



# Sea Wolf Island National Wildlife Area Management Plan



#### Acknowledgements:

We would like to thank the people who live along Cape Breton's western shore for their support and genuine interest in the human and natural history, and the ongoing protection, of Sea Wolf Island National Wildlife Area. A special thanks to Gil MacLeod and Joanne MacPherson, both of whom have a special appreciation of the island's history and conservation. This plan was written and prepared by Colin M. MacKinnon and Andrew C. Kennedy from Environment Canada's Canadian Wildlife Service, Atlantic Region.

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# About Environment Canada Protected Areas and Management Plans

## What are Environment Canada Protected Areas?

Environment Canada establishes marine and terrestrial National Wildlife Areas for the purposes of conservation, research and interpretation. National Wildlife Areas are established to protect migratory birds, species at risk, and other wildlife and their habitats. National Wildlife Areas are established under the authority of the *Canada Wildlife Act* and are, first and foremost, places for wildlife. Migratory Bird Sanctuaries are established under the authority of the *Migratory Birds Convention Act, 1994* and provide a refuge for migratory birds in the marine and terrestrial environment.

## What is the size of the Environment Canada Protected Areas Network?

The current Protected Areas Network consists of 54 National Wildlife Areas and 92 Migratory Bird Sanctuaries comprising more than 12 million hectares across Canada.

## What is a management plan?

A Management plan provides the framework in which management decisions are made. They are intended to be used by Environment Canada staff to guide decision making, notably with respect to permitting. Management is undertaken in order to maintain the ecological integrity of the protected area and to maintain the attributes for which the protected area was established. Environment Canada prepares a management plan for each protected area in consultation with First Nations and other stakeholders.

A management plan specifies activities that are allowed and identifies other activities that may be undertaken under the authority of a permit. It may also describe the necessary improvements needed in the habitat, and specify where and when these improvements should be made. A management plan identifies Aboriginal rights and allowable practices specified under land claims agreements. Further, measures carried out for the conservation of wildlife must not be inconsistent with any law respecting wildlife in the province in which the protected area is situated.

## What is Protected Area Management?

Management includes monitoring wildlife, maintaining and improving wildlife habitat, periodic inspections of facilities, enforcement of regulations, as well as the maintenance of signs and infrastructure. Research is also an important activity in protected areas; hence, Environment Canada staff carries out or coordinates research in some sites.

**The series**

All of the National Wildlife Areas are to have a management plan. All of these management plans will be initially reviewed 5 years after the approval of the first plan, and every 10 years thereafter.

**To learn more**

To learn more about Environment Canada's protected areas, please visit our website at [www.ec.gc.ca/ap-pa](http://www.ec.gc.ca/ap-pa) or contact the Canadian Wildlife Service.



The old lighthouse station on Sea Wolf Island, c. 1950  
© Joanne MacPherson and Gil Macleod

***“Chunniac mi eun an duigh!”***  
(I saw a bird today)

***“Oh, De seors’ a bh’ann?”***  
(Oh, what kind?)

Duncan MacLellan (Gaelic bard) on Sea Wolf Island

## Sea Wolf Island National Wildlife Area

Sea Wolf Island National Wildlife Area (NWA) is located on Sea Wolf Island along the northwest coast of Cape Breton Island in the province of Nova Scotia. Sea Wolf Island is also referred to as Margaree Island on terrestrial maps. Environment Canada, and this document, will refer to it as Sea Wolf Island but recognizes that a large number of people refer to this place as Margaree Island.

Sea Wolf Island NWA supports significant numbers of colonial nesting birds in an area of spectacular coastal scenery dominated by sheer cliffs and rocky headlands. Sea Wolf Island NWA was established in 1982 to protect an important breeding area for colonial nesting seabirds. Sea Wolf Island NWA was established primarily because of the importance of the site to nesting Great Cormorants with upwards of 2% of the entire Canadian population nesting on this 54 ha island. Sea Wolf Island supports important breeding colonies of Great Cormorant and Black Guillemot with lesser numbers of nesting Great Blue Heron, Herring Gull and Great Black-backed Gull. Sea Wolf Island also supports at least one pair of Bald Eagles.

Sea Wolf Island is located off the coast of the northwestern extremity of Inverness County, Cape Breton. The closest sizable communities are the villages of Inverness (14 km to the south) and Margaree Harbour (13 km to the north). The dominant commercial activities in the immediate area are forestry, farming along the lowland intervals, coal mining and fishing. Sea Wolf Island has a long history of human use and occupation by European immigrants dating back 200 years. During the days of sail, it was used as a base of operations close to fish stocks, as well as supporting a lighthouse station for mariners' safety. With the advent of the gasoline engine, the fishing families moved off the island and used mainland harbours as their home port.

There is one main access trail (walking only) on the island that once connected the old "village" and wharf site to the lighthouse. A single building (once used for storage) is maintained for rustic site accommodations for Environment Canada staff. No other buildings are present on the NWA. However, a small parcel of land, retained by the Department of Fisheries and Oceans, includes the old light dwelling, storage barn and lighthouse. Maintenance requirements on Sea Wolf Island NWA are minimal.

The management objective for Sea Wolf Island is to limit human disturbance of colonial nesting seabirds, especially the Great Cormorant. Presently, because of low public visitation during the bird nesting season, year-round public access to the island is authorized.

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# 1 SITE DESCRIPTION

Sea Wolf Island National Wildlife Area (NWA) is located on Sea Wolf Island along the west coast of Cape Breton Island, Nova Scotia, and is 14 km north of the village of Inverness, Inverness County (46°22'N, 61°16'W) (Figures 1 and 2). The 54 ha island (2300 m long by 750 m wide) is situated 4 km off the coast of Cape Breton and features sheer cliffs that rise 20–60 m above sea level (Selwyn 1885; Roland 1982).

The federal Department of Transport, Canadian Coast Guard, established and operated a manned lighthouse at the highest elevation on Sea Wolf Island from 1854–1970. The light station (lighthouse) is no longer operational and has been decommissioned. When the light station was declared surplus, the Canadian Wildlife Service (CWS) applied for transfer of control and administration of these lands for conservation purposes. The transfer was completed in 1971 with the exception of a small 0.4 ha parcel that the light tower occupies, which Fisheries and Oceans Canada has retained.

The island was named Sea Wolf Island National Wildlife Area under the *Wildlife Area Regulations* of the *Canada Wildlife Act* on January 14, 1982.

The island's plant communities consist of shrub/grass and forest communities on top of an elevated sandstone outcrop. The forest is composed of stunted White Spruce (*Picea glauca*) along the windswept western side with larger trees closer to the centre and south-eastern portions of the island. The floral and faunal communities present are considered typical of such small coastal islands with 105 species of vascular plants, 11 species of bryophytes and 4 species of lichen having been recorded there (Erskine 1965; Smith and MacKinnon 1992 and Newell 2009) (Appendix 2), and 59 species of birds have been recorded (Appendix 3).

**Table 1. Sea Wolf Island NWA Protected Area Summary**

<b>Protected Area Designation (PA)</b>	National Wildlife Area
<b>Province</b>	Nova Scotia
<b>Latitude and Longitude</b>	46°22'N 61°16'W
<b>Size</b>	54 ha
<b>PA Designation Criteria (PA Manual)</b>	Significant regional and national concentration of a species (breeding Great Cormorant)
<b>PA Classification System</b>	Species or Critical Habitat Conservation
<b>International Union for Conservation of Nature (IUCN) Classification</b>	1a
<b>Order in Council Number</b>	P.C. 1982-43 14 January, 1982 (SI/82-30)
<b>Directory of Federal Real Property (DFRP) Number</b>	24783
<b>Date Gazetted</b>	14 January 1982
<b>Additional Designations</b>	Important Bird Area – NS058
<b>Biological Importance</b>	Mixed seabird colony of Great Cormorant, Black Guillemot, Great Black-backed Gull, Herring Gull and Great Blue Heron present
<b>Invasive Species</b>	None documented
<b>Species at Risk</b>	None documented
<b>Land or Aquatic Use</b>	No permits issued

<b>Management Agency</b>	Environment Canada – Canadian Wildlife Service
<b>Public Access and Use</b>	Minimal public use because site has limited access

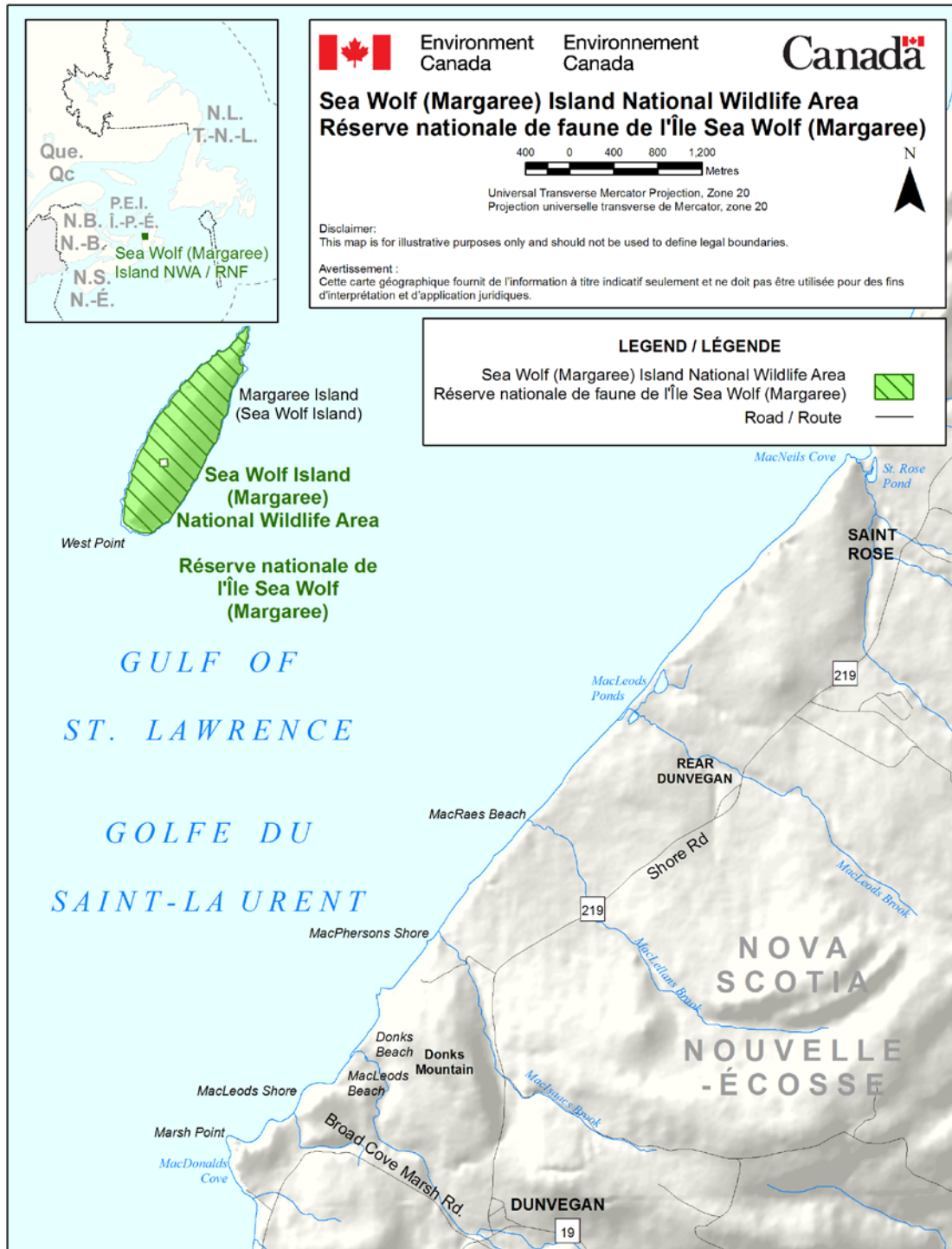


Figure 1: Map of Sea Wolf Island National Wildlife Area

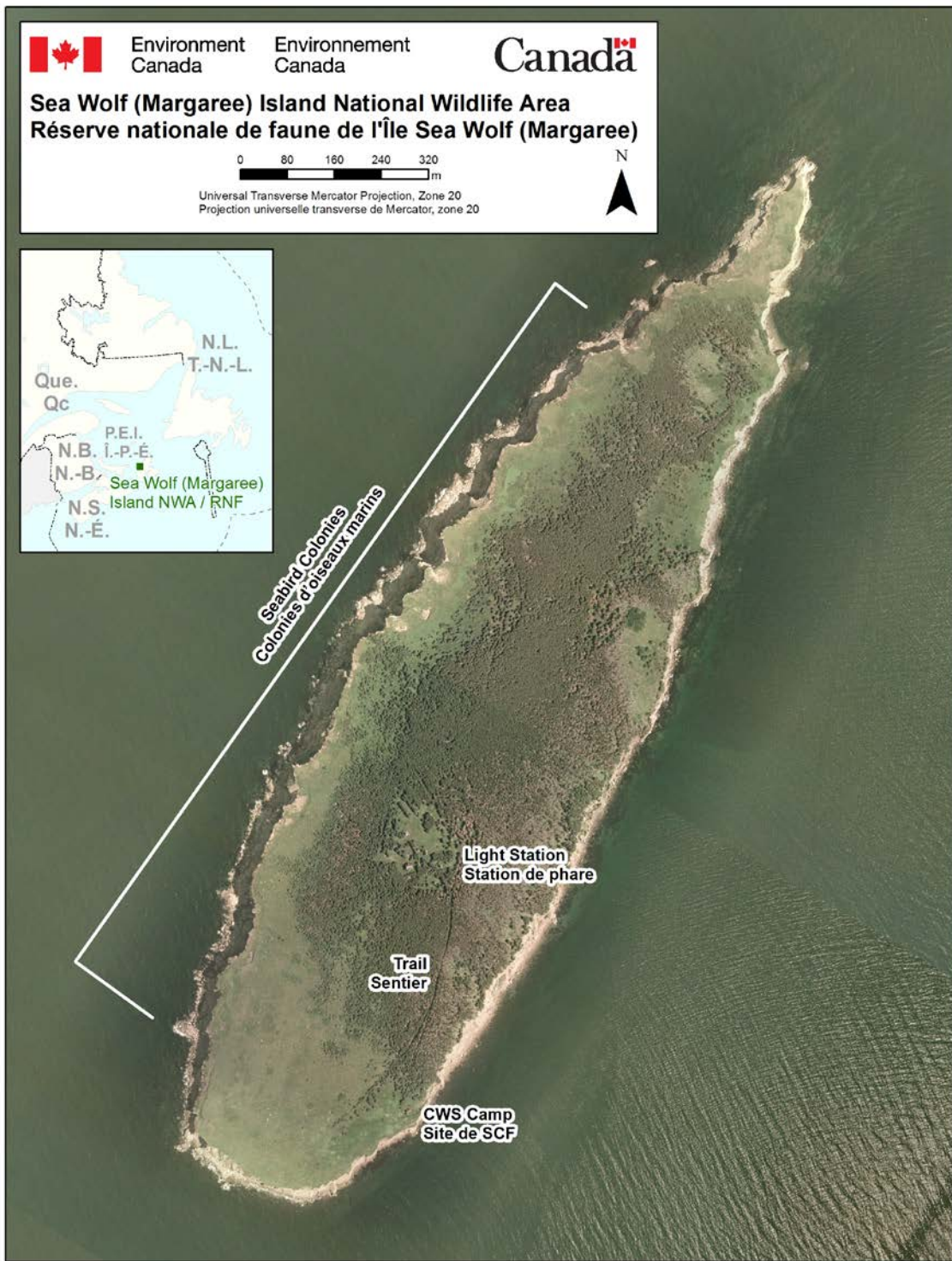


Figure 2: Air photo of Sea Wolf Island National Wildlife Area in 1993



**Figure 3: Oblique aerial photograph of Sea Wolf Island National Wildlife Area in 2009 © Environment Canada – Canadian Wildlife Service, photo: A. Kennedy. Note the presence of dead and diseased White Spruce that are brown in colour on eastern side of island.**



## 1.1 REGIONAL CONTEXT

The mainland area of the western coast of Cape Breton, adjacent to Sea Wolf Island, has been characterized as the “Inverness Coastal Plain” (Ecological Theme Region 551, Davis and Browne 1996a, 1996b; Figure 4).

Sea Wolf Island is one of only three large islands situated along the western coast of Cape Breton Island, Nova Scotia. This area has a rich fishing tradition, and coastal boats from nearby harbours at Margaree Harbour, Broad Cove and Inverness frequent the waters around the island. During the days of sail, many coastal communities established temporary communities closer to the fishing grounds and Sea Wolf Island was no exception. Throughout the early 20<sup>th</sup> century, and presumably before, an elaborate wharf system and supporting storage buildings, dwellings and even a store were located along the south-eastern shore where the EC-CWS cabin now stands (MacLellan, 2004). Most of these facilities were gone by the mid-20<sup>th</sup> century.

The climate of Sea Wolf Island is classified in the “Atlantic” zone. The island is found in the “Atlantic Maritime” ecozone and the “Nova Scotia Highlands” ecoregion. Within this ecoregion, the island falls under the Ainslie Uplands Ecodistrict. This area is affected by strong, cold winds from the Gulf of St. Lawrence and characterized as having the latest, coldest springs and the shortest growing season in Nova Scotia. The ecodistrict has a mean annual temperature of 6°C and mean summer and winter temperatures of 16.7°C and -4.4°C, respectively. The ecodistrict receives an average of 1200–1400 mm of precipitation annually, including 505 mm of rain between May and September (Davis and Browne 1996a). Environment Canada’s “Climate Normals 1971–2000” for the nearby town of Cheticamp include an average of 1053 mm of rain annually, and average maximum and minimum temperatures of -2.0°C and -6.4°C for February and 22.7°C and 14.0°C for July ([http://climate.weatheroffice.gc.ca/climate\\_normals/index\\_e.html](http://climate.weatheroffice.gc.ca/climate_normals/index_e.html)).

Sea Wolf Island is one of the six NWAs in Nova Scotia. The other five NWAs in Atlantic Canada are located in New Brunswick.

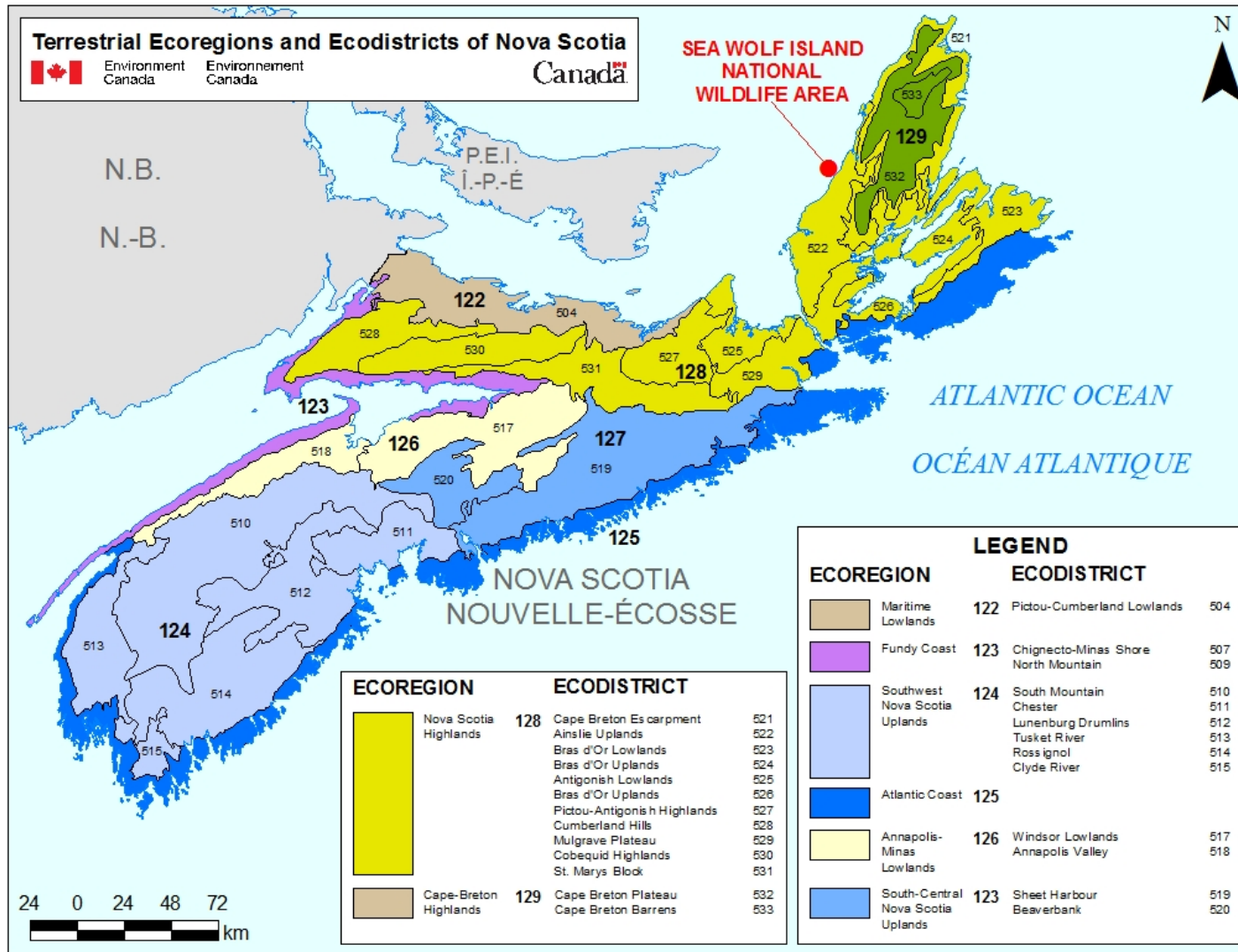


Figure 4: Terrestrial ecoregions and ecodistricts of Nova Scotia. Note: Sea Wolf Island falls within Ecoregion No. 128 (Nova Scotia Highlands) and Ecodistrict No. 522 (Ainslie Uplands).

## **1.2 HISTORICAL BACKGROUND**

Little is known regarding early human history on Sea Wolf Island. No Aboriginal sites or traces of use during early European settlement have been found. The surviving artifacts are related to the history of the Sea Wolf Island light station in the mid- to late 19<sup>th</sup> century (MacLellan, 2004).

The fishery around the island has been important for centuries; however, the treacherous coast has extracted a toll on vessels and a lighthouse was installed in 1854. It was located on the highest point of the island. The lighthouse was combined with a dwelling that contained seven rooms. In 1955, a new storage shed was constructed, which is the current CWS cabin.

To supplement their income, the lightkeepers also farmed. For example, Angus Y. MacLellan had one horse, three or four cows and about fifty sheep; the sheep roamed free across the island. More information on the history of the island and the lightkeepers can be found in Appendix 1.

## **1.3 LAND OWNERSHIP**

The entire island, to mean high water, is under the administration and control of EC-CWS, save for the 3716 m<sup>2</sup> lighthouse site (PID 50188994) held by the Department of Fisheries and Oceans, Canadian Coast Guard (DFO-CCG). There are no other travel routes, fences or right-of-ways on the island.

## **1.4 FACILITIES AND INFRASTRUCTURE**

There is only one foot trail from the old village site to the lighthouse. EC-CWS retains a small rustic dwelling for field visits. Semi-annual visits include site inspections and repairs and/or replacement of regulatory signage (boundary, public notice and 2' x 4' NWA identification sign).

The maintenance requirements of Sea Wolf Island NWA are minimal. There are no roads and only one building 4.8 m x 7.3 m (16' x 24') maintained by EC-CWS. The building is single storey (with loft), 2" x 6" construction over a concrete floor, and footings with an asphalt shingled roof having a 1:1 slope. This building was formerly a storage shed built by DFO-CCG in 1955.

The property held by DFO-CCG still retains a concrete light tower as well as a derelict dwelling (1 ½ storey) and a storage barn.

Access points onto the island are limited to the southeast coast due to the nature of the island's physical geography. Most of the perimeter of Sea Wolf Island is comprised of high cliffs. Sea Wolf Island NWA has no point of designated public access or landing infrastructure such as a dock or ramp.

A sign advising the public of permissible activities (wildlife observation, hiking, hunting and berry-picking) is posted at the building maintained by EC-CWS near the primary landing area. Regular inspections are conducted every second year, dependent on weather and access conditions.

**Table 2: Facilities and infrastructure in Sea Wolf Island National Wildlife Area**

<b>Type of asset</b>	<b>Approximate size/quantity</b>	<b>Responsibility</b>
Property boundary	4.5 km	Environment Canada – Canadian Wildlife Service
Boundary signs	10	Environment Canada – Canadian Wildlife Service
NWA entry signs	1	Environment Canada – Canadian Wildlife Service
Public notice signs	2	Environment Canada – Canadian Wildlife Service
Unimproved trail – foot path	1	Not maintained
Decommissioned lighthouse	1	Department of Fisheries and Oceans – Canadian Coast Guard
Decommissioned lightkeepers house	1	Department of Fisheries and Oceans – Canadian Coast Guard
Decommissioned lighthouse storage barn	1	Department of Fisheries and Oceans – Canadian Coast Guard
Storage/shelter building	4.8 m x 7.3 m (16' x 24')	Environment Canada – Canadian Wildlife Service



## 2 ECOLOGICAL RESOURCES

### 2.1 TERRESTRIAL AND AQUATIC HABITATS

Sea Wolf Island, as typical of small islands, has less species diversity than on the adjacent mainland (Roland and Smith 1969). Erskine documented 76 species of plants during a one-day trip to the island (Erskine 1965). The tree community along the southern aspect of the island is dominated by White Spruce (*Picea glauca*) and a few Balsam Fir (*Abies balsamea*). Smith and MacKinnon (1992) also recorded many of the same species noted by Erskine previously with the addition of one Honeysuckle sp. located near the lighthouse. A more complete flora study was conducted by R. Newell (2009).

The southeast windswept side of the island is covered by a mat of Crowberry (*Empetrum nigrum*), Creeping Juniper (*Juniperus horizontalis*) and Common Juniper (*J. communis*), while Bayberry (*Myrica pennsylvanica*), Wild Rose (*Rosa virginiana*), various grass species and stunted White Spruce and Balsam Fir cover the northwest windswept area of the island. The White Spruce stand occupies most of the sheltered southeastern side.

Sea Wolf Island was nearly devoid of trees in the mid-20<sup>th</sup> century, due to farming by lighthouse keepers and seasonal fisherman, who cleared the land for firewood and farming, with most of the island being used as pasture for sheep. In the past 10–20 years, White Spruce and Balsam Fir have expanded considerably in the centre portion of the island. The island is now largely forested by salt-tolerant coastal species such as White Spruce (Figures 5–9).



**Figure 5: Sea Wolf Island in 1936. Note the open landscape and agricultural fields.**



**Figure 6: Sea Wolf Island in 1947. Note the development of the White Spruce forest along the east side of the island.**



**Figure 7: Sea Wolf Island in 1969. Note the continued expansion of the White Spruce forest along the east side of the island as well as abandonment of farming.**



**Figure 8: Sea Wolf Island in 1993. Note the continued expansion of the White Spruce forest, now occupying nearly half of the island.**



**Figure 9: Sea Wolf Island in 2010. Much of the central core of the island is now dominated by White Spruce forest. Note the patches of dying forest, attributed to an outbreak of Spruce Beetle, along the eastern side of the island.**

**Table 3: Habitat types on Sea Wolf Island 2010 based on aerial reconnaissance**

Habitat type	Area (ha)	Percent	
Early and late succession White Spruce forest	28	51.8	
Area of open habitat (Low windswept shrubs)	Southern end – Creeping Juniper	9	16.7
	Windswept western flank	6	11.2
	North Point	1	1.9
Large patches of dead and dying White Spruce	7	13	
Old village site	1	1.8	
Lighthouse dwelling site	1	1.8	
Old road/trail from village to light station	1	1.8	
<b>Total</b>	<b>54</b>	<b>100</b>	

### **White Spruce die-off**

Considerable evidence of dead and dying White Spruce along the eastern side of Sea Wolf Island was observed in 2007. The area affected is adjacent to two areas of “blown-down” spruce. The Nova Scotia Department of Natural Resources (Inverness County District Office) has advised that there has been an outbreak of Spruce Beetle (*Dendroctonus rufipennis*) in the areas of Lake Ainslie, Dunvegan/St. Rose, Southwest Margaree and north to Cheticamp. This beetle attacks mature and over-mature White Spruce, but may also be found in Red Spruce as well. Areas with blow-downs are also preferred as the beetle can become easily established with minimal interference. It is possible, although not confirmed, that the defoliated and dead spruce trees at Sea Wolf Island are a result of the Spruce Beetle.

## 2.2 WILDLIFE

Human occupation, and related farming, during the past two centuries undoubtedly had a negative impact on the wildlife populations of Sea Wolf Island. The small size of the island and thus low plant diversity has also influenced the diversity and abundance of the few small mammals, and other species, that dwell there. With the reduction in human activity, the colonial nesting seabirds have quickly re-established their presence.

### **Birds**

NWA Inspection reports (1984–2009) document 59 species of birds on or around the island. It should be noted that Sea Wolf Island was not surveyed as part of the Atlas of the Breeding Birds of the Maritimes: 2006–2010. Eight species of colonial birds have been noted as breeding on Sea Wolf Island, including Black Guillemot (*Cepphus grylle*), Common Tern (*Sterna hirundo*), Great Blue Heron (*Ardea herodias*), Great Cormorant (*Phalacrocorax carbo*), Great Black-backed Gull (*Larus marinus*) and Herring Gull (*Larus argentatus*). It should be noted that Razorbills (*Alca torda*) have nested on the island in the past, and during the 2000 survey, Double-crested Cormorants (*Phalacrocorax auritus*) were observed nesting. The following is a summary of colonial nesting activity within the NWA.

### **Nesting Seabirds**

- 1) The island supports one of the relatively few colonies of Great Cormorants in the Maritime provinces (Erskine, 1992). The Sea Wolf Island colony has ranged from 127 nests in 1984 to 37 nests in 1997. During the most recent census (2007), 56 nests were counted. The Great Cormorant population is thought to have been extirpated in the Maritimes in the 19th century (see Erskine 1992), but has increased during the last century. Lock and Ross (1973) estimated the Great Cormorant population in Nova Scotia in 1972 to be 2050 pairs, and in 1992 the population consisted of 29 colonies totalling 3700 pairs (Milton et al. 1995; Hatch et al. 2000) (Figure 8).
- 2) Black Guillemots breed on Sea Wolf Island. The population has been difficult to survey because they nest in inaccessible cavities in the cliff face. Generally, only adult birds are recorded as an index to nesting numbers. A high of 275 adults were recorded along the Sea Wolf Island cliffs in 2003.
- 3) Great Blue Herons breed on the island in small numbers with only 7 nests and 1 adult being observed in 2000 and only 7 adults in 2007. This number is considerably lower than previously recorded. In 1997, 23 nests were observed, and a high of 53 nests was observed in 1986. The 7 nests observed in 2000 were on the ground in a new location on a cliff ledge located northwest of the lighthouse whereas the former colony site existed in trees to the

east-southeast of the lighthouse. The only other recorded ground nesting by Great Blue Heron in Nova Scotia was a small colony on an island within the Haley Lake Migratory Bird Sanctuary. The large area of dead spruce forest unsuitable for tree-nesting, combined with the presence of mammalian predators such as fox and perhaps coyote, are likely factors to the decline in number of Great Blue Herons nesting on the island.

- 4) In 1973, 50 adults and 13 nests of Common Tern were observed on the island. Common Terns have not been sighted on the island since 1992, when 6 adult birds were observed.
- 5) Razorbills have been recorded breeding on Sea Wolf Island in the past, and this location is one of five Razorbill nesting sites identified in Erskine's Breeding Bird Atlas of the Maritime Provinces (1992). Nesting Razorbills were observed in 1981, 1984, 1986, 1990 and 1997 surveys. No birds have been observed since 1997.
- 6) Double-crested Cormorants were observed during the 2000 survey, with three adults and one nest (one bird on the nest) being observed. All three birds were observed near nesting Great Cormorants. Forty adults were observed in 2007.
- 7) Herring Gull and Great Black-backed Gulls were once abundant on the island but their numbers have declined considerably since the early to mid-1980s, likely due to mammalian predation.

### **Other Bird Observations**

Northern Gannets (*Sula bassanus*) and Common Loons (*Gavia immer*) are frequently sighted offshore. Also of interest is the presence of Fox Sparrows (*Passerella iliaca*), as this species has limited distribution throughout the Maritimes (Erskine 1992). A pair of Bald Eagles (*Haliaeetus leucocephalus*) has frequently been observed and may be nesting on the island. Recently (1992), Ring-billed Gulls (*Larus delawarensis*) have also been recorded. No waterfowl have been documented on Sea Wolf Island, which does not have any large open water wetlands. However, seaducks (eiders, scoters and Long-tailed Ducks) are frequently observed offshore.

As previously mentioned, although Sea Wolf Island has no open water wetlands, there are a number of wet freshwater springs or "seeps" along the hillside that may provide habitat for American Woodcock (*Scolopax minor*) and Common Snipe (*Gallinago gallinago*).





**Figure 10: Great Cormorant nesting on the sandstone cliffs along the western side of Sea Wolf Island National Wildlife Area © Environment Canada – Canadian Wildlife Service, photo: Andrew Macfarlane**

### ***Mammals***

Mammals observed on Sea Wolf Island include Snowshoe Hare (*Lepus americanus*), Meadow Vole (*Microtus pennsylvanicus*) and Red Fox (*Vulpes vulpes*). The presence of fox on the island has likely played a role in the decline of Herring Gull and Greater Black-backed Gull numbers and may also be curtailing any nesting attempts by other ground-nesting species. There have been no observations or signs of Eastern Coyote (*Canis latrans*) on Sea Wolf Island to date. The presence of sea ice between the island and mainland in winter means that coyotes may utilize the island at some point in time.

Gray Seals (*Halchoerus grypus*), Harbour Seals (*Phoca vitulina*), Minke Whales (*Balaenoptera acutorostrata*), Harbour Porpoises (*Phocoena phocoena*), Atlantic White-sided Dolphins (*Lagenorhynchus acutus*) and Pilot Whales (*Globicephala melaena*) occur in the marine waters off Sea Wolf Island.

### ***Reptiles and Amphibians***

Maritime Garter Snakes (*Thamnophis sirtalis pallidula*) were recorded on Sea Wolf Island in 1997 and 2007. No other reptiles have been documented at this site. No amphibian species have been documented on the island.

## ***Fish***

There is no habitat for fish on the island.

## ***Insects***

No detailed work has been conducted on insects on Sea Wolf Island, but interesting occurrences have been noted. In 2000, a large number of bright red Cinnabar Moths (*Tyria jacobaeae*) were observed on the island, and during that same summer similarly large numbers were observed on the adjacent mainland.

The Cinnabar Moth is native to Europe and was introduced to various parts of Canada to control ragwort, *Senecio jacobaeae* L. Any benefits or concerns regarding its presence on Sea Wolf Island are unknown.

## **2.3 SPECIES AT RISK**

None recorded.



### 3 GOALS AND OBJECTIVES

#### 3.1 VISION

The long-term vision for Sea Wolf Island NWA's conservation is to maintain and enhance habitat for native wildlife and plants with priority being given to the island's colonial nesting birds.

#### 3.2 GOALS AND OBJECTIVES

Sea Wolf Island NWA was established to provide secure protection for the varied bird habitats within this coastal site. This goal is in accordance with the document *A Wildlife Policy for Canada*. This policy states that the goal for an NWA is:

*"... to maintain and enhance the health and diversity of Canada's wildlife, for its own sake and for the benefit of present and future generations."*

Sea Wolf Island NWA is classified under the International Union for the Conservation of Nature (IUCN) criteria for protected areas as a Category IA protected area. The site is protected for the preservation of species and genetic diversity as well as scientific monitoring and research. Sea Wolf Island is not promoted as a tourism destination or for on-site public education. Public visitation to Sea Wolf Island is not promoted, but it is not restricted. Some standard traditional activities are allowed at Sea Wolf Island NWA (e.g. berry picking), although rarely pursued at this location.

**Currently, the primary management goal for Sea Wolf Island NWA is *to ensure that the colonial nesting birds, and other wildlife, are protected from human disturbance such that the potential for natural biological processes to occur is maximized.***

To ensure that this goal is attained, more specific management goals and objectives are in place so that the ecological integrity is maintained and enhanced by maintaining or enhancing the quantity, quality and diversity of natural habitats, while permitting non-conflicting human use (Environment Canada 2011).

Sea Wolf Island NWA is a remote site where intensive management of human activities is presently not required. Current management activities are limited to responding to specific incidents as they may arise and planned site inspection visits. The goals and objectives listed below reflect a management approach of responding only to negative human activities as they arise within the limitations imposed by financial and staff resources. The discussion of monitoring activities (see Section 5.4) provides additional information on how the overall management goals will be addressed.

Specific goals and objectives are:

**Goal 1.** The habitat and wildlife resources of Sea Wolf Island NWA are conserved;

- 1.1 Habitat sub-goal: Forest habitats are regenerated so that migratory birds nesting in this habitat are sustained and/or residences and habitats are created, restored or maintained through natural processes or active management.
  - a. Objective: Remediate forest habitat loss from insect infestation and defoliation, by planting salt-tolerant conifer species such as White Spruce and Balsam Fir. Such remediation activities will be based on future assessments of habitat trends and bird population trends on Sea Wolf Island.
- 1.2 Wildlife sub-goal: All species of colonial nesting birds currently breeding on the NWA are retained.
  - a. Objective: Populations of mammalian predators such as Red Fox are kept at levels that do not cause the decline of ground-nesting seabirds.

**Goal 2.** Prohibited activities do not occur within the NWA.

- 2.1 Enforcement sub-goal: Protect and maintain the area's ecological integrity including natural habitats and special habitat features from the effects of prohibited activities (e.g. camping, camp fires).
  - a. Objective: Document and report the number and nature of incidents of illegal activities within Sea Wolf Island NWA to the Wildlife Enforcement Division, therefore reducing or eliminating their occurrence in the NWA.

### **3.3 EVALUATION**

Monitoring will be performed within the limits imposed by financial and human resources. The management plan itself will be reviewed in 5 years' time and every 10 years after that. Evaluation will take the form of an annual review of monitoring data obtained from the monitoring and research projects outlined below. These data and the annual review will be used to inform future management as well as to evaluate federal contributions towards accomplishing the mandates specific to Environment Canada for which the protected area was established.

The management goal for Sea Wolf Island will be met and continuously evaluated through the field visits to the island that occur every two years. New information, such as presence of newly listed species at risk, may be appended to the document (as required) to assist in site management and decision making.

## 4 MANAGEMENT CHALLENGES AND THREATS

Sea Wolf Island is partially protected from human impacts by its remoteness from the mainland and difficulty in landing with boats. However, the island is vulnerable to the impacts of tourism from those wishing to visit unique locations. The waters around the island are visited frequently during the summer months by local fishers as well as tour boats. Views of the island's cliffs, especially along the western side, are an attraction, but also the location of most of the colonial nesting birds. The waters closely adjacent to the island are deep, such that marine traffic (predominantly lobster fishers) can approach to within 25 m of the cliffs in calm weather. This activity is of periodic and limited duration (boats check their lobster pots quickly and move on) and does not appear to have any negative effect on the birds. However, the disturbance caused by tour boats that may linger in the vicinity of the cliff-nesting birds may create an impact (Hearne 1998; Regular 2007). Presently, this is believed to be an uncommon occurrence.

There are also infrequent summer visitors to the island that ascend the narrow path, near the EC-CWS cabin. A typical visit would probably be a few hours in duration where people would land, walk to the highest point on the island (area of the light house), picnic and then leave. Any overnight camping (an illegal activity) is rare, if it occurs at all. Traditionally, lobster fishers stored lobster pots on the island after the close of the lobster fishing season, but this activity no longer occurs.

At least one tour boat operator includes Sea Wolf Island as a destination, but the majority of this activity is believed to be whale watching/sightseeing from the boat.

### 4.1 TOURISM

Whereas Sea Wolf Island supports a large and diversified colonial nesting bird colony (notably the nesting Great Cormorant on the western cliffs), public access is not encouraged. However, such visitation is not restricted at this time due to the low numbers of visitors to Sea Wolf Island during the nesting season.

The adjacent mainland communities have expressed a strong emotional attraction to the island as many of the residents from along the shore have ancestors who as fishers or lightkeepers once lived on the island. The importance of Sea Wolf Island from both a human and natural history perspective has meant that the protection of Sea Wolf Island as an NWA is supported by the local communities. In support of this cooperative view, remnant farming implements (subject to continued deterioration if left *in situ*) found on the island by CWS Protected Areas staff have been donated to the community museum in Inverness. Furthermore, CWS will continue to be supportive of documenting and recording traditional knowledge pertaining to the human and natural history of the island.

## **4.2 HABITAT CHANGE**

Habitat change on the island is partly driven by forest succession since year-round human habitation on Sea Wolf Island ceased. Large open areas of field habitat are being replaced by very dense stands of salt-tolerant White Spruce (see Figures 3–7). However, this same habitat is also susceptible to a recent Spruce Beetle infestation as well as periodic “blow-down” of sections of forested area by very strong winds that are prevalent along this coast. Furthermore, such insect-weakened stands are much more susceptible to wind damage. Once the trees become defoliated and decay, the understory usually develops into dense thickets of Red-berried Elder.

## **4.3 PREDICTED CLIMATE CHANGE CONTEXT**

Climate change is not an immediate threat to Sea Wolf Island NWA. The rugged sandstone core of the island withstands erosion, and the elevation of the island would suggest any moderate sea-level rise would have little effect. However, the responses (both positive and negative) of the island’s flora and nesting birds to any rapid climatic changes are unknown. For example, the recent insect defoliation problems within the greater Cape Breton area caused by Spruce Beetle was likely exacerbated by a recent series of warmer than average winters (see Gullet and Skinner 1992).

A recent analysis of climate data for Prince Edward Island has indicated that winter temperatures have increased during the last 100 years (A. Fenech pers. comm.). Although published climate data from the Environment Canada Weather Office for Cape Breton is incomplete at present, the mean February temperature for Cheticamp 1971–2000 was -6.3°C, whereas in the period 2000–2006, the mean temperature was -4.9°C.

## **5 MANAGEMENT APPROACHES**

This section contains a description of possible approaches that could be used in the management of the Sea Wolf Island NWA. However, management actions will be determined during the annual work planning process and will be implemented as human and financial resources allow. Management activities will focus on the most cost-effective elements.

### **5.1 HABITAT MANAGEMENT**

Forest management (replanting of native trees if required) will be conducted on Sea Wolf Island if required.

### **5.2 ALIEN AND INVASIVE PLANTS**

On Sea Wolf Island NWA, there are no immediate threats from alien or invasive plant species. There may, however, be a possible infestation of White Spruce by the invasive Spruce Beetle.

### **5.3 WILDLIFE MANAGEMENT**

There are presently no species at risk identified on Sea Wolf Island. Inspections every two years and additional wildlife surveys may change this current assessment. As mentioned previously, if Red Fox (or Eastern Coyote) populations on the island were to become so high as to reduce the use of this island by colonial nesting seabirds, the CWS management response approach would be to encourage local trappers to go to the island and reduce numbers of mammalian predators. The rationale for this approach is that the number of uninhabited islands available as breeding habitat for colonial nesting seabirds is relatively low compared to the mainland habitat suitable for Red Fox and Eastern Coyote.

### **5.4 MONITORING**

As previously noted, access to Sea Wolf Island is challenging due to its remoteness and the conditions by which safe access can be guaranteed. Nevertheless, the site will be visited at least once every two years. Corresponding to the outlined goals and objectives above, these site inspections will include biological monitoring (wildlife populations with a focus on colonial birds; sub-goal 1.2). During the inspections, observations of other changes in habitat, such as changes in plant composition of the nesting habitat due to native, non-native, alien and invasive plant species will be recorded.

Large changes to the island's vegetation can be monitored by aerial photography or satellite imagery (sub-goal 1.1). Site inspections will also document any evidence of human use (camping, open fires, soil disturbance) that may require enforcement action (sub-goal 2.1).

Sea Wolf Island has little public use/visitation, and visitation during the seabird nesting season is not encouraged. The ongoing site inspection schedule, which includes building (cabin) maintenance and placement or replacement of National Wildlife Area regulatory signage, is presently adequate to monitor the island.

**Table 4: Management challenges and threats for Sea Wolf Island National Wildlife Area**

<b>Management Challenges and Threats</b>	<b>Goals and Objectives</b>	<b>Management Approaches</b>
<ul style="list-style-type: none"> <li>• Specific insect infestation followed by White Spruce defoliation often results in wide-scale tree “blow-down”.</li> <li>• Plant succession is ongoing following past human use (sheep grazing, etc.) with habitat naturally reverting to that found on undisturbed coastal islands in the area</li> </ul>	<p>Habitat Sub-goal 1.1 – Forested habitats are regenerated.</p> <p>Objective: Remediate forest habitat loss from insect infestation and defoliation, by planting salt-tolerant conifer species such White Spruce and Balsam Fir.</p>	<ul style="list-style-type: none"> <li>• Periodic aerial photography over the past 65 years and in future will be used to analyze habitat change.</li> <li>• Monitoring composition of native, non-native, alien and invasive plant species.</li> <li>• Planting of White Spruce and Balsam Fir as warranted.</li> <li>• Field surveys to monitor success of tree planting and presence of invasive Spruce Beetles.</li> </ul>
<ul style="list-style-type: none"> <li>• Mammalian predators such as red foxes and coyotes can have devastating impacts on nesting success and populations of ground nesting seabirds on islands.</li> </ul>	<p>Wildlife Sub-goal 1.2 – All species of colonial nesting birds are maintained</p> <p>Objective: Populations of red foxes (and other large mammalian predators) are managed at levels that will not impact colonial nesting seabirds on Sea Wolf Island.</p>	<ul style="list-style-type: none"> <li>• Monitor colonial nesting birds on a biennial basis to detect long-term island population changes.</li> <li>• Monitor populations of coyotes and red foxes on Sea Wolf Island using hair collection stations, as well as scat and track observations.</li> <li>• If warranted, encourage local trappers to go to island and thereby reduce numbers of mammalian predators.</li> </ul>
<ul style="list-style-type: none"> <li>• Plant Tourism activities such as bird watching and “adventure tourism,” camping and open camp fires present the potential for significant disturbance to colonial nesting and forest habitat birds.</li> </ul>	<p>Enforcement Goal 2.1 – Prohibited activities do not occur within the NWA.</p> <p>Objective: Monitor evidence of illegal activity (e.g. illegal camping, open camp fires) and related disturbances to colonial nesting birds.</p>	<ul style="list-style-type: none"> <li>• Evidence of illegal activities within the NWA is documented and reported to Wildlife Enforcement Division.</li> <li>• Communicate with local tourism operators and the provincial tourism department regarding the protected status of Sea Wolf Island and sensitivity of colonial nesting birds to human disturbance.</li> </ul>

## **5.5 RESEARCH**

As part of the site inspection program, long-term monitoring by Canadian Wildlife Service, Atlantic, is a fundamental component of the science-based management of Sea Wolf Island NWA (Environment Canada 2011). Data collected will be shared and used to answer, in part, questions regarding population status and trends of migratory birds and their habitat in the province and region.

All research activities conducted by third parties on NWAs require permits. Permits will only be approved if results from the research have the potential for the following:

1. Protecting, maintaining, restoring or enhancing naturally occurring habitats
2. Recovering species at risk or conserving migratory birds
3. Reducing the encroachment of invasive species in the NWA
4. Assessing the trends in species populations and habitats of concern
5. Reducing impacts of human activities on colonial nesting birds

To obtain a permit in order to conduct research in Sea Wolf Island NWA and to receive instructions on guidelines for research proposals, please contact:

National Wildlife Area – Permit Request  
Environment Canada  
Canadian Wildlife Service  
17 Waterfowl Lane  
Sackville NB E4L 1G6

## **5.6 PUBLIC INFORMATION AND AWARENESS**

Although public use of the island is not encouraged, the importance of this protected area as a “Heritage to Protect” was highlighted through the Environment Canada, Canadian Wildlife Service, NWA poster series. These posters have been distributed to public buildings (schools and post offices) as well as given to area residents on request.

No formal education plan is in place or anticipated. Due to the isolation of Sea Wolf Island, the nature of the island’s physical geography and the difficulty of boat access, the area will not be promoted by EC-CWS as a tourist destination.

## 6 PROHIBITED ACTIVITIES AND ENTRY

For the benefit of wildlife and its environment, human activities are minimized and controlled in NWAs through the implementation of the *Wildlife Area Regulations*. These regulations set out activities that are prohibited (subsection 3(1)) and provide mechanisms for the Minister of the Environment to allow for certain activities to take place in NWAs that are otherwise considered prohibited.

**It should be noted that all activities within an NWA are prohibited unless otherwise allowed through authorisation by notice (section 6.1), authorisations by permit (section 6.2), or exceptions (section 6.3).**

Examples of violations of the *Wildlife Area Regulations* that have occurred on NWAs include:

- destroying or disturbing any wildlife, their habitats or eggs;
- possession of any wildlife or carcass, nest, egg or parts thereof;
- cutting, picking, removing or wilfully damaging any vegetation;
- disturbing or removing soils, sand, gravel, rock or related material;
- removing, defacing, damaging or destroying any artifact, building, fence poster, sign or other structure;
- entry into any NWA property where notice prohibiting such entry has been given;
- camping or campfires;
- firewood cutting;
- motorized vehicle use on the land base;
- dumping or depositing waste or other refuse materials or substance that would degrade or alter the quality of the environment

### 6.1 AUTHORIZATIONS

Under the *Wildlife Area Regulations*, the Minister of the Environment may authorize an activity that is prohibited through the issuance of permits and notices issued in local newspapers or posted at the entrance of any wildlife area or on the boundary of any part thereof.

Authorizations may be issued only if the Minister is of the opinion that the activity:

- is scientific research relating to wildlife or habitat conservation;
- benefits the wildlife and their habitats;
- will contribute to wildlife conservation;
- is otherwise consistent with the criteria and purpose for which the NWA was established.



The above-listed conditions must be met before the Minister will consider authorizing a prohibited activity.

When the Minister considers them necessary, terms and conditions governing the activity may be added to the authorizations, provided that they are added to protect and minimize the impact of the authorized activity on wildlife and their habitat.

## **6.2 SEA WOLF ISLAND AUTHORIZATIONS BY NOTICE**

Under the *Wildlife Area Regulations*, the Minister may post notices at the entrance of any wildlife area or on the boundary of any part thereof indicating that it is prohibited to enter the NWA or part thereof. These notices can be posted when the Minister is of the opinion that entry is a public health and safety concern or when entry may disturb wildlife and/or their habitat.

### **Entry is allowed at Sea Wolf Island NWA.**

For Sea Wolf Island NWA, the notice authorizing the following activities is posted at the primary landing area (just south of the cabin) in combination with an identification sign (2' x 4' NWA sign) that is posted on the building exterior overlooking the water.

#### **The following activities are authorized by notice for Sea Wolf Island:**

- hunting
- fishing
- trapping
- wildlife observation
- canoeing
- hiking
- skiing
- skating
- snowshoeing
- photography
- berry picking

#### **Notes:**

- Provincial and Federal permits, limits and “seasons” apply for hunting, fishing and trapping.
- If there is a discrepancy between the information presented in this document and the notice, the notice prevails, as it is the legal instrument authorizing the activity.

Applicable conditions for allowed activities correspond to the management vision for the Sea Wolf Island NWA, i.e.: *to maintain and enhance habitat for native wildlife and plants with priority being given to the island’s colonial nesting birds.*

For example, climbing on the soft sandstone and conglomerate cliffs is not an authorized activity, in order to minimize disturbance of nesting birds and also as a safety precaution.

### **6.3 SEA WOLF ISLAND AUTHORIZATIONS BY PERMIT**

Examples of activities that are authorized by permit in NWAs include scientific research and archaeological investigations.

All permit requests must be made, in writing, to:

National Wildlife Area – Permit Request  
Environment Canada  
Canadian Wildlife Service  
17 Waterfowl Lane  
Sackville NB E4L 1G6

### **6.4 EXCEPTIONS**

The *Wildlife Area Regulations* allow for exceptions to the prohibited activities under the following circumstances:

- Activities related to public safety, health or national security, that are authorized by or under another Act of Parliament or activities under the *Health of Animals Act* and the *Plant Protection Act* for the health of animals and plants;
- Activities related to routine maintenance of National Wildlife Areas, to the implementation of management plans, and enforcement activities conducted by an officer or employee of Environment Canada.

### **6.5 OTHER FEDERAL AND PROVINCIAL AUTHORIZATIONS**

Depending on the type of activity, other federal or provincial permits may be required to undertake an activity in the Sea Wolf Island NWA.

Contact your regional federal and provincial permitting office for more information.

National Wildlife Area - Permit Request  
Environment Canada  
Canadian Wildlife Service  
17 Waterfowl Lane  
P.O. Box 6227  
Sackville NB E4L 1G6

Province of Nova Scotia  
Department of Natural Resources  
Fish and Wildlife Division

136 Exhibition Street  
Kentville NS B4N 4E5

## 7 HEALTH AND SAFETY

Any emergency pertaining to Sea Wolf Island should be reported to:

National Wildlife Area Program  
Environment Canada  
Canadian Wildlife Service  
17 Waterfowl Lane  
Sackville NB E4L 1G6  
Tel.: 506-364-5044  
Fax: 506-364-5062

All reasonable efforts will be made to protect the health and safety of the public, including adequately informing visitors of any known or anticipated hazards or risks. Furthermore, Environment Canada staff will take all reasonable and necessary precautions to ensure their own health and safety and that of their co-workers. However, visitors (including researchers and contractors) must make all reasonable efforts to inform themselves of risks and hazards and must be prepared and self-sufficient. Natural areas are inherently dangerous, and proper precautions must be taken by visitors, recognizing that Environment Canada staff neither regularly patrol nor offer services for visitor safety in NWAs.

Offshore islands, and activities along the seacoast in general, present issues of safety. In general, the public must seek and heed expertise to operate in these environments and obtain specialized training and certification, where required.

Sea Wolf Island NWA has no point of designated public access, and the perimeter of the island is comprised of high cliffs. In the case of an emergency, the most frequently used and preferred landing location is either immediately below, or about 150 m south of, the Environment Canada, Canadian Wildlife Service, cabin where access can be obtained, although due caution needs to be exercised. In dire emergency, an alternate landing can be made at the extreme northern tip of the island where an angling stratum of bedrock provides careful and prudent ascent from the water's edge to the island proper; caution is strongly advised. There is no other island access. Climbing on the soft sandstone and conglomerate cliffs is strictly forbidden.

Sea Wolf Island is remote and without resident staff; therefore, any emergency should be reported immediately to the appropriate responding authorities. The report should include date, time and nature of the incident/accident, who is reporting, contact information of the reporting party (for follow-up information) and all relevant details.

Multiple authorities should be advised, if the situation warrants, as soon as possible.

**Table 5: Emergency Contact Information**

<b>Emergency Contacts for Sea Wolf Island NWA</b>	
<b>In case of emergency dial 9-1-1. Only use local telephone numbers for general inquiries.</b>	
<b>Note: There is no civic address for Sea Wolf Island.</b>	
Police–Fire–Ambulance	911
Royal Canadian Mounted Police (RCMP), Inverness Detachment	1-902-258-2213
Rescue Coordination Centre to report air and marine emergencies (emergency only)	1-800-565-1582
Environmental emergencies (oil, pesticide, chemical spills and other environmental emergencies)	1-800-565-1633
Environment Canada, Wildlife Enforcement Division	1-506-364-5044 1-506-364-5036
Environment Canada, Canadian Wildlife Service, Habitat Program, Sackville, New Brunswick	1-506-364-5044 1-506-364-5039 1-506-364-5077
Nova Scotia Department of Natural Resources, Whycomomagh District Office, Cape Breton (conservation officer)	1-902-756-2339
Nova Scotia Department of Natural Resources – Wildlife Division, Kentville, Nova Scotia (general inquiry)	1-902-679-6091
Poison Control Centres (emergencies)	1-800-565-8161
Nearest hospital – Inverness Consolidated Memorial Hospital, Inverness, Cape Breton	1-902-258-2100
Weather Report – marine information for Nova Scotia	1-902-426-9090
Marine Radio Channel – monitored for emergencies	VHF Channel 16

**In the event of an emergency on Sea Wolf Island:**

It should be noted that the small cabin maintained by Environment Canada, Canadian Wildlife Service, in the event of a shipwreck or like catastrophe, is the only shelter on Sea Wolf Island. This shelter is locked; however, entrance could easily be attained in time of emergency by forcing the lock. The cabin is situated such that any emergency signal should be readily seen from the mainland. A first aid kit and other emergency supplies are stored within the cabin (Figure 9).

## 8 ENFORCEMENT

Officers monitor compliance with the *Canada Wildlife Act* on an ongoing basis and will initiate investigations as required. National Wildlife Area Program staff will provide specific details from site inspections that may require enforcement action. No charges have ever been laid regarding Sea Wolf Island NWA under the *Wildlife Area Regulations*.

Visitors to NWAs are encouraged to read NWA Management Plans, consult the Protected Areas website [www.ec.gc.ca/ap-pa](http://www.ec.gc.ca/ap-pa), and read on-site signage regarding allowable activities on NWAs in order to avoid unintentionally violating the *Canada Wildlife Act*.

## 9 PLAN IMPLEMENTATION

The major management component of this plan consists of site monitoring and review. Inspection visits every two years will provide required monitoring data to assess the status of colonial nesting birds.

A priority for Sea Wolf Island NWA is the completion of a botanical survey to augment existing data and evaluate for the presence of any rare species.

**Table 6: Implementation Strategy 2013–2022**

Activity	Year									
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Site inspection	x		x		x		x		x	
Colonial bird census	x		x		x		x		x	
Building inspection and maintenance	x		x		x		x		x	
Follow-up 2009 Botanical Survey							x			

### 9.1 MANAGEMENT AUTHORITIES AND MANDATES

The responsibility for management of Sea Wolf Island NWA resides with the Canadian Wildlife Service – Environment Canada.

### 9.2 MANAGEMENT PLAN REVIEW

Management plans will be reviewed every 5 years after initial development and every 10 years after that. Management plans will be developed by the Canadian Wildlife Service – Atlantic Region in consultation with Nova Scotia Department of Natural Resources – Wildlife Division, Nova Scotia Department of Environment – Protected Areas and Wetlands Branch, environmental non-governmental organizations as well as local communities.

## **10 COLLABORATORS**

There are no formal arrangements pertaining to the management or administration of Sea Wolf Island NWA. National Wildlife Area Program staff work in cooperation with the Nova Scotia Department of Natural Resources – Wildlife Division with frequent data and information sharing as it pertains to Sea Wolf Island.



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## APPENDIX I: HISTORY OF SEA WOLF ISLAND NATIONAL WILDLIFE AREA

Little is known regarding early human history on Sea Wolf Island. No Aboriginal sites or traces of use during early European settlement have been found. The surviving artifacts are related to the history of the Sea Wolf Island light station in the mid- to late 19<sup>th</sup> century (MacLellan, 2004).

The fishery around the island has been important for centuries; however, the treacherous coast has exacted a toll. In 1838, the schooner **Gentile** from Gloucester, Massachusetts, sank off Sea Wolf Island with the crew surviving. On 27 October 1872, the 141-ton brigantine, the **L. W. Eaton** was stranded off Sea Wolf Island. In 1903, the schooner **Euxine** was scuttled off the island; it was reported to have been involved in a smuggling operation (Sessional Papers, 1903).

The following historical summary relies heavily on an unpublished manuscript by Joanne MacPherson (1995). Joanne interviewed local residents about the history of the island and preserved for us wonderful details about a time and place since passed.

The first lightkeeper on the island, Clough MacKeen, also operated the first store in the late 19<sup>th</sup> century. This store was later administered by Joe Abriel and Cameron Smith. Besides the store, there were 12 fisher's shanties and an associated wharf complex. The high cliffs surrounding the island made building and maintaining a wharf a difficult task. Even the relatively protected south side of the island has cliffs over 10 m, and the wharf extended from this elevation down to crib work (a wooden frame filled with rocks) sunk in deeper water.

The only permanent residents on the island were the lighthouse keeper and his family but there was also a seasonal community centred on the fishing trade. At one time there were two small fish plants on Sea Wolf Island. These operations were owned by fish buyers; MacLean's (from Prince Edward Island) and a group from Cape Breton (Cameron Smith, Joe Abriel, L. D. Cameron and Howard Smith). Joe Abriel ran the plant and purchased cod and mackerel from the fisher.

To supplement their income, the lightkeepers also farmed. Angus Y. MacLellan had one horse, three or four cows and about fifty sheep; the sheep roamed free across the island. The lightkeepers often had large families, but most of the children were born on the mainland. The only person known to have been born on the island was Dan Larry MacFarlane (1897–1987).

**Table A1: The last shanty residents from the early 20<sup>th</sup> century on Sea Wolf Island.**

Joe Abriel (Broad Cove Marsh)	John Dan MacPherson (Dunvegan)
Joseph MacLellan	John Angus MacLellan (Dunvegan)
Billy Jim MacLellan (St. Rose)	Dan Wilkens (Rear St. Rose)
Ronald Smith (Inverside)	Allan MacNeil (St. Rose)
Will Day (Rear St. Rose)	Joe MacLellan
Alex S. MacLellan (St. Rose)	Joe Richardson (Broad Cove Marsh)

The following description of one of the fish buyer's dwellings on Sea Wolf Island provides detail on daily life on the island:

*“This particular shanty was different because it had two stories. All the others were one. These fish buyers used this shanty as a General Store. They sold such materials as boots, gloves, tobacco and kerosene. However, John Danny did not purchase this shanty to use as a store but as a dwelling. The ground floor was used for storage. This included his lobster traps, rope and buoys. The upstairs was the living quarters. It had three rooms, a kitchen and two bedrooms. When you climbed the stairs to enter the dwelling you entered the kitchen.*

*The walls and ceilings consisted of brown painted boards of different width, ranging from five inches to twelve inches. The floor was the same wood, but never painted. There were no windows in the kitchen and of course it was sparsely furnished. There was a few chairs and a table, a teapot and some dishes, a stove, a small bed, a water bucket on top of a stool, a kerosene lamp, a couple of flashlights, a face pan and a cupboard to store their food. Some examples of food that was stored were bread, eggs, biscuits, bannock, potatoes, baloney and a variety of canned goods such as spaghetti, beans and soup. Fish such as mackerel, cod and herring were fished right off the island. Fresh blueberries and strawberries were also on the island. Very seldom would the fishermen have lobster.*

*The two bedrooms had three beds and one cupboard; this was used for clothing. There was only one window in the shanty, this was on the west end of the shanty in the bedroom that John Danny's son Jimmy occupied. The shanty had no indoor plumbing of course, so when nature called, there was an outside building.” (MacPherson, 1995)*



**Figure A1: Remnants of the old fishing village on Sea Wolf Island National Wildlife Area © Environment Canada – Canadian Wildlife Service, 1974. The older building to the left of photo was “John Danny’s Shanty”. The Canadian Wildlife Service cabin is to the right.**

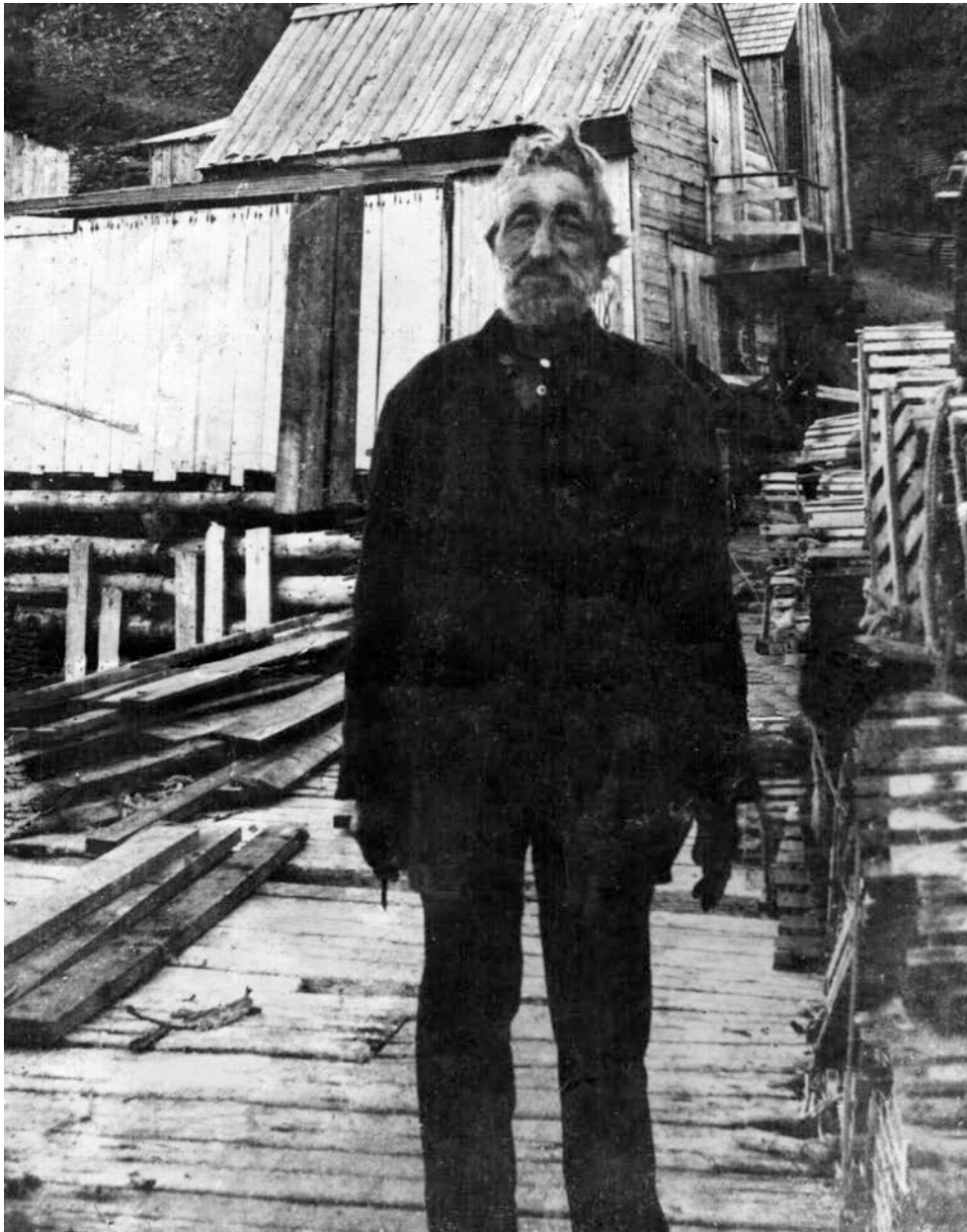
The following is a summary of Canadian Coast Guard activities pertaining to the Sea Wolf Island light station (DFO-CCG files):

The original Sea Wolf Island lighthouse was built in 1854. It was located on the highest point of the island. The wooden tower was eight sided, with each side being 8’ 8” wide at the bottom and narrowing to 6’ at the top. The height of the frame was 22’ 2”. The tower supported a 7’ aluminum lantern painted red. The lighthouse was combined with a dwelling that contained seven rooms. In 1955, a new storage shed was constructed (this is the current CWS cabin).

**Table A2: Lighthouse keepers on Sea Wolf Island c.1850–1970.**

<b>Name (Place of birth)</b>	<b>Comments</b>
Clough MacKeen (Mabou)	Employed in 1854
John McFarlane (South West Margaree)	
John Christopher MacFarlane (South West Margaree and Broad Cove Marsh)	He was the son of John MacFarlane.
Rory MacRae (Dunvegan)	(1872–1951)
John A. MacCrae	(1866–1946) Worked on the island in 1907.
Angus Y. MacLellan (Dunvegan)	Born 1879 and lived on the island for 50 years and had a large family. Besides tending the light, they raised a large number of sheep. Retired as light keeper 10 July 1946.
Alexander Dan MacLellan	(1906–1992) Son of Angus Y. MacLellan. Lived in Inverness. Temporary keeper in 1946.
John Fred LeFort (Inverness)	Temporary keeper in 1946.

Alexander Dan MacLellan (Broad Cove Marsh)	Temporary keeper in 1946.
Alexander John MacLellan	Lost his life in a boating accident returning to Sea Wolf Island on 29 November 1955.
James N. Stewart	Employed on the island from 1956 to 1958.
Bernard Alexander Beaton	Left the island in 1968. He was the keeper for 11 years. Died in 1992.



**Figure A2: Photo of Alasdair Fheachair MacLellan (Sandy Farquhar), the island's last private resident, standing on the Sea Wolf (Margaree) Island wharf c. 1950 © Joanne MacPherson and Gil MacLeod**

## APPENDIX II: FLORA OF SEA WOLF ISLAND NATIONAL WILDLIFE AREA

Latin name*	Common name*	Nova Scotia Department of Natural Resources – General status rank	Atlantic Canada – Conservation Data Centre – Provincial rank**
<b>Vascular Plants</b>			
<i>Abies balsamea</i>	Balsam Fir	Green	S5
<i>Achillea millefolium</i>	Yarrow	Green	S5
<i>Agrostis capillaris</i>	Colonial Bentgrass	Exotic	SE
<i>Agrostis scabra</i>	Rough Bentgrass	Green	S5
<i>Agrostis stolonifera</i>	Spreading Bentgrass	Green	S5SE
<i>Amelanchier</i> sp.	shadbush	-	-
<i>Ammophila breviligulata</i>	American Beachgrass	Green	S5
<i>Anaphalis margaritacea</i>	Pearly Everlasting	Green	S5
<i>Anthoxanthum odoratum</i>	Sweet Vernal Grass	Exotic	SE
<i>Aralia nudicaulis</i>	Wild Sarsaparilla	Green	S5
<i>Aster acuminatus</i>	Wood Aster	Green	S5
<i>Aster lateriflorus</i>	Calico Aster	Green	S5
<i>Aster novi-belgii</i>	New York Aster	Green	S5
<i>Aster umbellatus</i>	Tall White Aster	Green	S5
<i>Athyrium filix-femina</i>	Lady Fern	Green	S5
<i>Betula papyrifera</i>	White Birch	Green	S5
<i>Calamagrostis canadensis</i>	Blue-joint	Green	S5
<i>Capsella bursa-pastoris</i>	Shepard's-purse	Exotic	SE
<i>Carex deweyana</i>	Short-scaled Sedge	Green	S4
<i>Carex pallescens</i>	Pale Sedge	Green	S5
<i>Carex silicea</i>	Sea-beach Sedge	Green	S4S5
<i>Carum carvi</i>	Caraway	Exotic	SE
<i>Cerastium vulgatum</i>	Common Moused-eared Chickweed	Exotic	SE
<i>Chenopodium album</i>	Lamb's-quarters	Exotic	SE
<i>Chrysanthemum leucanthemum</i>	Ox-eye Daisy	Exotic	SE
<i>Cirsium arvense</i>	Canada Thistle	Exotic	SE
<i>Cirsium muticum</i>	Swamp Thistle	Green	S5
<i>Cirsium vulgare</i>	Bull Thistle	Exotic	SE
<i>Danthonia spicata</i>	Poverty Grass	Green	S5
<i>Dennstaedtia punctilobula</i>	Hay-scented Fern	Green	S5
<i>Deschampsia flexuosa</i>	Common Hairgrass	Green	S5
<i>Dicanthelium boreale</i> (= <i>Panicum boreale</i> )	Northern Witchgrass	Green	S5
<i>Elymus repens</i>	Quackgrass	Exotic	SE
<i>Empetrum nigrum</i>	Black Crowberry	Green	S5
<i>Empetrum atropurpureum</i>	Red Crowberry	Yellow	S2S3



<i>Epilobium angustifolium</i>	Fireweed	Green	S5
<i>Euphrasia canadensis</i>	Eyebright	Green	S5SE
<i>Euphrasia randii</i>	Small Eyebright	Green	S4
<i>Euphrasia stricta?</i>	Eyebright	Exotic	SE
<i>Euphrasia sp.</i>	an eyebright	Exotic	SE
<i>Festuca rubra</i>	Red Fescue	Green	S5
<i>Fragaria virginiana</i>	Wild Strawberry	Green	S5
<i>Galium triflorum</i>	Three-flowered Bedstraw	Green	S5
<i>Hieracium caespitosum</i>	Yellow Hawkweed	Exotic	SE
<i>Hieracium floribundum</i>	Hawkweed	Exotic	SE
<i>Hieracium lachenalii</i>	Common Hawkweed	Exotic	SE
<i>Hieracium pilosella</i>	Mouse-eared Hawkweed	Exotic	SE
<i>Hypericum perforatum</i>	Common St. John's-wort	Exotic	SE
<i>Juncus balticus</i>	Baltic Rush	Green	S5
<i>Juncus bufonius</i>	Toad Rush	Green	S5
<i>Juncus canadensis</i>	Canada Rush	Green	S5
<i>Juniperus communis</i>	Ground Juniper	Green	S5
<i>Juniperus horizontalis</i>	Creeping Juniper	Green	S4
<i>Kalmia angustifolia</i>	Sheep Laurel	Green	S5
<i>Lactuca canadensis</i>	Canada Lettuce	Green	S5
<i>Leontodon autumnalis</i>	Fall Dandelion	Exotic	SE
<i>Lonicera tartarica</i>	Tartarian Honeysuckle	Exotic	SE
<i>Luzula acuminata</i>	Hairy Woodrush	Green	S5
<i>Luzula multiflora</i>	Common Woodrush	Green	G5
<i>Maianthemum canadense</i>	Wild Lily-of-the-valley	Green	S5
<i>Matricaria matricarioides</i>	Wild Pineappleweed	Exotic	SE
<i>Moehringia lateriflora</i> (= <i>Arenaria lateriflora</i> )	Grove Sandwort	Green	S5
<i>Moneses uniflora</i>	One-flowered Wintergreen	Green	S5
<i>Myrica pensylvanica</i>	Bayberry	Green	S5
<i>Oenothera biennis</i>	Common Evening Primrose	Green	S5
<i>Oenothera parviflora</i>	Northern Evening Primrose	Green	S4?
<i>Phleum pratense</i>	Timothy	Exotic	SE
<i>Photinia floribunda</i>	Purple Chokeberry	Green	S5
<i>Picea glauca</i>	White Spruce	Green	S5
<i>Picea rubens</i>	Red Spruce	Green	S5
<i>Plantago lanceolata</i>	English Plantain	Exotic	SE
<i>Plantago major</i>	Common Plantain	Exotic	SE
<i>Plantago maritima</i> (= <i>P. juncooides</i> )	Seaside Plantain	Green	S5
<i>Platanthera lacera</i>	Ragged Fringed Orchid	Green	S4S5
<i>Poa compressa</i>	Canada Bluegrass	Exotic	SE
<i>Poa palustris</i>	Fowl Bluegrass	Green	S5
<i>Poa pratensis</i> ssp. <i>pratensis</i>	Kentucky Bluegrass	Green	S5
<i>Poa pratensis</i> ssp. <i>irrigata</i> (= <i>P.</i>	Kentucky Bluegrass	Undetermined	SE

<i>subcaerulea</i> )			
<i>Potentilla tridentata</i>	Three-toothed Cinquefoil	Green	S5
<i>Prenanthes nana</i>	Dwarf Rattlesnakeroot	Yellow	S2?
<i>Prunella vulgaris</i>	Self-heal	Exotic	SE
<i>Prunus pensylvanica</i>	Pin Cherry	Green	S5
<i>Prunus serotina</i>	Black Cherry	Green	S5
<i>Prunus virginiana</i>	Chokecherry	Green	S5
<i>Pteridium aquilinum</i>	Bracken Fern	Green	S5
<i>Pyrus malus</i>	Apple	Exotic	SE
<i>Ranunculus acris</i>	Tall Buttercup	Exotic	SE
<i>Ranunculus repens</i>	Creeping Buttercup	Exotic	SE
<i>Rhinanthus crista-galli</i>	Yellow Rattle	Green	S5
<i>Rhus typhina</i>	Staghorn Sumac	Green	S4S5
<i>Ribes hirtellum</i>	Smooth Gooseberry	Green	S5
<i>Rosa virginiana</i>	Virginia Rose	Green	S5
<i>Rubus idaeus ssp. strigosus</i>	Wild Raspberry	Green	S5
<i>Rumex acetosella</i>	Sheep Sorrel	Exotic	SE
<i>Sagina procumbens</i>	Procumbent Pearlwort	Green	S5SE
<i>Sambucus racemosa var. pubens</i>	Red Elderberry	Green	S5
<i>Senecio jacobaea</i>	Tansy Ragwort	Exotic	SE
<i>Senecio sylvaticus</i>	Woodland Groundsel	Exotic	SE
<i>Sisyrinchium montanum</i>	Blue-eyed Grass	Green	S5
<i>Solanum dulcamara</i>	Climbing Nightshade	Exotic	SE
<i>Solidago rugosa</i>	Rough Goldenrod	Green	S5
<i>Solidago sempervirens</i>	Seaside Goldenrod	Green	S5
<i>Sorbus sp.</i>	a mountain ash	Green	
<i>Spartina pectinata</i>	Fresh Water Cordgrass	Green	S5
<i>Spiranthes lacera</i>	Slender Ladies-tresses	Green	S5
<i>Stellaria graminea</i>	Common Stitchwort	Exotic	SE
<i>Taraxacum officinale</i>	Dandelion	Exotic	SE
<i>Thinopyrum pycnanthum</i>	Tick Quack Grass	Exotic	SE
<i>Toxicodendron rydbergii</i>	Western Poison Ivy	Green	S5
<i>Trientalis borealis</i>	Starflower	Green	S5
<i>Trifolium pratense</i>	Purple Clover	Green	S5
<i>Trifolium repens</i>	White Clover	Exotic	SE
<i>Vaccinium angustifolium</i>	Lowbush Blueberry	Green	S5
<i>Vaccinium boreale</i>	Northern Blueberry	Red	S2
<i>Vaccinium macrocarpon</i>	Large Cranberry	Green	S5
<i>Vaccinium vitis-idaea</i>	Foxberry	Green	S5
<i>Veronica officinalis</i>	Common Speedwell	Exotic	S5SE
<i>Veronica serpyllifolia ssp. serpyllifolia</i>	Thyme-leaved Speedwell	Exotic	S5
<i>Viburnum nudum</i>	Wild Raisin	Green	S5
<i>Vicia cracca</i>	Tufted Vetch	Exotic	SE

<i>Viola selkirkii</i>	Great-spurred Violet	Green	S4
<i>Viola septentrionalis</i>	Northern Blue Violet	Green	S5?
<b>Mosses</b>			
<i>Aulacomnium palustre</i>	Ribbed Bog Moss	-	-
<i>Ceratodon purpureus</i>	Fire Moss	-	-
<i>Dicranum polysetum</i>	Waxy Leaf Moss	-	-
<i>Dicranum scoparium</i>	Broom Moss	-	-
<i>Hylocomium splendens</i>	Stair-step Moss	-	-
<i>Leptobryum pyriforme</i>	Leptobryum Moss	-	-
<i>Pleurozium schreberi</i>	Red-stemmed Feather Moss	-	-
<i>Pohlia nutans</i>	Copper Wire Moss	-	-
<i>Polytrichum juniperinum</i>	Juniper Moss	-	-
<i>Ptilium crista-castrensis</i>	Knight's Plume	-	-
<i>Rhytidiadelphus triquetrus</i>	Rough Goose Neck Moss	-	-
<b>Lichens</b>			
<i>Cladonia rangiferina</i>		-	-
<i>Parmelia physodes</i>		-	-
<i>Cetraria glauca</i>		-	-
<i>Teloschistes parietina</i>		-	-

\* **Note: Plant names from Roland and Smith 1969 and Hinds 2000**

\*\* **See table below for definitions of the different classifications:**

S1	<b>Extremely rare:</b> May be especially vulnerable to extirpation (typically 5 or fewer occurrences or very few remaining individuals).
S2	<b>Rare:</b> May be vulnerable to extirpation due to rarity or other factors (6 to 20 occurrences or few remaining individuals).
S3	<b>Uncommon,</b> or found only in a restricted range, even if abundant at some locations (21 to 100 occurrences).
S4	<b>Usually widespread, fairly common,</b> and apparently secure with many occurrences, but of longer-term concern (e.g., watch list) (100+ occurrences).
S5	Widespread, <b>abundant,</b> and secure, under present conditions.
S#S#	Numeric <b>range rank:</b> A range between two consecutive ranks for a species/community. Denotes uncertainty about the exact rarity (e.g., S1S2).
SU	<b>Unrankable:</b> Possibly in peril, but status is uncertain – need more information.
S?	<b>Unranked:</b> Not yet ranked.
SE	<b>Exotic:</b> An exotic established in the province (e.g., Purple Loosestrife or Coltsfoot); may be native in nearby regions.

## APPENDIX III: BIRDS OF SEA WOLF ISLAND NATIONAL WILDLIFE AREA

Common Name	Species Name	Status	Comments
<b>Ducks, Geese and Swans</b>			
Black Scoter	<i>Melanitta nigra</i>		Coastal
Common Eider	<i>Somateria mollissima</i>		Coastal
Red-breasted Merganser	<i>Mergus serrator</i>		Coastal
Surf Scoter	<i>Melanitta perspicillata</i>		Coastal
White-winged Scoter	<i>Melanitta fusca</i>		Coastal
<b>Loons</b>			
Common Loon	<i>Gavia immer</i>	Transient	Coastal
Red-throated Loon	<i>Gavia stellata</i>	Transient	Coastal
<b>Cormorants and Allies</b>			
Double-crested Cormorant	<i>Phalacrocorax auritus</i>	Breeding	
Great Cormorant	<i>Phalacrocorax carbo</i>	Breeding	
Northern Gannet	<i>Sula bassanus</i>	Transient	
<b>Herons, Egrets and Bitterns</b>			
Great Blue Heron	<i>Ardea herodias</i>	Breeding	
<b>Hawks, Eagles and Kites</b>			
American Kestrel	<i>Falco sparverius</i>		
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Breeding	
Red-tailed Hawk	<i>Buteo jamaicensis</i>		
Sharp-shinned Hawk	<i>Accipiter striatus</i>		
<b>Sandpipers</b>			
Spotted Sandpiper	<i>Actitis macularia</i>		
Whimbrel	<i>Numenius phaeopus</i>		
<b>Gulls and Terns</b>			
Common Tern	<i>Sterna hirundo</i>		Coastal
Greater Black-backed Gull	<i>Larus marinus</i>	Breeding	
Herring Gull	<i>Larus argentatus</i>	Breeding	
Ring-billed Gull	<i>Larus delawarensis</i>		
Roseate Tern	<i>Sterna dougallii</i>		Coastal
<b>Alcids</b>			
Black Guillemot	<i>Cepphus grylle</i>	Breeding	
Razorbill	<i>Alca torda</i>		
<b>Woodpeckers</b>			
Northern Flicker	<i>Colaptes auratus</i>		
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>		
<b>Flycatchers</b>			
Alder Flycatcher	<i>Empidonax alnorum</i>		
Eastern Wood Pewee	<i>Contopus virens</i>		
<b>Vireos</b>			
Red-eyed Vireo	<i>Vireo olivaceus</i>	Breeding	
<b>Crows, Jays and Magpies</b>			
American Crow	<i>Corvus brachyrhynchos</i>	Breeding	
Common Raven	<i>Corvus corax</i>	Common	
<b>Swallows</b>			
Bank Swallow	<i>Riparia riparia</i>	Breeding	
Barn Swallow	<i>Hirundo Rustico</i>	Breeding	
<b>Chickadees and Kinglets</b>			
Golden-crowned Kinglet	<i>Regulus satrapa</i>	Common	
Black-capped Chickadee	<i>Parus atricapillus</i>	Common	
Boreal Chickadee	<i>Parus hudsonicus</i>		
Ruby-crowned Kinglet	<i>Regulus calendula</i>		
<b>Thrushes</b>			

Common Name	Species Name	Status	Comments
American Robin	<i>Turdus migratorius</i>	Breeding	
Swainson's Thrush	<i>Catharus ustalatus</i>	Common	
<b>Waxwings</b>			
Cedar Waxwings	<i>Bombycilla cedrorum</i>		
<b>Starlings</b>			
European Starling	<i>Sturnus vulgaris</i>	Breeding	
<b>Warblers</b>			
Black-and-White Warbler	<i>Mniotilta varia</i>		Woodland
Blackpoll Warbler	<i>Dendroica striata</i>		Woodland
Black-throated Green Warbler	<i>Dendroica virens</i>		Woodland
Common Yellowthroat	<i>Geothlypis trichas</i>		Woodland
Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>		Woodland
Magnolia Warbler	<i>Dendroica magnolia</i>		Woodland
Northern Parula	<i>Parula americana</i>		Woodland
Yellow Warbler	<i>Dendroica petechia</i>		Woodland
Yellow-rumped Warbler	<i>Dendroica coronata</i>		Woodland
<b>Sparrows</b>			
Fox Sparrow	<i>Passerella iliaca</i>	Breeding?	Woodland
Savannah Sparrow	<i>Passercus sandwichensis</i>	Common	
Song Sparrow	<i>Melospiza melodia</i>	Breeding	
White-throated Sparrow	<i>Zonotrichia albicollis</i>	Breeding	Woodland
<b>Blackbirds and Allies</b>			
Bobolink	<i>Dolichonyx oryzivorus</i>		
Common Grackle	<i>Quiscalus quiscula</i>		
<b>Finches and Allies</b>			
American Goldfinch	<i>Carduelis tristis</i>		Woodland
Pine Siskin	<i>Carduelis pinus</i>		Woodland
White-winged Crossbill	<i>Loxia leucoptera</i>		Woodland

\*Status Categories

**Breeding:** Birds that nest or have nested on Sea Wolf Island.

**Common** (Summer/Winter): Birds common only throughout certain seasons.

**Resident:** Birds present and largely non-migratory.

**Transient:** Birds that occur while travelling by Sea Wolf Island in the spring and fall

Status categories according to the Nova Scotia Museum of Natural History, 1998.

Scientific names follow the American Ornithologists' Union's Check-list of North American Birds.