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Mississippi Lake National Wildlife Area Management Plan



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Acknowledgements

This management plan was prepared by Laurie Maynard of the Canadian Wildlife Service (Ontario) of Environment Canada and Felicia Syer (formerly Canadian Wildlife Service [Ontario]). Thank you to Shannon Badzinski, John Brett, Mike Cadman, Brigitte Collins, Lesley Dunn, Andrea Kettle, Shawn Meyer, and Jeff Robinson (Canadian Wildlife Service [Ontario]), and Barbara Slezak (formerly Canadian Wildlife Service [Ontario]), Al Hanson (Canadian Wildlife Service [Atlantic]), Olaf Jensen (Canadian Wildlife Service [National Capital Region]), Gord Mountenay and Alyson Symon (Mississippi Valley Conservation Authority), and Shaun Thompson (Ontario Ministry of Natural Resources) for their expert input or review of earlier drafts, and to Marie-Claude Archambault, Marko Andan, and Andrew Noad (Canadian Wildlife Service [Ontario]) for preparation of maps and figures.

Hélène Lévesque (Canadian Wildlife Service [Ontario]) prepared the 1986 *Management Plan Mississippi Lake National Wildlife Area*, which provided the groundwork for this update.

Copies of this Plan are available at the following addresses:

Environment Canada
Inquiry Centre
10 Wellington Street, 23rd Floor
Gatineau QC K1A 0H3
Toll Free: 1-800-668-6767 (in Canada only)
Email: enviroinfo@ec.gc.ca

Environment Canada – Canadian Wildlife Service
Ontario Region
4905 Dufferin Street
Toronto ON M3H 5T4

Environment Canada – Protected Areas Website at:
www.ec.gc.ca/ap-pa

ISBN: 978-1-100-23263-8
Cat. No.: CW66-376/2014E-PDF

How to cite this document:

Environment Canada. 2014. Mississippi Lake National Wildlife Area Management Plan. Environment Canada, Canadian Wildlife Service, Ontario Region, 52 pp.

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TTY: 819-994-0736
Email: enviroinfo@ec.gc.ca

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About Environment Canada's Protected Areas and Management Plans

What are Environment Canada protected areas?

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

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

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

What is a management plan?

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

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

What is Protected Area Management?

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

The series

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

To learn more

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

Mississippi Lake National Wildlife Area

The Mississippi Lake National Wildlife Area (NWA) (264 ha), located at the southwest end of Mississippi Lake in eastern Ontario, provides important refuge and breeding habitat for a variety of bird and fish species. The Mississippi Lake NWA is located within the boundaries of the Mississippi Lake Migratory Bird Sanctuary (MBS), which is larger in size. The NWA is comprised of McEwen Bay and its surrounding wetlands, along with some drier, forested upland habitat west of McEwen Bay and a small wetland and forested area along the north shore of the Mississippi River, east of the town of Innisville. McIntyre Creek passes through the southeast corner of the NWA and connects McEwen Bay to Mississippi Lake. This NWA and MBS were designated to protect habitat for staging migratory waterfowl.

The Mud Lake MBS was designated in 1959 at the request of local landowners, to restrict hunting of the staging waterfowl that take refuge on Mud Lake (known today as McEwen Bay). The MBS was renamed Mississippi Lake in 1970 to distinguish it from other Mud Lakes in Ontario. In 1968, Environment Canada's Canadian Wildlife Service began purchasing the land around McEwen Bay in order to conserve the habitat. The Mississippi Lake NWA was established in 1977 under the *Canada Wildlife Act* (1973) as the first NWA in Ontario.

For many years, Mississippi Lake NWA has been known for its use by large numbers of waterfowl. The wetlands in McEwen Bay provide important staging habitat for significant numbers of waterfowl during migration. Ten thousand ducks can pass through the NWA in a day during fall migration, with American Black Duck, Blue-winged Teal, Green-winged Teal, Hooded Merganser, Mallard, Wood Duck and Ring-necked Duck being the most common. The wetlands are important breeding habitat for waterbirds such as the Common Loon, Marsh Wren and Pied-billed Grebe. The shallow waters of McEwen Bay provide habitat for amphibians such as the American Bullfrog and spawning areas for fish such as Largemouth Bass, Northern Pike and Walleye.

A number of species at risk listed under the federal *Species at Risk Act* have been reported at the Mississippi Lake NWA including the endangered Bittern, threatened Least Bittern, Golden-winged Warbler, Canada Warbler, and Eastern Musk Turtle, and special concern Rusty Blackbird, Red-shouldered Hawk, Snapping Turtle, Monarch, and Broad Beech Fern. In addition, five bird species (Barn Swallow, Bobolink, Eastern Meadowlark, Wood Thrush and Eastern Wood-pewee) designated at risk by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), and the Bald Eagle and Black Tern, classified as special concern under the Ontario *Endangered Species Act, 2007*, have been reported at this site.

Public access to the NWA is permitted for day use only, via the entrance on Drummond Concession 9A, from December 16 to September 14. Recreation activities allowed include: hiking, skiing, snowshoeing, picnicking and wildlife viewing on designated trails, and seasonally recreational boating from boat launch and sport fishing. To provide a safe, undisturbed refuge for staging

migratory waterfowl, recreational boating and sport fishing, in McIntyre Creek and McEwen Bay is prohibited September 15 through December 15, except to directly access Mississippi Lake (outside the NWA) and a portion of the Mississippi River (within the NWA) from the NWA boat launch on McIntyre Creek. There is no other water access elsewhere in the NWA. Hunting is not permitted within the boundaries of the NWA, in accordance with the *Canada Wildlife Act* and *Wildlife Area Regulations*, and *Migratory Bird Sanctuary Regulations*.

The Mississippi Lake NWA is one of 10 National Wildlife Areas in Ontario. This 2014 Mississippi Lake NWA Management Plan provides the framework for management activities, is an update of the 1986 management plan, and replaces all previous versions.

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*.

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1 DESCRIPTION OF THE PROTECTED AREA

The Mississippi Lake National Wildlife Area (NWA) (264 ha) is located at the southwestern end of Mississippi Lake within the Township of Drummond/North Elmsley (formerly Township of Drummond), in eastern Ontario (Figure 1). The Mississippi Lake NWA is located within the boundaries of the Mississippi Lake Migratory Bird Sanctuary (MBS), which is larger in size (Figure 2). The 284 ha Mississippi Lake MBS boundary extends beyond the NWA boundary approximately 75 to 300 m, into the Mississippi Lake and Mississippi River, and includes private land (north of Anchor Point) and water adjacent to the NWA on the Mississippi River (Figure 2). Nearby urban centres include Innisville 0.5 km west, Carleton Place, 20 km northeast, and Perth, 20 km south of the NWA (Figure 1).

The Mississippi Lake NWA is comprised primarily of a large emergent marsh, shrub swamp thicket and shallow open water, and includes McEwen Bay (also known as Mud Lake) in its entirety, along with some drier upland deciduous forest habitat on the north and west boundaries, and old field (former agriculture) and meadow, southwest of McEwen Bay (Figure 2). The small portion of the NWA, along the north shore of the Mississippi River, contains a mixture of marsh, swamp and upland deciduous forest (Figure 2).

A small stream, McIntyre Creek, passes through the southeast corner of the NWA and connects McCoy's Creek and McEwen Bay to Mississippi Lake (Figure 2). In years of high water levels, the bay may also be connected to the lake for a short distance along the eastern boundary of the NWA north of Anchor Point (Figure 2).

Table 1: Mississippi Lake National Wildlife Area Summary Information

Protected Area designation	National Wildlife Area
Province or territory	Ontario
Geographic township and county	Township of Drummond/North Elmsley (formerly Drummond), Lanark County
Latitude and longitude	Latitude: 45°03'N, Longitude: 76°14'W
Size	264 ha (249 ha gazetted; 15 ha ungazetted)
Environment Canada protected area selection criteria (Protected Areas Manual)	Criteria 1. a) – <i>The area supports a population of species or subspecies or a group of species which is concentrated, for any portion of the year.</i> For this NWA: The area is a staging area for migratory waterfowl during spring and fall migration.
Environment Canada protected area classification system (Protected Areas Manual)	Species or critical habitat conservation
International Union for Conservation of Nature (IUCN) classification	Category IV Habitat/species management area: Category IV provides a management approach used in areas that have already undergone substantial modification, necessitating protection of remaining fragments, with or without intervention (Dudley, 2008).
Order in Council number	P.C. 1977-2958
Directory of Federal Real Property (DFRP) number	09393
Gazetted	1977

Management agency	Environment Canada – Canadian Wildlife Service (Ontario)
Additional designations	<ul style="list-style-type: none"> • Mississippi Lake Migratory Bird Sanctuary • "McEwen Bay Provincially Significant Wetland" • "Innisville Wetlands" Provincially Significant Life Science Area of Natural and Scientific Interest (ANSI) (includes McEwen Bay, Haley Lake and Steward Lake provincially significant wetlands) • North American Bird Conservation Initiative (NABCI), Bird Conservation Region (BCR) 13; within the Mixedwood Plains Ecozone, Great Lakes – St. Lawrence Forest Region Ecoregion
Faunistic and floristic importance	<ul style="list-style-type: none"> • Staging area for large numbers of waterfowl during migration • Diversity of habitat: open water, wetland, upland forest, old field (former agriculture) and meadow • Breeding habitat for migratory birds • Provincially significant wetlands • Locally significant Dry-Fresh Sugar Maple forest
Species at risk	<ul style="list-style-type: none"> • Ten federally listed endangered, threatened and special concern species under the <i>Species at Risk Act</i> (SARA) including birds (5), reptiles (2), vascular plant (2) and insect (1) species, and • Fourteen Committee on the Status of Endangered Wildlife in Canada (COSEWIC) designated species have been recorded in the NWA (i.e. five bird species in addition to the nine SARA-listed species).
Non-native and invasive species	Purple Loosestrife (<i>Lythrum salicaria</i>), Flowering-rush (<i>Butomus umbellatus</i>), European Frogbit (<i>Hydrocharis morsus-ranae</i>), Eurasian Milfoil (<i>Myriophyllum spicatum</i> L.), Common Buckthorn (<i>Rhamnus cathartica</i>), Tartarian Honeysuckle (<i>Lonicera tatarica</i>), Scots Pine (<i>Pinus sylvestris</i>), Common Lilac (<i>Syringa vulgaris</i>), Double-crested Cormorant (<i>Phalacrocorax auritus</i>), Zebra Mussel (<i>Dreissena polymorpha</i>), Earthworm (undetermined species) and Butternut canker (<i>Ophiognomonia clavignenti-juglandacearum</i>).
Public access and use	<p>Mississippi Lake NWA</p> <ul style="list-style-type: none"> • Public access to NWA for day use only, via entrance on Drummond Concession 9A. • Activities allowed include hiking, skiing, snowshoeing, picnicking and wildlife viewing on designated trails and parking lot. Recreational boating (maximum speed limit eight kilometres per hour) and sport fishing (no lead sinkers) are permitted within the NWA. • Facilities include public parking lot, designated hiking trail, public boat launch and washroom. • Public access, recreational boating and sport fishing is prohibited from September 15 to December 15, in McIntyre Creek and McEwen Bay, except to directly access Mississippi Lake (outside the NWA) from the NWA boat launch on McIntyre Creek. • Overnight camping, open fires, hunting and use of vehicles off-roads are prohibited at all times. <p>Mississippi Lake MBS</p> <ul style="list-style-type: none"> • Possession of firearms and hunting are not permitted within the boundary of the MBS in accordance with the <i>Migratory Bird Sanctuary Regulations</i>, and the <i>Migratory Birds Convention Act, 1994</i>.

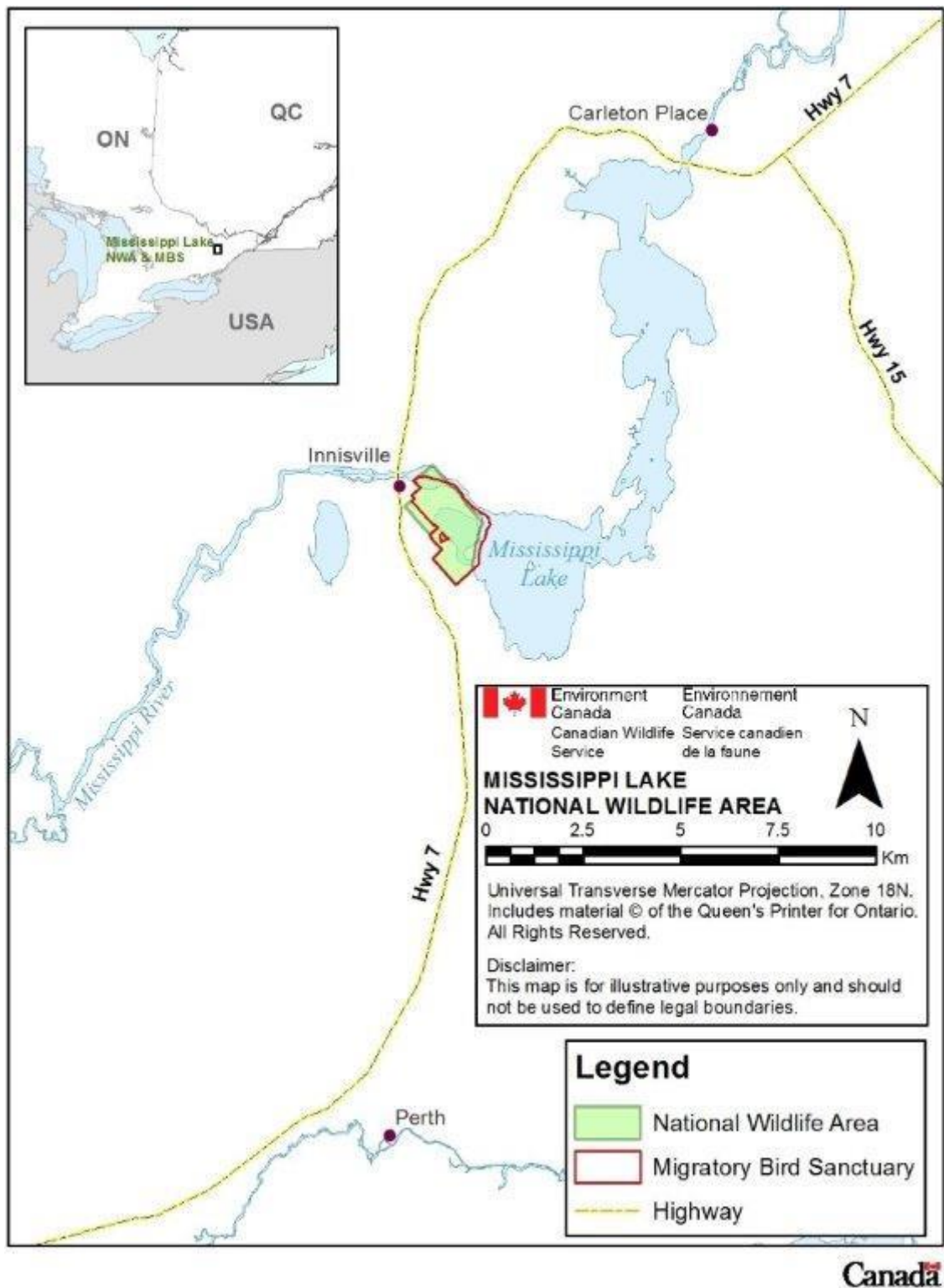


Figure 1: Location of Mississippi Lake National Wildlife Area, Ontario
 Source: Environment Canada, Canadian Wildlife Service (Ontario), 2014

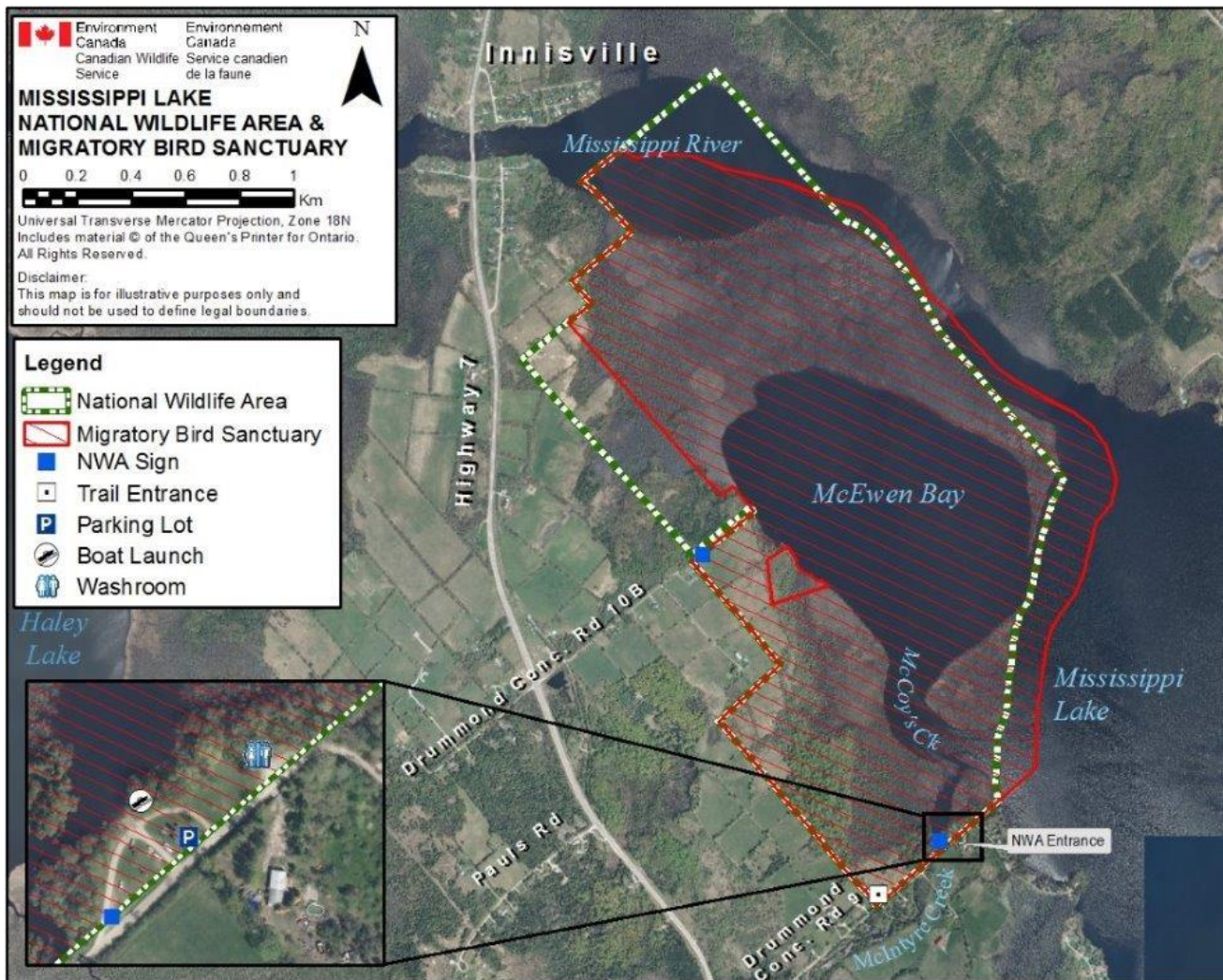


Figure 2: Aerial view of Mississippi Lake National Wildlife Area, Ontario (2006)

Source: Environment Canada, Canadian Wildlife Service (Ontario), 2014

1.1 REGIONAL CONTEXT

The Mississippi Lake NWA is located at the southwest end of Mississippi Lake. Mississippi Lake is one of numerous lakes along the Mississippi River and is one of the largest inland lakes in eastern Ontario. It is the last lake along the Mississippi River before it joins the Ottawa River. The entire perimeter of the lake is 55.9 km, and it reaches a depth of 9.2 m at its deepest point. Mississippi Lake is a mesotrophic lake due to nutrient inputs from development along the shore of the lake (Mississippi Valley Conservation Authority [MVCA], 2008).

Water levels on Mississippi Lake and River and McEwen Bay are controlled by a dam at Carleton Place (Mississippi River Water Management Plan [MRWMP], 2006). The dam is owned by MVCA in co-operation with the town of Carleton Place and Ontario Ministry of Natural Resources (OMNR) and operated following the Mississippi River Water Management Plan (Mountenay, personal communication, 2012). The lake level is managed to achieve an elevation of 134.35 m

(MRWMP, 2006). In the fall, the dam is operated to drawdown water levels in Mississippi Lake to provide storage for spring runoff (MRWMP, 2006).

Mississippi Lake is important to the local community. The lake provides the water supply for the town of Carleton Place and is popular for boating and sport fishing, waterfowl hunting, cottaging, and tourism. A number of fishing tournaments, including several professional bass competitions are held annually in Mississippi Lake (MVCA, 2011). In the winter, snowmobiling and ice fishing take place on Mississippi Lake.

In the mid-1980s, approximately 1700 residential structures were reported along the shores of Mississippi Lake, including 16 resorts, 1498 cottages and 259 permanent year-round residences (MVCA, 2011). Since this time, there has been a significant intensification and increase in both the number of residential structures on the lake and conversion of cottages to year-round residences (Symon, personal communication, 2012). McEwen Bay (within the NWA) is one of the few sections of the Mississippi Lake shoreline that is not developed, and the boat launch in the NWA provides the only public access at the southern end of the lake.

The Official Plan for the Township of Drummond/North Elmsley designates the NWA as an Area of Natural and Scientific Interest (ANSI) and as a Provincially Significant Wetland as classified by the Ontario Ministry of Natural Resources (Delcan Corporation, 2012). Surrounding areas are designated as rural.

The MVCA has established a Watershed Watch Program for the Mississippi watershed to monitor water quality and is currently working with OMNR and other organizations to prepare a Mississippi Lake Management Plan in response to increasing concern over development pressure, changes in land use, potential effects of upstream activities and the potential effects of climate change (MVCA 2008; Symon, personal communication, 2012).

The land cover surrounding the NWA is comprised of active and retired farmland (primarily livestock) and old field with numerous wetlands and forests adjacent to the Mississippi Lake and River. The wetlands with the NWA and several wetlands nearby are provincially significant. The "Innisville Wetlands" Provincially Significant Life Science Area of Natural and Scientific Interest (ANSI) is approximately 1900 ha of marsh and swamp and includes Haley and Steward Lakes, and the McEwen Bay provincially significant wetlands, Scotch Corner's Wetland and Campbell's Creek Wetlands (Thompson, personal communication, 2012). The size, substrate and habitat diversity make these wetlands some of the best examples of wetland complexes in Eastern Ontario (OMNR, 2012; White, 1992).

The Mississippi Lake NWA and MBS are within the North American Bird Conservation Initiative (NABCI), Bird Conservation Region (BCR) 13; within the Mixedwood Plains Ecozone, Great Lakes – St. Lawrence Forest Region Ecoregion.

The Mississippi Lake NWA is within the geographic area of a number of natural heritage conservation and land stewardship initiatives including the "Lower Great Lakes and St. Lawrence

River Area of Continental Significance" under the Eastern Habitat Joint Venture (EHJV) of the Canada-United States-Mexico North American Waterfowl Management Plan (NAWMP, 2012), the Eastern Ontario Model Forest (EMOF, 2010), the Mississippi Madawaska Land Trust Conservancy (MLTC, 2010) and the "Algonquin to Adirondack Initiative" (A2A, 2013).

1.2 HISTORICAL BACKGROUND

The Anishinabe Algonquins lived in the area, prior to the arrival of European settlers in the late 1700s. Around 1815, settlers of British origin arrived in the area, and much of the land surrounding Mississippi Lake was cleared for farming and lumber. In 1890, a dam was constructed at Carleton Place. Land at the southwest end of Mississippi Lake was inundated by water, forming Mud Lake (known today as McEwen Bay). The original purpose of the dam was to raise water levels so that timber could be floated downstream, three to four times a year (MVCA, 2011). Local use of Mississippi and Mud Lakes and the surrounding area in the 1800s-1900s included fishing, hunting, recreational boating, trapping of Common Muskrat (*Ondatra zibethicus*) and American Beaver (*Castor canadensis*), Wild Rice (*Zizania aquatica*) harvesting, agriculture (grazing), and maple syrup production (Lévesque, 1986). After construction of the dam, Mud Lake attracted large numbers of waterfowl and became an important hunting area. Prior to the 1890s, the majority of hunting areas were found on the eastern end of Mississippi Lake.

Establishment of the Mississippi Lake MBS

In the 1950s, the Mississippi Fish and Game Protective Association and local landowners advocated for the area to be declared MBS to restrict hunting and provide refuge for staging waterfowl. In 1959, the area was declared a federal bird sanctuary under the *Migratory Birds Convention Act (1917)*. The Mud Lake MBS was renamed Mississippi Lake MBS in 1970 to distinguish it from other Mud Lakes in Ontario. The 284-ha Mississippi Lake MBS includes McEwen Bay, private land surrounding the bay and north of Anchor Point, and a portion of the Mississippi River, east of the town of Innisville (Figure 2). At the same time, McIntyre Creek was also designated as a Provincial Fish Sanctuary by OMNR. The Fish Sanctuary designation was revoked in 1986 to allow sport fishing.

Establishment of the Mississippi Lake NWA

In 1968, the Canadian Wildlife Service (part of the Department of Indian Affairs and Northern Development at that time and subsequently part of Environment Canada in 1971) began purchasing land within the MBS to prevent development and establish a permanent waterfowl sanctuary. The Mississippi Lake NWA (249 ha) was officially designated in 1977 under the *Canada Wildlife Act (1973)* to protect habitat and create a refuge for staging migratory waterfowl. Mississippi Lake NWA was the first NWA established in Ontario. Since 1977, two small parcels of land (west of McEwen Bay adjacent to the NWA) totalling 15 ha have been acquired by Environment Canada Canadian

Wildlife Service (EC-CWS) and are planned for gazetting and management as part of the Mississippi Lake NWA. The Mississippi Lake NWA is 264 hectares in total: 249 gazetted, and 15 ha ungazetted.

1.3 LAND OWNERSHIP

The Mississippi Lake NWA is owned by the Government of Canada and administered by EC-CWS as described in Schedule 1 of the *Wildlife Area Regulations* of the *Canada Wildlife Act*. The NWA property is contiguous and is comprised of McEwen Bay in its entirety, land surrounding the bay, a portion of the Mississippi River and a small parcel of land along the north shore of the river (Figure 2). EC-CWS has full ownership of the land below the water in McEwen Bay and regulates activities in the waters proper. The land below and water in the Mississippi River and Mississippi Lake are under the jurisdiction of the Provincial Crown. The federal government does not hold the sub-surface mineral rights for Mississippi Lake NWA.

EC-CWS owns and maintains infrastructure (e.g., parking lot, washroom, metal storage container, trail, boat launch and fences) within the Mississippi Lake NWA. Fences installed along NWA boundaries adjacent to private property are jointly owned, and responsibilities for management are shared (see Section 1.4; Table 2).

There are two municipal roads along the NWA boundaries: Drummond Concession 10B and 9A (Figure 2). There are two unopened municipal road allowances within the NWA. These unopened road allowances are not maintained by the municipality and are used infrequently by Environment Canada staff to access the NWA. Public access to the NWA from unopened road allowances is only allowed for foot traffic from December 16 to September 14.

Land adjacent to the NWA is predominantly active and retired farmland under private ownership.

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*.

1.4 FACILITIES AND INFRASTRUCTURE

The primary access to the Mississippi Lake NWA is on the north side of Drummond Concession 9A, east of Highway No. 7 (Figure 2). There is a parking lot for 10 vehicles, a washroom and picnic tables at this entrance. A 3 km hiking trail through the forest in the south end of the NWA can be accessed from Drummond Concession 9A, southwest of the NWA parking lot (Figure 3). The facilities are maintained through an annual maintenance contract; however, the NWA parking lot is not maintained during the winter. Visitors can access McEwen Bay or Mississippi Lake by boat via the boat launch on McIntyre Creek at the southeast corner of the bay, within the NWA (Figure 3, 4).



Figure 3: Mississippi Lake National Wildlife Area Entrance and identification sign (2012)
 Photo: Jeff Robinson © Environment Canada, Canadian Wildlife Service (Ontario)



Figure 4: Boat launch on McIntyre Creek, Mississippi Lake National Wildlife Area (2012)
 Photo: Jeff Robinson © Environment Canada, Canadian Wildlife Service (Ontario)

Fences and Gates

Fences and gates have been installed in some areas to help prevent unauthorized off-road motorized vehicle access to the NWA property and restrict access to neighbouring properties from the NWA (Figure 2; Table 2).

Maintaining infrastructure is an ongoing need at Mississippi Lake NWA. Regular maintenance is required in order to ensure the safety of staff and authorized visitors, and to minimize potential risks associated with built structures (gates, buildings, fences, etc.).

Table 2: Mississippi Lake National Wildlife Area Facilities and Infrastructure

Type of facility or infrastructure	Approximate size or number	Responsibility holder or owner
Signs:		
911 sign #1024 Drummond Concession 9A	1	Township of Drummond/North Elmsley
NWA/MBS Boundary signs	80	Environment Canada – Canadian Wildlife Service (EC-CWS)
NWA identification signs	2	EC-CWS
Buildings:		
Public washroom	1.83 m x 1.83 m	EC-CWS
Structures:		
Metal storage container	6 m x 2 m	EC-CWS
Recreation facilities:		
Gravel parking lot	10 car capacity	EC-CWS
Picnic tables	2 tables	EC-CWS
Walking trail	3 km	EC-CWS
Boat launch	2.50 m x 17.0 m	EC-CWS
NWA driveway	~300 m	EC-CWS
Other:		
Fence	3 sections ~ 2 km	EC-CWS/private landowner

2 ECOLOGICAL RESOURCES

2.1 TERRESTRIAL AND AQUATIC HABITATS

Mississippi Lake NWA is primarily wetland habitat consisting of McEwen Bay and its associated marshland and the north shore of the Mississippi River. Approximately one sixth of the NWA is hardwood forest, and another small section consists of 5 ha mowed meadow and old field that was former cropland and pasture.

The gently sloping terrain around the low-lying McEwen Bay varies from smooth in the north to irregular in the south (Soil Research Institute, 1966). The lower areas are marshland and open water suitable for migrating waterfowl and spawning fish. This diversity provides habitat for a broad range of species. Limestone outcroppings are exposed in upland areas. In the higher areas, the vegetation communities are composed of open meadows and some deciduous forest.

2.1.1 Wetlands

There are two wetland areas within the NWA. The largest area is the provincially significant "McEwen Bay Wetland" which is a 224 ha wetland on Mississippi Lake, and covers approximately 80% of the NWA (EC-CWS, 1984; OMNR, 1984). McEwen Bay is separated from Mississippi Lake by a large island and peninsula at the mouth of the bay, and the wetland is comprised of emergent marsh (50%) and shrub thicket (50%) (EC-CWS, 1984; OMNR, 1984). The water in McEwen Bay is relatively shallow, exhibiting an average depth of about 1.5 m (Mohr and Maltby, 1985). The bottom is muddy, with loose vegetative debris and silt covering much of its surface. A very lush growth of aquatic plants can be found along the shoreline of the bay, between the open water and rooted aquatic submergent plants. Vegetation including Elodea (*Elodea canadensis*), Coontail (*Ceratophyllum demersum*), Water Celery (*Vallisneria Americana*), Wild Rice, Pondweed (*Potamogeton natans*), Yellow Pond Lily (*Nuphar variegatum*) and non-native Eurasian Milfoil (*Myriophyllum spicatum* L.) line the shore (Figure 5; Burns, 2003). During high water years, Wild Rice is the most abundant emergent to be found, forming extensive beds along the shore of the bay and river. Broad-leaf Cattail (*Typha latifolia*) occurs in the bay; however, few dense cattail stands are present. Flooded scrub, or more specifically willow-dogwood-maple thicket, dominates the land surrounding the bay. In some areas, this community is replaced by Silver Maple (*Acer saccharinum*) swamp at the water interface.

The second wetland area within the NWA is approximately 6 ha, and is part of the riverine wetland that extends along the north shore of the Mississippi River upstream from Mississippi Lake and is part of the "Innisville Wetlands Life Science ANSI" (OMNR, 2012). This small wetland area is composed of deciduous swamp and shallow marsh vegetation communities, providing a variety of habitats and connectivity to wetlands and uplands immediately adjacent to the east, and along the Mississippi River (The Nature Conservancy of Canada [NCC], 2008). The deciduous swamp

consists of trees such as Silver Maple and shrubs such as Red-osier Dogwood (*Cornus sericea*), and the shallow marsh consists mostly of Broad-leaf Cattail and areas of shallow open water.



Figure 5: Emergent vegetation in McEwen Bay, Mississippi Lake National Wildlife Area (2009)
Photo: © Stewart Hamill

2.1.2 Upland Forest

The upland forest is characteristic of the surrounding area. The forest is second growth, and forest patches are dominated by deciduous tree species. Within the NWA, Sugar Maple deciduous forest grows on dry land adjacent to the shrub thicket and marsh areas west of McEwen Bay and along the north shore of the Mississippi River (Figure 6; Hamill, 2009; White, 2008).

The forest is moderately mature, with little recent disturbance (Hamill, 2009; White, 2008). The canopy varies widely from open to closed and is comprised of Sugar Maple (*Acer saccharum*), Basswood (*Tilia americana*), White Ash (*Fraxinus americana*), White Elm (*Ulmus americana*), American Beech (*Fagus grandifolia*), White Birch (*Betula papyrifera*), Eastern Cottonwood (*Populus deltoides*), Eastern White Cedar (*Thuja occidentalis*) and Balsam Fir (*Abies balsamea*) (Hamill, 2009; White, 2008). This community supports a small population of the endangered Butternut (*Juglans cinerea*). There is limited undergrowth, no clear dominance in ground flora, containing typical spring flora including Blue Cohosh (*Caulophyllum thalictroides*), White Trillium (*Trillium grandiflorum*) and Wild Lily-of-the-Valley/Canada Mayflower (*Maianthemum canadense*) (Hamill, 2009), which are indicator species for undisturbed undergrowth (Keddy and Drummond, 1995). Non-native plant species are found primarily in disturbed areas along trails (Hamill, 2009; White, 2008).



Figure 6: Sugar Maple deciduous forest around McEwen Bay, Mississippi Lake National Wildlife Area (2008)

Photo: © Stewart Hamill

2.1.3 Old Field and Meadow

Old field and meadow habitats are located along the extreme west side of the NWA (Figure 2; White, 2008). These areas were formerly pasture and farmlands and have been recolonized by native shrubs and trees (e.g. Trembling Aspen [*Populus tremuloides*], Prickly Ash [*Zanthoxylum americanum*], White Ash, White Pine [*Pinus strobus*], and Choke Cherry [*Prunus virginiana*]) (Robinson, personal communication, 2012; White, 2008). Most of the ground flora is typical of past agriculture on the land, dominated by Kentucky Blue Grass (*Poa pratensis*), Timothy (*Phleum pratense*), Awnless Brome Grass (*Bromus inermis*), Wild Carrot (*Daucus carota*) and Canada Goldenrod (*Solidago canadensis*) (White, 2008).

2.1.4 Managed Lawn

Land cover at the NWA entrance on Drummond Concession 9A around the parking lot and boat launch is grassed lawn, dominated by Kentucky Blue Grass (*Poa pratensis*), White Clover (*Trifolium repens*) and Common Plantain (*Plantago major*) (White, 2008).

2.2 WILDLIFE

2.2.1 Birds

For many years, McEwen Bay has been known for its use by large numbers of waterfowl. The marshes provide important staging habitat for significant numbers of several different species of waterfowl during migration. The designation of the NWA and MBS provides birds with a safe haven from hunters and recreational boating as they migrate south each fall. Up to 10000 ducks can pass through the NWA in a day during fall migration, with American Black Duck (*Anas rubripes*), Blue-

winged Teal (*Anas discors*), Green-winged Teal (*Anas crecca*) Hooded Merganser (*Lophodytes cucullatus*), Mallard (*Anas platyrhynchos*), Wood Duck (*Aix sponsa*), and Ring-necked Duck (*Aythya collaris*) being the most common (Lévesque, 1986; Rosien et al., 2004). Waterfowl species reported breeding in the NWA include Mallard, American Black Duck, Wood Duck, Blue-winged Teal and Canada Goose (*Branta Canadensis*) (EC-CWS, 2012a; Hamill, 2009; Hamill and Thomson, 2012; Rosien et al., 2004).

Several species of marsh dependent waterbirds have been recorded in the NWA, including American Bittern (*Botaurus lentiginosus*), Virginia Rail (*Rallus limicola*), Swamp Sparrow (*Melospiza georgiana*), Sora (*Porzana carolina*) and the federally threatened Least Bittern (*Ixobrychus exilis*) (EC-CWS, 2012a; Hamill, 2009). Waterbird species reported breeding in the NWA include the Common Loon (*Gavia immer*), Marsh Wren (*Cistothorus palustris*), Virginia Rail, Black Tern (*Chilidonias niger*), Pied-billed Grebe (*Podilymbus podiceps*) and Common Tern (*Sterna hirundo*) (Figure 7; EC-CWS, 2012a; Hamill, 2009; Hamill and Thomson, 2012).



Figure 7: Common Loon nest at Mississippi Lake NWA (2009)

Photo: © Stewart Hamill

There is limited information on landbird species and use of upland habitats within the NWA. However, recent bird surveys reported over 50 species of landbirds using a variety of habitats (i.e., upland forest, old field, meadow and wetland) (Hamill, 2009; Hamill and Thomson, 2012). Landbird species reported include warblers (e.g., Yellow-rumped Warbler [*Dendroica coronata*] and threatened Canada Warbler [*Cardellina canadensis*], thrushes (e.g. Wood Thrush [*Hylocichla mustelina*]), sparrows (e.g. Swamp Sparrow [*Melospiza georgiana*] and raptors (e.g. Osprey [*Pandion haliaetus*]) (Hamill, 2009; Hamill and Thomson, 2012). The majority of landbird species reported are migratory species and will use the NWA as stopover and possibly breeding habitat. Landbird species confirmed breeding in the NWA include the Northern Rough-winged Swallow

(*Stelgidopteryx serripennis*), the Belted Kingfisher (*Megaceryle alcyon*), Hairy Woodpecker (*Picoides villosus*), Rose-breasted Grosbeak (*Pheucticus ludovicianus*) and the Eastern Kingbird (*Tyrannus tyrannus*) (Hamill, 2009; Hamill and Thomson, 2012).

2.2.2 Mammals

Mississippi Lake NWA is also home to a variety of mammals. A small mammal trapping study documented five species residing in the NWA: Short-tailed Shrew (*Blarina brevicauda*), Masked Shrew (*Sorex cinereus*), Meadow Vole (*Microtus pennsylvanicus*), Deer Mouse (*Peromyscus maniculatus*) and the Eastern Chipmunk (*Tamias striatus*) (EC-CWS, 1980). The marsh provides habitat for several species of fur bearers including North American Beaver, River Otter (*Lutra canadensis*) and Muskrat (Hamill and Thomson, 2012). Black Bear (*Ursus americanus*), Red Squirrel (*Tamiasciurus hudsonicus*), Raccoon (*Procyon lotor*), White-tailed Deer (*Odocoileus virginianus*), Eastern Cottontail (*Sylvilagus floridanus*), Snowshoe Hare (*Lepus americanus*) and Porcupine (*Erethizon dorsatum*) can also be found within the NWA (EC-CWS, 2012b; Hamill and Thomson, 2012; Robinson, personal communication, 2012).

2.2.3 Reptiles and Amphibians

Fourteen species of reptiles and amphibians have been reported in the NWA, including seven species of frogs and toads (e.g., Green Frog [*Rana clamitans*], Tetraploid Gray Tree Frog [*Hyla versicolor*], American Bullfrog [*Rana catesbeiana*], Northern Leopard Frog [*Rana pipiens*], Wood Frog [*Rana sylvatica*], Northern Spring Peeper [*Pseudacris crucifer crucifer*] and Eastern American Toad [*Bufo americanus americanus*]), two snakes (Eastern Garter Snake [*Thamnophis sirtalis sirtalis*] and Northern Water Snake [*Nerodia sipedon sipedon*]), three turtle species (Midland Painted Turtle [*Chrysemys picta marginata*], Eastern Musk Turtle, also known as Stinkpot [*Sternotherus odoratus*] and Snapping Turtle [*Chelydra serpentina*] and one salamander (Northern Redback Salamander [*Plethodon cinereus*]) (Burns, 2003; EC-CWS, 2012c; Hamill, 2009; Hamill and Thomson, 2012).

McEwen Bay is identified as important habitat for American Bullfrogs, and studies reported an abundant population (Burns, 2003; Seburn and Hamill, 2000). However, bullfrog surveys in 2001 and 2003 suggest a decline in American Bullfrogs. In 2003, the population could not be estimated due to a small sample size (Burns, 2003). The American Bullfrog population has not been formally surveyed since 2003 due to poor habitat suitability (Burns, 2003); however, the species was found within the NWA in 2008, 2009 and 2012 (Hamill, 2009; Hamill and Thomson, 2012).

2.2.4 Fish

There is no data specific to the NWA. However, Mississippi Lake is a popular site for sport fishers, supporting both warm and coldwater fish species (Kerr, 1999). Nineteen species were recorded in Mississippi Lake in 2009, with Yellow Perch (*Perca flavescens*) being the most

abundant, followed by Pumpkinseed (*Lepomis gibbosus*), Smallmouth Bass (*Micropterus dolomieu*), Bluegill (*Lepomis macrochirus*), Northern Pike (*Esox lucius*), Rock Bass (*Ambloplites rupestris*), Log Perch (*Percina caprodes*) and Walleye/Yellow Pickerel (*Sander vitreus*) (OMNR, 2009). McIntyre Creek passing through the southeast end of the NWA provides spawning areas for Walleye, Northern Pike and Largemouth Bass (*Micropterus salmoides*) (Kerr, 1999).

Walleye, Largemouth Bass and Black Crappie (*Pomoxis nigromaculatus*) are all introduced species in Mississippi Lake (Kerr, 1999). In the past, Mississippi Lake has been stocked with Smallmouth Bass, Walleye, Lake Trout (*Salvelinus namaycush*) and Lake Whitefish (*Coregonus clupeaformis*) (Kerr, 1999). Fish stocking was discontinued in 1980, and the lake is managed by OMNR as a self-sustaining fishery (Kerr, 1999).

2.2.5 Invertebrates

Although there are no inventories or surveys of invertebrates, it is likely the NWA supports a variety of invertebrates. The wetlands produce numerous flying insects, which insectivorous bird species consume to fuel their spring and fall migrations (EC-CWS, 2012a; Hamill, 2009; Hamill and Thomson, 2012). Field visits and surveys have reported several species of dragonflies, damselflies and butterflies (Hamill and Thomson, 2012; White, 2008).

The Monarch butterfly (*Danaus plexippus*), listed as special concern (SARA), has been reported at the NWA (Hamill, 2009). Monarchs use the NWA as migratory and stopover habitat during late summer and early fall, stopping to feed on plants or roost in trees on their way south to their wintering grounds (COSEWIC, 2010; Government of Canada, 2012; Hamill, 2009).

2.2.6 Species at Risk

Ten species at risk, listed under the federal *Species at Risk Act* (SARA), have been reported at Mississippi Lake NWA, including the endangered Butternut, threatened Eastern Musk Turtle, Canada Warbler, Golden-winged Warbler (*Vermivora chrysoptera*), Least Bittern and special concern Broad Beech Fern (*Phegopteris hexagonoptera*), Monarch butterfly, Snapping Turtle, Red-shouldered Hawk (*Buteo lineatus*) and Rusty Blackbird (*Euphagus carolinus*) (Table 3; COSEWIC, 2013; Government of Canada, 2013; Hamill, 2009; Hamill and Thomson, 2012).

In addition, the Barn Swallow (*Hirundo rustica*), Bobolink (*Dolichonyx oryzivorus*), Eastern Meadowlark (*Sturnella magna*) and Wood Thrush, assessed and designated as threatened, and Eastern Wood-pewee (*Contopus virens*), assessed and designated as special concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), have been observed at the NWA (Table 3; COSEWIC, 2013; EC-CWS, 2012e; Hamill, 2009; Hamill and Thomson, 2012). The Bald Eagle (*Haliaeetus leucocephalus*) and Black Tern are provincial species at risk classified as special concern under the Ontario *Endangered Species Act, 2007* and have been reported at this site (Table 3; Government of Ontario, 2012; Hamill, 2009; Hamill and Thomson, 2012; White, 2008).

It is anticipated that critical habitat¹ may be identified on the NWA for a number of species at risk.

The majority of the endangered Butternut within the NWA have been infected by the fungal blight (i.e., Butternut canker [*Ophiognomonia clavigignenti-juglandacearum*]) and are in decline (Hamill and Thomson, 2012; White, 2008; Wilson, 2009).

For more information on the federal SARA, COSEWIC and the provincial *Endangered Species Act, 2007*, refer to Appendix 1 or visit:

- www.sararegistry.gc.ca
- www.cosewic.gc.ca
- www.e-laws.gov.on.ca/html/source/regs/english/2012/elaws_src_regs_r12004_e.htm

Table 3: Species at risk recorded at the Mississippi Lake National Wildlife Area

Common and scientific names of species	Status		
	Canada		Ontario
	SARA ^a	COSEWIC ^b	ESA, 2007 ^c
Vascular plants			
Broad Beech Fern <i>Phegopteris hexagonoptera</i>	Special Concern	Special Concern	Special Concern
Butternut <i>Juglans cinerea</i>	Endangered	Endangered	Endangered
Invertebrates			
Monarch <i>Danaus plexippus</i>	Special Concern	Special Concern	Special Concern
Reptiles			
Eastern Musk Turtle <i>Sternotherus odoratus</i>	Threatened	Special Concern	Threatened
Snapping Turtle <i>Chelydra serpentina</i>	Special Concern	Special Concern	Special Concern
Birds			
Bald Eagle <i>Haliaeetus leucocephalus</i>	no status	not at risk	Special Concern
Barn Swallow <i>Hirundo rustica</i>	no status	Threatened	Threatened
Black Tern <i>Chlidonias niger</i>	no status	not at risk	Special Concern
Bobolink <i>Dolichonyx oryzivorus</i>	no status	Threatened	Threatened
Canada Warbler <i>Cardellina canadensis</i> / <i>Wilsonia canadensis</i>	Threatened	Threatened	Special Concern
Eastern Meadowlark <i>Sturnella magna</i>	no status	Threatened	Threatened
Eastern Wood-pewee <i>Contopus virens</i>	no status	Special Concern	not classified
Golden-winged Warbler <i>Vermivora chrysoptera</i>	Threatened	Threatened	Special Concern

¹ *Species at Risk Act*: “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.”
<http://laws-lois.justice.gc.ca/PDF/S-15.3.pdf>

Common and scientific names of species	Status		
	Canada		Ontario
	SARA ^a	COSEWIC ^b	ESA, 2007 ^c
Least Bittern <i>Ixobrychus exilis</i>	Threatened	Threatened	Threatened
Red-shouldered Hawk <i>Buteo lineatus</i>	Special Concern	not at risk	not classified
Rusty Blackbird <i>Euphagus carolinus</i>	Special Concern	Special Concern	not classified
Wood Thrush <i>Hylocichla mustelina</i>	no status	Threatened	not classified

^a SARA (*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).

^b COSEWIC (Committee on the Status of Endangered Wildlife in Canada): Extinct, Extirpated, Endangered, Threatened, Special Concern, not at risk (assessed not at risk) or data deficient (available information is insufficient to resolve eligibility for assessment or permit an assessment of the wildlife species' risk of extinction).

^c ESA, 2007 (*Endangered Species Act, 2007*): Ontario Ministry of Natural Resources (Species at Risk in Ontario [SARO] List): Extirpated, Endangered, Threatened, Special Concern or not classified.

3 MANAGEMENT CHALLENGES AND THREATS

3.1 LAND USE AND DEVELOPMENT ON MISSISSIPPI LAKE AND RIVER

Mississippi Lake NWA is one of the few undeveloped areas along the shoreline of Mississippi Lake and River and provides a variety of habitats and refuge for wildlife in the surrounding area. It is important that the management of nutrient inputs to the lake continues, so that the health of the McEwen Bay ecosystem is not negatively impacted by development. High levels of phosphorus and nitrogen can increase plant growth, causing an ecosystem shift towards less desirable fish and invertebrate species that may include invasive species (EC, 2010).

There is increasing concern over potential long-term effects of multiple stressors on the Mississippi Lake subwatershed such as climate change, intensified urbanization and growth, pollution, and the introduction of exotic and invasive species (Symon, personal communication, 2012). In response to these concerns, the MVCA in collaboration with Mississippi Lakes Association (MLA) initiated development of a Mississippi Lake Subwatershed Plan (MLSP) in 2011. The MLSP will identify adaptive strategies to maintain and improve water quality and water level management on Mississippi Lake (Symon, personal communication, 2012).

3.2 PUBLIC ACCESS ISSUES

The effects of public access on wildlife and habitat have not been studied, and the types and frequency of prohibited activities are difficult to determine.

There is widespread support in the local community to protect Mississippi Lake NWA for wildlife, and to maintain public access to Mississippi Lake via the boat launch in the NWA. However, Environment Canada staff and contractor reports of damage to habitat and infrastructure indicate unauthorized access and prohibited activities are a common occurrence.

The incidence of prohibited activities in the Mississippi Lake NWA, such as off-road ATV and vehicle use, hunting, firewood collection and open fires, dogs off leash, camping, garbage dumping, vandalism, disturbance to wildlife, and fishing and boating in McEwen Bay (i.e., September 15 – December 15), creates additional pressures on resources required to prevent and mitigate effects.

Enforcement of prohibited activities and water access in McEwen Bay (September 15 – December 15) is a challenge due to lack of capacity (this is an unstaffed site) as well as the multiple access points to the NWA by water and neighbouring properties.

Misinterpretation of NWA boundaries and the prohibitions on access during fall migration, a lack of acceptance of the prohibition on public access and the designation as federally protected lands has occurred within the local community.

Public access to McEwen Bay and McIntyre Creek during the winter over the ice and water poses particular risks to human health and safety. Other hazards to visitors include Poison Ivy (*Toxicodendron radicans*) along trails.

Any increase in visitation to the NWA may require an increase in the maintenance of facilities (e.g., parking lot, boat launch, access roads, trail and washroom), and actions to promote compliance and safe practices within the NWA.

3.3 NON-NATIVE AND INVASIVE SPECIES

There are several non-native and invasive plant species at Mississippi Lake NWA, including Purple Loosestrife (*Lythrum salicaria*), Tartarian Honeysuckle (*Lonicera tatarica*), Scots Pine (*Pinus sylvestris*), Common Lilac (*Syringa vulgaris*) and Common Buckthorn (*Rhamnus cathartica*) (Hamill, 2009; Hamill and Thomson, 2012). Other non-native plant species such as Flowering-rush (*Butomus umbellatus*), European Frogbit (*Hydrocharis morsus-ranae*) and Eurasian Milfoil (*Myriophyllum spicatum* L.) have been reported in marsh areas within the NWA (Hamill and Thomson, 2012). The majority of these plant species currently do not present a management challenge: they create some competition with native plants for light and nutrients, but do not dominate. Problems may arise with more aggressive plant species that have the ability to rapidly spread, limit growth of native species and reduce habitat quality for wildlife. Other non-native and invasive species reported at Mississippi Lake NWA include Butternut canker (*Ophiognomonia clavignenti-juglandacearum*), Earthworms (undetermined species), Double-crested Cormorant (*Phalacrocorax auritus*) and Zebra Mussel (*Dreissena polymorpha*) (Hamill, 2009; Hamill and Thomson, 2012). Vegetation and non-native and invasive species will be monitored regularly to identify the presence of non-native species, areas where species are expanding, and the effects on wildlife and habitat. Forecasting effective management options to reduce the spread and mitigate effects of these species is often hampered by limited knowledge and the ability of many of these species to adapt to Ontario growing conditions.

The Emerald Ash Borer (*Agrilus planipennis*) has made its way as far north as Sault Ste. Marie. Although it has not yet been confirmed in the NWA, its presence in surrounding areas suggests that it may soon become a threat. This insect kills all species of ash trees, including White Ash, a species found in the NWA (Canadian Food Inspection Agency [CFIA], 2011; White, 2008). The Emerald Ash Borer is able to fly several kilometres, although it is often spread through the transportation of wood products (CFIA, 2011). The CFIA has created wood and wood product movement restrictions to try and regulate the spread of Emerald Ash Borers (CFIA, 2011). These restrictions are not yet in place in Lanark County, but they are in place in the nearby Ottawa and the Leeds and Grenville regions (CFIA, 2011). Tree or wood products cannot be transported out of these regions, in an attempt to reduce the spread of this pest (CFIA, 2011).

There is a well-established Zebra Mussel (*Dreissena polymorpha*) population in Mississippi Lake (Lee, personal communication, 2011). Zebra Mussels have altered aquatic ecosystems within both Mississippi Lake and McEwen Bay (MVCA, 2008). At this time, there are no methods to stop

the spread of Zebra Mussels once established, and the effects on wildlife and habitat within the NWA are unknown.

3.4 FERAL AND DOMESTIC ANIMALS, AND OVERABUNDANT WILDLIFE

Wildlife such as Beaver, though native to Ontario, can become overabundant and create management challenges for NWA staff. Beavers cause damage to trees, and the construction of dams may alter hydrology within the NWA and neighbouring properties (Robinson, personal communication, 2012).

Other animals that can pose challenges for management of the site include feral cats, dogs, livestock, and wildlife such as skunks, raccoons, and groundhogs. These animals may be feral strays and in some cases are unwanted domestic pets (e.g., turtles and fish), livestock from neighbouring properties or unwanted wildlife (e.g., skunks and raccoons) that have been released illegally in the NWA.

While the number of feral and domestic animals on the NWA may be few and infrequent, these animals can exert significant predatory pressure on native wildlife through nest destruction and eating eggs and individuals (i.e., birds and turtles), transferring disease and pathogens to wild animals, as well as disrupting natural habitats through soil disturbance, and require ongoing active management.

3.5 WATER LEVEL MANAGEMENT ON MISSISSIPPI LAKE AND RIVER

The wetland habitat of Mississippi Lake NWA is dependent on the maintenance of water levels in the Mississippi River (OMNR, 2006). Water levels within McEwen Bay are directly affected by the operation of the dam at Carleton Place.

Studies examining water levels and flows and the potential impacts of climate change within the Mississippi valley watershed have indicated that stream flows could be 40% less than present by summer of 2099, with periods of intense rainfall, resulting in additional nutrient loading and decreased capacity to assimilate nutrient loads (Symon, personal communication, 2012; Bruce et al., 2000). Mississippi Lake has a low flushing rate and is particularly susceptible to nutrient inputs from its extensive 2900 km² upstream drainage area (Symon, personal communication, 2012).

There is a need to develop adaptive management strategies to consider water level changes over time and other potential effects of climate change and variability on habitat and wildlife, and to identify whether habitat management practices to restore and protect water quality within Mississippi Lake NWA and the broader Mississippi Lake watershed are needed.

3.6 MULTI-SPECIES CONSERVATION AND SPECIES AT RISK

Multi-species conservation and recovery is an ongoing challenge in the Mississippi Lake NWA. Many species have complex habitat requirements that are not well understood, and small and/or widely distributed populations are often underrepresented in general research studies, and

site-specific habitat requirements are unknown. It is anticipated that "critical habitat" (under SARA), necessary for the conservation and recovery of species at risk may be identified for a number of species on the NWA. A foreseeable challenge will be how to balance the varying habitat needs of multiple species: both common and species at risk.

3.7 LEGACY ISSUES

Ungazetted Lands

Following the establishment of the NWA in 1977, EC-CWS acquired two additional parcels of land totalling 15 ha, adjacent to the NWA. These lands are in the process of being gazetted and will be managed as part of the Mississippi Lake NWA. However, in the interim the *Wildlife Area Regulations* do not apply. This situation presents a management challenge to establish a consistent management approach for all NWA parcels.

Ownership and maintenance of fences are shared (between EC-CWS and neighbouring land managers). Once all lands are gazetted, boundaries and land and water management practices will be reviewed. It is anticipated that the continuation of shared ownership and arrangements for maintenance will need to be formalized to ensure responsibilities and commitments are documented. In some cases, boundary delineation at the field level needs to be clarified to promote management practices and land uses that are compatible with management objectives for the NWA as well as neighbouring land managers' objectives. This situation is of particular concern along waterways, where it may not be feasible to post boundaries and restrict access, and adjacent to agricultural lands where buffers are narrow or non-existent, and habitats may be vulnerable to damage from adjacent land use practices.

National Wildlife Area and Migratory Bird Sanctuary Boundaries

There is a long history of hunting and sport fishing within Mississippi Lake, both within and outside the NWA, prior to the establishment of the MBS and NWA. Access to the NWA and recreational activities within it are restricted because a key conservation purpose is to provide undisturbed staging habitat for migratory waterfowl. Since the establishment of the MBS (1959) and NWA (1977), hunting is not allowed in the MBS and NWA, and recreational boating and sport fishing (no lead sinkers) are prohibited during a portion of the year.

The NWA and MBS boundaries are not identical; they extend on land and water, and sometimes cause confusion for neighbouring landowners and visitors (by land and water) regarding prohibited and authorized activities relative to the boundaries of the NWA and MBS. It is a particular management challenge to communicate boundaries along the water to visitors accessing the NWA by water.

Environmental Site Assessment

EC-CWS works with Environment Canada's Contaminated Sites Program to conduct site audits to identify contaminants, assess risks and remediate contaminants on federal lands.

The Phase I and Preliminary Phase II (combined) Environmental Site Assessment at Mississippi Lake NWA was completed in 2008 by Environment Canada's Contaminated Sites Program to assess legacy issues (e.g., vacant structures, waste and debris) (Franz Environmental Inc., 2009). There was no need for further site investigation or remediation identified at that time (Franz Environmental Inc., 2009).

Table 4: Management Approaches for Mississippi Lake National Wildlife Area

Management challenges and threats	Goals and objectives	Management approaches (actions, including level of priority ¹)
<ul style="list-style-type: none"> Limited knowledge of the use of the site by resident and migratory species. Forest cover as buffer and contiguous habitat around McEwen Bay within the NWA is fragmented. Predation pressures and habitat disruption by feral and domestic animals. Reduction in biodiversity due to expansion of non-native and/or invasive plant and animal species. Water levels in McEwen Bay are outside of EC-CWS control. <i>Wildlife Area Regulations</i> do not apply to federally owned, ungazetted lands. Fragmentation of natural habitats surrounding the NWA as a result of development pressure. 	<p>Goal 1: Important habitats particularly for migratory birds and native plants and animals, including species at risk, are maintained and improved.</p> <p>1.1 Sub-goal: Wetland habitats will be managed to maintain and improve habitat quality and ecosystem functions and where feasible, to sustain and increase populations of migratory birds and native plants and animals, including species at risk.</p> <p>1.2 Sub-goal: Upland forest habitats will be managed to maintain and improve upland forest quality and ecosystem function to sustain and, where feasible, increase populations of migratory birds and native plants and animals, including species at risk.</p> <p>1.3 Sub-goal: The effects of non-native and invasive species, over-abundant wildlife, and feral and domestic animals on native habitat and wildlife are minimized.</p>	<ul style="list-style-type: none"> Establish baseline inventory of native, non-native, and invasive species. (1) Conduct periodic surveys of breeding and migratory bird numbers to assess habitat needs to support nesting and staging birds. (2) Maintain contact with the MVCA (the operators of the dam), and OMNR to ensure EC-CWS interests in management of water levels will be considered. (1) Track changes in wetland extent and quality, biodiversity, and wetland dependent species at risk in anticipation of the effects of water level management and climate change and variability on Mississippi Lake and River. (2) Contribute to the Mississippi Lake Subwatershed Plan. (as required) Monitor the health and status of Butternut trees. (1) Review agreements, permits and collaborative arrangements, revise and renew as appropriate. (1) Gazette federal lands (15 ha) under the <i>Canada Wildlife Act</i>. (1) Conduct periodic habitat assessments (i.e., wetland, upland forest, old field and meadow). (2) Provide guidance for authorized visitors (e.g., public, permit holders, contractors) to avoid and reduce disturbance to wildlife and habitat. (1) Implement recommendations from recovery documents for species at risk where feasible. (1) Restrict access (i.e., vehicle, foot traffic) to sensitive habitats. (1) Survey and map known aggressive non-native and invasive plant species to detect changes in the extent of the habitat dominated by these species. (1) Undertake targeted control of non-native and invasive plant species as appropriate. (1) Control and manage overabundant wildlife and feral and domestic animals. (1) Promote compliance and prevent release of domestic animals or unwanted wildlife at the NWA. (1) Engage Wildlife Enforcement Directorate (WED) when required. (1)

Management challenges and threats	Goals and objectives	Management approaches (actions, including level of priority ¹)
<ul style="list-style-type: none"> Unauthorized access causing disturbance to wildlife and habitat (particularly staging and nesting birds). Increased demand for public access and use. 	<p>Goal 2: The effects of human activities on habitat and wildlife, and infrastructure, are minimized.</p> <p>2.1 Sub-goal: Reduce the effects of human activities on the NWA.</p> <p>2.2 Sub-goal: Ensure a safe environment for visitors.</p>	<ul style="list-style-type: none"> Complete gazetting and clearly identify boundaries. (1) Communicate allowed and prohibited activities and conditions of seasonal use through signage, website, permits and public notices. (1) Engage stakeholders and visitors to promote safe practices and compliance to reduce unauthorized access and prohibited uses. (1) Continue to restrict the use of McEwen Bay by boaters to certain times of the year and within a specific speed limit. (1) Conduct annual site visits to monitor and maintain facilities and infrastructure, and to assess effects of public recreation on wildlife and habitat and mitigate as necessary. (1) Conduct routine site maintenance and reporting activities. (1) Schedule periodic formal assessments of all facilities and infrastructure to identify contaminant risks and other non-routine maintenance needs. (1) Enforce <i>Wildlife Area Regulations</i> through visits by the WED. (1) Contract with local business or individuals to maintain facilities and provide information to EC (EC-CWS and EC-WED) on health and safety or compliance matters. (1) Review agreements, permits and collaborative arrangements, revise and renew as appropriate. (1) Remove any structures that pose a health and safety risk. (1)
<ul style="list-style-type: none"> Fragmentation and degradation of natural habitats and loss of migration corridors and habitat connectivity as a result of development pressures. Development pressures in Township of Drummond/North Elmsley and Lanark County affecting the Mississippi Lake watershed. 	<p>Goal 3: Increase the habitat connectivity between Mississippi Lake NWA and adjacent properties.</p> <p>3.1 Sub-goal: Work with partners and stakeholders to maintain and increase connectivity of habitats and migration corridors by consolidating and, where possible, expanding the protected area land base through partnerships.</p> <p>3.2 Sub-goal: Contribute to regional landscape-level conservation and restoration initiatives.</p>	<ul style="list-style-type: none"> Identify priority lands adjacent to the NWA for conservation; contribute to regional landscape-level conservation initiatives. (2) Encourage conservation of priority adjacent lands through expansion of the NWA or other securement and stewardship options such as conservation easements, best management practices, partnerships with the private sector, land managers and non-governmental organizations, etc. (2) Participate in partnerships and collaborations to develop adaptive management strategies to address potential effects of water level and water quality changes and climate change and variability on wildlife and habitat, and contribute to conservation of adjacent lands and regional conservation initiatives (e.g. Mississippi Lake Subwatershed Plan). (2)

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

4 GOALS AND OBJECTIVES

4.1 VISION

The long-term vision for the Mississippi Lake NWA is conservation: to conserve habitat for migratory birds, and native wildlife and plants, including species at risk.

Where it does not compromise wildlife and habitat management goals, limited public access will continue for the purposes of research, education and recreation.

4.2 GOALS AND OBJECTIVES

The Mississippi Lake NWA was established to protect habitat and create a refuge for staging migratory waterfowl. It also provides habitat for a range of other species.

The goals and objectives for the Mississippi Lake NWA are based on minimal intervention in the natural processes. Active management will be undertaken to sustain habitats and biodiversity and to allow limited human uses of the NWA consistent with the International Union for Conservation of Nature and Natural Resources (IUCN) classification as a Category IV protected area (Habitat/species management area) (Dudley, 2008).

Goal 1: Important habitats particularly for migratory birds and native plants and animals, including species at risk, are maintained and improved.

1.1 Sub-goal: **Wetland habitats** will be managed to maintain and improve habitat quality and ecosystem functions and, where feasible, to sustain and increase populations of migratory birds and native plants and animals, including species at risk.

- a) Objective: Wetland habitats do not decrease in extent, and vegetated buffers around wetlands will be established and maintained over the long term.
- b) Objective: Wetland functions (e.g., hydrologic and wildlife use) will be maintained and improved.

1.2 Sub-goal: **Upland forest habitats** will be managed to maintain and improve upland forest quality and ecosystem function to sustain and where feasible increase populations of migratory birds and native plants and animals including species at risk.

- a) Objective: Upland forest habitats do not decrease in extent.
- b) Objective: The spatial extent of contiguous upland forest habitat around McEwen Bay will be increased by 5% over the long term (10 years).
- c) Objective: Old field and meadow habitats will naturally succeed to upland forest over the long term (10 years).

1.3 Sub-goal: The effects of **non-native and invasive species, over-abundant wildlife, and feral and domestic animals** on native habitat and wildlife are minimized.

- a) Objective: Determine areas of concern where cover by non-native and invasive plant species are >25%, expanding rapidly, or posing a threat to community structure or species composition, and implement methods to reduce extent and/or rate of expansion.
- b) Objective: Control and manage non-native, invasive or over-abundant wildlife, and feral and domestic animals, subject to monitoring and research results.

Goal 2: The effects of human activities on habitat and wildlife, and infrastructure, are minimized.

2.1 Sub-goal: Reduce the **effects of human activities** on the NWA.

- a) Objective: Monitor authorized visitor access and use (e.g., staff, researchers, public and partners), and control when necessary.
- b) Objective: Reduce the occurrence of prohibited activities and mitigate negative effects on native habitats and wildlife.

2.2 Sub-goal: Ensure a **safe environment for visitors**.

- a) Objective: Maintain facilities and infrastructure according to established standards.

Goal 3: Increase the habitat connectivity between Mississippi Lake NWA and adjacent properties.

3.1 Sub-goal: Work with partners and stakeholders to maintain and increase **connectivity of habitats and migration corridors** by consolidating and, where possible, expanding the protected area land base through partnerships.

- a) Objective: Lands adjacent to the NWA are prioritized for protection through acquisition or other means.

3.2 Sub-goal: Contribute to **regional landscape-level conservation and restoration** initiatives.

- a) Objective: Collaborate with partners and stakeholders to improve water quality and hydrologic functions in McEwen Bay, Mississippi Lake and Mississippi River.
- b) Objective: Improve local partnerships and community support.

5 MANAGEMENT APPROACHES

This section contains a description of approaches that could be used in the management of the Mississippi Lake NWA. However, management actions will be determined through the annual work planning process and will be implemented as human and financial resources allow.

The overall management philosophy for Mississippi Lake NWA will be to protect and conserve habitat **with minimal management intervention**.

5.1 HABITAT MANAGEMENT

The Mississippi Lake NWA will be managed primarily as a waterfowl staging area and nesting site for migratory birds. There has been no active habitat management at Mississippi Lake NWA. Natural processes have occurred unimpeded. However, more information about this site needs to be gathered to confirm that this is the best approach.

An ecological assessment of wetlands, upland forest, and old field and meadow habitats will be conducted to establish baseline information on vegetation community structure, hydrologic functions, non-native and invasive species, and wildlife use. The results will be used to track change over time, identify management practices required to protect and improve these habitats, and identify emerging issues that may require a management response (Section 5.5). Targeted surveys and/or monitoring for species at risk that occur within these communities may also be undertaken.

The following management actions will be carried in wetlands, upland forest, and old field and meadow.

Wetlands

The wetlands within the NWA are influenced by water levels on the Mississippi Lake and River, which are controlled by the operation of the dam at Carleton Place (OMNR, 2006). EC-CWS will work with MVCA and OMNR to provide input into the Mississippi Lake Subwatershed Plan and update of the Mississippi River Water Management Plan.

Upland Forest

Some management activities may be undertaken periodically to promote succession and improve species diversity. For example, herbicide application and weed control.

A 5 ha area of old field habitat along the south shore of McEwen Bay will be restored to upland deciduous forest to provide a continuous vegetated upland buffer around McEwen Bay.

Old Field and Meadow

Old field and meadow habitats will be allowed to naturally succeed to upland forest. In the interim, these areas will be surveyed for the presence of breeding migratory birds and non-native and invasive plant species.

Actions may be undertaken to control non-native and invasive plants, promote succession, and increase native vegetation. For example, the open field at the end of Drummond Concession 10B was used at one time to produce hay. It is no longer harvested, but the 3.5 ha area is mowed periodically by a contractor to prevent expansion of non-native woody vegetation (Robinson, personal communication, 2012).

5.2 WILDLIFE MANAGEMENT

There has been no active wildlife population management in the NWA. Natural processes have been allowed to occur unimpeded. Protection and preservation of breeding and migratory habitat for migratory birds, species at risk and other wildlife will be mainly achieved through limitation of human disturbance. As per the *Canada Wildlife Act*, all wildlife species are protected within the NWA.

Migratory birds and species at risk will be surveyed as part of broader efforts, and threats will be assessed. Active management actions may be undertaken if the need arises. However, certain threats to the birds (e.g., changes in food resources, weather events, increased incidence of botulism, toxics, disease and bird mortality) are considered to be beyond the influence of localized management approaches.

Species at risk will be surveyed to assess population size and distribution, potential and existing threats, and to determine and implement best management practices and recovery actions. Particular interest will be taken in the Butternut population, and the prospect of replanting canker-resistant trees.

5.3 MANAGEMENT OF NON-NATIVE AND INVASIVE PLANTS

To date, no measures have been taken to reduce or control non-native and invasive plants in Mississippi Lake NWA. Purple Loosestrife, Common Buckthorn, European Frogbit and Flowering-rush occur within the NWA, but have yet to be a cause for concern. The extent and spread of non-native and invasive plants will be surveyed. Control measures will be considered if a non-native or known invasive species is deemed to cause significant issues for wildlife or the ecological integrity of their habitats.

5.4 MANAGEMENT OF FERAL AND DOMESTIC ANIMALS, AND OVERABUNDANT WILDLIFE

EC-CWS will include relevant information in outreach materials to visitors, neighbouring residents and partners about the effects of feral and domestic animals on wildlife and habitats and the prohibitions on the release of domestic or wild animals within the NWA. Signage, notices and outreach materials will be used to increase awareness and promote voluntary co-operation to keep cats inside, dogs on leashes and to report sightings of feral and domestic animals, and compliance with *Wildlife Area Regulations* that prohibit the release of domestic or wild animals within the NWA.

Where routine surveying of the NWA identifies particular problems with feral or domestic animals, removal of problem animals may be undertaken by EC-CWS, and incidents of domestic livestock at large or people releasing or feeding wild or feral animals will be reported to Environment Canada's Wildlife Enforcement Directorate (EC-WED).

The effects of the beaver population on the NWA and adjacent properties will be monitored. Trapping of beavers will be undertaken if required. The trapping program will be monitored closely to reduce adverse effects upon resident beaver populations, minimize damage and document contributions to the local economy. Trapping will take place under the authority of a *Canada Wildlife Act* permit, using approved techniques by trappers licensed through the OMNR.

5.5 MONITORING AND SURVEYS

There have been few systematic surveys of habitats and wildlife within Mississippi Lake NWA. Monitoring and survey activities will be directed toward obtaining information on the movements, activities and numbers of migratory birds to inform habitat management actions.

Monitoring and survey methods and priorities will be in accordance with species at risk recovery strategies, action plans, management plans and other relevant policies.

Monitoring and surveys of habitat conditions and wildlife populations will be conducted on an as needed basis to:

1. Assess habitat suitability for a range of plant and wildlife species with emphasis on staging waterfowl, breeding marsh-dependent wildlife, migratory birds, species at risk and provincially rare species.
2. Assess change over time and identify potential threats and stresses to wildlife populations and habitat.
3. Assess migratory bird use within the NWA and nearshore waters and wetlands immediately adjacent to the NWA (i.e. Mississippi Lake and River), with emphasis on waterfowl and marshbirds.
4. Assess the effects of current or future management practices.
5. Assess the effects of access (authorized and unauthorized) and human activities (permitted and prohibited) on wildlife populations, habitats and infrastructure.
6. Measure the spatial extent of non-native and invasive species in order to inform management actions.
7. Assess the effects of water level fluctuations on wetland and upland forest habitats and associated migratory birds and species at risk.
8. Assess Butternut populations and the health of individual trees.

5.6 RESEARCH

Permits issued under the *Wildlife Area Regulations* of the *Canada Wildlife Act* are required to conduct research in Mississippi Lake NWA. Refer to Appendix 2: Canadian Wildlife Service (Ontario) Conditions of Research Requests at National Wildlife Areas.

Research activities will be considered for permitting when the results have the potential for increasing knowledge of waterfowl and migratory bird populations, habitat succession and species use, effects of climate change and water level change on wildlife and habitats, methods to reduce and mitigate the effects of non-native and invasive species, or methods to improve wetland, upland forest, and old field and meadow habitats.

All research requests must be made in writing. To request a *Canada Wildlife Act* permit to conduct research in Mississippi Lake NWA or to obtain information, please contact:

Environment Canada
Canadian Wildlife Service
Ontario Region
867 Lakeshore Road
Burlington ON L7R 4A6
Tel.: 905-336-4464
Fax: 905-336-4587
Email: wildlife.ontario@ec.gc.ca

5.7 REVIEW AGREEMENTS, PERMITS AND COLLABORATIVE ARRANGEMENTS FOR MISSISSIPPI LAKE NWA

EC-CWS will review agreements, permits and collaborative arrangements, and revise and renew as appropriate. Informal agreements and collaborative arrangements will be formalized.

Once federal lands within Mississippi Lake NWA are gazetted, all boundaries and land and water management practices will be reviewed. EC-CWS will review and update agreements and collaborative arrangements to include all lands within the NWA, and identify opportunities to address current and future management challenges and threats, including regional upland and wetland conservation, waterfowl conservation, multi-species conservation, control of invasive and non-native species, Mississippi Lake and River conservation, adaptations to climate change and variability, and species at risk recovery.

5.8 PUBLIC INFORMATION AND OUTREACH

Public information and outreach activities are designed to enhance public understanding and appreciation of the important conservation role of the Mississippi Lake NWA in the protection of migratory birds and other wildlife including species at risk, and to encourage public cooperation in wildlife conservation.

Signage at the Mississippi Lake NWA and communications and outreach materials will be reviewed and updated periodically to ensure that they provide clear direction to visitors, partners and the public on the permitted and prohibited activities and health and safety hazards within the NWA. EC-CWS will work with partners to provide clear direction on the jurisdictional boundaries, health and safety hazards, and conservation goals within the NWA and MBS.

Specific goals for public information and outreach include:

- a) Explain the purpose of NWAs, the importance of establishing them and the general role of the Environment Canada's protected areas network and national habitat program;
- b) Outline the importance of the different habitats for migratory birds and other wildlife (reptiles, mammals, plants, etc.);
- c) Promote appreciation for habitat and wildlife and the public's role in ongoing protection of the site; and
- d) Increase awareness and promote compliance with the *Canada Wildlife Act* and the *Wildlife Area Regulations*;

To meet these goals, Environment Canada has established a public website and printed material, available at www.ec.gc.ca/ap-pa. For information on Mississippi Lake NWA, follow these links: Network of Protected Areas, Ontario, and Mississippi Lake National Wildlife Area.

6 AUTHORIZATIONS AND PROHIBITIONS

To protect and conserve wildlife and their habitat, human activities are minimized and controlled in NWAs through the implementation of the *Canada Wildlife Act* and *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.

All activities in an NWA are prohibited unless a notice has been posted or published authorizing the activity to take place. Activities within an NWA are authorized where notices or signs have been posted at the entrance to or along the boundaries of the NWA or when notices have been published in local newspapers. 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.

Public entry to McIntyre Creek and McEwen Bay within Mississippi Lake NWA is prohibited between September 15 and December 15 each year. Public access is restricted at this time to reduce and limit disturbance to migratory birds.

Note: During September 15 to December 15, public entry to the NWA waters is permitted only from the boat launch on McIntyre Creek for the purpose of accessing Mississippi Lake (outside of the NWA). No other water access is allowed to the NWA.

Periodic visits by Environment Canada staff, particularly during periods of high use, will occur, and enforcement actions will be taken when required.

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 prohibiting entry.

6.2 AUTHORIZED ACTIVITIES

For Mississippi Lake NWA, an NWA identification sign and the notice authorizing activities is posted at the NWA entrance on Drummond Concession 9A.

Access and recreational activities are restricted in the Mississippi Lake NWA because a key conservation purpose is to provide undisturbed staging habitat for migratory waterfowl.

Authorized activities in designated areas and special restrictions: The following public access and authorized activities are allowed in designated areas within the Mississippi Lake NWA and MBS between sunrise and sunset daily and do not require a permit:

- Entering the NWA via the boat launch on McIntyre Creek or at the entrance via the public parking lot and designated trail at the NWA entrance on Drummond Concession 9A
- Entering the NWA via the unopened road allowance at the eastern terminus of Drummond Concession 10B by foot only (i.e., access by motorized vehicles [snowmobile, all-terrain vehicle, car] or bicycles is prohibited)
- Access to public boat launch on McIntyre Creek
- Parking within the designated parking lot
- Hiking, skiing, snowshoeing, wildlife viewing and photography (on designated trail and road)
- Picnicking (no open fires nor charcoal barbecue)
- Recreational boating (maximum speed eight kilometres per hour) and sport fishing (no lead sinkers) in the NWA between December 16 and September 14.

Recreational boating and sport fishing in McIntyre Creek and McEwen Bay is prohibited September 15 through December 15, except to directly access Mississippi Lake (outside the NWA), from the NWA boat launch on McIntyre Creek.

Overnight camping, open fires and use of vehicles off-road are prohibited at all times.

Hunting is prohibited within the boundary of the NWA at all times in accordance with the *Canada Wildlife Act* and *Wildlife Area Regulations*, and within the MBS under the *Migratory Bird Sanctuary Regulations*.

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 the wildlife and their habitats or will contribute to wildlife conservation; or the activity is otherwise consistent with the criteria and purpose for which the NWA was established as stated in this management plan. One of these conditions must be met before the Minister will consider authorizing a prohibited activity.

Permits are issued under the *Wildlife Area Regulations* of the *Canada Wildlife Act*. All requests to EC-CWS for *Canada Wildlife Act* permits for Mississippi Lake NWA must be made in writing at least seven weeks prior to the date of requirement. Permit requests will be denied if in the

opinion of the management authority the proposed activity is not in the best interest of the protected area. Refer to Appendix 2 for conditions of research permits in Mississippi Lake NWA.

The Minister may also add terms and conditions to permits to protect and minimize the effects of an activity on wildlife and wildlife habitat. A permit request may be denied or a permit may be revoked if the terms and conditions are not met.

To request a permit or to obtain information, please contact:

Environment Canada, Canadian Wildlife Service

Ontario Region

867 Lakeshore Road

Burlington ON L7R 4A6

Tel.: 905-336-4464

Fax: 905-336-4587

Email: wildlife.ontario@ec.gc.ca

6.4 EXCEPTIONS

The following activities will be exempt from the requirements for permitting and authorizations under the *Wildlife Area Regulations*:

- 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 *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 Canada.

For Mississippi Lake NWA, exceptions to the prohibited activities include, but are not limited to:

- Research, surveys and monitoring of species and habitat
- Mississippi Valley Conservation Authority operations and activities relating to maintenance and management of water levels in Mississippi Lake (i.e., McEwen Bay)
- Ontario Ministry of Natural Resources operations and biological research, monitoring and surveys
- Furbearer trapping by licensed trappers (provincial permits and "seasons" apply).
- Upland management activities (i.e., planting cover crops to conserve soil and reduce erosion, herbicide application and weed control)

These activities are administered through permits and collaborative arrangements.

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) (Environment Canada, 2011). This policy document is available on the protected areas website at www.ec.gc.ca/ap-pa.

6.5 OTHER FEDERAL AND PROVINCIAL AUTHORIZATIONS

Depending on the type of activity, other federal or provincial permits and/or authorizations may be required to undertake an activity in the Mississippi Lake NWA, MBS, or adjacent lands and waters. It is the responsibility of permit applicants to obtain all additional permits, authorizations and protocols as required by federal legislation (e.g., *Migratory Birds Convention Act, 1994*, *Migratory Birds Regulations*, *Migratory Bird Sanctuary Regulations*, *Species at Risk Act*, *Fisheries Act*), provincial legislation (e.g., *Fish and Wildlife Conservation Act*, *Endangered Species Act, 2007*), Animal Care Committee protocols and landowners (e.g., permission to access private land), prior to commencement of the activity (refer to Appendix 1 for a partial list of legislation).

For example, *Species at Risk Act* permits may be required for activities affecting species at risk, their residences and/or any part of its critical habitat.

Note: Provincial and federal permits and "seasons" apply to fishing and hunting.

Contact federal and provincial permitting offices for more information.

Federal:

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

Environment Canada
Canadian Wildlife Service
Ontario Region
867 Lakeshore Road
Burlington ON L7R 4A6
Tel.: 905-336-4464
Fax: 905-336-4587
Email: wildlife.ontario@ec.gc.ca

Fisheries Act and *Species at Risk Act*:

Fisheries and Oceans Canada
www.dfo-mpo.gc.ca/species-especes/permits-permis/permits-eng.htm

Central and Arctic Region (Northwest Territories, Nunavut, Alberta, Saskatchewan, Manitoba and Ontario)

Regional Office:
Freshwater Institute
501 University Cr.

Winnipeg MB R3T 2N6

Tel.: 204-983-4438

Provincial:

Ontario Ministry of Natural Resources

300 Water Street, P.O. Box 7000

Peterborough ON K9J 8M5

Tel.: 1-800-667-1940

7 HEALTH AND SAFETY

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 Canada staff or departmental representatives will take all reasonable and necessary precautions to assure 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 are inherently dangerous, and proper precautions must be taken by visitors, recognizing that Environment Canada staff neither regularly patrol nor offer services for visitor safety in NWAs.

The designated point of public access is the parking lot and main entrance on Drummond Concession 9A from December 16 to September 14.

Management activities directed at improving health and safety and reducing the risk of a hazardous occurrence may include:

- Installation of signs identifying safety precautions for authorized visitors;
- Posting of public notices within the community and tourist operations;
- Contaminated site assessment and remediation;
- Removal of debris; and
- Preparation of an NWA emergency response plan for fire and spill response.

Site visits will be conducted to monitor facilities and infrastructure (e.g., signs, fences), general site and habitat conditions, human use, and prohibited activities. Periodic formal assessments of all facilities and infrastructure will be performed by federal agencies.

EC-CWS works with Environment Canada's Contaminated Sites Program to conduct site audits to identify contaminants, assess risks and remediate environmental contaminants on federal lands. The Phase I and Preliminary Phase II (combined) environmental site assessment at Mississippi Lake NWA was completed in 2008. No further site investigation or remediation actions were identified at that time (Franz Environmental Inc., 2009).

This protected area has no on-site staff: In the case of an emergency at the NWA, call 911 immediately.

In the event of an environmental emergency or occurrence, please call the 24-hour telephone number below:

Ontario Spills Action Centre

Ontario Ministry of the Environment

Telephone: 416-325-3000 or 1-800-268-6060

Any emergency should be reported immediately to the appropriate responding authorities. Reports should include the date, time and nature of the incident, contact names and information of

the reporting party (for follow-up information), and other relevant details. Multiple authorities should be advised, if the situation warrants, as soon as possible. Refer to Appendix 3 for a list of contacts.

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

Environment Canada
Canadian Wildlife Service
Ontario Region
4905 Dufferin Street
Toronto ON M3H 5T4
Tel.: 416-514-2633

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 *Canadian Wildlife Act*, *Wildlife Area Regulations*, *Migratory Birds Conservation Act, 1994* and *Migratory Bird Sanctuary Regulations*, EC-CWS posts signs along the perimeter of the NWA and at main access points, signs are posted to identify authorized activities within each NWA and any conditions on those activities.

Environment Canada's Wildlife Enforcement Directorate (EC-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.

EC-WED officers monitor compliance with the Acts listed above as well the provincial *Fish and Wildlife Conservation Act, 1997* and the Ontario *Trespass to Property Act* and initiate investigations when required. EC-WED officers will respond to violations and take appropriate enforcement actions.

9 PLAN IMPLEMENTATION

Details of management plan implementation will be developed through Environment Canada's annual work planning process and will be implemented as human and financial resources allow. Implementation of the Mississippi Lake NWA Management Plan will be based on the goals identified in this Management Plan. Refer to Table 5 for a summary of priority actions for implementation 2014–2023.

9.1 MANAGEMENT AUTHORITY AND MANDATE

EC-CWS, Ontario, is responsible for site management of Mississippi Lake NWA and the Mississippi Lake MBS.

9.2 MANAGEMENT PLAN REVIEW

Evaluation will take the form of a review of data obtained from the monitoring, surveys, and research projects and collaborative arrangements outlined below. Monitoring, surveys and research at the Mississippi Lake NWA will be performed within the limits imposed by financial and human resources. The data collected will be reviewed annually and used to inform future management at the NWA. Furthermore, these data will be used to evaluate federal contributions towards accomplishing the mandates specific to EC-CWS for which the protected area was established.

This Management Plan will be reviewed 5 years after its formal approval by EC-CWS and every 10 years thereafter.

Information may be appended to the document as required to aid in site management and decision-making.

Table 5: Mississippi Lake National Wildlife Area Management Plan Implementation Strategy 2014-2023

Activity	Year									
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Site inspection (e.g., monitor signs, threats, and non-native and invasive species)	x	x	x	x	x	x	x	x	x	x
Maintain signs (replace/install) and public notices	x	x	x	x	x	x	x	x	x	x
Address safety issues in infrastructure	x	x	x	x	x	x	x	x	x	x
Meet with collaborators, neighbours	x	x	x	x	x	x	x	x	x	x
Review permits, agreements and collaborative arrangements, revise and renew as appropriate	x	x	x	x	x	x	x	x	x	x
Monitor visitor use	x	x	x	x	x	x	x	x	x	x
Document and report number and nature of incidents of illegal activities	x	x	x	x	x	x	x	x	x	x

Activity	Year									
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Monitor potential overabundant, non-native and invasive wildlife (e.g., beaver), manage as needed	x	x	x	x	x	x	x	x	x	x
Maintain or upgrade infrastructure (fences, trails, etc.)		x		x		x		x		x
Review public outreach and education			x			x			x	
Assess habitat, conduct baseline studies and ecological monitoring (wetland and upland (i.e., forest and old field/meadow; hydrology, water quality)	x	x	x							
Assess and apply species at risk recovery actions		x		x		x		x		x
Periodic assessment of habitats (i.e., wetland, upland forest, old field and meadow)										
Monitor bird and amphibian populations using established protocols		x			x			x		
Map distribution and percent cover of non-native and invasive plants		x			x			x		
Assess and apply non-native and invasive species controls		x			x			x		

10 COLLABORATORS

EC-CWS works with government and non-government organizations, Aboriginal peoples, landowners and individuals to meet goals for on-site management and contribute to landscape conservation. Partners include Ontario Ministry of Natural Resources, Mississippi Valley Conservation Authority, Algonquins of Ontario, Township of Drummond/North Elmsley, the Nature Conservancy of Canada, Mississippi Lakes Association and local landowners. Ongoing liaison with agencies, organizations, communities and individuals will help to avoid duplication of effort, assist in planning a balanced regional resource program, and provide an avenue of understanding with local residents.

11 LITERATURE CITED

- A2A (Algonquin to Adirondacks Conservation Association). 2013. Algonquin to Adirondacks Conservation Association, A2A Region. Available from: www.a2alink.org/a2a-region.html. Accessed January 2013.
- Bruce, J., I. Burton, H. Martin, B. Mills and L. Mortsch. 2000. Water Sector: Vulnerability and Adaptation to Climate Change. Final report submitted to the Climate Change Action Fund, Natural Resources Canada. Global Change Strategies International and Meteorological Service of Canada, Downsview, Ontario. 141 pp.
- Burns, C. 2003. Demographic Population Monitoring of *Rana catesbeiana* at two Representative Marshes in Eastern Ontario. Ontario Ministry of Natural Resources.
- CFIA (Canadian Food Inspection Agency). 2011. Pest Alert Emerald Ash Borer (*Agrilus planipennis*). Public notice. Government of Canada.
- COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2013. Available from: www.cosewic.gc.ca/eng/sct5/index_e.cfm. Accessed October 2013
- COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2010. Assessment and status report on the Monarch *Danaus plexippus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa, Ontario. vii + 43 pp. Available from: www.sararegistry.gc.ca/sar/assessment. Accessed January 2013.
- Delcan Corporation. 2012. Official Plan of the Township of Drummond/North Elmsley. Gloucester, Ontario.
- Dudley, N. (Editor) 2008. Guidelines for Applying Protected Area Management Categories. Gland, Switzerland: IUCN. X + 86 pp.
- EC (Environment Canada). 2011. 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). Cat. No.: CW66-311/2012E-PDF ISSN 978-1-100-20495-6.

EC (Environment Canada). 2010. Phosphorus in Canada's Aquatic Ecosystems. Available from: www.ec.gc.ca/eaudouce-freshwater

EC-CWS (Environment Canada – Canadian Wildlife Service). 2012a Mississippi Lake National Wildlife Area Bird Species. Unpublished data. Canadian Wildlife Service (Ontario), London, Ontario.

EC-CWS (Environment Canada – Canadian Wildlife Service). 2012b Mississippi Lake National Wildlife Area Mammal Species. Unpublished data. Canadian Wildlife Service (Ontario), London, Ontario.

EC-CWS (Environment Canada – Canadian Wildlife Service). 2012c. Mississippi Lake National Wildlife Area Amphibian and Reptile Species. Unpublished data. Canadian Wildlife Service (Ontario), London, Ontario.

EC-CWS (Environment Canada – Canadian Wildlife Service). 1984. McEwen Bay Provincial Wetland Evaluation 1984. Unpublished report. Canadian Wildlife Service (Ontario), Nepean, Ontario.

EC-CWS (Environment Canada – Canadian Wildlife Service) 1980. Mississippi Lake National Wildlife Area: Small mammal trapping study. Unpublished report. Canadian Wildlife Service (Ontario), Nepean Ontario.

EOMF (Eastern Ontario Model Forest). 2010. Visions and Objectives. About the EOMF. Available from: www.eomf.on.ca/index.php.

Franz Environmental Inc. 2009. Final Report Phase I and Preliminary Phase II Environmental Site Assessment at Mississippi Lake National Wildlife Area, Drummond/North Elmsley, Ontario DFRP # 09393. Prepared for: Public Works and Government Services Canada for Environment Canada Canadian Wildlife Service. Mississauga, Ontario.

Government of Canada. 2013. Species at Risk Registry. www.registrelep-sararegistry.gc.ca and www.sararegistry.gc.ca/species. Accessed October 2013.

Government of Canada. 2002. *Species at Risk Act* S.C. 2002, c. 29 Assented to 2002-12-12.

Government of Ontario. 2012. *Endangered Species Act, 2007*. Ontario Regulation 4/12 Species at Risk in Ontario List. Available from:

www.e-laws.gov.on.ca/html/source/regs/english/2012/elaws_src_regs_r12004_e.htm.

Accessed October 2013.

Hamill, S. 2009. Wildlife Inventory of Mississippi Lake, Prince Edward Point, and Wellers Bay National Wildlife Areas. Report to Environment Canada-Canadian Wildlife Service. London, Ontario.

Hamill, S. E. and E. R. Thomson. 2012. Mississippi Lake National Wildlife Area Species at Risk Surveys 2011–2012. Report to Environment Canada-Canadian Wildlife Service. Downsview, Ontario.

Keddy, P. and C. Drummond. 1995. Ecological Properties for the Evaluation of Eastern Ontario Forest Ecosystems, Report #13. Eastern Ontario Model Forest, Kemptville, ON.

Kerr, S.J. 1999. Mississippi Lake and its Fishery. Southcentral Sciences Section Technical Report TR-115. Ontario Ministry of Natural Resources. Kemptville, Ontario.

Lee, S. 2011. Mississippi Valley Conservation Authority, Personal Communication. Lanark, Ontario.

Lévesque, H. 1986. Management Plan Mississippi Lake National Wildlife Area. Canadian Wildlife Service. Ottawa, Ontario April 1986.

MMLTC (Mississippi Madawaska Land Trust Conservancy). 2010. Visions and Goals. About Us. Available from: <http://mmltc.ca/about/vision-and-goals>. Accessed December 2011.

Mohr, P. and L. Maltby. 1985. A Summary of Background Information on the National Wildlife Areas in the Ontario Region. Canadian Wildlife Service, Ontario Region.

Moutenay, G. 2012. Mississippi Valley Conservation Authority. Personal communication. Lanark, Ontario.

MVCA (Mississippi Valley Conservation Authority). 2011. Carleton Place Dam. General Operating Principles. Lanark, Ontario. Available from: www.mvc.on.ca/water-management/water-management-plans. Accessed May 2012.

MVCA (Mississippi Valley Conservation Authority). 2008. State of the Lake Environment Report 2008: Mississippi Lake. Lanark, Ontario.

MRWMP (Mississippi River Water Management Plan) 2006. Prepared by Mississippi Valley Conservation Authority, Waterpower producers, and Ontario Ministry of Natural Resources. Available from: www.mvc.on.ca/water-management/special. Accessed May 2012.

The Nature Conservancy of Canada. 2008. Property Management Plan – Crampton Property. NCC –Eastern Ontario Region, Kingston, Ontario. Unpublished report. 61 pp.

OMNR (Ontario Ministry of Natural Resources). 2012. NHIC (Natural Heritage Information Centre). <http://nhic.mnr.gov.on.ca>. Accessed May 2012 and November 2012.

OMNR (Ontario Ministry of Natural Resources). 2009. Mississippi Lake Near Shore Community Index Netting Project.

OMNR (Ontario Ministry of Natural Resources). 2006. Mississippi River Water Management Plan. Final Report. June 15, 2006. Kemptville District, Kemptville ON.

OMNR (Ontario Ministry of Natural Resources). 1983. An Evaluation System for Wetlands of Ontario South of the Precambrian Shield. First Edition. Wildlife Branch, Outdoor Recreation Group, OMNR, and Canadian Wildlife Service, Ontario Region, Environmental Conservation Service, Environment Canada.

Robinson, J. 2012. Environment Canada – Canadian Wildlife Service Ontario. Personal communication. London, Ontario.

Rosien, D., K. Bennet, T. Buchanan, and A. Jobes. 2004. Ontario Airboat Duck Banding Program. Ontario Waterfowl Management Fund. Ontario Ministry of Natural Resources.

Seburn, D. and S. Hamill. 2000. Lanark County Bullfrog Survey 2000. Ontario Ministry of Natural Resources. Report to Ontario Ministry of Natural Resources.

Soil Research Institute. 1966. Soil Map of Lanark County, Ontario, South Sheet. Soil Survey Report No. 40. Canadian Department of Agriculture.

- Symon, A. 2012. Mississippi Valley Conservation Authority. Personal communication. Lanark, Ontario.
- Thompson, S. 2012. Ontario Ministry of Natural Resources. Personal communication. Kemptville, Ontario.
- White, D. J. 2008. Preliminary Upland Vegetation Survey at Mississippi Lake National Wildlife Area. Report to Environment Canada – Canadian Wildlife Service. London, Ontario.
- White, D. J. 1992. Life Science Areas of Natural and Scientific Interest in Site District 6-11: A Review and Assessment of Significant Natural Areas. Ontario Ministry of Natural Resources, Eastern Region, Kemptville, Ontario.
- Wilson, P. 2009. Mississippi Lake National Wildlife Area Butternut (*Juglans cinerea*) Surveys. Environment Canada – Canadian Wildlife Service. Unpublished report. London, Ontario.

12 ADDITIONAL INFORMATION SOURCES

Cadman, M.D., D.A. Sutherland, G.G. Beck, D. Lepage, and A.R. Couturier (eds.). 2007. Atlas of the Breeding Birds of Ontario, 2001–2005, Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature, Toronto, xxii + 706 pp.

Species at Risk Public Registry: www.sararegistry.gc.ca

Species at Risk Public Registry – species recovery strategies:
www.sararegistry.gc.ca/sar/recovery/recovery_e.cfm

The American Ornithologists' Union (AOU) Nomenclature: www.aou.org/checklist/north/index.php

White, David J. 2011. Plants of Lanark County, Ontario (2011 Edition). Available from
www.lanarkflora.com/plantlist.html

APPENDIX 1: 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

www.registrelep-sararegistry.gc.ca

Provincial – Ontario Legislation

Endangered Species Act, 2007

www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_07e06_e.htm

Fish and Wildlife Conservation Act, 1997

www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_97f41_e.htm

Trespass to Property Act

www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90t21_e.htm

APPENDIX 2: CANADIAN WILDLIFE SERVICE (ONTARIO) CONDITIONS OF RESEARCH REQUESTS AT NATIONAL WILDLIFE AREAS

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

1. All requests for research must be accompanied by a written proposal outlining the objectives; project duration; collection of data and specimens and measurements if any, number of participants, funding sources, location where work is to be undertaken, benefits to the NWA, potential detractors; and proposed mitigation measures. All proposals will be subject to a review by the Animal Care Committee of Environment Canada or the submitting institution.
2. No research shall be undertaken without a permit issued under the *Canada Wildlife Act's Wildlife Area Regulations*, and the research must be consistent with the National Wildlife Area (NWA) management plan for the site and 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. All researchers are responsible for obtaining all permits (e.g., *Species at Risk Act*, *Fisheries Act*), approvals, and permissions (e.g., land managers, landowners), prior to commencement of the research project.
5. Copies of raw data (field books and maps), preliminary reports of the research activities and a copy of the final manuscript must be provided to Environment Canada, Canadian Wildlife Service (EC-CWS) Ontario at the end of each field season.
6. Priority will be given to researchers whose work has direct management implications for the NWA and species at risk.
7. Applications to undertake a minor research study must be submitted to the EC-CWS Ontario office, in writing, prior to commencement of the project. **Minor proposals without problems or issues require at least seven weeks for review, processing and issuance of a permit.** Major proposals (that may require expert review, are multi-year, etc.) require a longer review period (minimum six months).
8. A statement must be provided to EC-CWS Ontario on why the research project cannot be undertaken elsewhere.
9. 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).

Note: The Minister may add terms and conditions governing the activity in order to protect and minimize the effects of the authorized activity on wildlife and their habitats.

All projects and activities in the NWAs are subject to environmental screening and, if necessary, to further steps in the Environmental Assessment and Review Process of Environment Canada.

APPENDIX 3: CONTACTS FOR MISSISSIPPI LAKE NATIONAL WILDLIFE AREA AND MISSISSIPPI LAKE MIGRATORY BIRD SANCTUARY

Contacts for MISSISSIPPI LAKE NATIONAL WILDLIFE AREA and MISSISSIPPI LAKE MIGRATORY BIRD SANCTUARY, Ontario Administered by Environment Canada Canadian Wildlife Service (Ontario) Latitude 45°03'N / Longitude 76°14'W	
Emergency Contacts	
In case of emergency, dial 911. General inquiries should be directed to local telephone numbers, not 911. NOTE: THE CIVIC ADDRESS FOR MISSISSIPPI LAKE NWA IS #1024 DRUMMOND CONCESSION 9A. Township of Drummond/North Elmsley, Lanark County (Mississippi Lake NWA – main entrance)	
Any life-threatening emergency	911
Police-fire-ambulance	911
Ontario Provincial Police	1-888-310-1122
Ontario Provincial Police – Lanark Detachment 15 Coleman Avenue, Carleton Place, ON K7C 4N9	613-257-5610
Ambulance	1-800-267-2151
Carleton Place Fire Department	613-257-5526
To report air and marine emergencies, contact Ontario Provincial Police	911 1-888-310-1122
Marine and Air Search and Rescue (Emergency Only)	1-800-267-7270
Royal Ontario Mounted Police (RCMP), Ontario Division	519-640-7267
If an Unexploded Explosive Ordinance is found, dial 911	
Department of National Defence Unexploded Explosive Ordinance (UXO) Program (general Inquiry only)	1-800-207-0599
To report a spill to air, land or water, call the Ontario Spills Action Centre, 24/7	1-800-268-6060 or 416-325-3000
Poison Control Centres (Emergencies)	1-800-268-9017
Carleton Place and District Memorial Hospital 211 Lake Avenue East, Carleton Place, ON K7C 1J4	Main Hospital number: 613-257-2200
Perth and Smiths Falls District Hospital 33 Drummond St. West, Perth, ON K7H 2K1	Main Hospital number: 613-267-1500
Environment Canada – Ontario	
Canadian Wildlife Service (Ontario)	1-800-668-6767
Wildlife Enforcement Directorate (Ontario)	905-336-6410
General Contacts	
Ontario Ministry of Natural Resources (Conservation Officer)	1-877-847-7667
Ontario Ministry of Natural Resources (General Inquiry)	1-800-667-1940
Ontario Ministry of Natural Resources area office Kemptville, ON	613-258-8204
Geographic County: Lanark	613-267-4200 or 1-888-952-6275
Geographic Township: Drummond/North Elmsley	613-267-6500
Mississippi Valley Conservation Authority	613-253-0006
Town of Carleton Place	613-257-6200