

# Tintamarre National Wildlife Area Management Plan



## 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 close to 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 and Climate Change 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 and Climate Change Canada prepares a management plan for each protected area in consultation with First Nations, the public 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 facilities and infrastructure. Research is also an important activity in protected areas; hence, Environment and Climate Change 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 and Climate Change 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 in Ottawa.

## Tintamarre National Wildlife Area

The Tintamarre National Wildlife Area (NWA) is situated near Sackville, New Brunswick, and borders the upper fringe of the Tantramar Marshes at the head of the Bay of Fundy. Tintamarre NWA comprises 1990 ha of freshwater lakes, bogs, fens and upland habitats, and is located on the narrow Chignecto Isthmus that links New Brunswick and Nova Scotia. Tintamarre NWA provides valuable habitat for many species of birds and other wildlife, and is a keystone protected area of the habitat bridge between N.B. and N.S.

Encompassing lands that were once at the head of the tide of the Tantramar dykelands, this site protects some of the last remaining peat bogs, lakes and fens within the greater Tantramar ecosystem. Tintamarre NWA is particularly important habitat for migrating, staging and breeding waterfowl. Its mosaic of wetlands also supports a diversity of other species, ranging from unique bog orchids to secretive wetland birds such as Sora Rail (*Porzana carolina*) and Virginia Rail (*Rallus limicola*).

The name “Tintamarre” is an Acadian word meaning a celebration or noise, suggestive of the sounds made by waterfowl that once covered the marshes in abundance. This name may have even older roots as Tantama or Tantamalg, a Mi'kmaq name for the area that may have referred to the rolling uplands adjacent to the marsh (Ganong 1899). Today, the rich wetlands and woodlands of Tintamarre or, in its anglicized version, “Tantramar” are favoured areas for waterfowl and upland game hunting, trapping of furbearers, fishing, birdwatching and recreational canoeing. Situated just 9 km northeast of the town of Sackville, as well as being in close proximity to the Trans-Canada Highway and Route 16, Tintamarre NWA is easily accessible.

Tintamarre NWA is owned by the Government of Canada and is managed by the Canadian Wildlife Service of Environment and Climate Change Canada. A number of controlled water-level wetlands within Tintamarre NWA are maintained in collaboration with Ducks Unlimited Canada.

For greater certainty, nothing in this management plan shall be construed 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*.

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# 1 DESCRIPTION OF THE PROTECTED AREA

Tintamarre National Wildlife Area (NWA) is located in southeastern New Brunswick (45°58'N 64°16'W). Tintamarre NWA was established in 1978 to protect waterfowl habitat (Table 1). This 1990-ha protected area contains extensive tracts of marshes, fens, bogs, swamps and woodlands (Figure 1). Three large lakes, Jolicure Large Lake, Long Lake and Front Lake, are among the site's most prominent features. Collectively, these wetland and peatland habitats comprise 79.5% (1580 ha) of the NWA (Figure 2). All three lakes within the NWA are relatively shallow (1.5–2.0 m). Jolicure Large Lake has significant areas of open water, while Long Lake and Front Lake are more characterized by narrow zones of emergent vegetation, principally Cattail (*Typha spp.*) and Round-stem Bulrush (*Scirpus validus*). Efforts are currently under way to acquire and designate additional lands: the proposed Towers Goose Lake and Hog Lake units (Figure 2).

Tintamarre NWA protects some of the largest remaining tracts of peatlands in southeastern New Brunswick. These large and open raised bogs are characterized by deep peat deposits. The dominant plant cover is typically an expanse of Sphagnum (predominantly *Sphagnum rubrum*) surrounded by a narrow fringe of Black Spruce (*Picea mariana*). Within the floating Sphagnum are typically clumps of Leatherleaf (*Chamaedaphne calyculata*) and Pale Laurel (*Kalmia polifolia*) with creeping ground cover of Bog Cranberry (*Vaccinium macrocarpon*) and Crowberry (*Empetrum nigrum*). In the other zones of the NWA, Sphagnum moss is less dominant, with heath shrubs and stunted trees including Larch (*Larix laricina*) and Black Spruce becoming progressively more prevalent.

The development of controlled water-level impoundments began in 1967 with the assistance of Ducks Unlimited Canada. Thirteen separate marsh impoundments totalling 890 ha have been developed through a system of dykes and control structures (Figure 1). Some of these impoundments were constructed predominantly on drained and abandoned agricultural dykelands, while others aid in retaining water within the larger lake basins. Emergent and submergent vegetation within these managed wetlands include Broadleaf Cattail (*Typha latifolia*), Narrow Leaf Cattail (*Typha angustifolia*), Giant Burreed (*Sparganium eurycarpum*), Bladderwort (*Utricularia spp.*) and small pondweeds such as Slender Pondweed (*Potamogeton pusillus*).

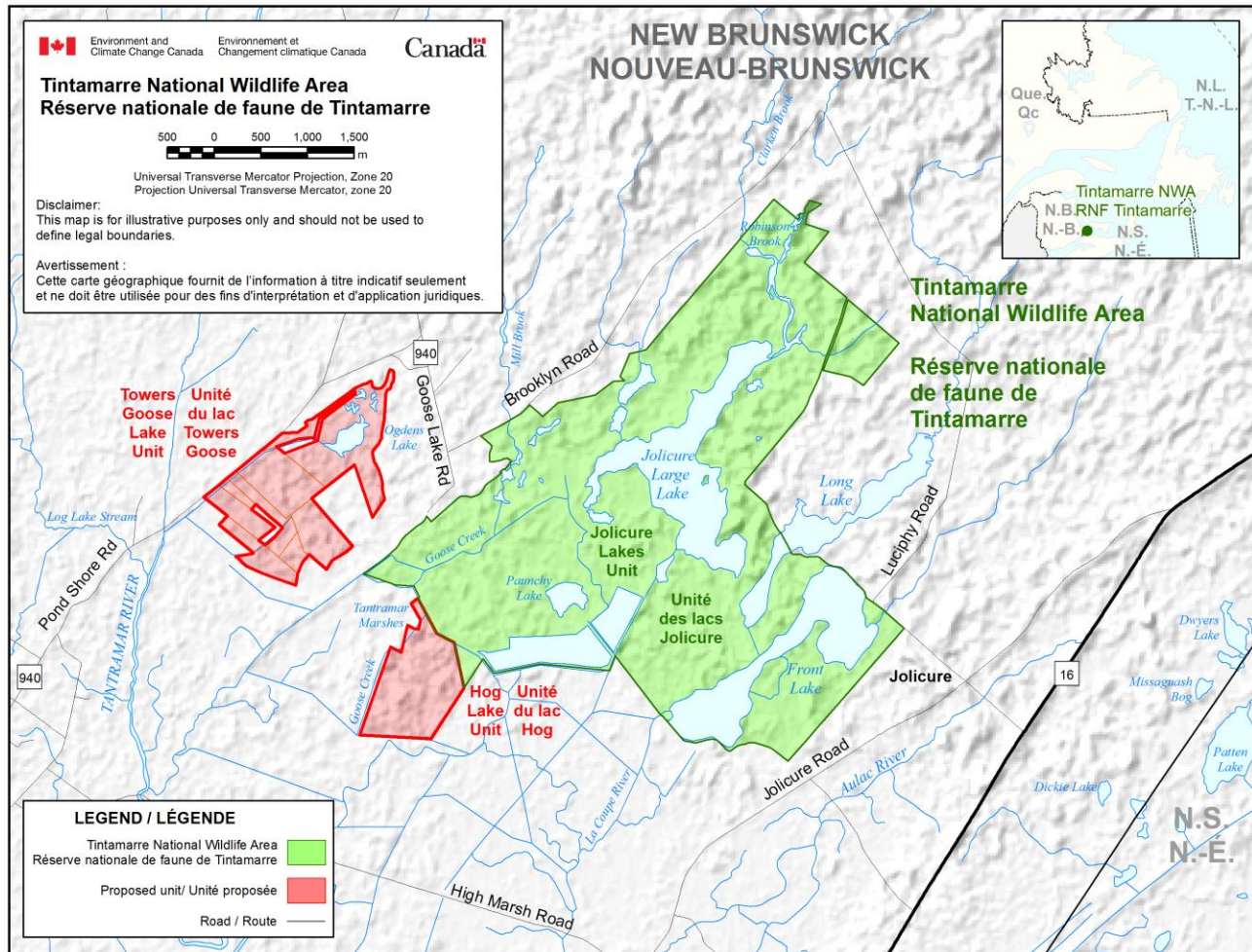
The uplands of Tintamarre NWA consist mainly of dense forests of coniferous trees, as well as remnants of abandoned farms and agricultural lands on the periphery (Figure 3). Several additional upland parcels, formerly cultivated, are now in various stages of old field and forest succession. The most recently abandoned sites are primarily vegetated by grasses and other herbaceous species with thickets of Hardhack (*Spirea latifolia*) on poorer soils, whereas other areas support various shrubs and young softwood trees. The forest cover in the NWA consists principally of conifers such as Black Spruce, Red Spruce (*Picea rubens*), Balsam Fir (*Abies balsamea*) and Larch. Black Spruce and Larch are found generally on the more poorly drained sites and provide the tree cover of wooded bogs. Most upland sites are covered by younger forest stands; however, some areas support more mature woodlands dominated by deciduous trees such as White Birch (*Betula papyrifera*), Yellow Birch (*Betula lutea*), Red Maple (*Acer rubrum*) and Sugar Maple (*Acer saccharum*).



**Figure 1: Robinson Brook Run, Jolicure Large Lake, Tintamarre NWA**  
Photo: A. Kennedy © Environment and Climate Change Canada, 2005

**Table 1: Tintamarre NWA Summary Information**

Protected area designation	National Wildlife Area
Province or territory	New Brunswick
Latitude and longitude	45°58'N 64°16'W
Size (ha)	1990 ha
Protected area designation criteria	Historic: Protecting a significant wetland complex of bogs, lakes and fens at the head of the Bay of Fundy that functions as an important area for waterfowl. Current: Criteria 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”. A significant number and diversity of waterfowl use the protected area as breeding or migration habitat.
Protected area classification system	The area possesses a high research potential for restoration and enhancement of migratory bird populations to national population targets (Environment Canada 2005).
International Union for Conservation of Nature (IUCN) classification	Category IV: Managed for conservation of habitat and species through management intervention.
Order in Council number	P.C. 1978-1439
Directory of Federal Real Property (DFRP) number	DFRP number 04315
Gazetted	27 April 1978
Additional designations	Grassy Hole Lakes proposed as an Ecological Reserve through the International Biological Program.
Faunistic and floristic importance	Wetland complex of lakes, streams, bogs, open marshes and fens at the headwaters of the Bay of Fundy supports a diversity of waterfowl and wetland birds.
Invasive species	Purple Loosestrife ( <i>Lythrum salicaria</i> ), Buckthorn ( <i>Rhamnus frangula</i> ), Japanese Knotweed ( <i>Fallopia japonica</i> ), Reed Grass ( <i>Phragmites communis [alpestris]</i> ) and Reed Canary Grass ( <i>Phalaris arundinacea</i> )
Species at risk	The National Wildlife Area supports five species at risk under the federal <i>Species at Risk Act</i> : Chimney Swift ( <i>Chaetura pelagica</i> ), Common Nighthawk ( <i>Chordeiles minor</i> ), Least Bittern ( <i>Ixobrychus exilis</i> ), Monarch ( <i>Danaus plexippus</i> ) and Short-eared Owl ( <i>Asio flammeus</i> ).
Management agency	Environment and Climate Change Canada, Canadian Wildlife Service
Public access and use	No public facilities on site. Low-level use consists of traditional activities such as hunting, fishing, trapping, canoeing, birdwatching, and berry picking (mainly bog cranberry).



**Figure 2: Tintamarre National Wildlife Area, including the original Jolicure Lake unit and the proposed Towers Goose Lake and Hog Lake units.**

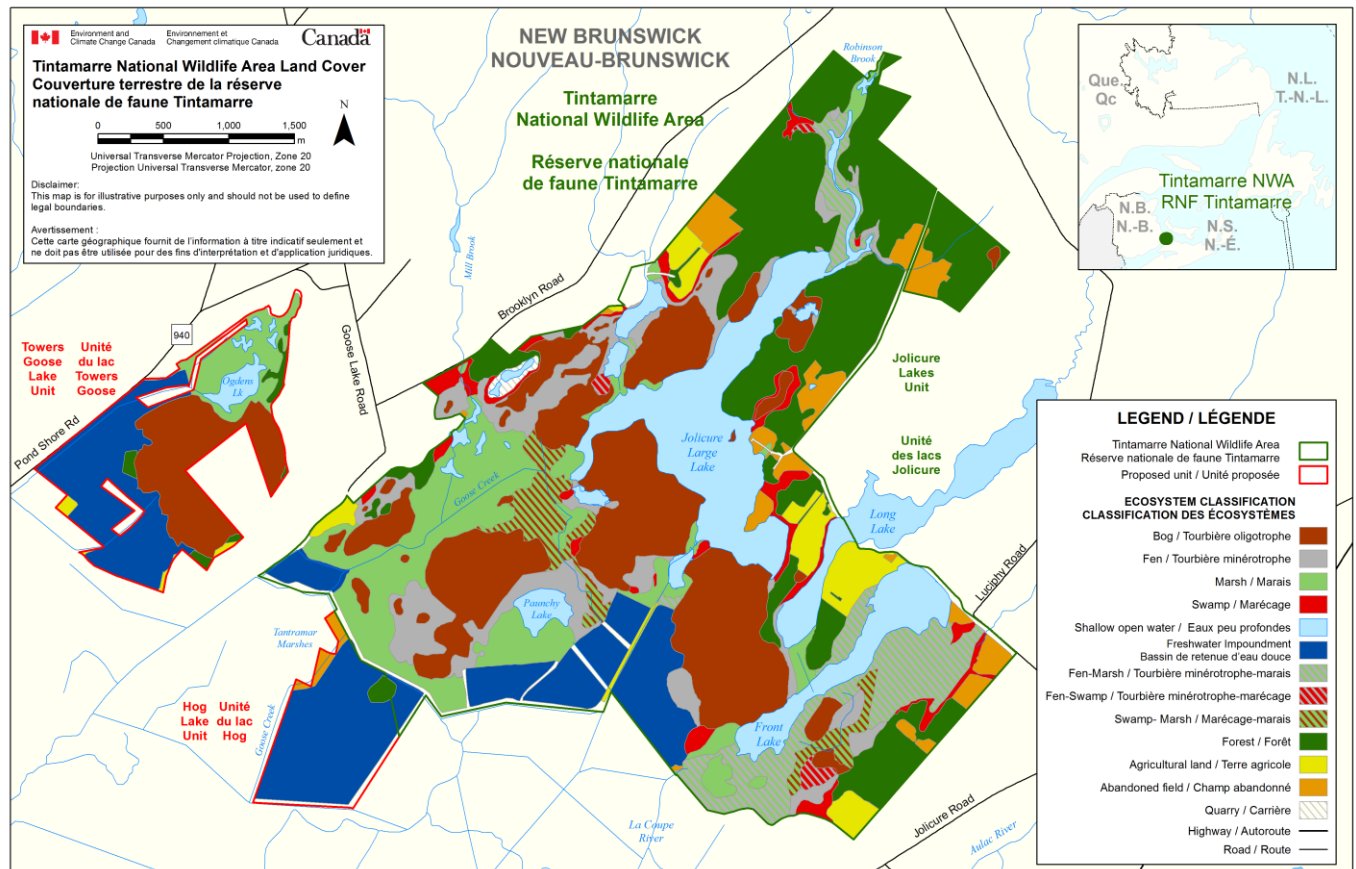


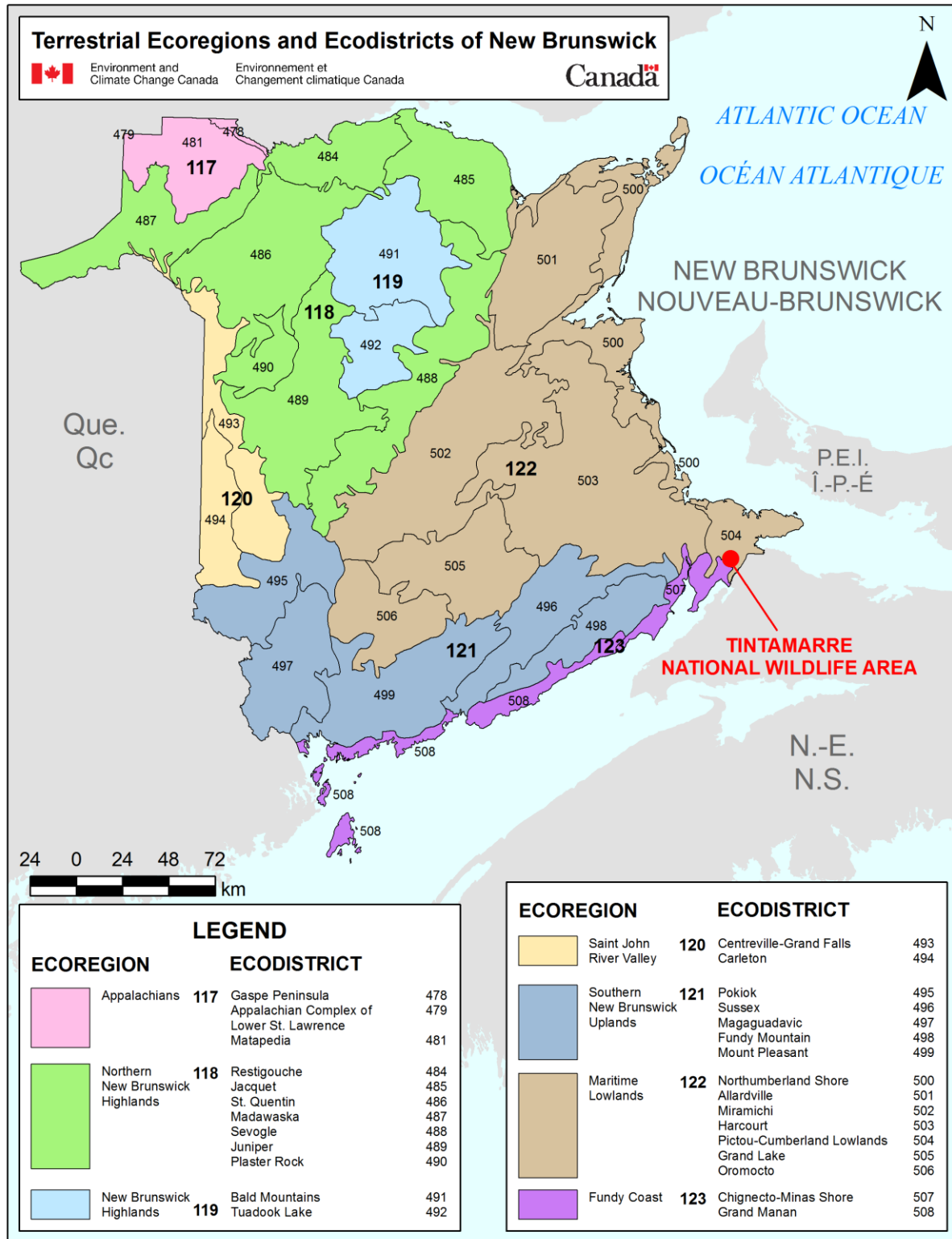
Figure 3: Tintamarre NWA Land Cover Map

### 1.1 REGIONAL CONTEXT

Tintamarre NWA is located at the geographic centre of the Maritime provinces on the Chignecto Isthmus that connects New Brunswick with Nova Scotia. This location is well known for its strategic importance to migratory birds, particularly waterfowl (Boyer 1948; Erskine 1992).

Tintamarre 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 NWA lies within the Maritime Lowlands Ecoregion and the Pictou-Cumberland Lowlands Ecodistrict (figure 4). This area is characterized as low-lying with gentle rolling hills over a geology consisting predominantly of non-calcareous Pennsylvanian sandstone, conglomerate and mudstone. Throughout the 19th century, the more uniform sandstone deposits were extracted for building stone for the nearby community of Sackville.

The rich farm lands of the Tantramar Marshes are derived from centuries of tidal silts being deposited over four millennia of sea level rise and coastal subsidence. Tintamarre NWA is situated generally where these silt deposits border the uplands, resulting in low, flat lands that support a diversity of wetlands. The Tantramar is generally cooler than nearby inland sites due to its proximity to the cold waters of Cumberland Basin. The area averages 415–450 mm of precipitation during the growing season (May to September).



**Figure 4: Terrestrial Ecoregions and Ecodistricts of New Brunswick. Tintamarre NWA falls within Ecoregion No. 122 (Maritime Lowlands) and Ecodistrict No. 504 (Pictou-Cumberland Lowlands)**

## 1.2 HISTORICAL BACKGROUND

The lakes, bogs and other wetlands comprising Tintamarre NWA developed as a result of a gradual subsidence of the coastal region, combined with sea level rise, over 4000 years ago. The invading tidal waters left deposits of silt that accumulated to form salt marshes and eventually a barrier that resisted further tidal intrusion. This natural levee also impeded the drainage of water from the land, with the result that large freshwater wetlands developed immediately inland from it. Tintamarre NWA lies in the area of former interaction between seawater invasion and freshwater runoff, and includes habitats formed by both processes.

Known human history of the Tantramar area follows the development of the marsh. The earliest Aboriginal sites are over 3700 years old (MacKinnon 2003b, 2003c). The wetlands within the NWA were undoubtedly used by First Peoples as both a navigation route and for obtaining food. Although there are no known Aboriginal locations within Tintamarre NWA, there is a small site from the Middle Woodland Period, approximately 1000 years old (Borden site designation DI-Db 19), just outside the east boundary on Jolicure Long Lake (MacKinnon 2003a).

Around 1670, the natural salt marsh processes were disrupted with the arrival of European settlers and their subsequent successful creation of arable farmland by dyking and draining tidal wetlands. Freshwater wetlands, including sites in the present NWA, were also drained and converted to farmland. Throughout the early 19th century, many of the more inland lakes and bogs were infilled with marine silts by a process known as warping or tiding (Hustvedt 1987). Hog, Rush and Goose Lakes, as well as Mud Bog, were altered in this way. To accomplish the infilling, canals were dug to allow saltwater to flood the freshwater wetlands and peatlands. These special canals can be identified on period maps as “tide feeder streams.”

The uplands of the area were cleared for merchantable timber and farm land. Early in the 20th century, there were six homesteads situated within the boundary of the present NWA. Most of these had been abandoned for a considerable period before land acquisition in support of the establishment of Tintamarre NWA was initiated in the late 1960s (Figure 5). With changing times and the transition from horses to tractors, many of the poorly drained haylands could not easily support heavy farm machinery, and peripheral areas were not maintained. Despite renewed attempts in the 1950s and early 1960s to revive and maintain some of this land for agricultural use, much of the dykeland within the NWA lay idle.



The importance of the Tantramar dykelands to waterfowl has long been recognized, and prompted one of the first studies to look at waterfowl use of these areas by Boyer (1951). Tintamarre NWA was proposed for acquisition through the National Habitat Protection Program in 1966 (Whitman 1966). Most lands were acquired in 1972 and 1973 by fee simple purchase.

The 1900 ha were officially identified as an NWA under the *Wildlife Area Regulations* on 27 April 1978 by Order in Council P.C. 1978-1439.

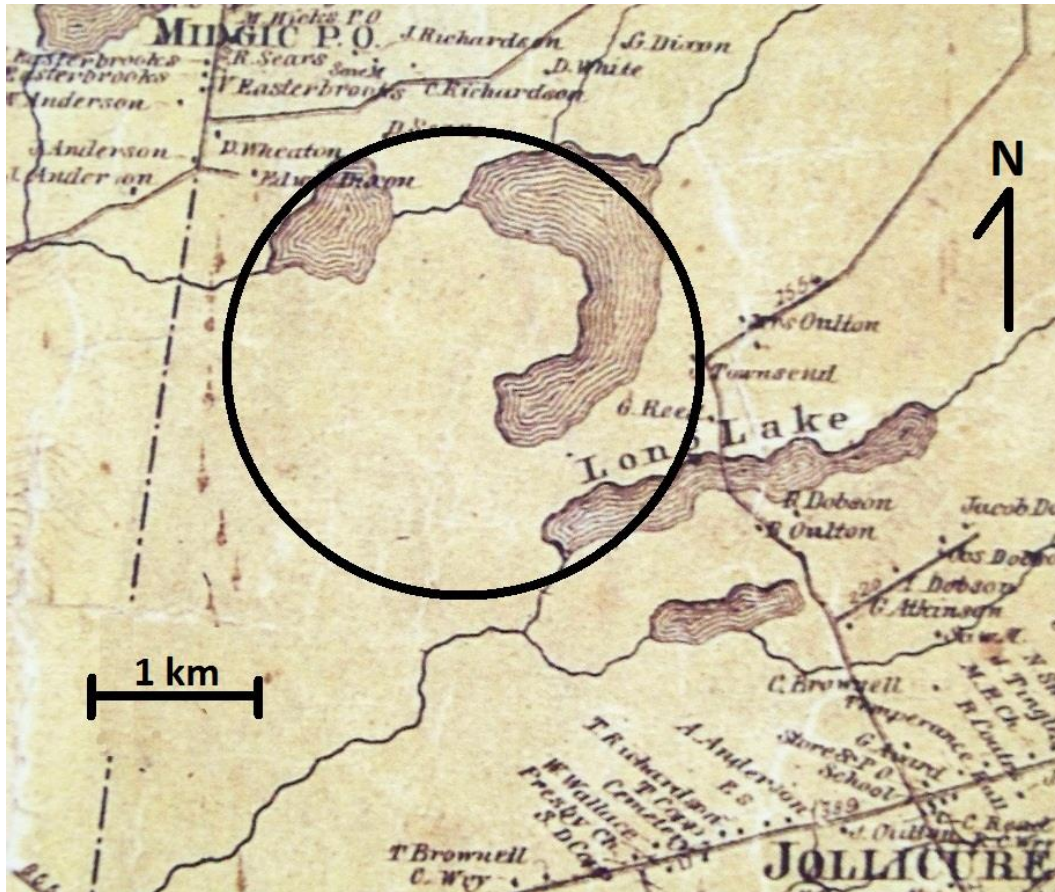


Figure 5: Portion of the circa 1862 Walling map depicting homesteads in the vicinity of the Jolicure Lakes, New Brunswick. The present-day Tintamarre NWA is roughly within the circled area.



**Figure 6: The Read family homestead, no longer standing, once overlooked Jolicure Long Lake**  
Photo: © Everett Mosher, Sackville, New Brunswick, 1965

### **1.3 LAND OWNERSHIP**

Tintamarre NWA is owned by the Government of Canada and administered by the Canadian Wildlife Service under the Canada Wildlife Act. The property boundary is delineated with NWA boundary signs.

The federal government does not hold the subsurface mineral rights for Tintamarre NWA.

### **1.4 FACILITIES AND INFRASTRUCTURE**

Maintenance of boundaries, entrance and regulatory signs, access roads, field accommodations, and storage facilities at Tintamarre NWA is an annual requirement (Table 2). The 30.5 km boundary is routinely inspected, and lines are cleared and signs replaced where necessary. Entrance signs are maintained at conspicuous sites: Goose Lake Road, Front Lake Landing and the entrance to the Jolicure Lakes Field Station (Figure 7). The Jolicure Lakes Field Station provides onsite accommodations, while a large barn and associated work yard provides storage space for the Atlantic Region's protected areas program (Figure 8).

Canadian Wildlife Service habitat staff and Ducks Unlimited Canada personnel conduct regular inspections of impoundments, including dykes, water control structures and water levels

(Figure 9). Ducks Unlimited Canada is responsible for maintenance and repairs to the controlled water-level impoundments within the NWA.

Thirteen controlled water-level projects totalling 890 ha have been developed at Tintamarre NWA with the cooperation of Ducks Unlimited Canada (Table 3). Macro-habitat conditions within all impoundments are assessed every year based on high-resolution aerial photography (MacKinnon and Kennedy 2012). Specific site-management objectives and actions for these projects are collaboratively determined between Ducks Unlimited Canada and the Canadian Wildlife Service each year. The Canadian Wildlife Service will work with Ducks Unlimited Canada to develop an annual planning framework for the maintenance of infrastructure.

**Table 2: Facilities and Infrastructure in the Tintamarre NWA**

<b>Type of Facility or Infrastructure</b>	<b>Approximate Size or Number</b>	<b>Responsibility Holder or Owner</b>
Property boundary	30.5 km	ECCC–CWS
Boundary signs	~600	ECCC–CWS
NWA entry signs	4	ECCC–CWS
Public notice signs	12	ECCC–CWS
Steel entry gates	6	ECCC–CWS
Foot bridges	1	ECCC–CWS
Storage barn	1 (10 m x 20 m)	ECCC–CWS
Field station	1 (10 m x 5 m )	ECCC–CWS
Boat house	1 (3 m x 5 m)	ECCC–CWS
Boat landing	4	ECCC–CWS
Parking lots	4	ECCC–CWS
Maintenance access points	9	ECCC–CWS
Impoundments	19	Ducks Unlimited Canada
Control structures	19	Ducks Unlimited Canada

**Table 3: Controlled Water-level Projects Maintained by Ducks Unlimited Canada in the Tintamarre NWA**

Ducks Unlimited Canadas Project Number	Project Name	Year Built	Size (ha)
<b>Jolicure Lakes Unit</b>			
6119	Front Lake	1967	417.6
	Large Lake		190.0
6106	Paunchy Lake Extension 1	1969	15.0
6106	Paunchy Lake Extension 2	1969	9.3
6106	Paunchy Lake Extension 3	1969	8.1
	Paunchy Lake Extension 4.3	2009	6.5
6129	Fillmore's Hole		14.6
6101	Robinson Brook	1971	172
6131	Paunchy Lake 1	1969	15.0
6131	Paunchy Lake 2	1969	9.3
6131	Paunchy Lake 3	1969	8.1
6131	Paunchy Lake 4	1969	14.0
6131	Paunchy Lake Extension	1971	10.1
<b>Total Area</b>			<b>889.6</b>



**Figure 7: The wetland complex within the Tintamarre NWA consists of a series of lakes, bogs and controlled water-level impoundments**

Photo: Andrew Kennedy © Environment and Climate Change Canada, 2006



**Figure 8: Environment and Climate Change Canada/Canadian Wildlife Service field station at 609 Luciphy Road, Jolicure Large Lake, Tintamarre NWA. Built around 1935, it was formerly part of the Jolicure Lakes hunting club.**

Photo: C. MacKinnon © Environment and Climate Change Canada, 2011



**Figure 9: Storage barn, 607 Luciphy Road, Tintamarre NWA**

Photo: C. MacKinnon © Environment and Climate Change Canada, 2011



**Figure 10: Controlled water-level wetlands within Tintamarre NWA are administered collaboratively with Ducks Unlimited Canada and Environment and Climate Change Canada's Canadian Wildlife Service**

Photo: A. Kennedy © Environment and Climate Change Canada, 2011

## 2 ECOLOGICAL RESOURCES

### 2.1 TERRESTRIAL AND AQUATIC HABITATS

The Tintamarre NWA contains a unique diversity of wetlands for such a comparatively small area (Figure 10) (Harries 1969; Malone 1977; Spicer *et al.* 1995). Bounded between a wooded interior and the upper extremity of the Tantramar dykelands, this area protects some of the last remaining lakes, bogs and fens in the Chignecto border region that have not been altered by ditches or dams. The upland areas, a mixture of forests and active and abandoned agricultural lands, also support a diversity of flora and fauna.

Tintamarre NWA, the nearby 4000 ha Missaguash Marsh managed by the Province of Nova Scotia and conservation lands of the Nature Conservancy of Canada, collectively provide a nearly continuous wildlife corridor through the narrow Chignecto Isthmus connecting Nova Scotia with New Brunswick. This corridor is a particularly important route that may be used by dispersed populations such as Canada Lynx (*Lynx canadensis*) (MacKinnon and Kennedy 2009) and Moose (*Alces alces*).



**Figure 11: The Jolicure Lakes and associated bogs are significant habitat features within the Tintamarre NWA**

Photo: © Environment and Climate Change Canada

## 2.2 WILDLIFE SPECIES

### 2.2.1 Birds

Several species of waterfowl, including Canada Goose (*Branta canadensis*), Green-winged Teal (*Anas carolinensis*), American Black Duck (*Anas rubripes*), Northern Pintail (*Anas acuta*), Blue-winged Teal (*Anas discors*), American Wigeon (*Anas americana*), Ring-necked Duck (*Aythya collaris*), Wood Duck (*Aix sponsa*), Mallard (*Anas platyrhynchos*) and Northern Shoveler (*Anas clypeata*), regularly breed at Tintamarre NWA. Significant increases in waterfowl production have resulted from the wetland development and improvement work undertaken at Tintamarre NWA since 1967 (Whitman 1969; Whitman 1971; Erskine 1987).

The freshwater wetlands of Tintamarre NWA also provide important habitat for the spring and fall migration and post-breeding staging of waterfowl. Peak numbers in late summer–early fall approach 1000 birds, including several species that occur regularly. The principal migrant and staging waterfowl are Green-winged Teal, Black Duck, Northern Pintail, Blue-winged Teal, American Wigeon and Ring-necked Duck.

Various species of marsh birds regularly breed at Tintamarre NWA, including Pied-billed Grebe (*Podilymbus podiceps*), American Bittern (*Botaurus lentiginosus*), Virginia Rail (*Rallus limicola*), Sora (*Porzana Carolina*) and Marsh Wren (*Cistothorus sp.*) (Healy 1976; Milton 1977; Cash *et al.* 1981). Pied-billed Grebes and Soras are the most abundant (Healey 1976), and those species in particular have increased significantly in response to development of controlled water-level impoundments (Erskine 1992). Other species including Least Bittern (*Ixobrychus exilis*), Common Moorhen (*Gallinula chloropus*), American Coot (*Fulica americana*) and Black Tern (*Chlidonias niger*) are either known or thought likely to breed occasionally. At least two or three pairs of Common Loons (*Gavia immer*) breed annually on the Jolicure Lakes.

Besides waterfowl and marsh birds, an impressive diversity of other birds is found within the area (Blacquiere 1975; Hudson 1978; Tingley 1980a and 1980b; Eskine and Smith 1986). Woodland birds, including a variety of warblers, make Tintamarre NWA a frequent destination for birdwatchers. Large birds of prey are also frequently observed within the area. Bald Eagle (*Haliaeetus leucocephalus*), Osprey (*Pandion haliaetus*), Northern Harrier (*Circus cyaneus*), Northern Goshawk (*Accipiter gentilis*), Sharp-shinned Hawk (*Accipiter striatus*) and American Kestrel (*Falco sparverius*) are all frequently observed. More secretive species such as the nocturnal Great-horned Owl (*Bubo virginianus*) and Barred Owl (*Strix varia*) are also common residents.



### **2.2.2 Mammals**

Twenty-nine species of mammals occur, or would be expected to occur, within the Tintamarre NWA (Morton 1980). These include all of the species commonly found in New Brunswick (Banfield 1974). Larger mammals such as White-tailed Deer (*Odocoileus virginianus*), Moose (*Alces alces*) and Black Bear (*Ursus americanus*) are common within the NWA. Wetland mammals such as Beaver (*Castor canadensis*) and Muskrat (*Ondatra zibethicus*) are frequently observed. The common but more secretive smaller mammals include Northern Flying Squirrel (*Glaucomys sabrinus*), Meadow Vole (*Microtus pennsylvanicus*), Masked Shrew (*Sorex cinereus*), Short-tailed Shrew (*Blarina brevicauda*), Water Shrew (*Sorex palustris*) and Star-nosed Mole (*Condylura cristata*) (Morton 1980; Dawe 2002).

Maritime Shrew (*Sorex maritimenis*) is an interesting component of the NWA's fauna. This species has a rather limited distribution in the Maritime provinces. However, it appears to be relatively more abundant in the area around the head of Cumberland Basin including Tintamarre and Chignecto NWAs (Morton 1980; Dawe 2002).

The Muskrat is the most important mammal of the Tintamarre NWA in terms of management of the site. The Muskrat population within the NWA has benefited considerably from the wetland development and improvements that have been undertaken. A December 1983 survey of 9 impoundments showed 457 muskrat houses, which probably represented a population in excess of 2000 animals. The Muskrat population within the entire NWA could be 2 to 3 times higher than this figure (Caron 1976; Parker 1984; Parker and Maxwell 1984).

Trapping is allowed within the NWA, subject to provincial regulations, and is an important component to the local economy and to the management of Muskrat populations and their impact on the NWA's wetlands.

### **2.2.3 Reptiles and Amphibians**

The amphibian and reptile fauna of Tintamarre NWA likely comprises most of the 16 species that commonly occur in the province, although thorough inventories have not been conducted (Brannen 2004). Confirmed snake species include the Eastern Garter (*Thamnophis sirtalis*), Green Snake (*Liochlorophis vernalis*) and Northern Redbelly Snake (*Storeria occipitomaculatus*), while frequently encountered amphibians include Green Frog (*Rana clamitans*), Wood Frog (*Rana sylvatica*), Bullfrog (*Rana catesbeiana*), Mink Frog (*Rana septentrionalis*) and Northern Leopard Frog (*Rana pipiens*). Salamanders are an inconspicuous

but abundant component of the fauna. Common species include the Yellow Spotted Salamander (*Ambystoma maculatum*), Eastern Red-backed Salamander (*Plethodon cinereus*) and Blue-spotted Salamander (*Ambystoma laterale*).



**Figure 12: Bullfrog (*Rana catesbeiana*) on *Nuphar* spp., Tintamarre NWA**  
Photo: A. Kennedy © Environment and Climate Change Canada

#### **2.2.4 Fish**

The lakes and waterways within the Tintamarre NWA support a number of fish species (Arbing and McIntyre 1996). Brook Trout (*Salvelinus fontinalis*) and Smallmouth Bass (*Micropterus dolomieu*), the latter found only in Jolicure Long Lake, are popular with many fishers that visit the area. Other species such as Yellow Perch (*Perca flavescens*) and White Perch (*Morone americana*) are also taken.

Three species of diadromous fish are found within Tintamarre NWA, the previously mentioned Brook Trout as well as American Eel (*Anguilla rostrata*) and Gaspereau (*Alosa pseudoharengus*).

Other commonly encountered fish within the NWA include Golden Shiner (*Notemigonus crysoleucas*), Brown Bullhead (*Ameiurus nebulosis*), Ninespine Stickleback (*Pungitius pungitius*) and White Sucker (*Catostomus commersonii*) (Hanson 1993).

## 2.3 SPECIES AT RISK

A list of species at risk that have been observed within the Tintamarre NWA is presented in Table 4. Of these, the Least Bittern (*Ixobrychus exilis*) and Short-eared Owl (*Asio flammeus*), which are listed as Threatened and of Special Concern respectively, likely breed within the NWA.

**Table 4: Species at Risk in Tintamarre NWA**

Common and Scientific Names of Species	Status			Presence or Potential of Presence <sup>4</sup>
	Canada		New Brunswick	
	SARA <sup>1</sup>	COSEWIC <sup>2</sup>	Provincial Ranking <sup>3</sup>	
<b>Birds</b>				
Barn Swallow <i>Hirundo rustica</i>	No Status	Threatened	No Status	Confirmed
Bobolink <i>Dolichonyx oryzivorus</i>	No Status	Threatened	No Status	Confirmed
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	Probable
Eastern Meadowlark <i>Sturnella magna</i>	No Status	Threatened	No Status	Potential
Short-eared Owl <i>Asio flammeus</i>	Special Concern	Special Concern	No Status	Confirmed
<b>Fishes</b>				
American Eel <i>Anguilla rostrata</i>	-	Special Concern	-	Confirmed
<b>Arthropods</b>				
Monarch Butterfly <i>Danaus plexippus</i>	Special Concern	Special Concern	No Status	Confirmed

<sup>1</sup> *Species at Risk Act* (SARA): Extinct, extirpated, endangered, threatened, special concern, not at risk (assessed and deemed not at risk of extinction) or no status (not rated)

<sup>2</sup> Committee on the Status of Endangered Wildlife in Canada

<sup>3</sup> Provincial ranking using provincial codes, if applicable

<sup>4</sup> List as "Confirmed," "Probable," or "Potential"

## 2.4 INVASIVE SPECIES

With such a long history of human settlement, a number of non-native plant species are found within the Tintamarre NWA (Spicer *et al.* 1995). Many of these plants were originally introduced and can be found associated with old and abandoned house sites. Although some species of plants may survive for a very long time in one location, they do not always spread to other sites and are not considered invasive. Some plants, such as Glossy Buckthorn (*Rhamnus frangula*), Phragmites (*Phragmites communis* [and *P. australis*]), Purple Loosestrife (*Lythrum salicaria*) and Reed Canary Grass, may be invasive, and expansion of these species may dictate some controls or removal (White *et al.* 1993).

### **3 MANAGEMENT CHALLENGES AND THREATS**

The challenges and threats faced by Tintamarre NWA are managed in the context of the broader upper Bay of Fundy and Chignecto Isthmus ecosystems. Although activities that occur outside of the boundary of the NWA are beyond the scope of this management plan, many of these factors have direct bearing on the successful management of Tintamarre NWA. A summary of the more salient issues follow.

#### **3.1 WIND POWER**

The Chignecto Isthmus is an important area for birds, and Tintamarre NWA, with its diversity of wetland habitats, is a concentration area for breeding and migrating birds. The development of wind turbine farms to generate electricity has the potential to harm birds directly, but a greater unknown is potential changes to bird flight paths around such farms that may possibly negate the value of habitat under protection. A wind farm is currently being proposed (2012) for the Tantramar and Aulac marshes, and a wind farm has already been developed on dykelands adjacent to the John Lusby NWA near Amherst, Nova Scotia. Studies are ongoing, but concern may be warranted, as some migratory birds known to pass over the Tintamarre NWA, such as Common Eider (Erskine and Smith 1986), are sometimes killed by flying into existing human-made structures on the Tantramar dykelands (MacKinnon and Kennedy 2011).

#### **3.2 TOURISM**

Ever-increasing ecotourism, while often providing valuable education opportunities to the public, adds additional pressures to protected areas that are specifically set aside to protect habitat and benefit wildlife. The blurring of the lines between ecotourism and adventure tourism adds to the problem of cumulative environmental effects. As local communities and businesses try to attract tourism dollars, public lands and protected areas such as Tintamarre NWA are sometimes advertised as destinations by external interests, often without a full understanding of the regulations by which an area is protected. Visitors to sites such as Tintamarre NWA may not always understand the regulatory distinction between a park and an NWA. Invariably, concession to improving public use and public access is to the detriment of wildlife, and concessions, once made, are not easily retracted. Additional resources (staff and infrastructure funds) would be required to support an increase in tourism-based visitation to this protected area.

### 3.3 OFF-ROAD VEHICLES

Illegal use of off-road vehicles (ORVs) such as all-terrain vehicles, especially in regions abounding in wetlands, results in habitat loss and degradation or destruction of plant cover, and it leaves lasting scars on the landscape (Hosier and Eaton 1980; Ross 1992). ORV 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 most local animal species.

The use of ORVs in streams and wetlands results in habitat destruction and loss. Portions of the sphagnum bog and ericaceous heath wetlands within Tintamarre NWA, particularly in the area of the Grassy Hole Lakes, show such scars (Figure 13). Often, the worst damage is in the form of “braiding,” where successive operators, in order to bypass a wet area, make a series of new and parallel trails adjacent to an existing one. Use of ORVs is prohibited within Tintamarre NWA.



**Figure 13: Illegal all-terrain vehicle damage within the Grassy Hole Lakes area of the Tintamarre NWA in 2004**

Photo: A. Kennedy © Environment and Climate Change Canada

### 3.4 CAMPING AND OPEN FIRES

Illegal camping, usually accompanied by open camp fires and damage to vegetation, is a problem. Trash associated with camping and left on site can also be a hazard to wildlife (Figure 14). Of greater concern are camp fires in woodland habitat, especially during the dry summer months. The forests of Tintamarre NWA border a number of private holdings and residences, and an illegal fire may put both the habitat under protection and private property at risk. The lakes and streams within the NWA are remote and have few access points, complicating fire suppression should an event occur.



**Figure 14: Illegal camp fires may create a forest fire hazard, Tintamarre NWA**  
Photo: © Environment and Climate Change Canada, 2010

### 3.5 PREDICTED CLIMATE CHANGE CONTEXT

Predicted sea level rise of 1.0 m over the next century is likely to result in increased flooding of low-lying areas (Shaw *et al.* 1998). Existing dykes that protect much of the agricultural lands around Cumberland Basin are designed for existing conditions and would require significant modifications to withstand increased tide height and storm surges. A breach of the coastal dykes, as has happened in the past, would result in the flooding of the low-lying marshes of Tintamarre NWA. Significant levels of intrusion of salt water into freshwater wetlands result in rapid death of flora and fauna that are not salt tolerant.

The existing coastal dykes protect not only agricultural lands, but also significant infrastructure on the Tantramar, including the Trans-Canada Highway, Canadian National Railway line, and high voltage power transmission lines between New Brunswick and Nova Scotia.

### **3.6 INVASIVE SPECIES**

Plants, such as Glossy Buckthorn (*Rhamnus frangula*), Phragmites (*Phragmites communis* [and *P. australis*]), Purple Loosestrife (*Lythrum salicaria*) and Reed Canary Grass may be invasive, and expansion of these species may dictate some controls or removal (White *et al.* 1993).

### **3.7 FISH PASSAGE**

Many species of fish in Atlantic Canada are diadromous, spending part of their life cycle in fresh water and part in marine waters. The ability to overcome obstacles to migration differs among fish species. The design of fish passage structures that were previously approved by Fisheries and Oceans Canada have been recently shown not to successfully allow the passage of many fish species (Roscoe and Hinch 2010). The Front Lake fishway was built around 1965. The fishway is a pool and weir design with lifts of 30 cm between the pools. It is part of a water control structure that manages the water level in Front Lake and handles the flow from a 26 km<sup>2</sup> watershed. This fishway has been shown to be an impediment to the migration of Gaspereau, although species such as American Eel and Brook Trout can pass through the structure (Andrews 2014).



## 4 GOALS AND OBJECTIVES

### 4.1 VISION

The long-term vision for Tintamarre NWA is conservation: to maintain and enhance habitat for native wildlife, with a priority given to waterfowl, wetland birds and species at risk.

### 4.2 GOALS AND OBJECTIVES

Tintamarre NWA was originally selected as a protected area to preserve an important diversity of wetland habitats for waterfowl. Conservation priorities have shifted over time, but the maintenance and management of habitats for wetland birds as well as rare and unique species continues to be the first priority. The NWA is classified under the International Union for the Conservation of Nature (IUCN) criteria for protected areas as a Category IV protected area, to be managed “mainly for conservation of habitat and species through management intervention”. Although the NWA is not currently promoted as a tourism destination or for on-site public education, public visitation is not restricted, and some renewable and traditional land uses are allowed.

The goals and objectives for Tintamarre NWA seek to create conditions that support or enhance those that would occur under natural ecological processes. These are goals to which Environment and Climate Change Canada aspires and, if achieved, would produce tangible benefits for habitat and wildlife, particularly migratory birds and species at risk, over the long term. Specific goals and objectives are as follows:

**Goal 1: Wetland habitats within controlled water-level impoundments will be managed to mimic an ecosystem driven by shallow but stable water levels, 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:

**1.1** Manage water levels to achieve a diversity of wetland vegetation with open water and vegetation maintained at a 50:50 ratio over the long term.

**Goal 2: Old-field and homestead habitats will be managed to provide the early stages of plant succession to benefit edge and open grassland migratory birds.**

Objectives:

**2.1** Maintain 5 ha of open field habitat in early succession through periodic mowing.

**2.2** Maintain wildlife food availability through the periodic thinning and pruning (once every five years) of 200 apple trees associated with abandoned homesteads within the NWA.

**Goal 3: Upland habitats will be managed to maintain native and historic upland vegetation diversity so that populations of migratory birds and species at risk are sustained.**

Objective:

**3.1** To enhance forest diversity, plant 5 ha of Acadian forest (tolerant hardwood species that have been lost) within existing older-growth Yellow Birch forests over the next five years.

**Goal 4: Fish passage will be maintained and enhanced for fish, especially for migratory (diadromous) species in the waterways of the NWA.**

Objective:

**4.1** Replace existing fishway at Front Lake with one that allows for the passage of Gaspereau within three years.

**Goal 5: Control invasive and alien plant species so that the size and number of habitat patches known to be dominated by alien and invasive species will decrease over time.**

Objective:

**5.1** Habitat and vegetation will be actively managed to eliminate (where possible) or reduce the extent and density of alien and exotic plant species.

**Goal 6: Human activities within the NWA do not have a negative impact on wildlife populations or their habitats.**

Objectives:

**6.1** Document and report the number and nature of incidents of illegal activities such as off-road vehicle use, within Tintamarre NWA to the Wildlife Enforcement Division, therefore reducing or eliminating their occurrence in the NWA.

**6.2** Promote public recognition and understanding of “cumulative environmental effects” and how repeated and routine activities may be harmful to wildlife and their habitat.

**Goal 7: Wildlife populations and habitat within the NWA are not negatively impacted by land use and anthropogenic stressors originating outside of the NWA.**

Objectives:

**7.1** Provide information on the NWA to environmental assessments for areas adjacent to the NWA.

**7.2** Undertake activities to mitigate negative consequences of climate change such as modifying water management regimes, invasive species control programs.

**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 reviewed 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 some of the possible approaches that can be used in the management of the Tintamarre NWA. However, specific management actions will be determined during the annual work planning process and will be implemented as human and financial resources allow.

**Table 5: Management Approaches for Tintamarre NWA**

Management Challenge or Threat	Goal and Objective(s)	Management Approaches (actions, including level of priority) <sup>1</sup>
Wind power farms are expanding.	<p><b>Goal 7: Wildlife populations and habitat within the NWA are not negatively impacted by land use and anthropogenic stressors originating outside of the NWA.</b></p> <p><b>Objective 7.1:</b> Provide information on the NWA to environmental assessments for areas adjacent to the NWA</p>	<ul style="list-style-type: none"> <li>• Provide the wind power industry with information as required to make sound decisions that minimize impacts on wildlife and wildlife movement. <b>(2)</b></li> </ul>
Tourism activities may have a cumulative environmental effect.	<p><b>Goal 6: Human activities within the NWA do not have a negative impact on wildlife populations or their habitats.</b></p> <p><b>Objective 6.2:</b> Promote public recognition and understanding of “cumulative environmental effects” and how repeated and routine activities may be harmful to wildlife and their habitat.</p>	<ul style="list-style-type: none"> <li>• Communicate to local tourism operators, which use the area for recreation, and the provincial tourism department in order to inform them of the protected status of Tintamarre NWA and of possible cumulative environmental impacts that this aspect of the industry has on protected areas. <b>(1)</b></li> </ul>
Off-road vehicles (ORVs), and especially all-terrain vehicles, cause extensive and long-lasting damage to the fragile wetland habitats within the NWA.	<p><b>Goal 6: Human activities within the NWA do not have a negative impact on wildlife populations or their habitats.</b></p> <p><b>Objective 6.1:</b> Reduce or eliminate ORV vehicle use and associated damage to vegetation within the NWA.</p>	<ul style="list-style-type: none"> <li>• Maintain communications with ORV rider associations regarding the regulations pertaining to Tintamarre NWA and damage caused by inappropriate use of ORVs. <b>(2)</b></li> <li>• Maintain regulatory signs. <b>(1)</b></li> <li>• Contribute to communication products highlighting impacts of ORVs on wetlands. <b>(2)</b></li> <li>• Eliminate access and habitat damage caused by ORVs. <b>(2)</b></li> <li>• Maintain the existing designated road to the Large Lake boat landing for legitimate “on-road” vehicle access. <b>(2)</b></li> </ul>

Management Challenge or Threat	Goal and Objective(s)	Management Approaches (actions, including level of priority) <sup>1</sup>
Camping and open fires cause extensive and long-lasting damage to vegetation.	<p><b>Goal 6: Human activities within the NWA do not have a negative impact on wildlife populations or their habitats.</b></p> <p><b>Objective 6.1:</b> Reduce or eliminate illegal camping, open camp fires and associated damage to vegetation within the NWA.</p>	<ul style="list-style-type: none"> <li>• Document the number and nature of incidents where evidence of illegal activities exists within the NWA and report to Wildlife Enforcement Division. <b>(1)</b></li> </ul>
Predicted climate change could result in the flooding of the low-lying marshes of Tintamarre NWA.	<p><b>Goal 7: Wildlife populations and habitat within the NWA are not negatively impacted by land use and anthropogenic stressors originating outside of the NWA.</b></p> <p><b>Objective 7.2:</b> Undertake activities to mitigate negative consequences of climate change such as modifying water management regimes, invasive species control programs.</p>	<ul style="list-style-type: none"> <li>• Understand potential impacts of climate change and how the valued ecosystem components of the protected area can be maintained. <b>(2)</b></li> <li>• Conduct long-term annual monitoring (ortho-rectified aerial photography) to retain a historical record of site changes and document significant tidal or climatic events. <b>(1)</b></li> </ul>
Invasive species.	<p><b>Goal 5: Control invasive and alien plant species so that the size and number of habitat patches known to be dominated by alien and invasive species will decrease over time.</b></p> <p><b>Objective 5.1:</b> Habitat and vegetation will be actively managed to eliminate (where possible) or reduce the extent and density of alien and exotic plant species.</p>	<ul style="list-style-type: none"> <li>• Monitor existing nodes of invasive plants for possible expansion. <b>(2)</b></li> <li>• Promote safe biological controls, such as <i>Galerucella</i> beetle for Purple Loosestrife. <b>(2)</b></li> </ul>
Fish passage structures are not efficient.	<p><b>Goal 4: Fish passage will be maintained and enhanced for fish, especially for migratory (diadromous) species in the waterways of the NWA.</b></p> <p><b>Objective 4.1:</b> Replace existing fishway at Front Lake with one that allows for the passage of Gaspereau within three years.</p>	<ul style="list-style-type: none"> <li>• Monitor fish passage at Front Lake fishway before and after replacement of fishway. <b>(1)</b></li> <li>• Replaced Front Lake fishway in August 2014. <b>(1)</b></li> </ul>

<sup>1</sup> 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 Forests**

Large-scale forest management within Tintamarre NWA is not desirable or anticipated. However, selected areas of older-growth forest with low species diversity, lost through past forestry operations, will be augmented through the planting of native tolerant hardwood species.

### **5.1.2 Fields and Farms**

Habitat manipulation will be conducted to maintain some old-field habitat (abandoned agricultural lands) in various stages of early plant succession. Vegetation with a high food value to wildlife such as wild apple trees, hawthorn (*Crataegus sp.*), Wild Rose (*Rosa virginiana*) and High Bush Cranberry (*Viburnum opulus*) will be retained and enhanced through judicious pruning. Woody material from this activity will be made into brush piles as cover for small mammals (Gullion 1984; Gullion, no date; Sepik *et al.* 1981). This work will provide and retain a wider variety of habitat within the Tintamarre NWA. This landscape is also beneficial as nesting and foraging habitat for Barred Owl, Great-horned Owl, Northern Goshawk, Northern Harrier and Short-eared Owl; the latter is a species of Special Concern.

### **5.1.3 Freshwater Impoundments**

The human history of the Tantramar Marsh has resulted in significant manipulations of the habitat (Hustvedt 1987; MacKinnon 2000). 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. Following a series of studies, it was decided that these long-abandoned agricultural dykelands should be flooded through construction of impoundments in collaboration with Ducks Unlimited Canada (Whitman 1974; Kerekes 1975; Whitman 1976; Beauchamp 1976; Beauchamp and Kerekes 1980; Wein and Krusi 1982; MacKinnon *et al.* 1995; Gloutney and MacKinnon 2009). A series of shallowly flooded freshwater wetlands have been developed to provide wetland habitat for a diversity of species. Maintenance of the dykes and control gates is the responsibility of Ducks Unlimited Canada under an agreement with Environment and Climate Change Canada; however, biological management is done collaboratively following annual evaluations of water levels and habitat changes based on site inspections and aerial photography. Management may include manipulation of water levels to control areas of overgrown vegetation (Table 5). On rare occasions, 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*). Management of these impoundments strives to develop or maintain a hemi-

marsh: an equal mix of vegetation and open water with a high degree of interspersed and plant species diversity (Sojda and Solberg 1993).

#### **5.1.4 Bogs and Fens**

These habitats will be retained in their present condition. The Grassy Hole Lakes, which feed into Jolicure Large Lake, have long been recognized as having unique and undisturbed habitat (Spicer *et al.* 1995). As such, these small lakes, along with the adjacent bog and fen, were proposed as a candidate ecological reserve in New Brunswick (Wein and Jones, 1975). This is one of the few known sites where Bronze Copper Butterfly (*Lycaena hyllus*) is found, and it is also a nesting area for the Sedge Wren (*Cistothorus platensis*) (Dionne *et al.* 1988).

### **5.2 WILDLIFE MANAGEMENT**

#### **5.2.1 Species at Risk**

Old fields will be held in early succession to provide rough cover foraging and nesting habitat for Short-eared Owl, Bobolink and Eastern Meadowlark. This habitat will also benefit open grassland predators such as Northern Harrier, Red-tailed Hawk (*Buteo jamaicensis*) and, in winter, Rough-legged Hawk (*Buteo laeopus*).

Careful consideration will be given to management of the cattail marshes and fens given their importance as habitat for Least Bittern and Yellow Rail respectively. No special habitat management is required for the aerial insectivores (Barn Swallow, Chimney Swift and Common Nighthawk).

### **5.3 MONITORING**

Most monitoring within the NWA has consisted of periodic habitat evaluations through botanical inventories and mapping, with much of the work focused on the controlled water-level impoundments. Further habitat monitoring is carried out annually by evaluation and review of high resolution aerial photography, in a joint meeting with wetland managers from Ducks Unlimited Canada and the Canadian Wildlife Service. Monitoring for many species, such as waterfowl, is conducted as part of a larger regional program, although specific studies have been conducted (Milton 1977; Hanson 1993, Maillet *et al.* 1999). Other studies, either by the Canadian Wildlife Service or in cooperation with university researchers, are conducted as required.

Effective and efficient monitoring requires careful planning and a coordinated approach. 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. Distribution and abundance of marsh birds, such as Pied-billed Grebe, American Coot, Sora Least Bittern and Virginia Rail, within the controlled water-level impoundments.
2. Periodical monitoring of songbird distribution and abundance within the wooded interior of the NWA and in grassland habitats (in support of an assessment of the quality of old-field habitats).
3. Distribution and density of alien invasive plant species within the NWA.
4. Monitor macro-habitat changes to the wetlands through an annual analysis of high-resolution aerial photography.
5. Monitor macro-habitat changes to the upland vegetation every 10 years, using high-resolution aerial photography.
6. Monitor unauthorized ORV activity in the NWA.
7. Monitor limnological conditions and fish populations every 10 years.

#### **5.4 RESEARCH**

Research activities will be considered for permitting when the results obtained through research have the potential for the following:

1. Increasing our understanding of habitat use and the distribution and abundance of waterfowl, shorebirds and migratory birds.
2. Increasing our understanding of the habitat requirements of wildlife.
3. Increasing our understanding of the habitat requirements of species at risk.
4. Increasing our knowledge of the efficacy of habitat restoration techniques.
5. Increasing our understanding of the possible effects of climate change and variability on water level management.
6. Increasing our understanding of the impacts of invasive species and measures for their control and eradication.



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

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

Permit requests should be directed to: [Permit.Atl@ec.gc.ca](mailto:Permit.Atl@ec.gc.ca)

## **5.5 PUBLIC INFORMATION AND OUTREACH**

Situated just 9 km northeast of Sackville, New Brunswick, and in close proximity to the Trans-Canada Highway, Tintamarre NWA is well situated to attract even more visitors than currently use the area. Tintamarre is not actively promoted as a tourism destination. Although public access is permitted, public services are limited to access roads and parking areas. The area is frequented by recreational birdwatchers, canoeists and photographers. Hunting, fishing and trapping are allowed, subject to applicable federal and provincial regulations. These outdoor pursuits support the local economy and provide health benefits to users of the NWA through leisure exercise and enjoyment.

Public access for recreational purposes within the Tintamarre NWA is subject to the federal *Wildlife Area Regulations* of the *Canada Wildlife Act*. Activities such as camping and open fires are not permitted. Some traditional activities such as hunting, fishing, trapping, canoeing and birdwatching are allowed by virtue of a public notice posted at all main entrances to the protected area. Hunting, fishing and trapping activities require the applicable provincial and federal permits. The NWA is open to public visitation, and the area lakes are frequently used in the summer months for recreational canoeing.

The unique character of Tintamarre NWA and its significance as an important wetland complex have been highlighted in the national “Heritage to Protect” poster series. A limited number of these are available to educators, students and the general public on request.

## 6 AUTHORIZATIONS AND PROHIBITIONS

In the interest of wildlife and their habitat, the effects of 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 to authorize certain activities to take place in NWAs that are otherwise considered prohibited. 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.

### 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 their habitat.

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

### 6.2 AUTHORIZED ACTIVITIES

For Tintamarre NWA, notices authorizing the following activities will be posted at all main entry points. Identification signs (2' x 4' NWA sign) are situated at prominent entry points around the NWA.

Authorized activities **without** special restrictions:

1. Wildlife observation
2. Hiking
3. Skating
4. Skiing
5. Snowshoeing

## 6. Photography

Authorized activities **with** special restrictions:

1. Hunting, fishing and trapping (subject to federal and provincial regulations)
2. Canoeing (outboard motors should be less than 10 horsepower)
3. Berry picking (non-commercial berry picking only)

**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.

### 6.3 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 their habitats 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  
17 Waterfowl Lane, P.O. Box 6227  
Sackville NB E4L 1G6

Permit requests should be directed to: [Permit.Atl@ec.gc.ca](mailto:Permit.Atl@ec.gc.ca)

For further information, please consult the 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 Environment and Climate Change Canada policy document is available on the protected areas website at [www.ec.gc.ca/ap-pa](http://www.ec.gc.ca/ap-pa).

#### **6.4 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, to the implementation of management plans, and enforcement activities conducted by an officer or employee of Environment and Climate Change Canada.

#### **6.5 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, Canadian Wildlife Service, Atlantic Region

17 Waterfowl Lane, P.O. Box 6227

Sackville NB E4L 1G6

## 7 HEALTH AND SAFETY

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

**1-800-565-1633**

Non-emergency issues related to security or health and safety issues for Tintamarre 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

Telephone: 506-364-5044

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 6 below.

**Table 6: Emergency Contacts for Tintamarre NWA**

<b>Emergency Contacts for Tintamarre NWA (45°58'N 64°16'W)</b>	
<b>Civic Address for Storage Barn/Work Yard: #607 Lake Road, Jolicure, NB</b>	
<b>Civic Address for Research Cabin: #609 Lake Road, Jolicure, NB</b>	
Emergency	911
Police/Fire/Ambulance	911
Royal Canadian Mounted Police (RCMP), Sackville Detachment	1-506-533-5151
Rescue Coordination Centre to report air and marine emergencies	1-800-565-1582
Environmental emergencies (e.g., oil, pesticide, chemical spills)	1-800-565-1633
Environment and Climate Change Canada – Wildlife Enforcement Division	1-506-364-5044
Environment and Climate Change Canada – Canadian Wildlife Service, 17 Waterfowl Lane, P.O. Box 6227, Sackville, New Brunswick, E4L 1G6	1-506-364-5044
New Brunswick Department of Natural Resources and Energy (1100 Champlain Street, Dieppe)	1-866-458-8080 1-506-856-2344
New Brunswick Department of Natural Resources and Energy – Fish and Wildlife Branch, Fredericton (general inquiry)	1-506-453-2440
New Brunswick Poison Control Centres (emergencies)	911
Nearest hospital – Sackville Regional Hospital, 8 Main Street, Sackville, New Brunswick	1-506-364-4100

## 8 ENFORCEMENT

The management of NWAs is based on three Acts:

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

To promote compliance with the *Canada Wildlife Act* and *Wildlife Area Regulations*, Environment and Climate Change Canada's Canadian Wildlife Service posts signs along the NWA boundaries and at main access points that identify which 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 uses within the NWA.

ECCC–WED officers monitor compliance with the *Canada Wildlife Act*, *Wildlife Area Regulations*, *Migratory Birds Convention Act, 1994*, *Species at Risk Act*, *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. Canadian Wildlife Service 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 and will be implemented 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 7.

**Table 7: Implementation Strategy Timeline**

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
Impoundment monitoring	x	x	x	x	x	x	x	x	x	x
Boundary line maintenance	x	x	x	x	x	x	x	x	x	x
Forest bird survey					x					x
Marsh bird monitoring						x			x	
Waterfowl banding	x	x	x	x	x	x	x	x	x	x
Botanical survey			x					x		
Upland habitat management	x		x		x		x		x	
Acadian forest restoration		x		x		x		x		x
Monitor limnology and fish populations					x					x

### 9.1 MANAGEMENT AUTHORITIES AND MANDATES

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

The controlled water-level impoundments are maintained by Ducks Unlimited Canada.

### 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 overall management or administration of Tintamarre NWA. However, a number of informal collaborators have a presence in Tintamarre NWA.

The controlled water-level impoundments within the NWA are managed by Ducks Unlimited Canada, in collaboration with Environment and Climate Change Canada's Canadian Wildlife Service, under a land use agreement. Ducks Unlimited Canada is responsible for the maintenance of these impoundments. In collaboration with Ducks Unlimited Canada, an annual work plan for the maintenance of infrastructure (dykes, water control structures and access roads) for habitat management within controlled water-level impoundments will be developed.

The Jolicure Lakes Field Station is frequented by volunteers from the Holland College School of Resource Management. These students participate in various aspects of wildlife research and monitoring within the NWA (Figure 15).

The abandoned farm sites within the NWA, and associated orchards and hedge rows, have been the focus of past upland habitat management projects in collaboration with the Ruffed Grouse Society of Canada and the Sackville Rod and Gun Club. This work has been directed towards maximizing habitat benefits for a diversity of species that prefer early succession and edge habitat. Although no projects are currently under way, the study site in the vicinity of the field station is still periodically maintained as a demonstration area.

Members of the Chignecto Naturalist Club frequent the area, and the club has expressed the desire of its members to be kept advised of rare or uncommon bird sightings.



**Figure 15: Holland College School of Integrated Resource Management, class of 2009. The school regularly conduct cooperative research projects within the Tintamarre NWA**  
Photo: © Environment and Climate Change Canada

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