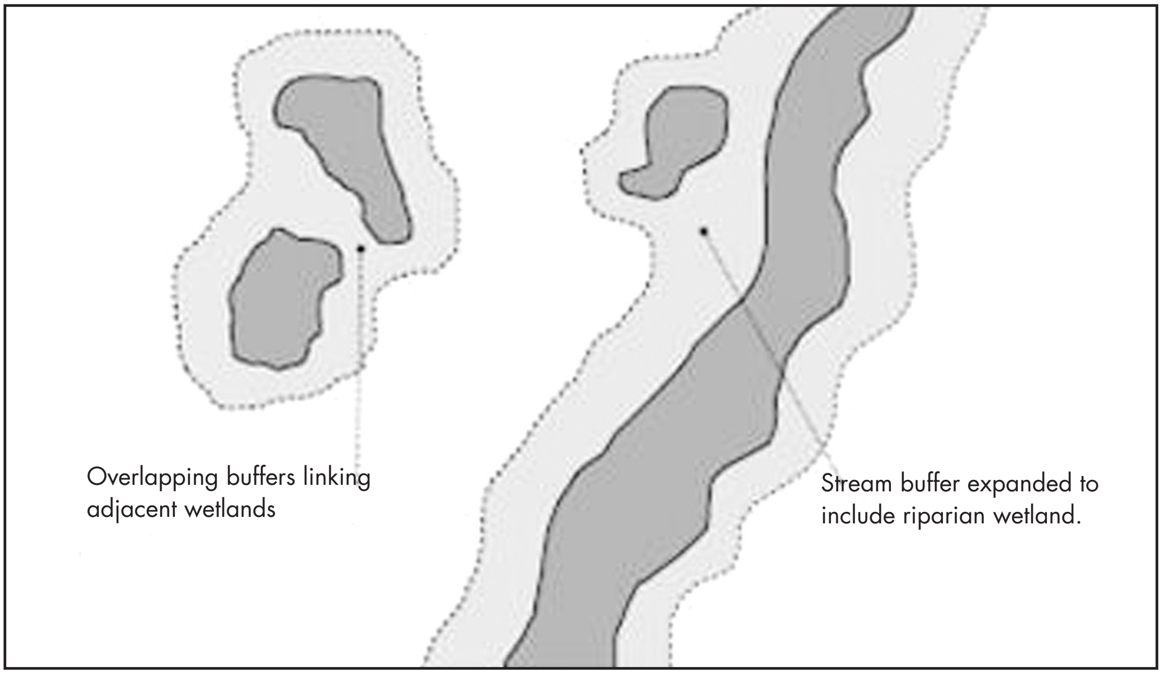
☐ Wetlands Covered

Local governments must determine which wetlands and waters to include within their buffer ordinances. Ordinances tend to exhibit ***four*** approaches to defining the wetlands to which local buffer requirements will be applied:

(1) The ordinance may cover ***all wetlands and waters***, as broadly defined in the ordinance, or it may reference the definitions of "waters of the state" or definitions of wetlands found in state laws or federal regulations. For example, the buffer ordinance may specify "wetlands," as in Chipley, Florida (§14.5-21), or "wetlands as defined by state law," as in Woodbury, Minnesota (§27-1).

(2) The ordinance may define ***specific wetland types or classes of wetlands*** that are protected under the ordinance. This approach may provide certain protections for tidal wetlands and different protections for nontidal wetlands. It may provide for protection of wetlands over a particular size (such as wetlands over one-half acre in area, as in Charlotte County, Florida, or wetlands over one-quarter acre in area, as in Lake County, Illinois). The ordinance may determine that buffer protections should be afforded to all wetlands over which federal jurisdiction exists under the Clean Water Act or under state wetlands laws, or it may specifically extend coverage to wetlands that *do not* receive protection under state and federal regulations. For example, Summit County, Colorado, protects wetlands as defined in the County ordinance, "notwithstanding any contrary determination by the U.S. Army Corps of Engineers."(§7105.1(A)) Some towns in New York offer protections for wetlands under 12.4 acres, the lower limit of the state's wetland program jurisdiction. Some of the ordinances we reviewed (although less than a quarter) provide different buffer protections for different classes of wetlands, using either state or local wetland quality or vulnerability ranking schemes. For example, Nashua, New Hampshire, prescribes a 75-foot nondisturbance buffer for "primary wetlands" as defined under state law, 40 feet for "critical wetlands," and 20 feet for other wetlands over one acre. (§16-575).

(3) The ordinance may be primarily aimed at the protection of ***stream and river corridors and floodways*** (riparian corridors), but provide for the inclusion and protection of wetlands where they are found within or adjacent to these areas. Most such ordinances provide for the expansion of the riparian buffer distance to a greater extent than would be required were such wetlands not present. For example, Summit County, Ohio's, riparian buffer ordinance provides that whenever wetlands protected under federal or state law are identified within the riparian setback (which is itself 30-300 feet depending on the size of the drainage



After *Cappiella* et al. *2005*

area), "the riparian setback shall consist of the full extent of the wetlands plus the following *additional* setback widths" from the outer boundary of the wetland —50 feet, 30 feet, or zero additional feet, depending upon the type of wetland. (§937.05(e3))

(4) Some local government wetland ordinances protect ***specifically identified, mapped wetlands*** within the jurisdiction, rather than relying on definitions. Schaumburg, Illinois', wetlands, streams, and aquatic resources overlay district applies to areas designated on the town's zoning map. (§154.196) Pickens County, Georgia's, ordinance applies to developments within 50 feet of a defined "wetlands protection district" boundary, as defined by the County's Health Department. This district specifically includes all land mapped as wetlands by the federal government's National Wetlands Inventory Maps. (§§12-26-124, 12-26-125) Oregon City, Oregon, applies wetland buffer protection to "Title 3 wetlands," defined as those wetlands of metropolitan concern as shown on the water quality and flood management area map and other wetlands added to city or county-adopted water quality and flood management area maps. (§17.49.040) Lewiston, Maine, applies its 250-foot regulatory review buffer (and 75 foot minimum setback) to "ten (10) acre or greater wetlands, located in the City of Lewiston, as shown" on a specifically-referenced set of Maine Department of Environmental Protection maps dated 1989, and identified by specific identification numbers on those maps. (§34.2(B)(2)) Strommen et al. (2007) advise using an adopted local wetland map.

☐ Definition of Buffer

Local governments use numerous approaches when defining wetland buffers. Ordinances may define a regulated area where scrutiny will be exercised over activities near wetlands, or define a non-disturbance area where natural vegetation must be maintained. Sometimes these are the same—so that there will be no disturbance, with limited exceptions by permit, throughout the entire defined regulatory buffer. In other instances, the ordinance will define a larger area of regulatory scrutiny, with limited uses by permit, and then define a smaller non-disturbance area nearest the wetland margins. Some ordinances prescribe a non-disturbance buffer area, but then establish an additional setback distance for buildings from the outer edge of the buffer. Because of these variations, simply comparing the number of feet prescribed in various buffer ordinances is not informative by itself. What matters is how the buffer ordinance defines what activities are allowed and not allowed in the defined areas.

The Science of Buffers for Wetlands

In adopting a buffer and defining its dimensions, the local government must rely on good science, both to achieve effective results and to meet any legal challenges. A large scientific literature examines effective buffer sizes for water quality and wildlife habitat. In general, wide and densely vegetated buffers are better than narrow and sparsely vegetated buffers. However, the buffer size necessary to provide a particular level of function depends on the functions of the wetland, the wetland's relative sensitivity (as influenced by water retention time and other factors), the characteristics of the buffer, the intensity of adjacent land use, and watershed characteristics. A multi-function buffer should be sized to meet all of the functions identified as being locally important.

Water Quality & Buffers

Wetland buffers protect the water quality of wetlands by preventing the buffer area itself from serving as a source of pollution, as well as by processing pollutants that flow from upland areas. Water quality benefits vary not just with the size of the buffer, but also with the flow pattern, vegetation type, percent slope, soil type, surrounding land use, pollutant type and dose, and precipitation patterns (Adamus 2007, Wenger 1999, Sheldon et al. 2005). Both the type and intensity of surrounding land uses are key factors determining the effectiveness of wetland buffers in protecting water quality. Variations in water quality have been correlated over extended distances with quantity of intense urban land use in the contributing area, forest cover, and proximity of road crossings (Houlahan and Findlay 2004, Wilson and Dorcas 2003). Intense urbanization, agriculture, and concentrated timber harvests can increase the amount of sediments and contaminants in surface runoff, cause changes in hydrology, and increase the severity of water fluctuations in a wetland during storm events. Vegetation and deep permeable soils in the buffer slow down surface flow, allow for infiltration before runoff reaches valuable wetlands, and inhibit the formation of channelized flow, improving removal of sediments and nutrients. Buffers that include both forested and grassy vegetation may be most effective at removing both sediments and nutrients, especially in agricultural areas. Buffer effectiveness, however, can be reduced over the long term by activities that destroy vegetation or compact or erode soils, causing rills and gullies. Effectiveness in the short term may diminish if sediment and nutrients are added too quickly or in chronically high concentrations.

Depending on site conditions, much of the sediment and nutrient removal may occur within the first 15-30 feet of the buffer, but buffers of 30-100 feet or more will remove pollutants more consistently. Buffer distances should be greater in areas of steep slope and high intensity land use. Larger buffers will be more effective over the long run because buffers can become saturated with sediments and nutrients, gradually reducing their effectiveness, and because it is much harder to maintain the long term integrity of small buffers. In an assessment of 21 established buffers in two Washington counties, Cooke (1992) found that 76% of the buffers were negatively altered over time. Buffers of less than 50 feet were more susceptible to degradation by human disturbance. In fact, no buffers of 25 feet or less were functioning to reduce disturbance to the adjacent wetland. The buffers greater than 50 feet showed fewer signs of human disturbance. Cooke concluded that the effectiveness of buffers to protect adjacent wetlands is increased when fewer lots are present, buffers are larger and vegetated, and buffers are owned by landowners who understand the purpose of the buffer. Tougher monitoring and enforcement of buffer requirements should also help.

Wildlife Habitat & Buffers

Wetland buffers maintain or serve directly as habitat for aquatic and wetland-dependent species that rely on complementary upland habitat for critical stages of their life-history (Chase et al. 1997). Buffers also screen adjacent human disturbance and serve as habitat corridors through the landscape. The appropriate buffer size for habitat functions will depend on the resident species, the life-history characteristics of the species, the condition of the wetland and the wetland buffer, the intensity of the surrounding land use, and the function the buffer is to provide. Adamus (2007) suggests that the buffer size determination consider

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Science of Water Quality Buffers

A considerable amount of research addresses the size of buffers needed to remove sediments, phosphorous, nitrogen, and other pollutants.

Sediments

Buffers remove sediments and attached nutrients, toxics, and pesticides by reducing the velocity of surface flow, allowing the suspended solids to settle out on the surface and/or filter through the soil. A significant percent of the sediment in surface flows may be removed in a 15-30 foot buffer, but sediments may be more consistently removed by buffers of 30-100 feet (Dillaha et al. 1988, 1989, Magette et al. 1989, Schoonover et al. 2006). Progressively larger buffers may be required to filter out incrementally greater amounts of sediments (Wong and McCuen 1982, as cited in Wenger 1999, EOR 2001). From their review of the literature, Sheldon et al. (2005) suggest that coarse sediments are likely removed efficiently in the first 16-66 feet of a buffer, and removal of finer particles may require buffers of at least 66 feet. Locations with high sediment loads and steep slope may also require wider buffers, as sediment removal efficiency decreases as slope increases (Wenger 1999, Sheldon et al. 2005). Wider buffers also may be necessary to maintain sediment removal efficiencies over time as buffers become saturated with sediments (Wenger 1999). The ability of a buffer to remove sediment is highly dependent on sediment-laden water entering the buffer surface via sheet flow rather than via highly focused flows (Wigington et al. 2003, and references in Sheldon et al. 2005). Water confined mainly in ditches, incised channels, subsurface pipes, and other types of highly focused flows does not allow much contact with buffer vegetation and often is not sufficiently slowed to allow sediment removal, reducing the pollution-filtering capability of the buffer. Riparian vegetation, litter, and woody debris on the surface can reduce the velocity of surface flow, allowing more contact with vegetation and soils and inhibiting the formation of incised channels and gullies (Lowrance and Sheridan 2005, Sheldon et al. 2005). In addition, buffers with low gradient slope are more effective for the same reasons. The use of level spreaders, grass filter strips, or other structural techniques also can encourage sheet flow through buffers (Wenger 1999). If stormwater pipes cross a buffer entirely underground before emptying into a wetland, the runoff purification purpose of the buffer will obviously be defeated.

Phosphorous

Much of the phosphorous entering a buffer is attached to sediments, which can be removed as suspended solids are filtered by the buffer (Wenger 1999). Much of the phosphorous may be removed within the first 15-30 feet of the buffer, but phosphorous may be more consistently removed by buffers of 30-100 feet (Dillaha et al. 1988, 1989, EOR 2001, Kuusemets and Mander 1999, Lowrance and Sheridan 2005, Syverson 2005). Buffers can become saturated with phosphorous and generally cannot provide long term storage of phosphorous, but they can help to regulate the flow of phosphorous and prevent large pulses of the nutrient from reaching the wetland (Wenger 1999). Vegetation management (haying, grazing) may help to permanently remove some phosphorus from the system (Wenger 1999).

Nitrogen

Subsurface flow is the dominant water flow route through many buffers and wetlands. Nitrogen is removed primarily through conversion of nitrate to nitrogen gas by denitrifying bacteria and by vegetative uptake. This occurs primarily in the upper few feet of a buffer's soil or a wetland's sediment. Removal efficiencies are generally high (see Table 1 in Mayer et al. 2005). However, nitrogen removed via vegetative uptake can be released back to the system as plants die and decompose. Nitrogen also enters a buffer as particulate nitrogen attached to sediments, which can be removed as suspended solids are filtered by the buffer. Mayer and colleagues (2005) recently completed a comprehensive review and synthesis of the literature pertaining to the nitrogen removal function of riparian buffers. From their interpretation of that literature, they suggested that narrow buffers, 3.3 – 49.2 feet, can be effective at removing nitrogen, but wider buffers, >164 feet, more consistently remove significant amounts of nitrogen. They suggest 50%, 75%, and 90% nitrogen removal efficiencies (through both surface and subsurface flow) would occur in buffers of approximately 10 feet, 92 feet, and 367 feet wide, respectively, depending on buffer characteristics and nitrate loading rates. Based on a review of some of the same literature, Wenger (1999) suggested that a minimum of 50 feet is necessary for effective nitrogen removal, and depending on the soils (wet organic soils being the best), 100 feet or more would include more areas of denitrification activity and provide more nitrogen removal. Buffers of various vegetation types may be temporarily effective in retaining nitrogen being carried in the *subsurface* flow. High levels of organic carbon in the soil, saturated soil, anoxic or low oxygen conditions, and extended contact of the groundwater with the root zone of riparian vegetation are necessary for effective microbial denitrification and plant uptake of nitrogen. Removal of subsurface nitrate is highest when these soil conditions are maintained (Correll 1997, Wenger 1999), and these criteria may be more important than width in determining the effectiveness of the buffer (Mayer et al. 2005). For example, Vidon and Hill (2004) found that a 50 foot buffer was effective at removing 90% of the nitrate at locations with loamy soils, but at locations with sand and cobble sediments (soils with less organic matter), the buffer width required for 90% nitrate removal ranged from 82 ft to 577 feet. In order to maintain the nitrogen removal effectiveness of buffers, soil compaction, gullying, increases in impervious surfaces in the buffer, and excessive removal of leaf litter or ground cover should be minimized (Mayer et al. 2005).

Other Pollution

A few studies have shed some light on effective buffer widths for removing fecal coliform and other pathogenic microorganisms. In one study, a 30 foot buffer that had been treated with poultry manure was able to remove 34-74 % of the fecal coliform. However, the resulting runoff still exceed the primary contact standard (Coyne et al. 1995). Toxics (pesticides and metals) may also be partially removed through filtration of sediments by the buffer (Sheldon et al. 2005), and temporarily, through vegetative uptake (Gallagher and Kibby 1980). Urban buffers are thought to be generally good at removing hydrocarbons and metals from surface runoff (Herson-Jones et al. 1995, as cited in Wenger 1999).

Limitations

There are many limitations to the conclusions about buffer widths that can be drawn from the scientific literature on buffers. More studies focus on buffers to protect stream and river functions than on wetlands. Also, many buffer studies are not conducted year-round, although water quality effects vary across seasons. Further, much of the science examining the effectiveness of buffers to remove pollutants describes the percentage of pollutant reduced by the buffer, but more rarely whether the buffer enabled the receiving water body to meet water quality standards. Finally, most studies tend to evaluate effects of specific buffer sizes rather than to derive buffer distances from conditions. Nevertheless, the scientific literature, if interpreted cautiously by experts in bio-geochemistry and wildlife, can help municipalities determine the dimensions and characteristics of an effective wetland buffer (Sheldon et al. 2005).

Science of Wetland Habitat Buffers

Many of the buffer studies in the scientific literature make conclusions on appropriate buffer sizes for wildlife habitat based on how far individuals range from the wetland or water body for breeding or other life-cycle needs. The Environmental Law Institute's (2003) review of the science found that effective buffer sizes for wildlife protection may range from 33 to more than 5000 feet, depending on the species. Specific information on ranges for birds, mammals, reptiles, and amphibians has been developed:

Birds: from 49 to over 5000 feet (ELI 2003, Fischer 2000).
Mammals: between 98 and 600 feet (ELI 2003).
Reptiles & Amphibians: In a review of the literature, Semlitsch and Bodie (2003) found that core terrestrial habitat for reptiles associated with wetlands ranged between 417 and 948 feet, and for amphibians 521and 951 feet. They suggest preserving core habitat plus an additional 164 foot (50 meter) buffer to minimize edge effects. However, little guidance is given concerning what type and density of buffer vegetation is acceptable for protecting particular species.

The type and intensity of surrounding land uses will affect the wildlife habitat function of a buffer. For example, studies have shown that amphibian species richness declines with increasing urban land use and road density (Rubbo and Kiesecker 2005, Houlahan and Findlay 2003). Marsh bird community integrity has been shown to decline significantly when the amount of urban/suburban development within 500 m and 1000 m of the marsh exceeds 14% and 25%, respectively (DeLuca et al. 2004). Well designed buffers must be employed in combination with comprehensive land use planning that maintains a land-scape containing relatively large, intact habitat areas in order to further habitat conservation goals.

Buffers can screen light, noise, domestic pets, and human presence from wetland wildlife (Castelle et al. 1992). The level of human disturbance in a buffer will likely depend on the intensity of adjacent land uses (Cooke 1992), thus buffer sizes should be increased with increasing intensity of land use. Buffers of at least 50 feet are likely necessary to maintain buffer effective-ness over time (Cooke 1992).

In general, forested buffers will be best around forested and scrub-shrub wetlands for forest species, but grassy and herba-ceous vegetation may be most effective in other locations and for other species (Adamus 2007). Buffers with greater structural complexity will usually support more species (Shirley 2004), although buffers with less complexity can be more favorable to particular species that may be locally rare. Native vegetation is more likely to be effective at conserving native wildlife (Wenger 1999). Parkyn et al. (2000, as cited in Parkyn 2004) suggest that a buffer of 33–66 feet is necessary for sustaining native vegetation in some wetlands.

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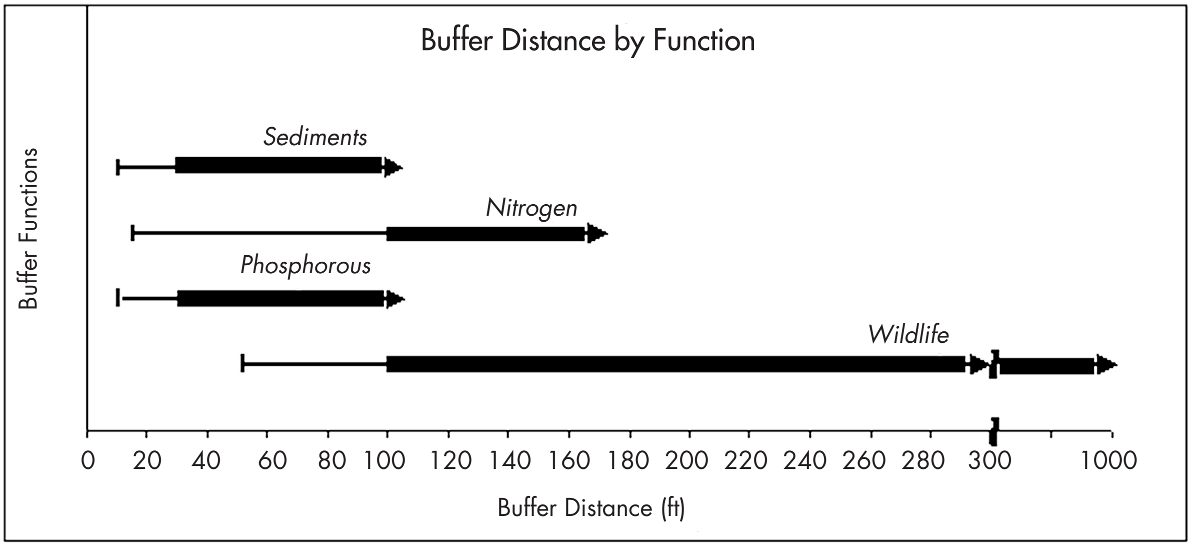

Effective buffer distance for water quality and wildlife protection functions. The thin arrow represents the range of potentially effective buffer distances for each function as suggested in the science literature. The thick bar represents the buffer distances that may ***most*** *effectively accomplish each function (30 - > 100 feet for sediment and phosphorous removal; 100 - > 160 feet for nitrogen removal; and 100 - >300 feet for wildife protection. Depending on the species and the habitat characteristics, effective buffer distances for wildlife protection may be either small or large.*

all of the buffer functions relevant to habitat including removing pollutants, limiting disturbance by humans, limiting the spread of non-native species into wetlands, helping maintain microclimatic conditions, and providing habitat for native wetland-dependent species that require both wetland and upland habitats. The Environmental Law Institute's (2003) review of the science found that effective buffer sizes for wildlife protection may range from 33 to more than 5000 feet, depending on the species. The State Wildlife Action Plans (www.teaming.com), developed by fish and wildlife agencies in all fifty states, are good sources of relevant information on native species, species of conservation concern, and their habitat requirements. These data can be supplemented by consulting local biologists to tailor buffer sizes to specific habitat types, species, and landscapes.

Approaches to Setting Buffer Distances

There are a number of alternative approaches to setting the buffer distance—usually defined in feet measured horizontally from the edge of the defined wetland. Many ordinances simply prescribe a fixed buffer distance for all wetlands subject to the ordinance (*e.g.*, 75 feet or 100 feet). Others vary the prescribed distance depending upon the type of wetland or the quality of wetland from which the buffer is extended (*e.g.*, 75 feet from least vulnerable wetland type; 100 feet from most vulnerable). Others further vary the buffer distance to account for slope toward the wetland—requiring wider buffers where slopes are steeper because negative impacts from land-disturbing activities, including concentrated water flows, are likely to increase with increasing slope. Some ordinances vary the buffer distances based on the type or intensity of land use—requiring larger buffers for more intensive land uses potentially affecting the wetland area. In contrast, some ordinances require or allow the zoning administrator to establish or vary buffers on a case-by-case basis. These ordinances usually prescribe the factors that must be taken into account and the information to be supplied by an applicant, but then rely on performance standards in the ordinance to drive the buffer distance decision. In another approach, Strommen et al. (2007) suggest an ordinance that regulates the entire drainage area contributing surface or subsurface flow to sensitive wetlands, with defined buffer protections within this area.

Enacted local government buffer ordinances show a wide range of wetland buffer dimensions. The lowest we found was 15 feet measured horizontally from the border of the wetland, with the highest approximately 350 feet. Several ordinances set 500 feet as a distance for greater regulatory review of proposed activities, but do not require nondisturbance at this distance. Often the ordinances provide a range of protections, with nondisturbance requirements nearest the wetland and various prohibitions and limitations as the distance from the wetland increases. Among the ordinances we examined, the largest number of ordinances clustered around nondisturbance or minimal disturbance buffers of 50 feet or 100 feet, with variations (usually upward variations) beyond these based on particular wetland characteristics, species of concern, and to account for areas with steeper slopes. The largest ordinance-prescribed buffer distances (350 feet or more) tended to be for tidal wetlands and vernal pool wetlands.

Local governments, in general, use five approaches in defining buffer distances.

(1) Fixed Nondisturbance Buffer. Some local ordinances provide for a fixed buffer distance within which disturbance activities are prohibited (or strictly limited). For example, Casselberry, Florida, requires wetland buffers of 50 feet. (§3-11) Virginia cities and counties subject to the state's Chesapeake Bay Preservation Act establish "resource protection areas" of a 100-foot vegetated buffer landward of tidal and certain nontidal wetlands, as in Petersburg, Virginia (§122-76) and Henrico County, Virginia (§24-106.3). Some local buffer ordinances are "setback" ordinances. For example, Bay County, Florida, prohibits construction of any building or structure within 30 feet of any wetland. (§1909) The Northeastern Ohio Model Ordinance provides for a 120-foot or 75-foot "setback" from Ohio EPA Category 3 and 2 wetlands, respectively. Summit County, Colorado, and LaPorte, Indiana, each provide that soil disturbances and structures are prohibited within 25 feet of a wetland. (§7105.1(A); §82-561)

(2) Nondisturbance Buffer plus Additional Setback. Some ordinances prescribe a fixed nondisturbance wetland buffer, and then prescribe an *additional* setback distance for structures from the edge of the wetland buffer. The idea is that the prescribed nondisturbance buffer protects the wetland, and that buildings should not be constructed on the buffer's edge if a functional buffer is to be maintained. Baltimore County, Maryland, provides for a nondisturbance buffer of 25 feet from nontidal wetlands in accordance with the state nontidal wetlands law (75-100 foot buffers apply if associated with a stream, and 100-300 feet if a tidal wetland), but then further provides that residential buildings must be set back an *additional* 35 feet and commercial buildings an additional 25 feet *from the edge of the buffer*. (§§33-2-303, 33-2-401, 33-2-204(c), 33-3-111(d)) Charleston, South Carolina, defines "critical line" wetland buffers of a minimum of 25 to 40 feet based on zoning districts, but then further provides that all buildings must be set back a minimum of ten feet from the edge of the required buffer. (§54-347.1a3)

(3) Regulated Buffer Area with Minimum Nondisturbance Area. Another approach defines the buffer in terms of the area within which *regulatory scrutiny* will be applied to limit uses by permit or other review. Monroe County, New York, regulates a 100-foot "adjacent area" to freshwater wetlands. (§377-1 *et seq.*) Permits are required for activities within this area. Many jurisdictions supplement this regulated area with a prescribed minimum nondisturbance zone immediately adjacent to the wetland. Polk County, Wisconsin, provides for regulation of shorelands within 1000 feet of the ordinary high water mark of any navigable lake or pond or flowage, and within 300 feet of any navigable river or stream or floodplain including wetlands. It then provides *within* these fairly substantial regulated areas for a 75-foot minimum setback with a 35-foot vegetated protective area immediately adjacent to the wetlands or waters. (Art.7, 11(C)) New Lenox, Illinois, provides for the regulation of all lots lying wholly or in part within 100 feet of the edge of a wetland, while requiring a minimum nondisturbance set-back of 75 feet from the edge of the wetland (with only very minimal activities allowed by permit) and a minimum natural vegetation strip of 25 feet from the edge of the wetland. (§§38-131 to -133) Lewiston, Maine, regulates all areas within 250 feet of the upland edge of all ten-acre or larger wetlands, and requires that all structures must be set back at least 75 feet from the wetland edge with no variances, and that a "natural vegetative state" must be maintained for the first 50 feet. (§34.2) Croton-on-Hudson, New York, does this in reverse by first specifying a mandatory nondisturbance area of 20 feet adjacent to the wetland, and then the regulatory "minimum activity setback" extending an additional 100 feet from the edge of the nondisturbance buffer. (§227-3).

Massachusetts' state wetlands protection act, which is locally administered by municipal conservation commissions, provides for a 100-foot regulated buffer area, and a permit process that applies to both the buffer and the wetland. (110 Mass. Gen. L. 131 §40) Many municipalities have adopted variations on this regulatory approach. Barnstable, Massachusetts, using home rule authority as well as the state wetlands law, has added a provision that requires an undisturbed area of 50 feet adjacent to the wetland, and further provides that any structures permitted within the 100 foot regulated buffer must be located within the 20 feet of the landward margin of the buffer (viz. 80 feet from the wetland). (§704-1) Sturbridge, Massachusetts, specifies various regulatory buffer areas greater than the state-required 100 feet (e.g. 200 feet for freshwater wetlands), and prescribes minimum nondisturbance areas ranging from 25 feet to 200 feet, depending upon the wetland resource. (§1.4)

(4) Matrix Based on Listed Factors. Some ordinances include a matrix of wetland types, slopes, habitats, and land use intensities, which are then used to define the extent of the buffer. For example, Sammamish, Washington, prescribes a set of buffers based on four distinct categories of wetlands initially defined by their wetland functions, and further modified by the habitat scores for each of these wetlands (see Table below).

Under the ordinance, Sammamish's development department may further increase the required buffer distance by the greater of 50 feet or a distance necessary to protect the functions and values of the wetland as well as to provide connectivity whenever a Category I or II wetland with a habitat score of 20 or greater is located within 300 feet of another Category I or II wetland, a fish and wildlife conservation area, or a stream supporting anadromous fish. Required buffers may be reduced if the impacts are mitigated and result in equal or better protection of wetland functions. (§21A.50.290)

Since 1984, Island County, Washington, has had an ordinance that takes into account wetland type, wetland size, and land use zones. The County has recently revised the ordinance for new development proposals

Wetland Category		Standard Buffer Width (ft)
Category I:	Natural Heritage or bog wetlands	215
	Habitat score 29-36	200
	Habitat score 20-28	150
	Not meeting above criteria	125
Category II:	Habitat score 29-36	150
	Habitat score 20-28	100
	Not meeting above criteria	75
Category III:	Habitat score 20-28	75
	Not meeting above criteria	50
Category IV:		50

Sammamish, Washington, ordinance: Wetlands rated according to the Washington State Wetland Rating System for Western Washington (Washington Department of Ecology, 2004, or as revised).

to base buffer distance which can range from 15 to 300 feet in width, primarily on intensity of surrounding land uses, habitat structure within and around a wetland (as scored with a simple checklist that landowners may use), and wetland sensitivity. The ordinance considers depressional "isolated" wetlands that lack outlets to be more sensitive to degradation due to accumulating sediment and bioaccumulation of contaminants and requires these wetlands to have wider buffers. Some wetlands surrounded by steep slopes or highly erodible soils are also required to have wider buffers. Island County also requires wider buffers for several carefully-defined wetland types, due to their high ecological value or sensitivity: (A) bogs, coastal lagoon wetlands, delta estuary wetlands, mature forested wetlands, (B) large non-estuarine ponded wetlands, anadromous fish stream wetlands, wetlands associated with a bog, coastal lagoon or delta estuary, (C) other estuarine wetlands, resident salmonid stream wetlands, mosaic wetlands, and (D) native plant wetlands and small ponded wetlands. The County prepared a series of tables that show buffer widths required for various combinations of these factors (e.g., intensity of surrounding land use, wetland structure, and slope). (§17.02B.090). See Appendix II.

Another example is Bensalem, Pennsylvania, which prescribes varying wetland buffer distances within natural resource protection overlay districts based on the underlying land use zoning. The buffer distance ranges from 20 feet in agricultural zones, to 100 feet in general industrial zones. (§ 232-57) The ordinance's standards require the buffer to be maintained in 80 percent natural vegetative cover.

(5) Case by Case Buffer Determinations. A number of wetland buffer ordinances do not specify a numerical distance, but require the applicant to submit information sufficient to allow the local government to specify the buffer distance based on performance standards. For example, Commerce City, Colorado, requires that the buffer must be sized to ensure that the natural area is "preserved" and expressly provides that the director of community development may increase or decrease the buffer to meet the goals of the ordinance; however, it further provides that the buffer for wetlands will in no case be less than 25 feet. Woodbury, Minnesota, provides for a minimum native vegetated buffer of 15 feet, but further provides that the city reserves the right to require up to a 75-foot undisturbed buffer where "in the opinion of the city" the area contains "significant natural vegetation in good condition," or up to a 25-foot buffer where "useful for water quality improvement, wildlife habitat, a greenway connection, or any other wetland function or value."(§27-4(b))

Alachua County, Florida, provides for a case-by-case performance standard buffer, but also provides for a numerical default value when sufficient information is not available to support a case-by-case determination. The buffer:

> shall be determined on a case-by-case basis after site inspection by the county, depending upon what is demonstrated to be scientifically necessary to protect natural ecosystems from significant adverse impact. (§406.43)

The county requires the following factors to be considered in making the case-by-case determination: 1) Type of activity and associated potential for adverse site-specific impacts; 2) Type of activity and associated potential for adverse offsite or downstream impacts; 3) Surface water or wetland type and associated hydrological requirements; 4) Buffer area characteristics, such as vegetation, soils, and topography; 5) Required buffer area function (*e.g.,* water quality protection, wildlife habitat requirements, flood control); 6) Presence or absence of listed species of plants and animals; and 7) Natural community type and associated management requirements of the buffer. (§406.43) Where sufficient scientific information is not available, the ordinance prescribes default values with an average buffer distance of 50 feet, and minimum of 35 feet for wetlands less than or equal to a half acre; 75/50 feet for wetlands greater than half acre; 150/75 feet where listed species are documented; and 150/100 feet where the wetland is an outstanding resource water. (§406.43(c))

Crestview, Florida's, ordinance provides:

> The size of the buffer shall be the minimum necessary to prevent significant adverse effects on the protected environmentally sensitive area. §102-202(e)(1).

Fife, Washington's, ordinance specifies buffer distances, but further provides that:

> The community development director shall require increased standard buffer zone widths on a case by case basis when a larger buffer is necessary to protect wetlands functions and values based on local conditions. This determination shall be supported by appropriate documentation showing that it is reasonably related to protection of the functions and values of the regulated wetland. Such determination shall be attached as a permit condition and shall demonstrate that: A. A larger buffer is necessary to maintain viable populations of existing species; or B. The wetland is used by species proposed or listed by the federal government or the state as endangered, threatened, rare, sensitive or monitor, critical or outstanding potential habitat for those species or has unusual nesting or resting sites such as heron rookeries or raptor nesting trees; or C. The adjacent land is susceptible to severe erosion and erosion control measures will not effectively prevent adverse wetland impacts; or D. The adjacent land has minimal vegetative cover or slopes greater than 15 percent. (§17.17.260)

This approach requires more information at the application stage and also requires the administrator to have sufficient technical capacity to make a legally sufficient and sustainable choice.

Transitional Provisions

Some buffer ordinances have imposed more stringent requirements on new development than on existing development or subdivisions previously recorded. This may, in some cases, recognize "vested rights" in development conditions, but more often it represents a way of avoiding potential legal contests over the applicability of newer environmental regulations while still asserting some controls over prior and pending developments. Casselberry, Florida, for example, requires a 50 foot buffer; but provides that "buffers shall be 25 feet on lots less than five acres created prior to February 17, 1992."(§3-11.1(C)) Summit County, Colorado, exempts single family and duplex residential construction (but not other construction) on lots platted before the 1996 adoption of the county's first wetland regulations. (§7105.1(A))

Buffer Averaging and Minimum Distances

Some buffer ordinances that set specific and minimum buffer dimensions allow the local government to accept buffer averaging in order to accommodate variability in terrain or to accommodate development plans. For example, a wetland normally entitled by ordinance to a 75-foot minimum buffer may be able to tolerate a 50-foot buffer over part of its margin if a wider buffer is provided along another part. This may depend upon such issues as water flow, topography, habitat and species needs, and other factors that can best be assessed on a case-by-case basis. Port Townsend, Washington allows buffer averaging if the applicant demonstrates that the averaging will not adversely affect wetland functions and values, that the aggregate area within the buffer is not reduced, and that the buffer is not reduced in any location by more than 50 percent or to less than 25 feet. Woodbury, Minnesota allows buffer averaging where averaging will provide additional protection to the wetland resource or to environmentally valuable adjacent uplands, provided that the total amount of buffer remains the same.

☐ **Activities Prohibited/Permitted**

Many ordinances simply prohibit all disturbance, excavation, or building within the buffer, and then provide a separate list of activities that may be authorized by permit, or that are exempt from the ordinance. Massachusetts local ordinances typically provide that except as permitted by the local conservation commission or as provided in the local ordinance, "no person shall commence to remove, fill, dredge, build upon, degrade, discharge into, or otherwise alter" the protected wetland and buffer area.

Many wetland buffer ordinances also include outright prohibitions of particular activities, such as solid waste facilities, dams, and septic systems. LaPorte, Indiana, provides that "no building, structure, street, alley, driveway, or parking area shall be placed within a wetland district;" and further prohibits placement of any development that will allow "surface water runoff" to be "directed or flow into a wetland district," except by permit allowing such flow, and excepting a single-family dwelling that may result in such flow. (§82-606)

Many ordinances prohibit the use of wetland buffers for stormwater retention ponds, requiring that such structures be located outside the buffer. Oregon City, Oregon, allows new stormwater quantity and quality control structures to encroach "a maximum of 25 feet" upon a required buffer, but requires the area of encroachment to be replaced by an equal area of buffer on the property, requires good water quality at the outfall, and requires a determination of no significant negative impact as a result of the changes. (§17.40.050(H)(6))

Some buffer ordinances do not list prohibited activities (or all prohibited activities), but state that buffer conditions must remain sufficient to protect the wetland or its functions. This requires the administrator of the ordinance to make findings supported by information on the anticipated impacts. For example, the Cape Cod Commission's Model Wetlands and Wildlife Bylaw provides that "No project shall be permitted which will have an adverse effect on a vernal pool or any naturally vegetated land area within 350 feet of a vernal pool by altering topography, soil structure, plant community composition, hydrologic regime and/or water quality in such a way as will result in any short-term or long-term adverse effect upon the vernal pool. No diversion of any new stormwater runoff into the vernal pool shall be permitted." (§IB2)

New Lenox, Illinois, allows only the following activities, by permit, within the 75 foot buffer: 1) limited filling and excavating necessary for the development of public boat launching ramps, swimming beaches, park shelters or similar structures, 2) land surface modification for the development of stormwater drainage swales between the developed area of the site (including a stormwater detention facility on the site) and a stream, lake or pond, or wetland, 3) installing piers for the limited development of walkways and observation decks, subject to mitigation by an equal area of wetland habitat improvement, and 4) modification of degraded wetlands for purposes of stormwater management where the quality of the wetland is improved and total wetland acreage is preserved. The ordinance requires that where such modification is permitted, wetlands shall be protected from the effects of increased stormwater runoff by measures such as detention or sedimentation basins, vegetated swales and buffer strips, and sediment and erosion control measures on adjacent developments, and that the direct entry of storm sewers into wetlands shall be avoided. (§38-132) [*See* Appendix for full text.]

Many buffer ordinances identify a limited number of essential or water-dependent uses that are allowed as conditional uses by permit. For example, Charlotte County, Florida, provides that wetland buffers shall be maintained in a completely natural state except for the minimum disturbance necessary to provide: shoreline access to riparian property owners; the construction of utility crossings and shoreline stabilization structures permitted by federal and state regulatory agencies; the construction of bridges, drainage conveyances, and fences; and the removal of exotic vegetation. (§3-5-348(b)) Polk County, Wisconsin, allows limited uses within the buffer by permit; these include roads essential for agriculture or silviculture where no alternative alignment is practicable, water dependent uses, recreation, utility crossings, and aquatic uses compatible with wetland preservation. (Art.7(D)(4))

Many ordinances also identify a set of limited-impact activities that are allowed within the buffer without review or permit. Pickens County, Georgia's, ordinance exempts conservation activities, outdoor passive recreation, forestry or agriculture conducted under state-approved Best Management Practices, education, science research, and nature trails. (§26-126) The Cape Cod Commission's model ordinance authorizes planting of native vegetation and habitat management to enhance the wetland values, unpaved pedestrian access paths no wider than 4 feet, maintenance of existing utility crossings and stormwater structures, new utility lines where the proposed route has been determined to be the best environmental alternative, and accessory structures for existing houses where there is no feasible alternative and placement is as far from the wetland as possible, subject to review and approval by the Commission. (§IIB2)

☐ Procedures for Review

A wetland buffer ordinance should not just define the buffer and prohibited and authorized activities, but should also provide for procedures that trigger the applicability of the ordinance and allow for necessary determinations, specify standards for review, define mitigation of authorized impacts, and specify whether and under what circumstances variances can be granted.

Administration of Ordinance

Responsibility for applying the ordinance to landowners and land development activities must be clearly assigned to a local government unit or body. If the ordinance is part of the zoning code, this will ordinarily be the zoning administrator. Alternatively, responsibility may be assigned to a specialized board or commission, such as a wetland commission (as in Massachusetts). Baltimore County, Maryland, assigns these responsibilities to its Department of Environmental Protection and Resource Management. If the ordinance is a wetland protection ordinance including regulation of activities in the wetland itself as well as in the buffer, it may be desirable to adopt a review process that is congruent with federal and state review procedures for wetlands. If the ordinance requires site-specific findings, such as variable buffer distances based on listed factors, it is desirable to have a technically trained professional staff or consultants available to the administrator charged with carrying out the ordinance.

> **Green Development Standards**
>
> In 2007, the U.S. Green Building Council finalized pilot rating standards for the new Leadership in Energy and Environmental Design – Neighborhood Development (LEED – ND) certification program, which set standards for environmentally superior development practices. Among the credits towards certification that may be earned for neighborhood location and design and green construction, developers can earn credit for preserving in perpetuity a buffer around all wetlands and water bodies located on site. Buffer distances, minimum of 100 feet, are to be calculated based on the functions provided by the wetland or water body, contiguous soils and slopes, and contiguous land uses. Local governments that adopt buffer ordinances encourage LEED-ND developments.

Submittals

Nashua, New Hampshire, specifies what triggers review under the ordinance:

> A review process and procedure for applicability to this article shall be caused by the following proposed land use applications or required approvals: Building permit applications; zoning board of adjustment applications; planning board applications; board of health application; any other land use requiring a permit or approval as required by and within the Nashua Revised Ordinances. The initial review of any of the above-mentioned items shall cause a determination as to whether the land area in which the proposed use or activity is or is not within or abutting a wetland. (§16-574(a))

Many ordinances that allow some regulated activities or conditional uses within the wetland buffer, or that authorize variable buffer distances based on site-specific conditions and proposed land uses, provide that the applicant must submit detailed information concerning the site. Summit County, Colorado, requires submission of a detailed "wetlands disturbance plan" including mitigation improvements, revegetation plan, grading and erosion control measures, "and a narrative explaining how a proposed activity in the wetland setback or a wetland area will meet the criteria" set forth in the ordinance. (§7105.04) Schaumburg, Illinois, requires an applicant seeking to conduct an activity by special use permit within the 100-foot wetland buffer to supply a report of geological and soil characteristics, site grading and excavation plan, vegetation and revegetation description and plan, wetland delineation report, and stormwater management plan. (§154.196(d)) Many local jurisdictions in the State of Washington require applicants to submit a wetland's function scores as estimated using the Department of Ecology's Rating System or an acceptable alternative.

Casselberry, Florida, requires an applicant seeking an alternative buffer methodology to submit information addressing: erodibility of soils upland of the wetland line; depth of the water table below the soil surface in the zone immediately upland of the wetland line; and habitat requirements of aquatic and wetland-dependent wildlife based on habitat suitability, spatial requirements, access to upland habitat, and noise impacts. (§3-11.1(C)(2))

Standards

Nashua, New Hampshire's, ordinance provides that in addition to enforcing the use and activity prohibitions and limitations for which a permit is required: "Any use or activity proposed within one hundred (100) feet of a wetland shall be reviewed administratively by the zoning administrator for compliance with the following performance standards:

(1) That no significant impact on the aquatic habitat of rare or endangered species, as listed by the State of New Hampshire or the Federal government, will result.
(2) That the filtration of stormwater runoff is adequately provided for and controlled both during and after construction.
(3) That the topography and required regrading of the subject property accounts for and adequately reflects the proximity of a nearby wetland area.
(4) All landscaping requirements and maintenance regiments for a project will ensure that fertilizer and chemical run-off shall not enter the wetland.
(5) Any wetland area utilized for water run-off shall demonstrate that excess flow on wetlands shall not cause excessive ponding and retention, thereby causing environmental damage to existing flora.
(6) Where land is proposed to be subdivided, the applicant shall demonstrate that there is adequate non-wetland area to contain all proposed uses, structures, and utilities in accordance with these regulations.
(7) No more than fifty (50) percent of the open space required by the underlying zone shall be classifiable as wetlands under the provisions of this article.
(8) No part of a wetland may be counted in minimum lot area requirements. (§16-575(d)).

Mitigation

Virtually all buffer ordinances that provide for permitted uses or conditional uses within the buffer also require compensatory mitigation to offset unavoidable impacts to the buffer area. Compensatory mitigation involves the replacement of wetland acreage and wetland functions through restoration, creation, enhancement, or (in some cases) preservation of other wetlands, onsite or offsite. Mitigation may be required both for the wetland itself and for impacts to wetland buffers protected by local ordinance. For example, the Port Townsend, Washington, critical areas ordinance requires compensatory mitigation for any development proposal within a critical area or required buffer, and specifies mitigation replacement ratios. (§19.05.110(F1-F9)) Oregon City, Oregon, requires a mitigation plan and feasibility assessment. (§17.49.050(G)) Kusler (2007) identifies factors that a local ordinance providing for compensatory mitigation should include.

Variances

Some wetland buffer ordinances include provisions for hardship variances, while others that are part of the zoning or land development codes rely on the jurisdiction's normal variance standards and procedures. Because of the health and safety aspects of wetlands buffer protections, variances are disfavored. Bay County, Florida, has a fairly typical provision, allowing a hardship variance in those situations where, "due to the size, shape, topography, location(s) of wetlands, or similar factors, application of the wetland buffer would preclude reasonable use of the property involved." (§1909(3)(d),(e)) The ordinance, however, limits variances for "accessory uses" to no more than 20 percent of the buffer.

☐ **Affirmative Requirements**

Buffer ordinances are not limited to prohibiting disturbances and encroachments. Many also set standards for the establishment and maintenance of buffer conditions. Belleaire, Florida, provides that natural buffers must be retained or "if a natural buffer does not exist an equivalent buffer shall be created." (§74-414(b)(3)(c)) Woodbury, Minnesota's buffer ordinance provides:

> Buffer areas must be established in appropriate vegetation such as native grasses, forbs, shrubs, and trees. The buffer area cannot consist primarily of common or noxious weeds. After becoming established, the vegetation in wetland buffer areas must be left undisturbed…The requirement to leave the buffer area undisturbed does not prohibit the removal of dead, diseased, or dying vegetation, or the control of noxious or common weeds. (§27-4(b)(5),(6))

The Northeastern Ohio Model Ordinance prohibits mowing, allows planting consistent with the buffer's functions, but also limits landowner affirmative obligations:

> There shall be no disturbance, including mowing, of the natural vegetation, except for such conservation maintenance that the landowner deems necessary to control noxious weeds; for such plantings as are consistent with this regulation; for such disturbances as are approved under the "Uses Permitted…" section of these regulations; and for the passive enjoyment, access, and maintenance of landscaping or lawns existing at the time of passage of this regulation. Nothing in this regulation shall be construed as requiring a landowner to plant or undertake any other activities in riparian and wetland setbacks.

The Commerce City, Colorado, ordinance includes performance standards relating to the buffer's function on the landscape and its potential connection to other natural areas:

> If the development site contains existing natural areas including floodplains that connect to other off-site natural areas with natural areas, to the maximum extent feasible the development shall preserve the natural area connections. Such connections shall be designed and constructed to allow for the continuance of existing wildlife movement along the natural areas. (§ 21-43 (b)(3)(c))

☐ Monitoring, Reporting, and Enforcement

Even the most comprehensive and scientific ordinance will not protect community interests if it is not enforced. Enforcement requires information, so local jurisdictions that have adopted buffer ordinances must allocate sufficient personnel to monitor approved buffers to identify possible violations. Some types of violations not visible from roadsides can be identified during flyovers or from existing high-resolution aerial photographs from different points in time. To help maintain public support, the disposition of all investigated potential violations, as well as all approved or denied permits and variances, should be documented in a regularly updated database or report available to all citizens.

Many wetland buffer ordinances do not specify their own enforcement provisions because they are part of the zoning code or subdivision regulations and are enforced by the usual array of enforcement tools provided in those ordinances—including authority to enter, stop work orders, notices to correct, cease-and-desist orders, injunctions, criminal prosecution, nuisance abatement, and penalties. It may be worthwhile to consider adding particular provisions for wetland buffer enforcement that address the vulnerabilities of these landscape features. For example, the ability of the local government to enter and monitor wetland and buffer condition, or to conduct restoration activities, may be important. This can prevent loss of the habitat and hydrological functions if a violator does not promptly take corrective action; similarly, provision for daily accrual of penalties may provide an important incentive to act promptly.

Another issue is how the ordinance deals with encroachments or degradation affecting the wetland buffer that is not caused by the developer at the time of a permitting decision, but later. Ordinances that are expressed solely in terms of setbacks or land development permit reviews may not sufficiently address affirmative obligations to maintain the buffer in a functional condition and prevent encroachments by homeowners or third parties.

Where establishment and maintenance of the buffer requires affirmative action by a landowner or developer, the ordinance may require the posting of a performance bond or similar financial guarantee. Summit County, Colorado, provides that a financial guarantee must be posted to ensure compliance with its wetlands regulations, and that the term of the guarantee must extend for at least three years in order to ensure the success of vegetation plantings. (§7105.06)

Sturbridge, Massachusetts, provides that the town may require recordation of a restrictive covenant to ensure that long term recognition and function of the buffer are protected. (§3.10) Similarly, the Northeastern Ohio model ordinance provides:

> Upon completion of an approved property subdivision/property/parcel split, commercial development or other land development or improvement, riparian and wetland setbacks shall be permanently recorded on the plat records for the Community and shall be maintained as open space thereafter through a per-

> manent conservation easement. A third party, not the landowner or permittee or the Community, which is allowed by state law, shall be given the conservation easement. If no third party will accept the conservation easement, the Community shall accept it and protect it in perpetuity.

Whenever possible it is desirable to monitor not just compliance with buffer requirements, but also changes in the condition of the wetlands. A few local governments, such as Island County, Washington, have enacted and funded a long term water monitoring program that will help evaluate buffer performance and allow for adaptive management to address any water quality issues related to buffer underperformance or other changes in the surrounding environment.

Conclusion: Adopt a Local Wetland Buffer Ordinance

Wetland buffers protect communities from foreseeable hazards and enhance community values. As such, wetland buffers reinforce many of the Smart Growth Principles, including compact design, distinctive communities with a strong sense of place, critical environmental and natural areas, and predictability in development decisions.

A community considering a wetland buffer ordinance should be clear about its objectives. Spending time on developing the purpose statement will help clarify what the ordinance is intended to do, and will guide the process of defining what wetlands are to be protected, the appropriate buffer dimensions, allowable activities, review procedures, affirmative obligations, and enforcement provisions.

Science should serve as the foundation for buffer protection. But this does not mean that communities need to commission an elaborate scientific study. A great deal of information is available from state environmental protection agencies, state natural heritage programs, and from other communities that have adopted wetland ordinances. The key lessons from wetland science are summarized in this publication and the sources cited in the References section. Two simple wetland buffer ordinances adopted by local governments, and an example of a more detailed matrix approach to buffer size, are reproduced in the Appendix.

The steps for adopting a local wetland buffer protection ordinance are:

- data gathering,
- planning to connect the wetland buffer protection to other community plans and goals,
- drafting the regulation or ordinance,
- notice of public hearings,
- adoption of the regulation or ordinance,
- provision for administration of the requirements, and
- enforcement. (Kusler & Opheim 1996).

Buffer ordinances may be simple or complex, but they serve a critical role in maintaining community quality of life, management of stormwater and flooding, protection of water quality and quantity, habitat conservation, and resilience to the future effects of global climate change on local communities.

Smart Growth Principles

1. Mix land uses.
2. Take advantage of compact building design.
3. Create a range of housing opportunities and choices.
4. Create walkable neighborhoods.
5. Foster distinctive, attractive communities with a strong sense of place.
6. Preserve open space, farmland, natural beauty and critical environmental areas.
7. Strengthen and direct development towards existing communities.
8. Provide a variety of transportation choices.
9. Make development decisions predictable, fair and cost effective.
10. Encourage community and stakeholder collaboration in development decisions.

Smart Growth Network: www.smartgrowth.org

Appendix I. Simple Buffer Ordinances

Chipley, Florida:
"§14.5-21. Buffer required. A thirty-foot buffer of native vegetation, subject to site plan approval, shall be required around and along all wetlands. Such buffer shall be measured from the [Department of Environmental Resources] wetlands jurisdictional line. The property owner may create a pathway through the buffer for visual or authorized pedestrian access to the wetland provided that the pathway is limited to a five-foot wide swath."

Village of New Lenox, Illinois:
"Sec. 38-131. Intent. This article applies to development in or near streams, lakes, ponds, and wetlands within the Village of New Lenox. Streams, lakes, and ponds (including intermittent streams) are those which are shown on the United States Department of the Interior Geological Survey (USGS) 7.5 minute quadrangle maps and those additional streams, delineated on the village's comprehensive plan. Those maps are hereby made a part of this article, and two copies thereof shall remain on file in the office of the village administrator for public inspection. Within the jurisdiction of the Village of New Lenox, those waterbodies and watercourses that are named and are subject to the provisions of this article are Jackson Creek, Jackson Branch Creek, Sugar Run Creek, Hickory Creek, Marley Creek, and Spring Creek. Wetlands are those designated in the U.S Fish and Wildlife Service/Illinois Department of Conservation wetland inventory.

The procedures, standards and requirements contained in this article shall apply to all lots within wetlands and streams, and all lots lying wholly or in part:

(1) Within the special flood hazard area (SFHA) designated by the federal emergency management agency (FEMA); (2) Within 100 feet of the ordinary high water mark (OHWM) of a perennial stream or intermittent stream, the ordinary high water mark of a lake or pond, or the edge of a wetland; or (3) Within depressional areas serving as floodplain or stormwater storage areas.

Sec. 38-132. Minimum setback of development activity from streams, lakes, ponds, and wetlands. Absolutely no development activity (except as provided below) may occur within the minimum setback which is defined as 75 feet from the ordinary high water mark of streams, lakes, and ponds, or the edge of wetlands, or within a designated depressional area. In no case shall the setback be less than the boundary of the 100-year floodway as defined by FEMA. These setback requirements do not apply to a stream in a culvert unless the stream is taken out of a culvert as part of development activity. If a culvert functions as a low-flow culvert, where water is intended to periodically flow over it, the setback requirements apply. Review waiver of this article for proposed development activity within the minimum setback area will consider the following:

(1) Only limited filling and excavating necessary for the development of public boat launching ramps, swimming beaches, or the development of park shelters or similar structures is allowed. The development and maintenance of roads, parking lots and other impervious surfaces necessary for permitted uses are allowed only on a very limited basis, and where no alternate location outside of the setback area is available.

(2) Land surface modification within the minimum setback shall be permitted for the development of stormwater drainage swales between the developed area of the site (including a stormwater detention facility on the site) and a stream, lake or pond, or wetland. Detention basins within the setback are generally discouraged, unless it can be shown that resultant modifications will not impair water quality, habitat, or flood storage functions.

(3) No filling or excavating within wetlands is permitted except to install piers for the limited development of walkways and observation decks. Walkways and observation decks should avoid high quality wetland areas, and should not adversely affect natural areas designated in the Illinois Natural Areas Inventory or the habitat of rare or endangered species.

(4) Wetland area occupied by the development of decks and walkways must be mitigated by an equal area of wetland habitat improvement.

(5) Modification of degraded wetlands for purposes of stormwater management is permitted where the quality of the wetland is improved and total wetland acreage is preserved. Where such modification is permitted, wetlands shall be protected from the effects of increased stormwater runoff by measures such as detention or sedimentation basins, vegetated swales and buffer strips, and sediment and erosion control measures on adjacent developments. The direct entry of storm sewers into wetlands shall be avoided.

The applicant shall present evidence, prepared by a qualified professional, that demonstrates that the proposed development activity will not endanger health and safety, including danger from the obstruction or diversion of flood flow. The developer shall also show, by submitting appropriate calculations and resource inventories, that the proposed development activity will not substantially reduce natural floodwater storage capacity, destroy valuable habitat for aquatic or other flora and fauna, adversely affect water quality or ground water resources, increase stormwater runoff velocity so that water levels on other lands are substantially raised or the danger from flooding increased, or adversely impact any other natural stream, floodplain, or wetland functions, and is otherwise consistent with the intent of this article.

In addition to locating all site improvements on the subject property to minimize adverse impacts on the stream, lake, pond, or wetland, the applicant shall install a berm, curb or other physical barrier during construction, and following completion of the project, where necessary, to prevent direct runoff and erosion from any modified land surface into a stream, lake, pond, or wetland. All parking and vehicle circulation areas should be located as far as possible from a stream, lake, pond or wetland. The Village of New

Lenox may limit development activity in or near a stream, lake, pond, or wetland to specific months, and to a maximum number of continuous days or hours, in order to minimize adverse impacts. Also, the Village of New Lenox may require that equipment be operated from only one side of a stream, lake, or pond in order to minimize bank disruption. Other development techniques, conditions, and restrictions may be required in order to minimize adverse impacts on streams, lakes, ponds, or wetlands, and on any related areas not subject to development activity.

Sec. 38-133. Natural vegetation buffer strip required. To minimize erosion, stabilize the stream bank, protect water quality, maintain water temperature at natural levels, preserve fish and wildlife habitat, to screen manmade structures, and also to preserve aesthetic values of the natural watercourse and wetland areas, a natural vegetation strip shall be maintained along the edge of the stream, lake, pond or wetland. The natural vegetation strip shall extend landward a minimum of 25 feet from the ordinary high water mark of a perennial or intermittent stream, lake, or pond and the edge of a wetland. These guidelines are outlined in the publication "Native Plant Guide for Streams and Stormwater Facilities in Northeastern Illinois" jointly published by the Fish & Wildlife Service, NRCS, IEPA, and Army Corps of Engineers.

Within the natural vegetation strip, trees and shrubs may be selectively pruned or removed for harvest of merchantable timber, to achieve a filtered view of the waterbody from the principal structure, to control the spread of undesirable invasive species such as buckthrow or box elder, to restore a balanced community of native plant species, and for reasonable private access to the stream, lake, pond or wetland. Said pruning and removal activities shall ensure that a live root system stays intact to provide for stream bank stabilization and erosion control. The vegetation must be planned in such a way that access for stream maintenance purposes shall not be prevented."

Appendix II. Matrix Approach to Buffer Distance

Island County, Washington:
This excerpt is based on Island County's *draft ordinance* from November 2007, which reflects a sophisticated use of the matrix approach to buffer distance. The ordinance first prescribes buffers for a few types of particularly sensitive wetlands (especially bogs, coastal lagoons and estuarine wetlands), with wider buffers for more intensive land uses. Then it establishes matrices to calculate buffers for *other* wetlands based on land use intensity, habitat condition, and wetland sensitivity (as predicted by slope and presence or absence of a surface water outlet). Wetlands that lack outlets and are adjoined by steep slopes are presumed to be more sensitive to accumulation of sediment and contaminants, so receive larger buffers. For most wetlands both habitat and water quality buffers are calculated separately and the *larger* buffer (usually habitat) is applied. (The numbers below should be taken as illustrative). The habitat calculation is:

Habitat Buffers					
Land use Intensity	Habitat Functions Score				
	50 or higher	42-48	39-41	32-38	Less than 32
Low	150 ft	125 ft	100 ft	75 ft	Use Water Quality & Slope Tables
Moderate	225 ft	175 ft	150 ft	110 ft	
High	300 ft	200 ft	175 ft	150 ft	

The water quality calculation includes differing buffers based on wetland type (A-E) and whether there is a surface water outlet from the wetland.

Water Quality Buffers						
Land Use Intensity	Wetland Category					
	Wetland Outlet	A	B	C	D	E
Low	Yes	40 ft	35 ft	30 ft	25 ft	20 ft
	No	75 ft	50 ft	40 ft	35 ft	25 ft
Moderate	Yes	90 ft	65 ft	55 ft	45 ft	30 ft
	No	105 ft	90 ft	75 ft	60 ft	40 ft
High	Yes	125 ft	110 ft	90 ft	65 ft	40 ft
	No	175 ft	150 ft	125 ft	90 ft	50 ft

The water quality value is then adjusted for slope:

Slope Adjustment	
Slope Gradient	Additional Buffer Multiplier
5-14%	1.3
15-40%	1.4
>40%	1.5

This matrix approach is more complex than a single number, but can better reflect scientific understanding, particularly with diverse wetland types and land use conditions in a locality. With appropriate public outreach and technical support, a matrix-driven buffer can gain public support and achieve good results.

Ordinances Chiefly Consulted

Ordinances: Boulder, CO, Commerce City, CO, Summit County, CO, New Castle County, DE, Alachua County Land Development Regulations, FL, Bay County Development Code, FL, Bellaire Land Use Regulations, FL, Belle Isle Land Development Code, FL, Bunnell Land Development Code, FL, Casselberry Preservation of Wetlands Ordinance, FL, Charlotte County Surface water and wetland protection ordinance, FL, Chipley Wetlands Resource Protection Ordinance, FL, Crestview Environmentally Sensitive Lands Ordinance, FL, Forsyth County Soil Erosion and Sediment Control ordinance, GA, Lumpkin County Soil Erosion and Sediment Control ordinance, GA, Pickens County Wetlands Protection Ordinance, GA, Lake County Uniform Development Ordinance, IL, New Lenox Wetland Protection Ordinance, IL, Schaumburg Biodiversity Zoning Overlay, IL, LaPorte, Indiana, Lexington-Fayette Riparian Buffer Ordinance, KY, Biddeford Shoreline Zoning Ordinance, ME, Eliot Shoreline Zoning Ordinance, ME, Lewiston Shoreline ordinance, ME, Baltimore County Environmental Protection and Resource Management Ordinance, MD, Barnstable Wetlands Protection Ordinance, MA, Holyoke Wetland Protection Code, MA, Sturbridge Wetland Bylaw, MA, Woodbury Preservation of Waterbodies and Wetlands Ordinance, MN, Nashua Wetlands Ordinance, NH, Croton-on-Hudson Wetlands and Watercourses Ordinance, NY, Monroe County Freshwater Wetlands Protection Law, NY, Summit County, OH, Oregon City Water Quality Resources Overlay District, OR, Bensalem Natural Resources Preservation Districts Overlay, PA, Charleston Zoning Ordinance, SC, Mount Pleasant Critical Line Buffer Ordinance, SC, Henrico County Chesapeake Bay Preservation Overlay, VA, Petersburg Chesapeake Bay Overlay, VA, Fife Wetlands protection ordinance, WA, Island County Critical Areas Ordinance, WA, King County Shoreline Management ordinance, WA, Port Townsend Critical Areas Ordinance, WA, San Juan County Shoreline Management Ordinance, WA, Polk County Shoreland Protection Zoning Ordinance, WI.

Model Ordinances: Association of State Wetlands Mangers Inc. Model Ordinances for Regulating Wetlands and Riparian/Stream Buffers (http://www.aswm.org/propub/jon_kusler/model_ordinance_051407.pdf), Cape Cod Commission Model Wetlands Bylaw (http://www.capecodcommission.org/bylaws/wetandwild.html), Center for Watershed Protection : A Local Ordinance to Protect Wetland Functions (http://www.cwp.org/wetlands/articles/WetlandsArticle4.pdf), MACC Model Wetlands Protection Bylaw/Ordinance (http://www.maccweb.org/documents/MACC_Model_Bylaw.doc), New Jersey Model Riparian Buffer Ordinance (http://www.state.nj.us/dep/watershedmgt/DOCS/pdfs/StreamBufferOrdinance.pdf), Northeast Ohio Areawide Coordinating Agency Ordinance Controlling Riparian Setbacks and Wetland Setbacks (http://www.noaca.org/reglmodord.html), Stormwater Center Model Forest Buffer Ordinance (http://www.longislandsoundstudy.net/riparian/Buffer_Model_Ordinance_Rhode_Island.pdf), U.S. Environmental Protection Agency Aquatic Buffer Model Ordinance (http://www.epa.gov/nps/ordinance/mol1.htm), Westchester County Model Wetland Protection Ordinance (http://www.longislandsoundstudy.net/riparian/Wetland_Ordinance_Westchester.pdf).

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