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A photograph of a coastal landscape in autumn. In the foreground, there are green and yellow grasses and some red maple leaves. In the middle ground, there is a sandy area with some low-lying vegetation and a line of evergreen trees. In the background, there is a body of water and a cloudy sky. A large, semi-transparent geometric pattern of overlapping triangles is overlaid on the image.

Shepody National Wildlife Area

Management Plan 2018

Acknowledgements

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About Environment and Climate Change Canada's Protected Areas and Management Plans

What are Environment and Climate Change Canada protected areas?

Environment and Climate Change 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 and Climate Change 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 within which management decisions are made. It is intended to be used by Environment and Climate Change Canada staff to guide decision making, particularly 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 and Climate Change 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 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, enforcement of regulations, as well as the maintenance of facilities and infrastructure.

Research is also an important activity in protected areas; hence, Environment and Climate Change Canada staff carries out or coordinates research at 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 and Climate Change Canada's protected areas, please visit our website at www.ec.gc.ca/ap-pa or contact the Canadian Wildlife Service.

Shepody National Wildlife Area

Shepody National Wildlife Area (NWA), at the head of the Bay of Fundy in southeastern New Brunswick (Figure 1), is composed of three separate units: Mary's Point, New Horton and Germantown Marsh. Collectively, these three units encompass 795 ha of wetlands and 195 ha of uplands. Shepody NWA protects important wildlife habitat, particularly for migratory birds, and affords opportunities to improve habitat through research and active management.

Mary's Point is the smallest management unit at 109 ha (Figure 1), much of it comprised of upland habitat. Mary's Point was acquired by the Canadian Wildlife Service because of its strategic location adjacent to the beaches and intertidal flats of one of the most important shorebird migration sites in North America. Every summer from late July to early August, hundreds of thousands of Semipalmated Sandpipers (*Calidris pusilla*) visit Shepody Bay on their annual southward migration from Arctic breeding grounds. Tens of thousands of these small shorebirds use the beaches at Mary's Point as an important roosting site during high tide. The birds rest on the beach until the receding tides expose the adjacent mudflats and their primary food source, the mud shrimp *Corophium volutator*.

The New Horton unit (185 ha) and Germantown unit (696 ha) contain freshwater wetlands created on what were historically tidal marshes. These wetlands provide some of the best waterfowl production and staging sites and marsh bird breeding habitat in the Atlantic Provinces.

The NWA is managed by the Canadian Wildlife Service of Environment and Climate Change Canada. Controlled-water-level impoundments within this NWA are managed collaboratively with Ducks Unlimited Canada.

Shepody National Wildlife Area is helping to Connect Canadians to Nature

This site has been selected as one of ten NWAs to be part of the Connecting Canadians to Nature initiative. This initiative will invest funding on selected sites over five years (2015-2020) and beyond to improve access infrastructure and to support the development of interpretive on-site programming. The purpose of the initiative is to provide Canadians with more opportunities to recreate and connect to nature on federal lands managed on their behalf, where these activities will not interfere with the conservation of wildlife and are consistent with the objectives of the site.

Shepody NWA was selected to implement the initiative because of its existing appeal to visitors, proximity to nearby communities and larger urban areas, abundance of wildlife and other natural features and its opportunities for interpretation activities on migratory bird conservation and biology.

The *Canada Wildlife Act* allows for the creation, management and protection of wildlife areas for wildlife research activities, or for the conservation or interpretation of wildlife. Shepody NWA was established to provide protection for the varied bird habitats within this coastal site, with interpretive activities related to shorebirds a focus in recent years. Its primary management goal is to ensure that the quantity and quality of wetland habitat, and shorebird habitat, are maintained and protected.

At the international level, Shepody NWA is classified under the International Union for the Conservation of Nature criteria for protected areas as a Category IV protected area. The site is protected for the preservation of species and genetic diversity, and scientific monitoring and research. A shorebird research and interpretation centre is open to the general public weekdays throughout the shorebird migration season (July and August). Visits to the Germantown and New Horton units of Shepody NWA are allowed, although public use facilities are not provided. Some traditional activities are allowed, such as hunting, fishing and trapping (subject to applicable federal and provincial regulations), as well as bird watching, canoeing, and berry picking. Specific permitted activities are posted at main entrances to the area.

For greater certainty, nothing in this management plan shall be construed so as to abrogate or derogate from the protection provided for existing Aboriginal or treaty rights of the Aboriginal peoples of Canada by the recognition and affirmation of those rights in section 35 of the *Constitution Act, 1982*.



Figure 1: The Mary's Point unit of the Shepody NWA is both a Ramsar site and an important link in the Western Hemisphere Shorebird Reserve Network

Photo: C. MacKinnon © Environment and Climate Change Canada, 1995

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1 DESCRIPTION OF THE PROTECTED AREA

Shepody National Wildlife Area (NWA) is composed of three discrete units in Albert County, southeastern New Brunswick (Figure 2). These parcels are situated at the head of the Bay of Fundy and include Germantown Marsh (45°41'N/64°46'W), New Horton Marsh (45°41'N/64°42'W) and Mary's Point (45°43'N/64°39'W). Shepody NWA is comprised of a diversity of habitats in a small geographic area. These habitats include rocky coastal headlands, brackish marshes, salt marshes, an old lake basin and a series of controlled water level freshwater wetlands. The adjacent uplands are a mix of coniferous and deciduous forests interspersed with long-abandoned agricultural lands that are in later stages of plant succession.

This coastal site is an important staging and migration area for waterfowl, shorebirds and other wetland obligate species. Shepody NWA is an International Union for Conservation of Nature Category IV Protected Area. Mary's Point and the surrounding tidal flats were designated a Wetland of International Importance on May 24, 1982 under the Ramsar Convention of 1971 (Figure 3); they were also designated the "Shepody Bay Hemispheric Shorebird Reserve" as part of the Western Hemisphere Shorebird Reserve Network. These designations serve to highlight the values of the site and the fact that this site is also a NWA provide us the opportunity to streamline investments when fulfilling requirements under several programs at the same time.

Lands at Shepody were purchased from private interests by the Government of Canada and were declared a National Wildlife Area on June 5, 1980. Shepody NWA is administered under the *Wildlife Area Regulations* of the *Canada Wildlife Act* and managed by Environment and Climate Change Canada's Canadian Wildlife Service.

Table 1: Shepody NWA Summary Information

Protected Area (PA) Designation	National Wildlife Area
Province or Territory	New Brunswick
Latitude and Longitude	45°44'N/64°45'W
Size	990 ha (3 sections)
PA Designation Criteria	Historic: Protecting an area with concentrations of birds. Current: Criterion 1(a), where "The area supports a population of a species or subspecies or a group of species that is concentrated for any portion of the year." The area also satisfies criterion 2(b), where "The area has special value for maintaining the genetic and ecological diversity of a region because of the quality and uniqueness of its fauna and flora."
PA Classification System	For species or critical habitat conservation

International Union for Conservation of Nature (IUCN) Classification	IV
Order in Council Number	Order in Council PC 1980-1479
Directory of Federal Real Property (DFRP) Number	Germantown Marsh Unit: 04244 New Horton Marsh Unit: 22847 Mary's Point Unit: 22846
Gazetted	June 5, 1980
Additional Designations	• Wetland of International Importance (designated a Ramsar site on May 24, 1982) Mary's Point solely. • Part of the Western Hemisphere Shorebird Reserve Network (Shepody Bay Hemispheric Shorebird Reserve)
Faunistic and Floristic Importance	Freshwater wetlands support large numbers of breeding and staging waterfowl and other wetland birds. Salt marsh supports shorebirds and spring and fall staging waterfowl. Mary's Point unit supports significant numbers of roosting Semipalmated Sandpiper.
Invasive Species	Purple Loosestrife (<i>Lythrum salicaria</i>), Common Reed grass (<i>Phragmites australis [communis]</i>)
Species at Risk	Least Bittern (<i>Ixobrychus exilis</i>) – Threatened Peregrine Falcon (<i>Falco peregrinus</i>) – Special Concern
Management Agency	Environment and Climate Change Canada, Canadian Wildlife Service, Atlantic Region
Public Access and Use	Recreational hunting, fishing and trapping at New Horton and Germantown units (subject to applicable federal and provincial regulations). A Research and Interpretation Centre at Mary's Point is open during the peak of the shorebird migration, most weekdays in July and August.

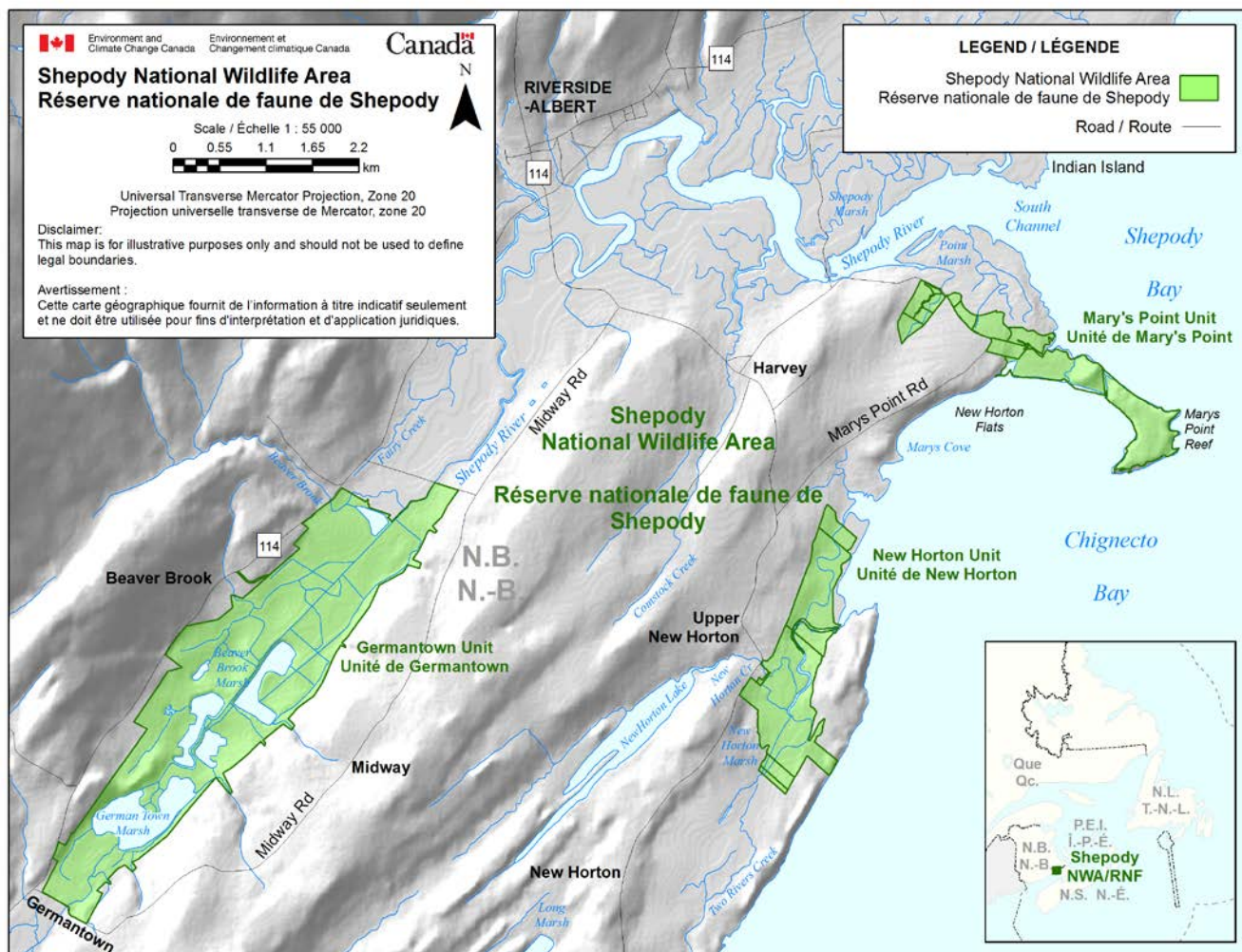


Figure 2: Shepody NWA

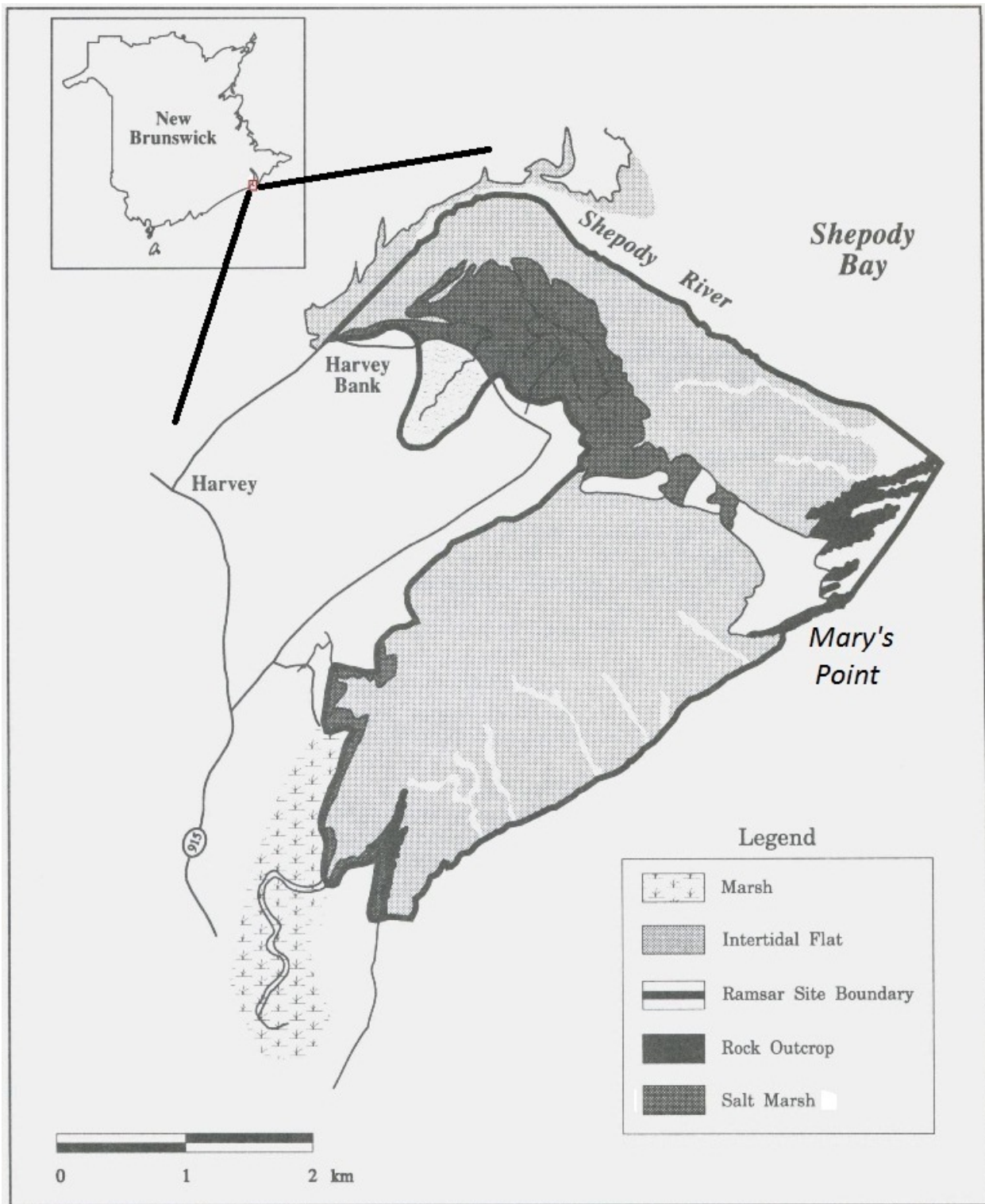


Figure 3: The Mary's Point unit of the Shepody NWA, and the adjacent mudflats, were designated a Ramsar site (Wetland of International Importance) on May 24, 1982.

1.1 REGIONAL CONTEXT

Shepody NWA is situated within the Atlantic Maritime Ecozone (one of 15 terrestrial ecozones in Canada). The Atlantic Maritime Ecozone includes all of New Brunswick, Prince Edward Island, Nova Scotia and Quebec's Gaspé Peninsula. Within this ecozone, the three units of the Shepody National Wildlife Area are situated along the eastern extremity of the Fundy Coast Ecoregion and lie within the Chignecto-Minas Shore Ecodistrict (Figure 4). This narrow band of habitat is influenced by the cold waters and high tides of the Bay of Fundy, and extends from Grand Manan and Machias Seal Island in the west to the tip of the Cape Maringouin peninsula and town of Sackville in the east. This region has above-average precipitation and fog, but summer and winter temperatures are also moderated by the bay.

Much of the geology around Shepody Bay consists of layers of soft Carboniferous Period sandstones intermixed with narrow seams of coal-bearing ore (Jackson 1855; Aauland and Wickland 1950; Roland 1982). These uniform sandstone deposits have been sourced for grindstones and building stones for over 300 years. These deposits are also noted for their fossils, and the internationally recognized Joggins UNESCO World Heritage Site lies across the bay. The most commonly encountered fossil at Mary's Point is the extinct horsetail *Calamites*. A unique clump of *Cordaite*s, a genus of extinct gymnosperms, can be seen at the base of a sea stack, known as Grenadier's Cap, at Mary's Point (Miller 2009) (Figure 5).

The lands around the Shepody NWA are predominantly rural with some forestry operations, blueberry production, cattle farming and harvesting of hay for export. By road, Fundy National Park is situated 15 km west of the Germantown unit while the village of Riverside-Albert is 5 km east. The larger centres of Moncton, Riverview and Dieppe are 60 km to the north.

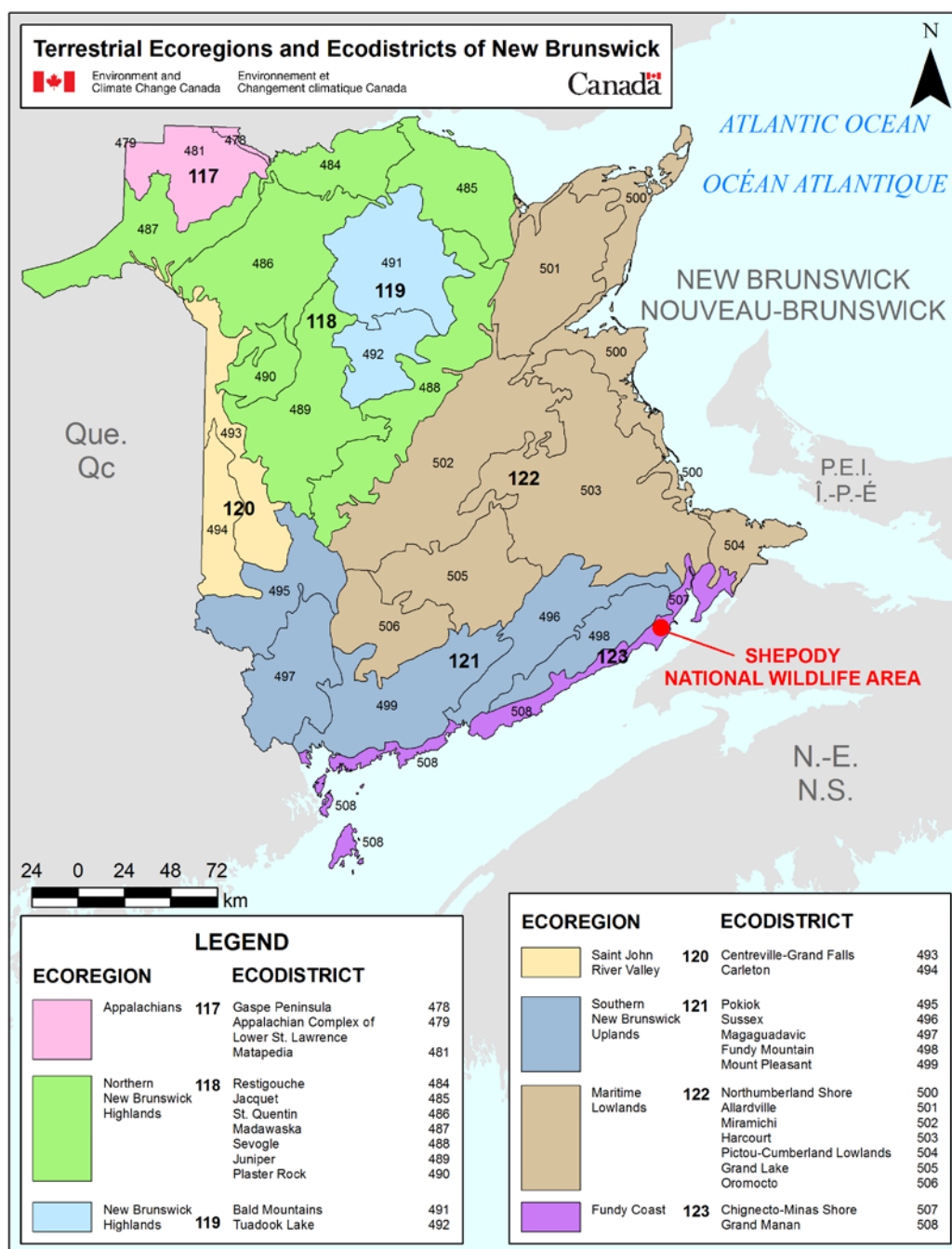


Figure 4: Terrestrial Ecoregions and Ecodistricts of New Brunswick. Shepody NWA falls within Ecoregion No. 123 (Fundy Coast) and Ecodistrict No. 507 (Chignecto-Minas Shore).

1.2 HISTORICAL BACKGROUND

The geography and underlying geology of Shepody NWA have shaped the area's human history. At the head of the Bay of Fundy, with the influence of macro-tides, centuries of siltation have created the large expanse of dykeland soils around the Shepody, Mary's Point and New Horton marshes (Hustvedt 1987). These wetlands are, geologically speaking, of recent development and are only 4000 to 5000 years old. These deep marsh deposits, caused by a combination of coastal subsidence and sea-level rise, have resulted in an average sediment accumulation of 30 cm per

century. The development history and age of these marshes mirror some of the earliest known human history here, with sites at the head of the Bay of Fundy ranging from 3300 to 3700 years old (MacKinnon 2003a, 2003b). The Mi'kmaq are the area's First People, and many local place names have Aboriginal roots. It is likely that the productive wetlands and coastal waters around Shepody NWA were widely used by early inhabitants. Nearby Indian Island (west of Daniel's Flats) and Grindstone Island mark traditional stopping points (Ganong 1899). The New Horton marshes would have provided an alternative portage and canoe route during bad weather. Mary's Point was, according to local history, named after an Aboriginal girl who lived on the island in the mid-1700s, and the small sandy crescent of beach on the southeastern corner of the island is still known as Mary's Cove.

Throughout most of the 1700s and up to the present day, much of the area's tidal marshes were dyked and drained for agriculture. As part of this process, many wetlands were lost. In the mid-1800s, the upper Shepody River was straightened and channelized in an attempt to drain the old Shepody Lake at the head of the system. Some of these early features, such as marsh dykes and aboiteau, are still visible (Figures 6 and 7). On the coast, the rocky headlands provided valuable grindstone and building stone to local markets and large centres along the eastern seaboard of the United States (Martin 1990; MacKinnon 2012). At its peak around 1875–1880, some 75 people lived and worked on Mary's Point. Remnants of this industry, in the form of dwelling basements and wharf pilings, remain today (MacKinnon and Kennedy 2007; Bourgeois 2009).

The Mary's Point unit of the NWA includes a small upland parcel adjacent to the point, which had been cultivated until about 1950 (Figure 8). Much of this habitat is now being colonized by White Spruce (*Picea glauca*), Larch (*Larix laricina*) and other old-field plants. The Point Horn Creek marsh and adjacent salt marshes provided hay land for over two centuries: from the early 18th century, when European settlers successfully built dykes on the salt marsh, until the first half of the 20th century, when the land was no longer used and the dykes fell into disrepair. With the assistance of Ducks Unlimited Canada (DUC) in 1980, the 18-ha Point Horn Creek marsh was developed into a shallowly flooded freshwater wetland. This project has been dedicated to the late Lars Larsen, a neighbour, noted wildlife artist and conservationist.

The New Horton unit of Shepody NWA is located 2.5 km southwest of Mary's Point and has an area of 185 ha, of which 173 ha are marshlands (Figure 9). This unit is part of a larger marshland tract that is separated from Chignecto Bay along much of its length by a narrow but prominent wooded ridge. The land was agriculturally idle when purchased by the Canadian Wildlife Service (CWS) in the 1970s. As with most former salt marshes of the Bay of Fundy, the tidal waters have been held back by earthen dykes to protect the arable land. From 1980–1981, 135 ha of freshwater wetlands were developed on the New Horton unit by DUC. Four separate marshes with individual

water control structures were constructed. These shallow wetlands host a variety of emergent and submergent aquatic plant species. The New Horton unit also includes two small upland parcels of about 6 ha each. One of these parcels is located on the ridge between the marsh and Chignecto Bay and is covered primarily by evergreens, including Spruce variety and Balsam Fir (*Abies balsamea*). The old-field upland on the opposite side of the marsh is vegetated by a variety of grasses, forbs and invading Speckled Alder (*Alnus rugosa*) and White Spruce.

The Germantown unit is located 8 km inland from Shepody Bay. This unit includes 583 ha of lowland, through which the Shepody River flows, and 113 ha of bordering upland (Figure 10). When acquired by CWS in 1973, the lowland area consisted of abandoned agricultural marshlands, bog/meadow wetlands and remnants of the old Shepody Lake. The lower, formerly tidal section had been successfully converted to hay land more than 250 years earlier and was cultivated until the 1960s (Figure 11).

Since 1975, in cooperation with CWS, DUC has developed 400 ha of freshwater wetlands at the Germantown unit of the NWA. This wetland habitat restoration comprises 11 separate wetlands enclosed by dykes and uplands. Each segment is shallowly flooded and vegetated by a variety of emergent plant species interspersed with areas of open water. These wetlands are managed as a hemi-marsh: a wetland with a high interspersed and diversity of wetland vegetation with equal amounts of open water, primarily through water-level manipulation, although natural vegetation removal by muskrats also plays a part. The Germantown unit also includes 80 ha of woodland and 27 ha of abandoned agricultural upland. The woodland tree cover consists largely of Spruce and Balsam Fir, but also contains deciduous trees including White Birch (*Betula papyrifera*) and Red Maple (*Acer rubrum*). The old-field habitats are vegetated by a variety of successional plant species, including Spiraea (*Spiraea latifolia*), Wild Rose (*Rosa virginiana*), Speckled Alder and White Spruce.



Figure 5: Cordaite fossil on a sea stack at the Mary's Point unit of the Shepody NWA. This formation is about 0.5 m in diameter.

Photo: C. MacKinnon © Environment and Climate Change Canada, 2008

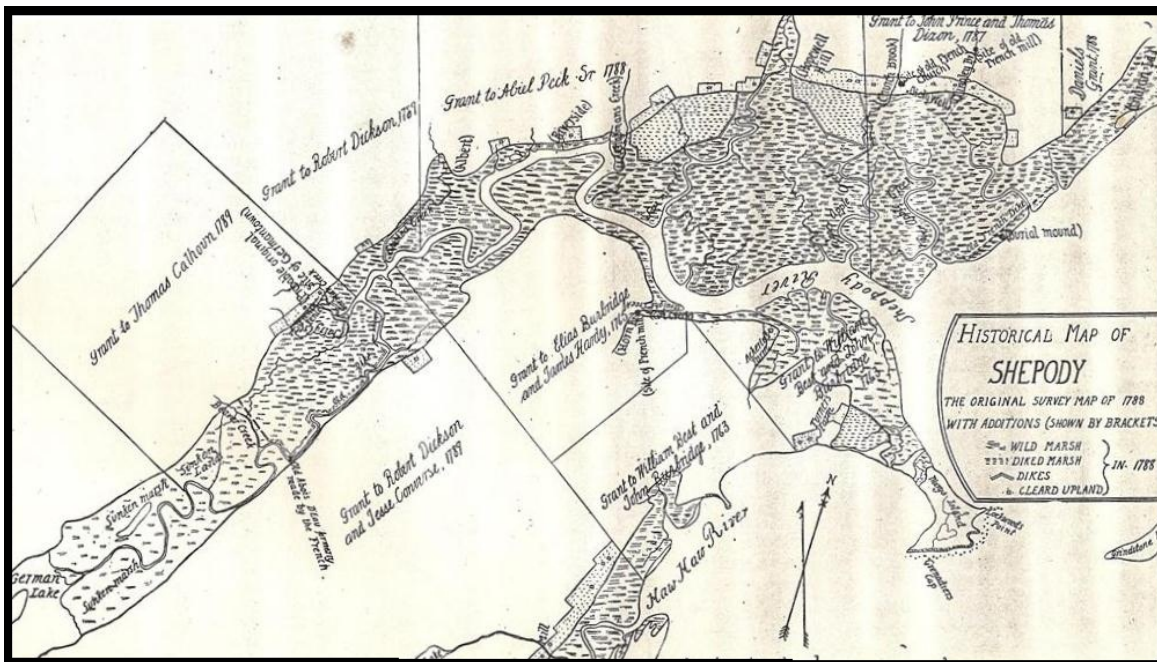


Figure 6: Later copy of a circa 1788 map prepared by W. F. Ganong (1899). Features identified on this map are evident within the Shepody NWA today. Note that “German Lake” (bottom left of map) is also referred to as “Shepody Lake.”



Figure 9: Aerial view of the New Horton unit of the Shepody NWA. From top left to bottom right of photograph, Impoundments A to D are shown.

Photo: C. MacKinnon © Environment and Climate Change Canada



Figure 10: Aerial view of the Germantown unit of the Shepody NWA. Remnants of the old Shepody Lake in the foreground. Note the “straightened” Shepody River, centre of photograph, that was modified in the mid-1800s to drain the lake and adjacent wetlands.

Photo: C. MacKinnon © Environment and Climate Change Canada



Figure 11: Old barns once dotted the landscape on the Germantown Marsh

Photo: © Environment and Climate Change Canada, 1960

1.3 LAND OWNERSHIP

The Germantown Marsh, the original unit of Shepody NWA, was proposed for acquisition through the National Habitat Protection Program (Whitman 1966; Barkhouse 1976). The 686-hectare site was subsequently acquired by fee simple purchase which was mostly complete by 1975. The 109 ha Mary's Point unit and 185 ha New Horton unit were acquired by fee simple purchase between 1975 and 1981. The three units of Shepody NWA were scheduled under the *Canada Wildlife Act* on 5 June 1980 by Order in Council P.C. 1980-1479.

The federal government does not currently hold the sub-surface mineral rights for Shepody NWA.

1.4 FACILITIES AND INFRASTRUCTURE

Shepody NWA sees year-round public use. A relatively small number of people frequent the area for outdoor pursuits, such as hunting, fishing, trapping, bird watching, and picking of wild berries and saltmarsh greens (Samphire, *Salicornia europaea* and Goose Tongue, *Plantago maritima*). The Mary's Point unit is the most intensively used unit of the NWA, with 2 500–5 000 annual visitors during the July and August shorebird migration season. The complex at Mary's Point consists of a modest Shorebird Research and Interpretation Centre which currently meets the needs of visitors (Figure 12), composting toilets, a garden/tool shed, work room and a two-bedroom field station (Figure 13). All facilities require annual maintenance and upkeep as well as regular tracking

of work conducted to meet health and safety requirements (Table 2). Under the Connecting Canadians to Nature initiative (2015-2020), investments will be made over the next few years in order to complement visitors services offered in Shepody NWA. A new Shorebird Interpretation Center will be built to replace the existing facilities to accommodate the growing number of visitors; improvement will be made to the parking area and access trail in the Germantown Marsh unit; construction of a canoe launch and parking lot at the New Horton unit will be undertaken; as well as the construction of new hiking trails and a viewing area overlooking the Mary's Point salt marsh.

The Shepody NWA also has a significant area of controlled-water-level freshwater wetlands. These are maintained by DUC and managed collaboratively by DUC and CWS (Tables 2 and 3). Water is maintained at a consistent level through the combination of earthen dykes (Figure 14), water control structures (Figure 15) and often with the inclusion of a device affectionately known as a "Beaver Baffler" (Figure 16). This pipe system reduces or eliminates flooding caused by beaver activity.



Figure 12: Mary's Point current Shorebird Research and Interpretation Centre, Shepody NWA
Photo: C. MacKinnon © Environment and Climate Change Canada, 2008



Figure 13: Shepody NWA Field Station, completed in 2013, at the Mary's Point unit

Photo: C. MacKinnon © Environment and Climate Change Canada, 2013

Table 2: Facilities and Infrastructure in the Shepody NWA

Type of Facility or Infrastructure	Approximate Size or Number	Responsibility Holder or Owner
Property boundary	36.1 km	Environment and Climate Change Canada – Canadian Wildlife Service (ECCC-CWS)
Boundary signs	725	ECCC-CWS
NWA entry signs	4	ECCC-CWS
Public Notice signs	20	ECCC-CWS
Steel entry gate	5	ECCC-CWS
Foot bridge	1 (10 m)	ECCC-CWS
Walking trail/Hiking trail	375 m	ECCC-CWS
Germantown cabin	32 m ²	ECCC-CWS
Mary's Point Centre	85 m ²	ECCC-CWS
Staff facility	80 m ²	ECCC-CWS
Parking lots	2 (300m ²) (800m ²)	ECCC-CWS
Access points	7	ECCC-CWS
Lower Germantown road	730 m	ECCC-CWS
Upper Germantown road	630 m	ECCC-CWS
Germantown dyke road	4 300 m	Ducks Unlimited Canada (DUC)
New Horton road A	550 m	Multiple jurisdictions
New Horton road D	700 m	Multiple jurisdictions
Impoundments at Germantown	11	DUC
Impoundments at Daley Creek	1	DUC
Impoundments at New Horton	4	DUC

Dykes at Germantown	12 100 m	DUC
Dykes at Daley Creek	425 m	DUC
Dykes at New Horton	8 100 m	DUC
Water control structures	16	DUC
Cemeteries (West family plot at Mary's Point; Berryman family cemetery at Germantown)	2	ECCC-CWS

Table 3: DUC-controlled water level projects in Shepody NWA

Project Name	Year Built	Size (ha)
Germantown Unit		
A-1	1975	6.0
A-2	1974	13.4
B	1974	28.3
C	1975	50.9
D	1975	68.8
E	1975	38.4
F-1	1975	52.6
F-2	1975	23.5
G (DUC-9)	1975	62.7
G-1 (DUC-10)	1975	11.7
H (DUC-11)	–	121.4
I (DUC-12)	1983	54.6
New Horton Unit		
A (DUC 1 #6237)	1980	55.4
B (DUC 2 #6104)	1980	18.6
C (DUC 3 #6237)	1980	38.5
D (DUC 4 #6237)	1980	17.0
Mary's Point Unit		
Daley Creek (DUC #6171)	1979	24.3
Total		686.1



Figure 14: Portion of the dyke complex at the Germantown Marsh, Shepody NWA
 Photo: A. Kennedy © Environment and Climate Change Canada, 2012



Figure 15: Example of a typical control structure used to regulate water levels within an impoundment. A wire cage is applied to reduce plugging from beaver activity.
 Photo: C. MacKinnon © Environment and Climate Change Canada, 2013



Figure 16: A “beaver baffle” ready for installation by DUC. This device reduces the ability of beavers to plug the control structure with vegetation.

Photo: A. Kennedy © Environment and Climate Change Canada

2 ECOLOGICAL RESOURCES

2.1 TERRESTRIAL AND AQUATIC HABITATS

The forested area of the Shepody NWA lies within the Fundy Bay Ecoregion of the Atlantic Maritime Ecozone. This zone is characterized by a stable association of Red Spruce (*Picea rubens*), Balsam Fir (*Abies balsamea*) and Red Maple (*Acer rubrum*) with scattered White Spruce (*Picea glauca*), White Birch (*Betula papyrifera*) and Yellow Birch (*Betula alleghaniensis*). The following brief habitat descriptions highlight the diversity of wetlands within the Shepody NWA (Harries 1970).

2.1.1 Mesotrophic water

Aquatic plants prominent in this zone are pondweeds (*Potamogeton* spp.), milfoils (*Myriophyllum* spp.), Naiad (*Najas flexilis*), Coontail (*Ceratophyllum demersum*) and Wild Celery (*Vallisneria americana*).

2.1.2 Mesotrophic marsh

This marsh type is composed of fen species such as Sweet Gale (*Myrica gale*), Marsh Cinquefoil (*Potentilla palustris*) and Buckbean (*Menyanthes trifoliata*).

2.1.3 Fen

Small to medium-sized delicate sedges (*Carex* spp.), cottongrasses (*Eriophorum* spp.) and beak rushes (*Rhynchospora* spp.) are dominant in this zone. Also found here are Sweet Gale, Marsh Cinquefoil, Buckbean and sphagnum mosses.

2.1.4 Bog heath

Dominant species are lichens, heath shrubs, Cloudberry (*Rhubus chamaemorus*), Cottongrass (*Eriophorum spissum*) and Bulrush (*Scirpus cespitosus*). Some sphagnum moss is also present.

2.1.5 Old field meadow

This zone contains moderately well-drained soil with the dominant species being tall Compositae, such as Goldenrod (*Solidago* spp.), Aster (*Aster umbellatus*) and Joepyeweed (*Eupatorium maculatum*).

2.1.6 Swamp meadow

Wet soil characterizes this zone, and the dominant species are Blue-joint (*Calamagrostis canadensis*), Chaffy Sedge (*Carex paleacea*) and Fresh-water Cord-grass (*Spartina pectinata*).

2.1.7 Bog forest

Black Spruce (*Picea mariana*) and Larch (*Larix laricina*) are the dominant tree species, with an understory component of heath shrubs and bryophytes (*Sphagnum* spp., *Pleurozium schreberi*, *Ciliare* spp. and *Dicranum* spp.).

2.2 WILDLIFE SPECIES

2.2.1 Birds

Waterfowl

Black Ducks (*Anas rubripes*), Green-winged Teal (*Anas carolinensis*), Blue-winged Teal (*Anas discors*) and Ring-necked Ducks (*Aythya collaris*) regularly breed at Shepody NWA. The present level of waterfowl production has been achieved through habitat development and improvements. Observed production on the Germantown unit of the NWA increased from 11 broods in 1972 to 117 broods in 1979 following the development of 345 hectares of wetlands. Mallards (*Anas platyrhynchos*), Northern Pintails (*Anas acuta*) and Northern Shovelers (*Anas clypeata*) now also breed occasionally in the Germantown unit. Similar increases in waterfowl production have also occurred in the wetlands developed in 1980–1981 at the New Horton unit. The older wetlands and deeper water remnant lake basins are often preferred by Ring-necked Ducks and small numbers of Hooded Mergansers (*Lophodytes cucullatus*).

The wetlands of Shepody NWA provide valuable waterfowl moulting, staging and migration habitat. Waterfowl that do not normally breed in the NWA but use the site for moulting include male Wood Duck (*Aix sponsa*) and Common Eider (*Somateria mollissima*). As many as 400 males Wood Ducks annually moult in the freshwater wetlands on the Germantown marsh. Smaller numbers of Common Eiders moult among the ledges off the headlands of Mary's Point. Post-breeding concentrations of more than 2000 waterfowl occur on the freshwater wetlands at Shepody NWA prior to migration and movement to coastal waters. Waterfowl continue to frequent those wetlands until late autumn.

Marsh birds

Various marsh bird species have been recorded at Shepody NWA, including six that have limited distribution and occurrence in the Atlantic provinces. Relative to natural marshes, the managed wetlands at Shepody NWA attract substantially higher densities of marsh birds common in the region, including Pied-billed Grebe (*Podilymbus podiceps*), American Bittern (*Botaurus lentiginosus*), Sora Rail (*Porzana Carolina*), American Coot (*Fulica americana*), Black Tern (*Chlidonias niger*) and Marsh Wren (*Cistothorus* sp.) (Morton and MacKinnon 1980; Cash *et al.* 1981). These marshes have also attracted less common species, including Virginia Rail (*Rallus limicola*) and Common Moorhen (*Gallinula chloropus*) and the threatened Least Bittern (*Ixobrychus exilis*). All of the above species are either known or suspected to breed at Shepody NWA.

The older wetlands are also important to various species of swallow, especially in early spring when temperatures are cooler and flying insects are less abundant. During this time of year, hundreds of Tree Swallows (*Tachycineta bicolor*) and Bank Swallows (*Riparia riparia*) frequent the older open-water marshes, presumably feeding on early hatches of Chironomid larvae.

Other commonly observed birds include Osprey (*Pandion haliaetus*), Kingfisher (*Megaceryle alcyon*), Northern Harrier (*Circus cyaneus*), Red-winged Blackbird (*Agelaius phoeniceus*) and Song Sparrow (*Melospiza melodia*), while the adjacent uplands support large numbers of edge passerines such as Common Yellowthroat (*Geothlypis trichas*), Yellow Warbler (*Setophaga petechia*) and Yellow-rumped Warbler (*Setophaga coronata*).

Shorebirds

Mary's Point is considered one of the most important shorebird migration sites in North America (Hicklin 1987). Each year, between the middle of July and mid-August, several hundred thousand shorebirds, predominantly the Semipalmated Sandpiper (*Calidris pusilla*), stop at Mary's Point on the way south from their northern breeding grounds (Figure 17). They generally remain about two weeks, and during that time they may double their weight. This weight gain, or energy reserve, is required for the over-water flight to their wintering areas in South America. Roosting flocks estimated at upwards of 100 000 birds are frequently recorded, and many more may use the adjacent intertidal flats for foraging. Their main food is a small "mud shrimp", *Corophium volutator*, which occurs in extremely high densities at this time of year. At high tide, the birds gather into densely packed flocks at roosting sites on the sandy beach along the point. Several other shorebird species occur at Mary's Point, including Black-bellied Plover (*Pluvialis squatarola*), Semipalmated Plover (*Charadrius semipalmatus*), Least Sandpiper (*Calidris minutilla*), Short-billed Dowitcher (*Limnodromus griseus*), the endangered Red Knot (*Calidris canutus*), Dunlin (*Calidris alpina*) and others. Peak numbers of these species range from 1 000 to 2 000. Although *Corophium volutator* is an important food for many of these species, Black-bellied Plover and Red Knot feed mainly on *Macoma balthica* (a small bivalve) and polychaetes (bristle worms).



Figure 17: Portion of a large flock of Semipalmated Sandpiper at Mary's Point unit, Shepody NWA
Photo: V. Singh © Environment and Climate Change Canada, 2010

Other birds

Many species of upland and forest birds, both breeding and migrant, frequent the NWA in addition to those for which Shepody NWA is primarily managed. Detailed inventories of all habitats have not been conducted; however, 93 species are known or suspected to breed at Shepody NWA, and another 80 species are regular visitors or migrants.

2.2.2 Mammals

Commonly occurring and frequently observed are White-tailed Deer (*Odocoileus virginianus*), Moose (*Alces alces*), Red Fox (*Vulpes vulpes*), Raccoon (*Procyon lotor*), Porcupine (*Erethizon dorsatum*), Striped Skunk (*Mephitis mephitis*), Beaver (*Castor Canadensis*), Eastern Coyote (*Canis latrans*) and Muskrat (*Ondatra zibethicus*). All mammals that commonly occur throughout New Brunswick are found, at least intermittently, within the NWA (Banfield 1974; Dawe 2004).

Musk rats (*Ondatra zibethicus*) inhabit all the freshwater wetlands in Shepody NWA and have benefited from the development and improvement of these habitats (Parker 1977; Parker and Maxwell 1978). Past surveys have recorded over 659 muskrat houses representing a conservative overwintering population of more than 3 000 animals. Trapping furbearers within the NWA represents a significant economic input into this predominantly rural area. Other commonly harvested species include Red Fox, Beaver, Raccoon, Eastern Coyote and Mink (*Neovison vison*).

Moose (*Alces alces*) frequent the wetlands within the NWA. As many as 13 have been seen in the Germantown Marshes in a single day. Impoundment I, which is north of the Shepody River and dominated by Black Spruce and a sphagnum bog, is locally referred to as the “moose pasture.”

2.2.3 Reptiles and Amphibians

Amphibians and reptiles known or suspected to occur at Shepody NWA include most of the limited number that inhabit New Brunswick. The more commonly occurring reptiles and amphibians known or suspected within the Shepody NWA are listed in Table 4 (Brannen 2004).

Table 4: Reptiles and Amphibians Found Within Shepody NWA

Common Name	Species	Global (G-) Rank ¹	Regional (S-) Rank ²
Green Frog	<i>Rana clamitans</i>	G5	S5
Northern Spring Peeper	<i>Hyla crucifer</i>	G5	S5
American Toad	<i>Bufo americanus</i>	G5	S5
Northern Leopard Frog	<i>Rana pipiens</i>	G5	S5
Yellow Spotted Salamander	<i>Ambystoma maculatum</i>	G5	S5
Maritime Garter Snake	<i>Thamnophis sirtalis</i>	G5	S5

Common Name	Species	Global (G-) Rank ¹	Regional (S-) Rank ²
Northern Redbelly Snake	<i>Storeria occipitomaculata</i>	G5	S5

¹ G-ranks are defined as follows: G1 = Critically Imperiled; G2 = Imperiled; G3 = Vulnerable; G4 = Apparently Secure; G5 = Secure. For more detailed definitions of G-ranks, see www.natureserve.org/explorer/ranking.htm#globalstatus.

² S-ranks are defined as follows: S1 = Critically Imperiled; S2 = Imperiled; S3 = Vulnerable; S4 = Secure with Some Cause for Concern; S5 = Secure; M = Migrant; B = Breeding. For more detailed definitions of S-ranks, see www.natureserve.org/explorer/ranking.htm#globalstatus.

2.2.4 Fish

Numerous tidal creeks cut their way through the salt marsh at Shepody NWA, and tidal pools exist in the salt marsh at low tide. Typical salt marsh tidal pool species expected to occur are Banded Killifish (*Fundulus diaphanus*), Ninespine Stickleback (*Pungitius pungitius*) and Fourspine Stickleback (*Apeltes quadracus*).

Brook Trout (*Salvelinus fontinalis*), Gaspereau (Alewife) (*Alosa pseudoharengus*) and American Eel (*Anguilla rostrata*) are commonly found in the main Shepody River. The shallowly flooded freshwater wetlands of Shepody NWA provide habitat for a number of smaller fish species. Ninespine Sticklebacks (*Pungitius pungitius*) are the most numerous, and certain marsh sites support very high populations of this species. Smaller populations of other species, such as Three-spined Stickleback (*Gasterosteus aculeatus*), Banded Killifish (*Fundulus diaphanous*) and Golden Shiner (*Notemigonus crysoleucas*), are also present in these wetlands. Ninespine Sticklebacks in particular provide a valuable food source for the Great Blue Heron (*Ardea herodias*), Belted Kingfisher (*Megasceryle alcyon*), Pied-billed Grebe and other fish-eating marsh birds.

2.3 SPECIES AT RISK

The following two species at risk use the Shepody NWA frequently while others, such as the Red Knot, may pass through during fall migration.

The Peregrine Falcon (*Falco peregrinus*) is commonly observed foraging over the Germantown and New Horton marshes as well as frequenting the shorebird roosts at Mary's Point throughout July and August. This species has made a successful recovery following a release program in the 1980s, and the first recorded pair occurred on Grindstone Island in Shepody Bay in 1990 (MacKinnon 1990a, 1990b; MacKinnon *et al.* 2009). Presently, there are at least five nests in the greater Shepody Bay area that are likely strongly dependent on the annual shorebird migration as an important food source.

The Least Bittern (*Ixobrychus exilis*) breeds in low numbers within the Shepody marshes. This species prefers cattail-associated habitat and appears to have responded positively to controlled water level management over the past 35 years. This secretive species has been observed at both the Germantown and New Horton units of the NWA and is likely more abundant at

these sites than suggested by existing data. These wetland habitats used by the Least Bittern within Shepody NWA will be eventually identified as Critical Habitat under the *Species at Risk Act*.

Table 5: Species at Risk in Shepody NWA

Common and Scientific Names of Species	Status			Presence or Potential of Presence ⁴
	Canada		New Brunswick	
	SARA ¹	COSEWIC ²	Provincial Ranking ³	
Birds				
Bald Eagle <i>Haliaeetus leucocephalus</i>	No Status	No Status	Regionally Endangered	Confirmed
Barn Swallow <i>Hirundo rustica</i>	No Status	Threatened	No Status	Confirmed
Bobolink <i>Dolichonyx oryzivorus</i>	No Status	Threatened	No Status	Probable
Canada Warbler <i>Wilsonia canadensis</i>	Threatened	Threatened	No Status	Probable
Chimney Swift <i>Chaetura pelagica</i>	Threatened	Threatened	No Status	Probable
Common Nighthawk <i>Chordeiles minor</i>	Threatened	Threatened	No Status	Confirmed
Least Bittern <i>Ixobrychus exilis</i>	Threatened	Threatened	No Status	Confirmed
Olive-sided Flycatcher <i>Contopus cooperi</i>	Threatened	Threatened	No Status	Potential
Peregrine Falcon <i>Falco peregrinus anatum</i>	Special Concern	Special Concern	Endangered	Confirmed
Piping Plover <i>Charadrius melodus melodus</i>	Endangered	Endangered	Endangered	Potential
Rusty Blackbird <i>Euphagus carolinus</i>	Special Concern	Special Concern	No Status	Probable
Short-eared Owl <i>Asio flammeus</i>	Special Concern	Special Concern	No Status	Probable
Arthropods				
Monarch <i>Danaus plexippus</i>	Special Concern	Special Concern	No Status	Confirmed

¹ *Species at Risk Act*: extinct, extirpated, endangered, threatened, special concern, not at risk (assessed and deemed not at risk of extinction) or no status (not rated)

² Committee on the Status of Endangered Wildlife in Canada

³ Provincial ranking

⁴ “Confirmed”, “Probable”, or “Potential”

2.4 INVASIVE SPECIES

Eastern Canada has a long history of European contact, with results in much of our plant community being a mixture of native and non-native species. Many of the non-native plants are now part of the local flora and are seen as essentially part of the normal habitat. There are, however, some plants that become invasive and disruptive of existing plant communities. Although presently limited in their distribution, there are concerns over expansion of species such as Purple Loosestrife (*Lythrum salicaria*) and Common Reed grass (*Phragmites communis* [*alpestris*]) (White *et al.* 1993). There is also a single patch of Oriental Bittersweet (*Celastrus orbiculatus*) on the boundary line of Shepody NWA, near the Mary's Point Centre, that may be invasive and should be monitored.

3 MANAGEMENT CHALLENGES AND THREATS

A number of potential issues pertaining to the management of the Shepody NWA are outlined below. Some stressors are external to the NWA and may have a negative impact on the site's overall value to wildlife.

3.1 RECREATION AND TOURISM

Recreation and tourism can provide valuable educational opportunities to the public, yet have the capacity to contribute additional pressure to protected areas that are specifically set aside as wildlife habitat. Visitors to sites, such as Shepody NWA, may not always be aware of the wildlife habitat conservation priority of NWAs or that there are limits placed on certain activities. Uninformed use of sensitive areas, or use at sensitive times of the year can have detrimental impacts on habitat and wildlife.

Unique and previously inaccessible areas are increasingly being promoted for day adventure opportunities, either as guided tours or in tourism promotion material. The turbulent waters around the Mary's Point are often promoted for sea kayaking, and adventurers have been known to camp with open campfires illegally at the point over the summer months. Such activity may appear harmless but can result in disturbance to the shorebirds the NWA is set aside to protect. The remote coves at nearby Grindstone Island, and possibly Mary's Point, supports small numbers of nesting Common Eiders that are highly susceptible to disturbance. Also of concern are camp fires on the shore in mid-summer when the forests are dry, with the subsequent high risk to the NWA and nearby homes and properties. Illegal camping is also frequently associated with habitat loss. Contrary to the regulations, trees are often damaged or cut down as part of the camping activity.

The Mary's Point beach is also being used more frequently by recreational beach users. Throughout July and August, such activity at low tide is not likely to cause an undue disturbance. However, at high tide, and for up to two hours before and after, shorebirds in the tens of thousands use these same beaches to rest and build up energy reserves prior to their long over-water migration south. Birds that do not store enough fat may not be able to complete their flight and they die over the open ocean. Human activities on this beach have a cumulative environmental effect: a detriment to shorebirds from one person on a single day may be insignificant, but many people on the beach at every high tide throughout the season, especially in the migratory period starting late July reduce the opportunity for the birds to rest, creating a negative effect.

3.2 OFF-ROAD VEHICLES

Use of off-road vehicles (ORVs) is prohibited within Shepody NWA. Illegal use of ORVs such as all-terrain vehicles (ATVs), especially in regions abounding in wetlands, results in habitat loss and

degradation or destruction of plant cover. It leaves lasting scars on the landscape (Hosier and Eaton 1980; Ross 1992). ORVs use can also lead to soil compaction, removal of the top layer of soil, and alterations to drainage, which in turn may degrade or destroy plant cover and the habitat of animal species.

The use of ORVs in streams and wetlands results in the destruction and loss of aquatic habitats. Often, the worst damage is in the form of “braiding,” where a series of new and parallel trails adjacent to an existing one are created in order to bypass a wet area.

3.3 TIDAL POWER

There is currently renewed interest in developing tidal power in the Bay of Fundy. Research in the 1970s raised concerns about this technology, because of the use of full tidal barriers (Smith and Hicklin 1984). Current proposals are considered to have less potential impact compared to earlier technologies, as they involve in-flow devices; however, actual impacts on the mudflats or adjacent wetlands require additional study (Isaacman and Daborn 2011). Any change to the tidal regime, and thus the delicate balance of sedimentation that has built the expansive mudflats that provide food for shorebirds, is of concern.

3.4 CLIMATE CHANGE, COASTAL EROSION AND HABITAT LOSS

The Bay of Fundy dykelands were created by silt deposition from the bay over many centuries. This process has taken place through a delicate balance of coastal submergence and sea level rise over the past 4 000 years. Anticipated sea level rise, at rates in excess of previous levels, may have consequences on coastal marshes (Shaw *et al.* 1998). As an example, rapid inundation from breached dykes, in nearby John Lusby Marsh in the mid-1900s, resulted in significant erosion along tidal channels and loss of salt marsh habitat.

The three islands of Mary’s Point are connected to the mainland by salt marsh and a narrow fringe of dune. Increased erosion and sea level rise are likely to have a severe impact on the inner islands and this mainland connection. The present shorebird roost is maintained by the beach accumulation adjacent to these islands and could be compromised by erosion events.

3.5 HABITAT MANAGEMENT

A significant portion of the Germantown and New Horton units of the NWA consists of controlled water level impoundments (Morton and MacKinnon 1980; Barkhouse 1981; Barkhouse and Hicks 1983). These structures assist in holding water on a landscape that was formerly wetland but was drained for agriculture for many years. As part of this process, the Shepody River was channelized (straightened) and blocked by a tidal dam at the mouth. Maintaining these impoundments for the highest benefit to a broad diversity of wildlife is a challenge that is partly due to the area’s history.

3.6 STONE EXTRACTION AND MINERAL RIGHTS

Sandstone from the upper Bay of Fundy has long been recognized for its quality as building material (Martin 1990). Over the past 300 years, significant areas along the coast have been mined for this product. Although extraction is not occurring at present, renewed interest in this industry could result in significant impacts on coastal salt marshes and mudflats. In the late 1980s, Environment Canada permitted a one-time, limited quantity extraction of stone from Mary's Point to assist in the refurbishment of the historic Art Gallery of Nova Scotia (Welling 1989); Mary's Point was the source of the building's original material. Further extraction within the NWA will not be allowed.

3.7 HABITAT FRAGMENTATION

The Germantown and New Horton units of Shepody NWA were acquired to protect important Bay of Fundy dykelands long known to be important to waterfowl. As a result, the upland component of the NWA is relatively small, and the three component units of Shepody NWA are geographically isolated from each other. Changes in land use on private parcels adjacent to the NWA, such as forestry, agriculture and rural development, often result in a loss of habitat and further diminish the habitat connectivity between these areas. This fragmentation is of lesser concern to migratory birds, but may impact other, less mobile species. Furthermore, demand for waterfront properties has resulted in an increase in use and related pressures on the region's coastal area.

In recognition of the growing concern for the value of habitat connectivity in the upper Bay of Fundy and other considerations, the area from Fundy National Park to the New Brunswick–Nova Scotia border has been declared a Biosphere Reserve by the United Nations Educational, Scientific and Cultural Organization.

4 GOALS AND OBJECTIVES

4.1 VISION

Shepody NWA was established for conservation purposes. The long-term vision for the NWA is habitat conservation through the maintenance and enhancement of habitat for native wildlife and plants, and to encourage public understanding and participation in conservation processes. This takes a significant place as all three units of the Shepody NWA will be accessible to public with the implementation of the Connecting Canadians to Nature Initiative. As portions of this NWA consist of significant areas of controlled-water-level impoundments, the habitat within these sites will be actively managed for waterfowl and water-bird production. Together with the Mary's Point Shorebird Research and Interpretation Centre, this adaptive management will incorporate wetland research and shorebird education opportunities.

4.2 GOALS AND OBJECTIVES

Goal 1: Human activities that have negative impacts on the habitat or the wildlife of Shepody NWA are minimized.

- a. Objective: Manage visitor activities by eliminating beach access at high tides so that shorebirds are able to feed and roost without disturbance from human activities.
- b. Objective: Prevent mineral extraction, including rock quarrying activities, from occurring within the NWA.
- c. Objective: Control prohibited activities in the NWA. Document the number and nature of incidents where evidence exists of illegal activities within Shepody NWA and report to the ECCC's Wildlife Enforcement Division, for their consideration and action.
- d. Objective: Contribute to decisions and actions that avoid or minimize effects of adjacent land use on Shepody NWA.

Goal 2: Promote the opportunities for responsible public access to enhance Canadians' connection to nature. Visitors to Shepody NWA become stewards of Canada's natural heritage, and in particular the Bay of Fundy ecosystem.

- a. Objective: Increase the number of annual visitors from 7,000 (current estimate for 2014) to 10,000 by the end of 2020 (43% increase).
- b. Objective: Inform visitors about shorebird ecology and conservation so that they can become stewards of our natural heritage.

Goal 3: Wetland habitats within impoundments are managed to replicate an ecosystem driven by periodic water level fluctuations so that populations of migratory birds and resident flora and fauna, including species at risk, are sustained, and habitats and residences are created, restored or maintained through active management.

- a. Objective: Maintain, enhance and restore physical works (dykes, water control structures, access roads) associated with water level management on impounded wetlands.
- b. Objective: Manage water levels to achieve a diversity of wetland vegetation and a hemi-marsh composition of vegetation and water at 50:50, with patchy vegetation interspersed with areas of shallow open water, within the next five years, and maintain them over the long term.
- c. Objective: If required, create vegetative–open water interspersion by managing muskrat populations or physical means within the next five years, and maintain it over the long term.

Goal 4: Upland habitats will be managed to maintain upland vegetation so that populations of migratory birds and resident flora and fauna, including species at risk, are sustained, and habitats and residences are created or maintained through active management.

- a. Objective: Establish and implement a 10-year plan to maintain upland Acadian Forest.

Goal 5: Control invasive and alien plant species.

- a. Objective: Determine areas of concern where cover by invasive and alien plant species is >25% or expanding rapidly, and implement methods to reduce extent and rate of expansion.
- b. Objective: Invasive plant species will be controlled or removed within two years of being detected, depending on the species and eradication options.

4.3 EVALUATION

Annual monitoring will be performed within the limits imposed by the availability of financial and human resources. The management plan will be evaluated 5 years after its initial approval, and reviewed and updated every 10 years thereafter. The evaluation will take the form of an annual review of monitoring data obtained from the monitoring and research projects outlined below. This monitoring will be used to establish priorities for action and to allocate resources.

5 MANAGEMENT APPROACHES

This section and the following table contain a description of all the possible approaches that could be used in the management of the Shepody NWA. However, management actions will be determined during the annual work planning process and will be implemented as human and financial resources allow.

Table 6: Management approaches for Shepody NWA

Management challenge or threat	Goal and objective(s)	Management approaches (actions, including level of priority) ¹
Recreational and tourism activities (only some of these activities being illegal within the national wildlife area) such as beach use, kayaking, camping, open camp fires and boating may have a cumulative environmental effect.	Goal 1: Human activities that have negative impacts on the habitat or the wildlife of Shepody NWA are minimized. Objective 1.a: Manage visitor activities by eliminating beach access at high tides so that shorebirds are able to feed and roost without disturbance from human activities. Objective 1.c: Control prohibited activities in the NWA. Document the number and nature of incidents where evidence exists of illegal activities within Shepody NWA and report to the ECCC's Wildlife Enforcement Division, for their consideration and action.	• Maintain staff on site during July and August. (1) • Document the number and nature of incidents where evidence exists of illegal activities within the NWA and report to Wildlife Enforcement Division. (1) • Communicate with local tourism operators and the provincial Tourism Department concerning the protected status of Shepody NWA and provide material demonstrating the ecological values of the area. (1) • Collaborate with other conservation organizations to deliver a consistent message emphasizing minimal disturbance of habitat and wildlife. (1)
	Goal 2: Promote the opportunities for responsible public access to enhance Canadians' connection to nature. Visitors to Shepody NWA become stewards of Canada's natural heritage, and in particular the Bay of Fundy ecosystem. Objective 2.a: Increase the number of annual visitors from 7,000 (current estimate for 2014) to 10,000 by the end of 2020 (43% increase). Objective 2.b: Inform visitors about shorebird ecology and conservation so that they can become stewards of our natural heritage.	• Maintain staff on site during July and August. (1) • Collaborate with other conservation organizations to deliver a consistent message emphasizing minimal disturbance of habitat and wildlife. (1) • Install innovative and effective habitat conservation communication materials for all three public access area. (1) • Restore and improve public access infrastructure as part of the CCtN initiative (1)

Management challenge or threat	Goal and objective(s)	Management approaches (actions, including level of priority) ¹
Wetland habitat management	Goal 3: Wetland habitats within impoundments are managed to replicate an ecosystem driven by periodic water level fluctuations so that populations of migratory birds and resident flora and fauna, including species at risk, are sustained, and habitats and residences are created, restored or maintained through active management. Objective 3.a: Maintain, enhance and restore physical works (dykes, water control structures, access roads) associated with water level management on impounded wetlands. Objective 3.b: Manage water levels to achieve a diversity of wetland vegetation and a hemi-marsh composition of vegetation and water at 50:50, with patchy vegetation interspersed with areas of shallow open water, within the next five years, and maintain them over the long term. Objective 3.c: If required, create vegetative–open water interspersed by managing muskrat populations or physical means within the next five years, and maintain it over the long term.	• Monitor habitat change using annual aerial photography. (1) • Conduct ground-based monitoring (in collaboration with Ducks Unlimited Canada and Bird Studies Canada) to monitor water levels, water chemistry and wildlife response to management activities. (1) • In collaboration with academic institutions, conduct research projects that focus on specific management issues. (1)
Upland habitat management	Goal 4: Upland habitats will be managed to maintain upland vegetation so that populations of migratory birds and resident flora and fauna, including species at risk, are sustained, and habitats and residences are created or maintained through active management. Objective 4.a: Establish and implement a 10-year plan to maintain upland Acadian Forest.	• Monitor habitat change using annual aerial photography. (1) • Periodically mow abandoned early succession pasture and hay lands (3 ha) for grassland birds such as Bobolink. (2)
Stone extraction and mineral rights	Goal 1: Human activities that have negative impacts on the habitat or the wildlife of Shepody NWA are minimized. Objective 1.b: Prevent mineral extraction, including rock quarrying activities, from occurring within the NWA.	• Seek mineral rights protection for lands within the NWA from the Province of New Brunswick. (2) • No permits for quarrying activities within the NWA will be issued. (1)

Management challenge or threat	Goal and objective(s)	Management approaches (actions, including level of priority) ¹
Invasive species	Goal 5: Control invasive and alien plant species. Objective 5.a: Determine areas of concern where cover by invasive and alien plant species is >25% or expanding rapidly, and implement methods to reduce extent and rate of expansion. Objective 5.b: Invasive plant species will be controlled or removed within two years of being detected, depending on the species and eradication options.	• Monitor existing nodes of invasive plants for possible expansion. (2) • Promote safe biological controls such as Galerucella beetle for Purple Loosestrife. (2)
Tidal power production is an anticipated activity in the Bay of Fundy that could change tidal dynamics. Impacts on the mud flats or adjacent wetlands are largely unknown.	Goal 1: Human activities that have negative impacts on the habitat or the wildlife of Shepody NWA are minimized. Objective 1.d: Contribute to decisions and actions that avoid or minimize effects of adjacent land use on Shepody NWA.	• Provide the industry with information as required to make sound decisions that minimize impacts on wildlife and wildlife movement. (2) • Support research directed towards understanding and anticipating potential impacts from tidal power. (2)
Predicted sea-level rise over the next century due to climate change is likely to result in increased flooding and possible breaches of dykes.	Goal 1: Human activities that have negative impacts on the habitat or the wildlife of Shepody NWA are minimized. Objective 1.d: Contribute to decisions and actions that avoid or minimize effects of adjacent land use on Shepody NWA.	• Understand potential impacts of climate change and how the valued ecosystem components of the protected area can be maintained. (2) • Conduct long-term annual monitoring (ortho-rectified aerial photography) to retain a historical record of site changes as well as to document significant tidal and climatic events. (1)
Off-road vehicles (ORVs) cause extensive and long-lasting damage to the fragile wetland habitats within Shepody NWA.	Goal 1: Human activities that have negative impacts on the habitat or the wildlife of Shepody NWA are minimized. Objective 1.c: Control prohibited activities in the NWA. Document the number and nature of incidents where evidence exists of illegal activities within Shepody NWA and report to the Wildlife Enforcement Division, for their consideration and action.	• Maintain communications with ORV rider associations regarding the regulations pertaining to Shepody NWA and damage caused by inappropriate use of ORVs. (2) • Maintain regulatory signs. (1) • Contribute to communication products highlighting the impact of indiscriminate ORV use. (2)

¹ Level of Priority: 1 (from 0 to 3 years); 2 (from 4 to 6 years); 3 (from 7 to 10 years)

5.1 HABITAT MANAGEMENT

5.1.1 *Wetlands*

The human history of Mary's Point and the Shepody marshes has resulted in significant manipulations of the habitat. Uplands were once cut for timber, and the wetlands have been cut off from the sea by dykes and then ditched and drained for agriculture (Hustvedt 1987). Water once again covers these long-abandoned agricultural dykelands through collaboration with DUC (Table 7). A series of shallowly flooded freshwater wetlands has been developed to provide wetland habitat for a diversity of species. Maintenance of the dykes and control gates is the responsibility of DUC; however, biological management is decided collaboratively and based on annual evaluations of water levels and habitat changes, which are determined through site inspections and aerial photography (Maillet *et al.* 1999; MacKinnon and Kennedy 2011). This annual monitoring is supplemented periodically with additional studies on habitat and habitat change (MacKinnon *et al.* 1995; Malone 1978; Bagnell and Bishop 2004; Blaney 2004). Management may include manipulation of water levels to control areas of overgrown vegetation (Table 7). Vegetation may also be managed by mechanical removal if water level manipulation alone cannot control emergent plant cover (predominantly of concern are overgrowths of Cattail or Phragmites). Generally, optimal wetland management strives for a hemi-marsh: an equal mix of vegetation and open water with a high degree of interspersed plant species diversity (Sojda and Solberg 1993).

5.1.2 *Old fields*

Significant portions of the upland habitat within the Shepody NWA consist of old house sites in various stages of succession. Remnant apple orchards survive around the abandoned farmsteads. Areas with a higher nutrient load tend to remain in grasses and forbs, while surrounding former agricultural lands have reverted predominantly to White Spruce. From 1990 to 1995, the ECCC's collaborated with the New Brunswick Federation of Naturalists (Nature NB), Shepody Fish and Game Association, and the Ruffed Grouse Society of Canada to conduct an upland habitat demonstration project on some of these old farm sites. Habitats, particularly those holding wild apple trees, were manipulated to provide a food source for a broad diversity of wildlife. This demonstration project proved beneficial to a wide diversity of wildlife.

Table 7: Flooding Levels for Ducks Unlimited Canada (DUC) Controlled-water-level Impoundments within the Shepody NWA

CWS Project Name	Project Number (DUC)	Level of Marsh (feet) (above sea level) ¹	Maximum Operating Level (feet) ¹	Normal Operating Level (feet) ¹
Germantown Unit				
A-1	1	19.2	23.0	21.3
A-2	2	18.3	22.4	20.3
B	3	18.9	21.4	20.1
C	4	17.6	20.7	19.4
D	5	16.7	19.4	17.9
E	6	14.2	19.4	15.8
F-1	7	17.1	19.2	17.8
F-2	8	–	21.4	19.2
G	9	16.0	18.0	17.2
G-1	10	15.1	–	16.5
I	12	18.8	21.4	21.0
New Horton Unit				
A	(DUC 1 #6237)	17.7	21.0	18.8
B	(DUC 2 #6237)	18.0	21.3	20.0
C	(DUC 3 #6237)	18.3	22.0	19.8
D	(DUC 4 #6237)	17.7	21.0	18.5
Mary's Point Unit				
Daley Creek	(DUC Lars Larsen marsh #6171)	–	–	Tide-gate

¹ Canadian Geodetic Vertical Datum 1928 (CGVD28); elevation above mean sea level.

5.2 WILDLIFE MANAGEMENT

5.2.1 *Species at risk*

No specific management is conducted for species at risk. However, annual planning for impoundment management and maintenance considers requirements for Least Bittern habitat.

5.3 MONITORING

A comprehensive program has been conducted to monitor managed wetlands, including marsh bird and waterfowl brood surveys, muskrat house counts, vegetation mapping, and water quality and water depth measurements (Hanson 1993, MacKinnon 2012). Waterfowl banding activities at Shepody NWA also provide information on relative annual abundance of waterfowl. Numbers of migrant shorebirds at Mary's Point, particularly roosting shorebirds, are monitored annually by CWS staff. These observations are shared with the Nature Conservancy of Canada, who manages the equally important Johnson's Mills shorebird roost sites across Shepody Bay from

Mary's Point, as well as with visiting researchers and local tourism operators who promote the shorebird phenomena.

Effective and efficient monitoring requires careful planning and a coordinated approach. For species at risk, monitoring will be carried out in a manner that contributes to meeting recovery strategy and action plan objectives. Ongoing monitoring needs are as follows:

1. Daily shorebird roosting counts at the Mary's Point unit throughout July and August.
2. Daily Peregrine Falcon observations (shorebird interactions) throughout July and August.
3. Monitoring of public visitation at Mary's Point throughout July and August each year, and implementation of electronic trail counters for the remainder of the tourist season.
4. Annual suite of aerial photography (reviewed by the protected area staff at the annual habitat management meeting). These photographs, started in 1989, provide an essential data series of habitat change both within, and adjacent to, the NWA. From these records, a number of observations can be extracted, such as rates of coastal erosion, illegal infringements to the NWA (wood cutting, ATV damage), annual muskrat house counts and conditions of vegetation interspersed within specific marshes.
5. A waterfowl banding program as part of the regional population assessment program conducted by the Environment and Climate Change Canada Canadian Wildlife Service Surveys Group.

5.4 PUBLIC INFORMATION AND OUTREACH

One of the goals of the Connecting Canadians to Nature initiative is to increase public access to the selected NWAs while managing their visitation so that activities do not interfere with the conservation of wildlife. Indeed, one way of reducing damage caused by unauthorized recreational access is to create opportunities for authorized recreational access, and communicating this clearly to potential users. Section 6.2 lists authorized activities for Shepody NWA, both with and without special restrictions.

The most intensive uses of Shepody NWA by the public include waterfowl hunting, muskrat trapping, trout fishing, bird watching, edible saltmarsh plant harvest and shorebird observation. As part of the connecting Canadians to Nature Initiative, the shorebird Research and Interpretation Centre at the Mary's Point will be rebuilt, other public facilities will be established or improved in the other units, and on-site programs will be delivered through collaborative partnerships. It is therefore essential that public use of the NWA and development of facilities for such use be compatible with the area's habitats and wildlife resources.

6 AUTHORIZED ACTIVITIES AND PROHIBITIONS

In the interest 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)] in the wildlife area and provide mechanisms for the Minister of the Environment and Climate Change to authorize certain activities that would otherwise be prohibited to take place in NWAs. The regulations also provide the authority for the Minister to prohibit entry into NWAs.

Activities within an NWA are authorized where notices have been posted at the entrance to or along the boundaries of the NWA or when notices have been published in local newspapers. All activities in an NWA are prohibited unless a notice has been posted or published authorizing the activity to take place. However, in addition to notices, certain activities may be authorized by obtaining a permit from the Minister of the Environment and Climate Change.

6.1 PROHIBITION OF ENTRY

Under the *Wildlife Area Regulations*, the Minister may publish a notice in a local newspaper or post notices at the entrance of any wildlife area or on the boundary of any part thereof prohibiting entry to any wildlife area 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 its habitat.

For Shepody NWA, entry is not prohibited. Authorized activities and those activities that will be considered for permitting are described below.

6.2 AUTHORIZED ACTIVITIES

For Shepody NWA, public notices authorizing the following non-commercial activities have been posted at all designated access points.

Authorized activities **without** special restrictions:

1. Wildlife observation
2. Hunting, fishing and trapping¹
3. Hiking
4. Photography
5. Canoeing
6. Hiking

¹ Hunting, fishing and trapping activities are subject to the applicable federal and provincial seasons, permits and regulations. All hunting in NWAs requires the use of non-toxic shot.

7. Skiing
8. Skating
9. Snowshoeing
10. Photography
11. Berry picking²

Note: 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.

Prohibited activities and applicable conditions for allowed activities correspond to the management vision for the Shepody NWA: *to maintain and enhance habitat for native wildlife and plants with priority being given to the islands' colonial nesting birds.*

6.3 RESEARCH

Research activities will be considered for permitting when the results obtained through research have the potential to provide data and information on the following topics of interest:

1. Waterfowl
2. Shorebirds
3. Migratory bird population
4. Habitat requirements
5. Protection or recovery of species at risk
6. Habitat restoration
7. Climate change effect
8. Variability on water level management
9. Impact of invasive species

To obtain a permit in order to conduct research in Shepody NWA and to receive instructions concerning guidelines for a research proposal, please contact:

National Wildlife Service – Permits Officer
Environment and Climate Change Canada,
Canadian Wildlife Service 17 Waterfowl Lane, P.O. Box 6227 Sackville NB E4L 1G6

Permit applications should be directed to: Permi.Atl@ec.gc.ca.

² For Shepody NWA, this includes the non-commercial harvest of salt marsh greens (Goose tongue and Samphire) as identified in this plan.

6.4 AUTHORIZATIONS

Permits and notices authorizing an activity may be issued only if the Minister is of the opinion that the activity is scientific research relating to wildlife or habitat conservation; or the activity benefits wildlife and its habitat or will contribute to wildlife conservation; or the activity is not inconsistent with the purpose for which the NWA was established and is consistent with the most recent management plan.

The Minister may also add terms and conditions to permits in order to minimize the impact of an activity on wildlife and wildlife habitat.

All requests for permits or authorizations must be made (in writing or online) to the following address:

National Wildlife Area – Permit Request
Environment and Climate Change Canada, Canadian Wildlife Service
Atlantic Region
17 Waterfowl Lane, P.O. Box 6227
Sackville NB E4L 1G6

Permit requests should be directed to: Permi.Atl@ec.gc.ca.

For further information, please consult the Environment and Climate Change Canada Policy when Considering Permitting or Authorizing Prohibited Activities in Protected Areas Designated Under the *Canada Wildlife Act* and *Migratory Birds Convention Act, 1994* (December 2011). This policy document is available on the protected areas website at www.ec.gc.ca/ap-pa.

6.5 EXCEPTIONS

The following activities will be exempt from the requirements for permitting and authorizations:

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

6.6 OTHER FEDERAL AND PROVINCIAL AUTHORIZATIONS

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

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

National Wildlife Area – Permit Request
Environment and Climate Change Canada
17 Waterfowl Lane, P.O. Box 6227
Sackville NB E4L 1G6

Province of New Brunswick
Department of Natural Resources
Fish and Wildlife Branch
P.O. Box 6000
Fredericton NB E3B 5H1

7 HEALTH AND SAFETY

In the case of environmental emergencies, contact will be made with the Canadian Environmental Emergencies Notification System at the following telephone number:

1-800-565-1633

Non-emergency issues related to security or health and safety issues for Shepody NWA should be reported to:

National Wildlife Area Program
Environment and Climate Change Canada
Canadian Wildlife Service
17 Waterfowl Lane, P.O. Box 6227
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. Further, Environment and Climate Change Canada staff will take all reasonable and necessary precautions to protect their own health and safety as well as 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 contain some inherent dangers, and proper precautions must be taken by visitors, recognizing that Environment and Climate Change Canada staff neither regularly patrol nor offer services for visitor safety in NWAs.

Incidents or emergencies can be reported to the numbers listed in Table 8 below.

Table 8: Emergency contacts information for Shepody NWA

Emergency Contacts for Shepody NWA, New Brunswick 45°44'N/64°45'W	
Emergency	Contact
Mary's Point Shorebird Research and Interpretation Centre #419 Mary's Point Road, Harvey, Albert County, NB E4H 2M9	506-882-2544
Mary's Point Field Station #415 Mary's Point Road, Harvey, Albert County, NB E4H 2M9	506-882-2544
Any life-threatening emergency	911
Police-Fire-Ambulance	911
Royal Canadian Mounted Police (RCMP), Codiac Regional – Moncton	1-506-857-2400
Rescue Coordination Centre to report air and marine emergencies	1-800-565-1582
Environmental emergencies (oil, pesticide, chemical spills)	1-800-565-1633

Emergency Contacts for Shepody NWA, New Brunswick 45°44'N/64°45'W	
Environment and Climate Change Canada – Wildlife Enforcement Division	1-506-364-5036
Environment and Climate Change Canada – Canadian Wildlife Service, Sackville, NB	1-506-364-5044
New Brunswick Department of Natural Resources and Energy (Fish and Wildlife Branch), Fredericton, NB	1-506-453-2440

8 ENFORCEMENT

The management of NWAs is based on three Acts:

- *Migratory Birds Convention Act, 1994, and Migratory Bird Sanctuary Regulations*
- *Canada Wildlife Act and Wildlife Area Regulations*
- *Species at Risk Act*

To promote compliance with the *Canada Wildlife Act* and *Wildlife Area Regulations*, ECCC-CWS posts signs along the NWA boundaries and at main access points, which identify what activities are authorized within each NWA and any conditions on those activities.

Environment and Climate Change Canada's Wildlife Enforcement Division (ECCC-WED) is responsible for enforcement of federal and provincial wildlife laws, and will perform on-site inspections and investigations, patrol the NWA to promote compliance, and prevent prohibited activities within the NWA.

ECCC-WED officers monitor compliance with the *Canada Wildlife Act*, *Wildlife Area Regulations*, the *Migratory Birds Convention Act, 1994*, the *Species at Risk Act*, the *Fisheries Act* and the provincial *Wildlife Act, 1989* on an ongoing basis and will initiate investigations when required. ECCC-WED officers will respond to violations and take appropriate enforcement actions. CWS Atlantic staff provides details from site inspections that may require investigation.

9 PLAN IMPLEMENTATION

The management plan will be implemented over a 10-year period. Annual work plans will be developed in accordance with priorities and budgets, and the details of management plan implementation will be developed through Environment and Climate Change Canada's annual work planning process; implementation will proceed as human and financial resources allow. An adaptive management approach will be favoured for the implementation of the management plan. The implementation of the plan will be evaluated 5 years after its publication, on the basis of the actions identified in Table 9.

Table 9: Implementation Strategy timeline for Shepody NWA

Activity	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Site inspections (health and safety)	X	X	X	X	X	X	X	X	X	X
Facilities maintenance	X	X	X	X	X	X	X	X	X	X
Staff facility upgrade	X									
Public parking area upgrade (Mary's Point unit)		X								
Dyke and road maintenance (ongoing)	X	X	X	X	X	X	X	X	X	X
Shorebird Research and Interpretation Centre operations (July – August)	X	X	X	X	X	X	X	X	X	X
Shorebird monitoring	X	X	X	X	X	X	X	X	X	X
Controlled freshwater impoundment monitoring	X	X	X	X	X	X	X	X	X	X
Marsh bird monitoring (Least Bittern)		X					X			
CCtN initiative implementation	X	X	X	X						

9.1 MANAGEMENT AUTHORITIES AND MANDATES

Environment and Climate Change Canada, Canadian Wildlife Service, Atlantic is responsible for site management of Shepody NWA.

9.2 MANAGEMENT PLAN REVIEW

This Management Plan will be reviewed 5 years after its formal approval by Environment and Climate Change Canada, Canadian Wildlife Service, and every 10 years thereafter.

Additions of new information may be appended to the document as required to aid in site management and decision making.

10 COLLABORATORS

There are no formal arrangements pertaining to the management or administration of Shepody NWA, with the exception of an agreement with DUC to maintain the 16 controlled-water-level impoundments within the NWA. Although DUC is responsible for the maintenance of these impoundments, habitat management is jointly implemented by DUC and CWS (MacKinnon and Kennedy 2011).

From 1989 to 2004, the Shorebird Research and Interpretation Centre at Mary's Point was developed and jointly administered by Nature New Brunswick (formerly the New Brunswick Federation of Naturalists) and ECCC-CWS. Since 2004, the site has been staffed and administered by CWS.

Close working relationships and sharing of data and information pertaining to Shepody NWA are maintained with the following entities: New Brunswick Department of Natural Resources and Energy–Wildlife Division, the New Brunswick Museum, Mount Allison University, and the University of New Brunswick.

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APPENDIX I: CONDITIONS OF RESEARCH REQUESTS

Permission under the *Wildlife Area Regulations* to undertake research may be given subject to the following conditions:

1. All requests for research must be accompanied by a written proposal outlining objectives, project duration, collection of data and specimens and measurements if any, number of participants, funding sources, and location where work is to be undertaken, benefits to the NWA, potential detractors and proposed mitigation measures (all proposals may be subject to a review by the Animal Care Committee of either ECCC-CWS or the submitting institution).
2. No research shall be undertaken without a permit issued under the *Canada Wildlife Act – Wildlife Area Regulations*, and research must be consistent with the respective NWA management plan and other relevant legislation (e.g., *Species at Risk Act* or *Migratory Birds Convention Act, 1994*).
3. All researchers must conform to regulations in effect regarding the NWA.
4. Copies of raw data (field books/maps), preliminary reports of the research activities and a copy of the final manuscript must be provided to ECCC-CWS Atlantic at the end of each field season.
5. Priority will be given to researchers whose work has direct management implications for the NWA and species at risk.
6. Applications to undertake a minor research study must be submitted to the ECCC-CWS Atlantic office (Permi.Atl@ec.gc.ca), in writing, prior to commencement of the project. **Minor proposals without problems or issues require at least seven (7) weeks for review, processing and issuance of a permit.** Major proposals (that may require expert review, are multiyear, etc.) require a longer review period (minimum six [6] months).
7. A statement must be provided to ECCC-CWS Atlantic on why the research project cannot be undertaken elsewhere.
8. Any proposed work is subject to the *Canada Labour Code*, Part II (subject to the strictest safety certification, training, operational experience and mandatory use of appropriate safety equipment).

All projects and activities in the NWA are subject to environmental screening and then, if necessary, to further steps in the Environmental Assessment and Review Process (Environment Canada).

APPENDIX II: LEGISLATION

Federal Legislation

Canada Wildlife Act

<http://laws-lois.justice.gc.ca/eng/acts/W-9/index.html>

Fisheries Act

<http://laws.justice.gc.ca/eng/acts/F-14>

Migratory Birds Convention Act, 1994

<http://laws-lois.justice.gc.ca/eng/acts/M-7.01>

Wildlife Area Regulations

<http://laws-lois.justice.gc.ca/eng/regulations/C.R.C., c. 1609/index.html>

Species at Risk Act

www.sararegistry.gc.ca

APPENDIX III: GOVERNMENT OF CANADA SPECIES AT RISK GLOSSARY

Species at Risk Act (SARA): The federal legislation that provides protection to species at risk in Canada. This Act establishes Schedule 1 as the legal list of wildlife species at risk to which the SARA provisions apply. It classifies those species as being: extirpated, endangered, threatened or special concern. Once listed, the measures to protect and recover a listed wildlife species are implemented. Schedules 2 and 3 contain lists of species that, at the time SARA came into force, needed to be reassessed. After species on Schedule 2 and 3 are reassessed and found to be at risk, they undergo the SARA listing process to be included in Schedule 1.

www.sararegistry.gc.ca

COSEWIC: Committee on the Status of Endangered Wildlife in Canada. In Canada, species at risk are assessed and classified by COSEWIC (the Committee on the Status of Endangered Wildlife in Canada); those designated before the coming into force of the *Species at Risk Act* must be reassessed according to the new criteria of the Act before they can be added to Schedule 1. These species are listed on Schedules 2 and 3, and are not yet officially protected under SARA.

COSEWIC assessments and status reports: www.sararegistry.gc.ca

Critical habitat: Means the habitat that is necessary for the survival or recovery of a listed wildlife species and that is identified as the species' critical habitat in the recovery strategy or in an action plan for the species.

ECCC-CWS: Environment and Climate Change Canada – Canadian Wildlife Service

Schedule 1: Is the official list of species that are classified as extirpated, endangered, threatened or of special concern.

Schedule 2: Species listed in Schedule 2 are species that had been designated as endangered or threatened, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.

Schedule 3: Species listed in Schedule 3 are species that had been designated as of special concern, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.

Species at risk: An extirpated, endangered or threatened species, or a species of special concern.

Wildlife species (SARA): A species, subspecies or biologically distinct population of animal, plant or other organism, other than a bacterium or virus, that is wild by nature and native to Canada or has been present in Canada without human intervention for at least 50 years.

Species at Risk Act COSEWIC Status		Definition
EXT	Extinct	A wildlife species that no longer exists.
EXP	Extirpated	A wildlife species that no longer exists in the wild in Canada, but exists elsewhere in the wild.
END	Endangered	A wildlife species that is facing imminent extirpation or extinction.
THR	Threatened	A wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.
SC	Special Concern	A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.

