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St. Clair

National Wildlife Area

MANAGEMENT PLAN 2018

Acknowledgements:

This management plan was prepared by Laurie Maynard of Environment and Climate Change Canada's Canadian Wildlife Service (Ontario). Thank you to Shannon Badzinski, Mike Cadman, Barb Campbell, Brigitte Collins, Lesley Dunn, Christian Friis, John Haggeman, Krista Holmes, Andrea Kettle, Shawn Meyer, Dave Moore, Tania Morais, Nancy Patterson, Jeff Robinson, Christopher Sharp, Barbara Slezak and Chip Weseloh of the Canadian Wildlife Service (Ontario); Gerry Brunet of Environment and Climate Change Canada's Wildlife Enforcement Directorate (Ontario); Andrea McCormack of the Canadian Wildlife Service (NCR); Jason Barnucz and Shawn Staton of Fisheries and Oceans Canada; Allen Woodliffe of the Ontario Ministry of Natural Resources and Forestry, and Clint Jacobs of the Walpole Island First Nation, for their expert input into the plan and review of earlier drafts. We also wish to thank Marie-Claude Archambault, Andrew Noad, Corey Nugent and Paul Watton of the Canadian Wildlife Service (Ontario) for preparation of maps and figures.

The 1982 Management Plan: St. Clair National Wildlife Area, prepared by Gerald McKeating, Duncan Gow, and Paul Madore of the Canadian Wildlife Service (Ontario) and the 1988 Draft Management Plan: Bear Creek Unit of the St. Clair National Wildlife Area, prepared by Jeff Robinson (Canadian Wildlife Service (Ontario)) provided the groundwork for this update.

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ISBN: 978-0-660-27935-0
Cat. No.: CW66-503/2018E-PDF

How to cite this document:

Environment and Climate Change Canada. 2018. St. Clair National Wildlife Area Management Plan.
Environment and Climate Change Canada, Canadian Wildlife Service, Ontario Region, 75 p.

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About Environment and Climate Change Canada's protected areas and management plans

What are Environment and Climate Change Canada's protected areas?

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

What is the size of the Environment and Climate Change Canada's 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 and Climate Change Canada staff to guide decision making, notably with respect to permitting. Management is undertaken in order to maintain the ecological integrity of the protected area and to maintain the attributes for which the protected area was established. Environment and Climate Change Canada prepares a management plan for each protected area in consultation with First Nations 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?

Protected area management includes monitoring wildlife, maintaining and improving wildlife habitat, periodic inspections, enforcement of regulations, and the maintenance of facilities and

infrastructure. Research is also an important activity in protected areas; hence, Environment and Climate Change Canada staff members carry out or coordinate research in some sites.

The series

All of the national wildlife areas are to have a management plan. All of these management plans are initially reviewed 5 years after the approval of the first plan, and every 10 years thereafter.

To learn more

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

St. Clair National Wildlife Area

The St. Clair National Wildlife Area (NWA) (St. Clair Unit) was established in 1978 along the eastern shore of Lake St. Clair to protect wetlands of the St. Clair marshes as essential habitat to waterfowl and other migratory birds for staging, stopover and feeding. Lake St. Clair and the adjacent marshes are the most important and extensive staging and feeding areas for migratory waterfowl in Ontario south of James Bay. In 1988, the NWA was expanded (Bear Creek Unit) to include additional property on the eastern shore of the Snye channel or Chenal Ecarté, a tributary of Lake St. Clair.

The Great Lakes shoreline within Canada's Mixedwood Plains Ecozone contains some of the most modified landscapes in Canada, and also some of the most important bird areas in North America. Prior to European settlement in the 1800s, the Lake St. Clair shoreline was once an extensive belt of marsh and tallgrass prairie, but as much as 90% of the coastal and inland marshes have been converted to agriculture and residential development. The protection, management and connectivity of the remaining habitat, including within the NWA, is essential to maintain wetland and prairie habitat in the Lake St. Clair region. St. Clair NWA Units are protected areas within this drastically altered landscape. They provide important spring and fall migratory stop-over locations along the eastern flyway of North America, and their wetland, meadow and tallgrass prairie habitats are managed to provide nesting and roosting cover for migratory birds and species at risk. In 1985, the St. Clair NWA (St. Clair Unit) was designated as a Ramsar Wetland of International Importance, and in 1998, eastern Lake St. Clair, including the NWA's St. Clair Unit, was designated by Birdlife International as a globally significant Important Bird Area.

The St. Clair NWA is an important migration stopover, breeding site and pre-migration congregating area for an impressive number and variety of migratory birds: over 220 species of birds have been observed since 1974, with more than 60 species observed breeding in the NWA, including waterfowl, waterbirds, landbirds and shorebirds. Peak numbers occur during fall migration where as many as 8600 waterfowl, including ducks, geese and swans, can congregate at the Lake St. Clair NWA to rest and feed in the marshes before continuing their migration south. More than 20 waterfowl species have been recorded in the NWA, primarily dabbling ducks and geese, including Mallards, American Black Ducks, American Wigeons, and migrant and temperate-breeding (resident) Canada Geese.

Thirty-five species listed under the federal *Species at Risk Act* have been reported at the St. Clair NWA, including 18 birds, 7 reptiles, 1 insect, 4 fishes, 1 mammal and 4 plants. Many species are at the northern limit of their range in this part of Ontario and are rare or absent elsewhere in Canada. The NWA provides important habitat for species at risk like the Least Bittern, Swamp Rose-

mallow, Northern Map Turtle, and Pugnose Shiner and critical habitat has been identified for some of them. Several bird species at risk use the NWA as an area of respite during migration, including the Golden-winged Warbler, Eastern Whip-poor-will and Rusty Blackbird. The St. Clair NWA is also an important roosting and feeding area for Monarch butterflies during migration. In late summer and early fall, several thousand Monarchs can be observed daily in the area as they migrate to their wintering grounds to the south.

Habitats at the St. Clair NWA include wetlands, tallgrass prairie, uplands and farmland, totalling up to 351.8 hectares (ha). The predominant habitat within the NWA is cattail marsh. Earthen dykes surround marsh compartments, and water levels are controlled within the dyked impoundments by a system of water control structures and pumps to replicate the natural rise and fall of water levels that triggers a diversity of plant growth. The St. Clair NWA is managed to provide optimum habitat diversity, quality staging and nesting habitat for waterfowl and marshbirds, and conservation and restoration of wetland and prairie habitats. A variety of wildlife and habitat management techniques are employed. Priority management actions include manipulation of water levels to encourage the growth of a diverse community of wetland vegetation, removal and reduction of invasive and non-native plant species, prairie restoration, fur-bearer trapping, and control of overabundant wildlife.

Most of the St. Clair NWA, including the Bear Creek Unit and portions of the St. Clair Unit, is closed to the public in order to provide undisturbed staging habitat for migratory waterfowl, with exceptions made for research, surveys and monitoring activities authorized by permit under the *Wildlife Area Regulations* of the *Canada Wildlife Act*. Within the St. Clair Unit, public access for interpretation and recreation is limited to day use only where a hiking trail and a wildlife viewing tower on the cross-dyke are open to the public year-round, providing opportunities to view large numbers of waterfowl during spring and fall migration. Fishing and recreational boating within the St. Clair Unit are prohibited. Within the Bear Creek Unit, public access is limited to recreational boating and fishing, and to wildlife viewing in the Maxwell and Little Bear Creeks. Overnight camping, open fires, hunting and use of motorized off-road vehicles are prohibited at all times.

This 2018 St. Clair NWA Management Plan is an update of the Management Plan: St. Clair National Wildlife Area (McKeating et al. 1982) and the Draft Management Plan: Bear Creek Unit, of the St. Clair National Wildlife Area (Robinson 1988), and replaces all previous versions.

For greater certainty, nothing in this management plan shall be construed so as to abrogate or derogate from the protection provided for existing Aboriginal rights 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 St. Clair National Wildlife Area (NWA) was established in 1978 and provides continentally and nationally important habitat for migratory birds, wildlife, and species at risk. The diversity and number of plant and animal species is high due to its location in one of the southernmost locations of Canada, and its warmer climate moderated by the nearby Great Lakes. Several species found on the NWA are at the northern limit of their ranges. Wetlands are the major habitat features of the NWA with patches of prairie and upland habitat in the drier areas.

The St. Clair National Wildlife Area (NWA) is comprised of two Units totalling 351.8 hectares (ha) along the eastern shore of Lake St. Clair in southwestern Ontario (Figure 1). The St. Clair Unit (242.8 ha) is located 19 km west of Chatham, on the southeast shore of Lake St. Clair (Figure 1). The Bear Creek Unit (109 ha) is located approximately 20 km north of the St. Clair Unit and 7 km south of Wallaceburg, where the Little Bear Creek and Maxwell Creek enter the eastern channel of the St. Clair River known locally as The Snye or Chenal Ecarté (hereafter referred to as the Snye channel), southeast of the Walpole Island First Nation (Figure 1).

St. Clair Unit

Located on the edge of a clay plain where it meets the eastern shore of Lake St. Clair, the St. Clair Unit consists of two large dyked wetland impoundments, known as the East and West cells, a small, undyked open-water marsh (approximately 5 ha) west of the Lakeshore Dyke on Lake St. Clair and, 3 ha of dry land in the north corner of the property that houses the St. Clair NWA office and other buildings. A series of former sandy-beach ridges, formed by wave action, run diagonally north-south across the Unit (Figure 2). Both cells are predominantly cattail (*Typha* spp.) marsh with areas of shallow open water (approximately 1–2 m deep). Water levels are managed within the cells using a system of water control structures and a pump. A public trail runs along the top of the cross-dyke that separates the East and West cells (Figure 2).

Land cover adjacent to the St. Clair Unit is primarily privately owned agricultural land (e.g., cropland growing vegetables, corn and soybeans) and marshes managed for waterfowl hunting (Figure 2).

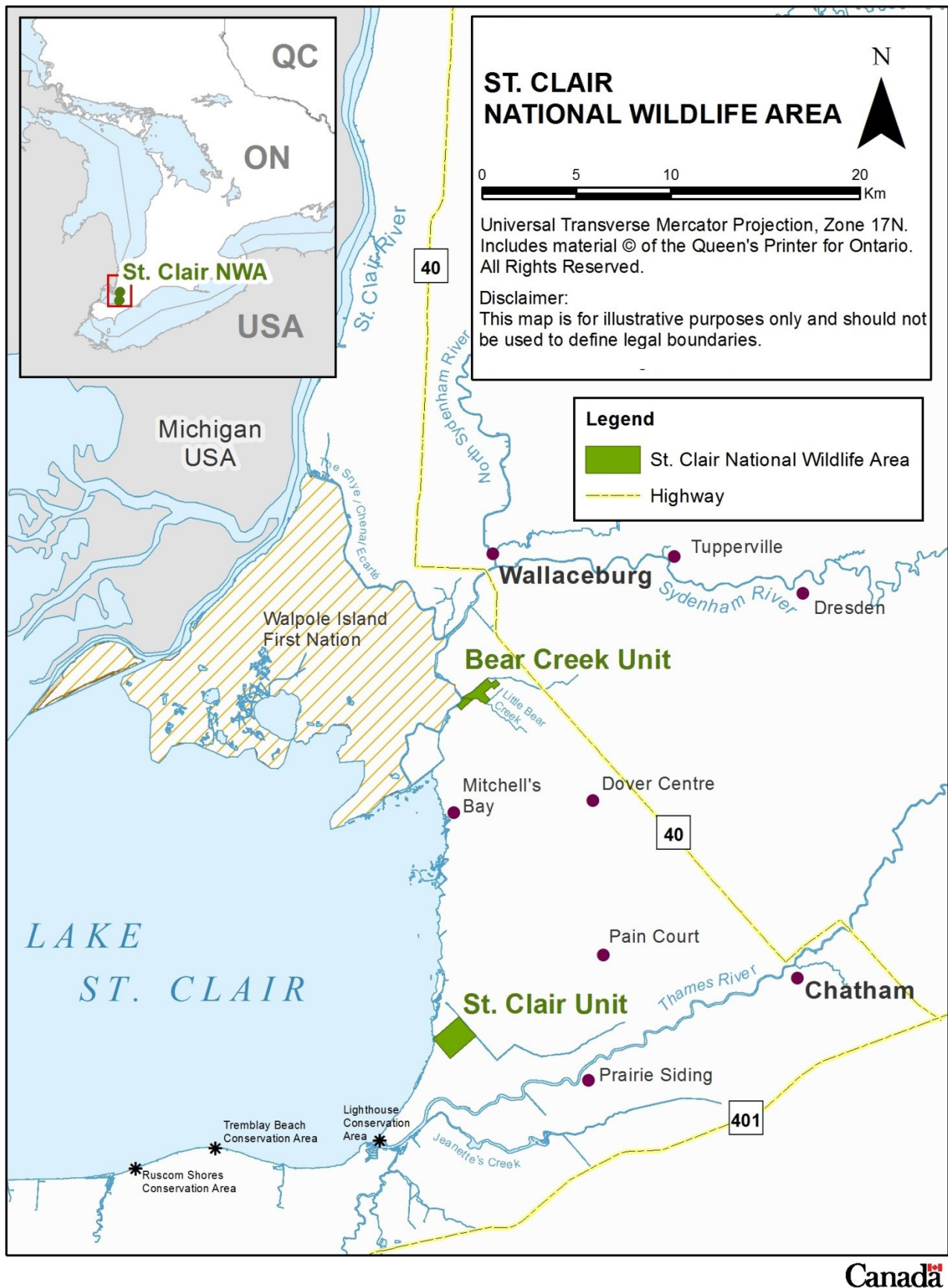


Figure 1: Location of the St. Clair National Wildlife Area, Ontario

Source: Environment Canada – Canadian Wildlife Service (Ontario), 2013

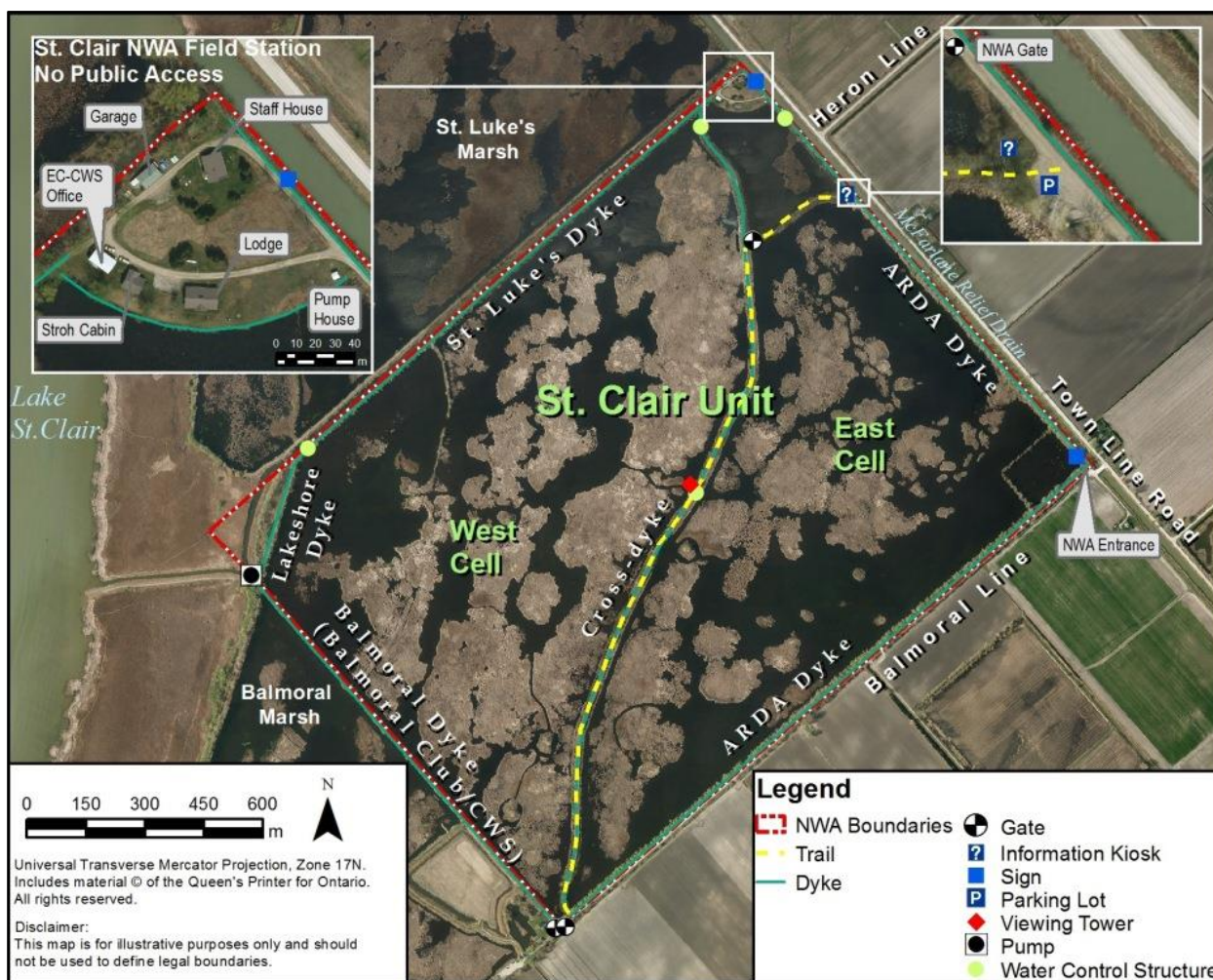


Figure 2: Aerial view of the St. Clair Unit, St. Clair National Wildlife Area (2006)

Source: Environment Canada, Canadian Wildlife Service – Ontario, 2013

Bear Creek Unit

The Bear Creek Unit is located at the mouth of Little Bear Creek and the mouth of Maxwell Creek where they enter at the Snye channel of the St. Clair River (Figure 3). The Snye channel is the easternmost channel of the St. Clair River delta, at the mouth of the St. Clair River where it enters Lake St. Clair (Figure 1). The Bear Creek Unit is inland from Lake St. Clair and thus is influenced more by the St. Clair River than by the lake.

The Bear Creek Unit consists of six dyked impoundments known as the Orchid, Snye, Maxwell, Lozon-Pidgeon,¹ OPG (Ontario Power Generation) and Corsini cells, and one upland area known as the Corsini Upland segment (Figure 3). The cell names are attributed to the previous landowners (Corsini, Pidgeon), nearby watercourses (the Snye channel, Maxwell), and agencies or individuals (OPG, Lozon) that have contributed to the conservation of this NWA. The NWA

¹ Lozon-Pidgeon is also known as Pigeon Marsh and Pidgeon Marsh.

boundary, along the Maxwell and Little Bear Creeks (i.e., adjacent to the Maxwell, OPG, Corsini and Lozon-Pidgeon cells) extends (approximately 15 m) to the centre line of these creeks. The NWA boundary extends only to the water's edge along the Snye channel (i.e., Snye and Orchid cells) (Figure 3).

Within the Unit, the Orchid cell is predominantly tallgrass prairie, while the Snye channel, Maxwell, Lozon-Pidgeon and OPG cells, and the western half of the Corsini cell, are predominantly shallow marsh. The eastern half of the Corsini cell contains primarily old field (former cropland) and a small area of upland native tallgrass prairie. Water levels are managed within the cells using a system of pumps and water control structures. Areas outside the dyked impoundments include the Corsini Upland segment, which consists of cultivated tallgrass prairie, the grassed dykes and banks along watercourses, the Old Marden Dredge Cut, and a marsh area at the mouth of the Little Bear Creek (Figure 3). Land cover adjacent to the Bear Creek Unit is primarily privately owned agricultural land (e.g., cropland growing vegetables, corn and soybeans) and private marshes managed for waterfowl hunting (Figure 3). The Walpole Island First Nation is situated on the St. Clair River delta northwest of the Bear Creek Unit, on the west shore of the Snye channel (Figure 3).

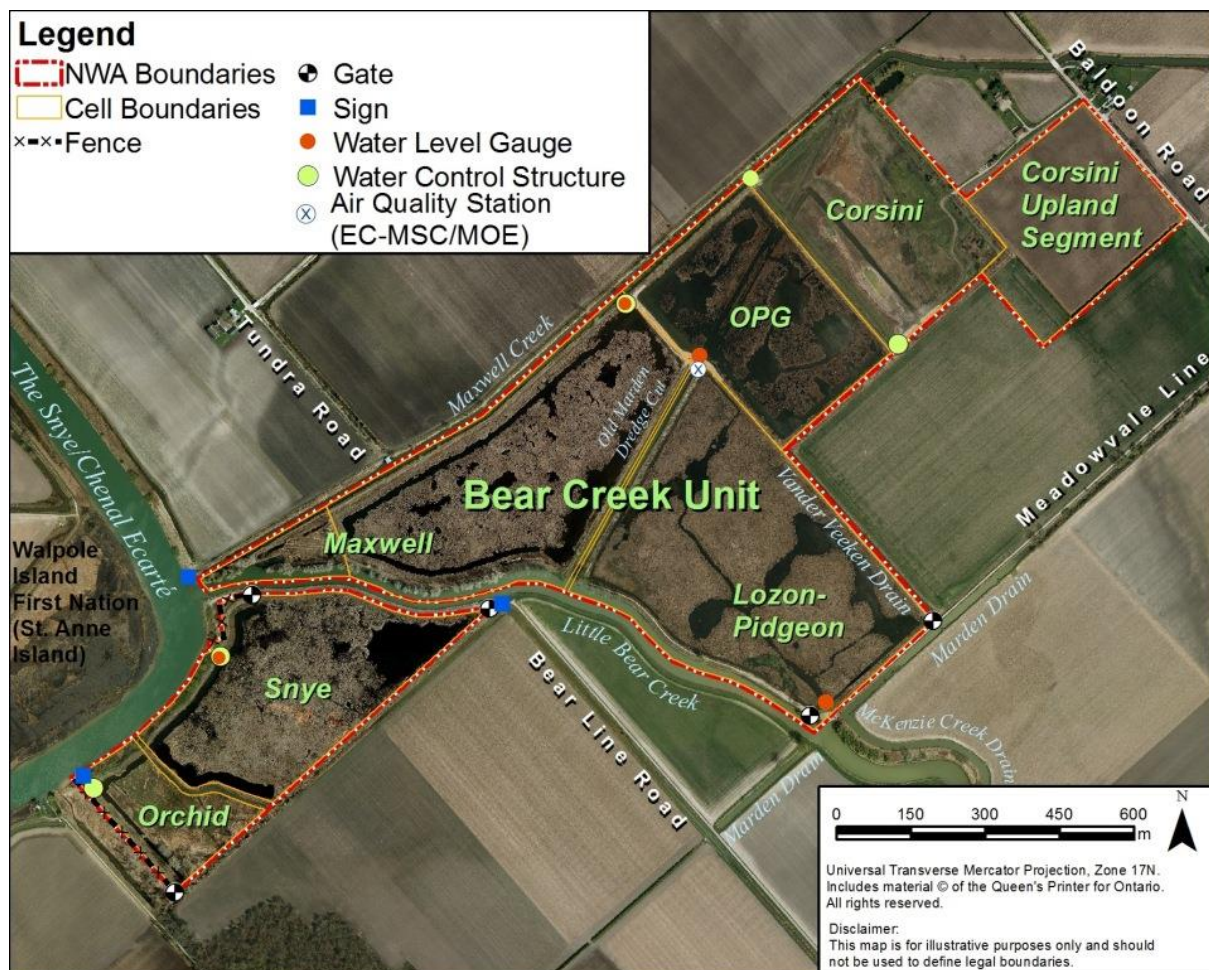


Figure 3: Aerial view of Bear Creek Unit, St. Clair National Wildlife Area (2006)

Source: Environment Canada – Canadian Wildlife Service (Ontario), 2013

Table 1: St. Clair National Wildlife Area Protected Area Summary Information

Protected Area Designation	National Wildlife Area	
Province or Territory	Ontario	
Municipality	Municipality of Chatham–Kent	
Geographic County (historical)	Kent County	
Geographic Township (historical)	Township of Dover	
Latitude and Longitude	St. Clair Unit: Latitude 42.366334 Longitude -82.405108	Bear Creek Unit: Latitude 42.533290 Longitude -82.396169
Size	Total 351.8 ha	
	St. Clair Unit: 242.8 ha	Bear Creek Unit: 109.0 ha
Environment and Climate Change Canada Protected Area Designation Criteria	<p>Criteria 1(a) <i>The area supports a population of a species or subspecies or a group of species which is concentrated, for any portion of the year.</i></p> <ul style="list-style-type: none"> • Lake St. Clair and adjacent marshes are the most important staging and feeding areas for migratory waterfowl in Ontario south of James Bay. • In late fall, tens of thousands of diving ducks are found in rafts on the lake. • Marshes adjacent to the lake contain tens of thousands of puddle ducks and geese. • A large proportion of the eastern population of Tundra Swans (<i>Cygnus columbianus</i>) passes through the region in early spring. • The area is a refuge for several species of waterfowl and marshbirds in summer and fall during the post-breeding molt. • Monarch butterflies (<i>Danaus plexippus</i>) breed in the NWA (June–September), and feed and roost in the NWA during migration (late summer–early fall), when several thousand can be observed daily in the Lake St. Clair area. <p>Criteria 3(a) <i>The area is rare or unusual wildlife habitat, of a specific type in a biogeographic region.</i></p> <ul style="list-style-type: none"> • Wetland and tallgrass prairie habitats are rare in southwestern Ontario; over 90% of pre-European settlement wetlands in this region have been dyked and drained or converted to other uses, primarily agriculture. • The diversity and number of plant and animal species is high due to the moderate climate; several species are at the northern extent of their North American range. • Significant numbers of species at risk in Canada and/or rare species in Ontario are found there. 	
Environment and Climate Change Canada Protected Area Classification System	Category A – 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.	
Order in Council Number	St. Clair Unit: P.C. 1978-1439	Bear Creek Unit: P.C. 1988-829
Directory of Federal Real Property (DFRP) Number	10656	67558
Gazetted	1978	1988
Additional Designations	<ul style="list-style-type: none"> • St. Clair NWA Ramsar Site – Wetland of International Importance (St. Clair Unit) • Eastern Lake St. Clair – globally significant Important Bird Area (includes NWA) • St. Clair Marshes Complex – Provincially Significant Wetland 	

	(includes NWA) <ul style="list-style-type: none"> • Lake St. Clair Marshes Ontario Life Science – Area of Natural and Scientific Interest (includes NWA) • North American Waterfowl Management Plan Lower Great Lakes and St. Lawrence River Area of Continental Significance (Eastern Habitat Joint Venture) (includes NWA) • Canada–United States St. Clair River Area of Concern (Bear Creek Unit)
Faunistic and Floristic Importance	<ul style="list-style-type: none"> • Over 220 bird species were observed at the NWA from 1974–2011 and more than 60 of these species have been recorded breeding at the NWA. • Over 20 species of waterfowl, and fall abundance peaks of 8600 individuals, primarily Mallard, American Black Duck and Canada Goose (Southern James Bay population) have been recorded at the NWA • The Lake St. Clair region, which includes the NWA, is an important staging area for waterfowl, with fall and spring peaks of 150 000 and 60 000 birds, respectively. • A large proportion of the eastern population of Tundra Swans passes through the NWA in the spring <i>en route</i> to breeding grounds in the Canadian Arctic and Alaska. • The NWA provides important habitat for both common and rare species. In addition to birds, 21 mammal species, 15 reptile and amphibian species, and 27 fish species have been reported. • Key habitats include a large marsh (part of the internationally and provincially significant Lake St. Clair wetland complex) and a small remnant patch of tallgrass prairie.
Species at Risk	<ul style="list-style-type: none"> • 35 federally listed species (Endangered, Threatened and Special Concern) under the <i>Species at Risk Act</i> (SARA), including 18 birds, 7 reptiles, 1 insect, 4 fishes, 1 mammal and 4 vascular plants; • 40 species designated by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) have been recorded at the NWA (i.e., 5 bird species in addition to SARA-listed species); and • 2 additional provincially listed species under the <i>Endangered Species Act, 2007</i> (ESA) have been recorded.
Invasive and/or Non-native Species	<ul style="list-style-type: none"> • Plants include non-native Phragmites/European Common Reed (<i>Phragmites australis</i> subsp. <i>australis</i>), Purple Loosestrife (<i>Lythrum salicaria</i>), Eurasian Watermilfoil (<i>Myriophyllum spicatum</i>), Frog-bit or European Frog-bit (<i>Hydrocharis morsus-ranae</i>), Curly-leaf Pondweed (<i>Potamogeton crispus</i>), Water Lettuce (<i>Pistia stratiotes</i>), Flowering Rush (<i>Butomus umbellatus</i>), Reed Canary Grass (<i>Phalaris arundinacea</i>), Sow Thistle (<i>Sonchus oleraceus</i> L.), Canada Thistle (<i>Cirsium arvense</i>), Prickly Lettuce (<i>Lactuca scariola</i>) and White Mulberry (<i>Morus alba</i>). • Animals include Common Carp (<i>Cyprinus carpio</i>), Round Goby (<i>Neogobius melanostomus</i>), Mute Swan (<i>Cygnus olor</i>), temperate-breeding (resident) Canada Goose (<i>Branta canadensis</i>), American Crow (<i>Corvus brachyrhynchos</i>), Double-crested Cormorant (<i>Phalacrocorax auritus</i>), and feral domestic cats and dogs.
Management Agency	Environment and Climate Change Canada (Canadian Wildlife Service)
Public Access and Use	<p>Limited public access is authorized in designated areas for day use only in the St. Clair Unit, which include a hiking trail and wildlife viewing tower that are open to the public year-round.</p> <p>Public access is prohibited in the Bear Creek Unit except for water access to the Maxwell and Little Bear Creeks for recreational boating and fishing (no lead sinkers or spears).</p> <p>Access to other parts of the NWA is restricted, and all other activities within the NWA require a <i>Canada Wildlife Act</i> permit.</p>

1.1 REGIONAL CONTEXT

The St. Clair NWA is within the Municipality of Chatham–Kent (formerly the Township of Dover, Kent County) along the eastern shore of Lake St. Clair, the smallest lake within the Laurentian Great Lakes system. Located between the upper and lower Great Lakes, Lake St. Clair connects Lake Huron to Lake Erie via the St. Clair and Detroit Rivers as part of the Great Lakes Seaway, and shares international borders between Canada and the United States of America (Figure 1). Dredging maintains a key shipping channel that extends from the mouth of the St. Clair River to the Detroit River. The St. Clair River enters Lake St. Clair in the northeast and forms the large St. Clair delta, the largest freshwater delta in the world (Henson et al. 2010).

Walpole Island First Nation includes most of the St. Clair River delta (Figure 1). The Walpole Island First Nation is referred to in Ojibwe as “Bkejwanong” (where the waters divide) and consists of six islands (Walpole, St. Anne, Potawatomi, Squirrel, Bassett and Seaway).

For many years, the St. Clair River has been subject to industrial activity and urban development along its shores including unregulated discharges from petroleum refineries, chemical manufacturers, paper mills, electric power plants and runoff from agricultural operations in rural areas of the watershed (Environment Canada and Ontario Ministry of the Environment 2011). In 1987 the St. Clair River, its delta channels and its immediate drainage basin was designated an Area of Concern under the Canada – United States *Great Lakes Water Quality Agreement*. A coordinated remedial action plan is legislated. The Bear Creek Unit falls within this Area of Concern.

The landscape including and surrounding the St. Clair NWA is locally known as the Chatham Flats—tabletop flat lands that slope slightly toward Lake St. Clair created during the glacial retreat where suspended sediments were deposited forming stone-free, flat, clay plains. Chatham Flats is mainly a marsh habitat with remnant patches of tallgrass prairie. This low-lying plain contains some of the most fertile soils in southern Ontario. Much of the land is dyked and tile-drained for agriculture; drains and ditches running beside farmlands end in pumping stations. The black soils, enriched by the once-broad tallgrass prairies, produce high yields of a variety of vegetables, including tomatoes, onions, carrots and beets; and of cash crops, including corn, soybeans and winter wheat. Corn is the principal crop accounting for about 60 percent of the land being farmed (Jalava et al. 2013).

The region contains some of the largest coastal wetlands in the Great Lakes. Marshes occur along the Ontario shore of Lake St. Clair, stretching north from the mouth of the Thames River to Mitchell's Bay, and the north shore of the lake in the St. Clair delta. Approximately 12,769 ha of coastal wetlands occur on the Canadian side of the St. Clair delta, with the majority of these wetlands, approximately 10,360 ha, located on the Walpole Island First Nation (Environment

Canada and Ontario Ministry of Natural Resources 2003). Five other wetlands totalling approximately 2,522 ha are located south of the St. Clair delta along the eastern and southern shores of Lake St. Clair: Paternoster Club Marsh (3.9 ha), Tremblay Beach Marsh (24 ha), Ruscom Shores Marsh (29 ha), Thames River Mouth (131 ha) and the St. Clair Marshes Complex (2,335 ha) (Environment Canada and Ontario Ministry of Natural Resources 2003). The St. Clair NWA (St. Clair Unit) is part of the St. Clair Marshes Complex, a Provincially Significant Wetland complex comprising 20 marshes, including, Bradley Marsh, Balmoral Marsh, St. Luke's Marsh and Big Point Club (Environment Canada and Ontario Ministry of Natural Resources 2003).

Walpole Island First Nation is known for some of the richest and most diverse wetlands in the Great Lakes but also includes rare remnant tallgrass prairies. Recreation and tourism is an important industry in the community and many still support their families by guiding and participating in hunting, trapping and fishing.

Almost all wetlands along the Canadian Lake St. Clair shoreline, south of the Walpole Island First Nation, are privately owned and are maintained by private clubs for waterfowl hunting (e.g., Bradley Marsh, Balmoral Marsh, St. Luke's Marsh and Big Point Club). Many of these wetlands are dyked, and water levels are controlled (EHJV 1998). Where wetlands are not controlled, water level fluctuations greatly affect the extent and position of wetlands because the topography surrounding much of the lake and especially in the delta is almost flat. Large changes in wetland area are especially great between years of high and low water levels (Herdendorf et al. 1986).

Lake St. Clair is popular for boating and fishing in the summer months, waterfowl hunting in the fall, and bird watching in the spring and fall. In the winter, snowmobiling and ice fishing take place on the lake. Associated tourism benefits the local economy.

The shoreline and nearshore wetlands are also important stopover and travel routes for other migratory birds, bats and butterflies. Particularly during spring migration, shoreline sites are especially important due to the early emergence of insects that provide a critical food source for migrant species. Several factors are responsible for the large numbers of migratory waterfowl using the Lake St. Clair region: Lake St. Clair is located on the Atlantic and Mississippi flyway migration corridors; the climate is moderated by Lake St. Clair and Lake Erie, meaning snow seldom remains on the ground for long, and periods of low summer rainfall often occur; its southern geographical position gives the region a warmer climate, allowing the marshes to freeze late in the fall and open early in the spring; and the marshes and bays of Lake St. Clair contain supplies of high-quality duck foods such as Sago Pondweed (*Potamogeton pectinatus*) and Wild Celery (*Vallisneria americana*).

The St. Clair NWA is located within the North American Bird Conservation Initiative, Bird Conservation Region 13, on the Lower Great Lakes/St. Lawrence Plain, and within the Mixedwood

Plains Ecozone and Lake Erie Lowland Ecoregion (Wiken 1986). The Lake Erie Lowland Ecoregion is more generally referred to as the Carolinian Forest or the Carolinian Canada lifezone (Johnson 2007), a region rich in rare species usually not found in other parts of Canada. In addition, the Lake St. Clair region, which includes the St. Clair NWA, has been recognized as a conservation priority on a continental and global scale, because of the large numbers of migratory birds that use the marshlands and agricultural fields including:

- In 1998, the Canadian Nature Federation and Bird Studies Canada designated Eastern Lake St. Clair (ELSC) as an Important Bird Area (IBA) of global significance under the congregatory species category, due to the globally significant numbers of waterfowl and shorebirds during migration (Cheskey and Wilson 2001).
- The ELSC IBA is also recognized as a nationally significant IBA under the threatened species category, due to the number of bird species at risk found within the IBA (Cheskey and Wilson 2001).
- The St. Clair NWA is within the geographic area of 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). Areas of continental significance were established to conserve wetland and upland habitats important to waterfowl conservation.
- In 1985, the St. Clair NWA (i.e. St. Clair Unit) was designated as a Ramsar site under the Convention on Wetlands of International Importance, because the area is one of the most important sites for migratory waterfowl in southern Canada and supports a number of rare or threatened amphibians and reptiles (Ramsar Convention Secretariat 2012).
- The Lake St. Clair Marshes (including the NWA) are provincially recognized as a Life Science – Area of Natural and Scientific Interest.

1.2 HISTORICAL BACKGROUND

Prior to European settlement in the 1800s, the surrounding region along the lakeshore was marshland that merged into broad tallgrass prairie and oak savannah. The coastal marshes and wet meadows extended in a 5-to-10-km-wide fringe along the shore of the lake from Stoney Point to the northern end of Walpole Island (Collins 1973). At the eastern edge of the meadows grew hardwood forests of Ash, Oak, Maple and some Black Walnut (McNiff 1791). The coastal marshes, wet meadows and prairie along the eastern shore of Lake St. Clair were greatly influenced by lake water levels and local climate. Only three natural creeks traversed the Chatham Flats: the Pain Court, Little Bear and Big Creeks, making farming difficult. A large amount of the area east of Lake St. Clair was under water each spring, including the St. Clair NWA lands, and only discernible during periods when the water level of Lake St. Clair was low (McKeating et al. 1982).

Lake St. Clair, the St. Clair River and the Chatham Flats have a history of human use and occupation stretching back approximately 6000 years when Aboriginal peoples moved into southwestern Ontario shortly after the retreat of the Wisconsin glacier. The region was an important hunting and fishing area for many Aboriginal peoples providing an abundance of fish and wildlife for consumption and clothing, and a transportation corridor (Raphael 1987). Aboriginal peoples also practiced agriculture; growing corn, beans, pumpkins and tobacco. European traders arrived by the 1600s and began consuming natural resources in the region. In the early 1800s European settlement of the region had begun (Weaver et al. 2015).

The wet soil of the Chatham flats made productive farming difficult to impossible in spite of the highly fertile soil and long growing season. To increase agricultural production, the local municipalities established a system of artificial drainage to control water levels using a system of dykes and pumping stations. Industry booms such as ship building, salt evaporation ponds and oil extraction brought significant road and rail development to the region. The timber industry used ships as their primary mode of transport. To avoid shipping delays on Lake St. Clair, a major shipping channel was established in 1873 by dredging through the lake from the St. Clair delta to the Detroit River.

With better access to the St. Clair River delta, the agricultural industry began to expand at the north end of the lake. Hotels, hunt clubs and cottages were built along the shorelines. The tall grass prairie were either ploughed or destroyed by cutting and heavy grazing. The forests were removed to provide farmland, building materials and fuel. By the mid-nineteenth century oak staves and walnut lumber were being exported from the Lower Thames area in great quantities (Weaver et al. 2015).

By the end of the 19th century, waterfowl hunting clubs had been established at each of the three large natural marshes along the St. Clair shoreline: Mud Creek, Big Point and St. Luke's Bay. Over time, dykes and water control structures were installed in many of the private marshes to maintain water in the fall, during periods of drought and low lake levels, as well as to protect against flooding during periods of high water.

In the 1900s residential and commercial development began to grow however, the predominant land use on the Canadian side of Lake St. Clair was and continues to be agriculture. Human impacts have been wide spread. Major industry development was paired with the promotion of wetland drainage, resulting in the changes to many natural habitats of the Lake St. Clair region. Landscapes changed from primarily prairie, wetland and forest habitats to a rural agricultural landscape. Only traces of the once extensive tallgrass prairie and of the oak forests remain. Wetland losses due to agriculture and other forms of development are among the highest on the continent

(EHJV 1998). Over 90% of the original wetlands within the Lake St. Clair region have been drained and converted to agricultural production (Ducks Unlimited Canada 2010; Snell 1987). The remaining wetlands continue to be vulnerable to loss and as such, there is a critical need to restore and recover lost waterfowl and wetland values.

Establishment of the St. Clair NWA

Historically, the land known today as the St. Clair Unit was open to the lake and subject to changes in water levels. In high-water periods the majority of the St. Clair Unit would have been marsh, and in low-water periods this area would have been prairie. In the 1930s the prairie was used for livestock grazing, and in 1940 this grazing land was purchased by Dover Marshes Limited with the intent to establish a waterfowl hunting club. At the time, a number of dykes were established along the eastern shore of Lake St. Clair (e.g., Balmoral, Dover [present St. Clair Unit] and portions of St. Luke's marshes) and were managed for waterfowl and Muskrat production (which were important local food sources) as well as to produce an environment favorable to the growth of marsh vegetation. Water was kept low in the summer to encourage the germination and growth of aquatic plants including cattails. In the fall, it was raised to attract waterfowl and kept fairly high until the end of the Muskrat trapping season.

The grazing land was converted to marsh, initially by constructing a dyke around the perimeter of the property. In order to maintain water access to Lake St. Clair and install water control structures, a small portion of the property along the eastern shore of Lake St. Clair was not dyked. In the early to mid-1970s, dykes were constructed along watercourses and the eastern shore of Lake St. Clair under the *Agricultural and Rural Development Act* (ARDA) program to protect farmland and infrastructure adjacent to Lake St. Clair and the Snye channel from flooding (Figure 2). The ARDA dyke along the northeast and southeast boundary of the St. Clair Unit is part of the ARDA dyke system that extends north to Mitchell's Bay, and south to the mouth of the Thames River.

St. Clair NWA – St. Clair Unit

In 1974, ECCC-CWS purchased 242.8 ha from Dover Marshes Limited as part of its habitat preservation program. In 1978, the St. Clair NWA was established under the *Canada Wildlife Act* (CWA), named after the nearby St. Clair River and Lake St. Clair. It is believed that Lake St. Clair was named by French explorers who discovered the lake in 1679 and called it Lac Sainte Claire in honour of Sainte Claire of Assisi.

In 1980, a cross-dyke was built to divide the St. Clair Unit into two separate marsh compartments, the East and West cells, and several small islands were created as waterfowl

nesting areas (McKeating et al. 1982). Water levels are controlled in both compartments by water control structures and a single high-capacity electric pump.

St. Clair NWA – Bear Creek Unit

In 1985, ECCC–CWS purchased 46.53 ha known as the Bear Creek Marsh (i.e., Snye, Maxwell and Orchid cells) (Figure 3) from Nannin Inc. In 1988, this property was designated as the Bear Creek Unit of the St. Clair NWA under the CWA. The Unit is named after the Bear Creek, which runs through the property (Figure 3).

In 1988, ECCC–CWS in partnership with Ducks Unlimited Canada (DUC) undertook the repair and reconstruction of existing perimeter dykes and the installation of water control structures in the Maxwell and Snye cells. That same year, DUC purchased an additional 62.47 ha of private land adjacent to the Bear Creek Unit. This private land was known as the Pidgeon Marsh (i.e., the Lozon-Pidgeon, OPG [Ontario Power Generation], and Corsini cells, and the Corsini Upland segment) (Figure 3). In 2002, DUC transferred ownership of the Pidgeon Marsh to ECCC–CWS, expanding the Bear Creek Unit to 109.0 ha and the total size of the St. Clair NWA to 351.8 ha.

In 1982, ECCC–CWS entered into a formal long-term agreement with DUC to coordinate ongoing maintenance and management of select infrastructure on the St. Clair NWA. The agreement was updated in 2003 to include the newly acquired Bear Creek Unit properties. The agreement allows DUC to maintain and repair the dykes, pumps or other installations they constructed or installed within the St. Clair NWA, for purposes of water-level management, wildlife habitat management, and invasive and non-native species control.

Since the Bear Creek Unit was acquired, emphasis has been placed on water-level management to maintain marshes for waterfowl staging habitat. In the fall of 2005, a cross-dyke was constructed by DUC across the western third of the Snye cell (Figure 3), to enable water-level management of the Orchid cell independently to produce an environment more favorable to the growth of prairie vegetation, in order to promote recovery of endangered plant species.

Previous management plans have been prepared for the St. Clair NWA (McKeating et al. 1982, Robinson 1988) and further rationale for the management actions taken in the past can be found in these plans. This 2018 St. Clair NWA Management Plan updates and replaces all previous versions.

1.3 LAND OWNERSHIP

Surface title of the St. Clair NWA belongs to the Crown in Right of Canada and is administered by ECCC–CWS as described in Schedule 1 of the *Wildlife Area Regulations* of the CWA. It comprises two parcels of land and water, which are separated by approximately 11 km of

privately owned agricultural land (Figure 1). The Crown in Right of Canada does not hold the subsurface mineral rights for the St. Clair NWA.

ECCC–CWS manages and maintains lands and infrastructure (e.g., dykes, roads, driveways, gates and fences) within the St. Clair NWA. The maintenance and repair of dykes, pumps or other structures installed by DUC are ensured through a formal agreement between ECCC–CWS and DUC. Where infrastructure occurs along NWA boundaries, and where there is joint ownership of these features, responsibilities for management are shared (see Section 1.5, Table 2). Because the system of dykes, channels and drains runs through the NWA and adjacent properties, ECCC–CWS works with neighbouring landowners (e.g., marsh managers, farmers and hunt clubs), organizations such as DUC, the Ontario Ministry of Natural Resources and Forestry, conservation authorities and municipalities to monitor and manage water levels within the NWA. Other shared interests in land within the NWA include the municipal road allowance along Balmoral Line, and agreements with Ontario Hydro and Bell Canada for service lines.

1.4 FACILITIES AND INFRASTRUCTURE

Facilities and infrastructure occur on both Units of the St. Clair NWA and are comprised of a number of signs, fences and gates, and water-control infrastructure (Table 2). The St. Clair Unit also has a number of buildings, including a residence.

Signs are posted to identify NWA boundaries, indicate areas where entry is prohibited, list conditions of access and permitted uses, and provide interpretation. Signs require frequent maintenance due to damage from weather and vandalism. Fences and gates have been installed to help prevent off-road vehicle access to NWA property and restrict access to ECCC–CWS buildings and neighbouring properties (Figures 2, 3; Table 2).

The water management infrastructure in the St. Clair and Bear Creek Units consists of earthen dykes, water control structures, water level gauges, pumps and pumphouses (Figures 2, 3; Table 2). The dykes isolate the wetland from the lake and adjacent drains, to allow the manipulation of water levels. The water levels within the dyked wetlands are artificially controlled using a system of pumps, water control structures and dykes.

St. Clair Unit

The main entrance to the St. Clair NWA is located at the east corner of the St. Clair Unit at 5633 Balmoral Line (Figure 2). Six buildings owned by ECCC–CWS are located at the north corner of the St. Clair Unit, including the ECCC–CWS office/workshop and five other buildings (Figures 2, 4; Table 2). Infrastructure consists of signs, fencing, gates and items listed below for water management (Figures 2, 4, 5, 6; Table 2). The ECCC–CWS buildings and compound area are

secured by a locked gate, and posted as prohibited entry, accessible only by ECCC–CWS staff and authorized visitors. ECCC–CWS maintains a gravel road leading from the NWA entrance to the compound.

The driveway leading to the public parking lot and ECCC–CWS compound, on the west side of Town Line Road, is located in part on the NWA as well as on the municipal road allowance (owned by the Municipality of Chatham–Kent) and is maintained by ECCC–CWS (Figure 2).

There is a public hiking trail (approximately 2.5 km) and a wildlife viewing tower located along the top of the cross-dyke, accessible from the public parking lot (Figures 2, 5 and 6). The trail extends beyond the viewing tower, along the top of the cross-dyke, and ends at Balmoral Line (Figure 2).



Figure 4: Environment and Climate Change Canada – Canadian Wildlife Service office and other structures at the St. Clair Unit, St. Clair National Wildlife Area, 2011
Photo: Jeff Robinson © Environment and Climate Change Canada



Figure 5: Public parking lot, interpretive signs and trail entrance, St. Clair Unit, St. Clair National Wildlife Area, 2010

Photo: John Haggeman © Environment and Climate Change Canada



Figure 6: Viewing tower, St. Clair Unit, St. Clair National Wildlife Area, 2011

Photo: Jeff Robinson © Environment and Climate Change Canada

Bear Creek Unit

The Bear Creek Unit has no facilities. Infrastructure consists of signs, fencing, and gates and items listed below for water management (Figure 3; Table 2).

Ontario's Ministry of the Environment (MOE) in coordination with Environment and Climate Change Canada's Meteorological Service of Canada (ECCC–MSC) jointly operate an air quality station to monitor air quality (ECCC–MSC) and precipitation (MOE) (Figure 3; Table 2). The air quality station is located north of Meadowvale Line, and access to the station along a gravel laneway is controlled by a locked gate (Figure 3; Table 2). The air quality station consists of monitoring equipment housed in a small building and a tower (Table 2).

The Municipality of Chatham–Kent owns a small parcel of land outside of the NWA on the northwest corner of the Snye cell in the Bear Creek Unit, used by the public to access the Snye channel. ECCC–CWS maintains a fence to separate this municipal parcel from the NWA in order to restrict access into the NWA (Figure 3).

Table 2: Facilities and Infrastructure at St. Clair National Wildlife Area

St. Clair Unit		
Type of facility or infrastructure	Approximate size or number	Responsibility holder or owner
<i>Signs</i>		
911 sign #5633 Balmoral Line, RR 1 Pain Court	1 sign	Municipality of Chatham–Kent
NWA identification signs	2 signs	ECCC–CWS
NWA boundary signs	22 signs	ECCC–CWS
NWA Entry Prohibited signs	25 signs	ECCC–CWS
Interpretive signs	4 signs	ECCC–CWS
Ducks Unlimited Canada (DUC) partner sign	1 sign	ECCC–CWS
DUC dedication sign	1 sign	DUC
<i>Buildings</i>		
Office/workshop	75 m ²	ECCC–CWS
Garage	65 m ²	ECCC–CWS
Lodge	100 m ²	ECCC–CWS
Stroh cabin	75 m ²	ECCC–CWS
Staff house	95 m ²	ECCC–CWS
<i>Dykes and water control structures</i>		
Dykes	~ 10 km	ECCC–CWS/DUC/adjacent landowners
ARDA dyke	~ 3 km	Municipality of Chatham–Kent
Pumphouse (domestic water system)	1.10 m ²	ECCC–CWS
Pumphouses – metal enclosures (not in use)	2 pumphouses, 2 enclosures 2.4 m ²	ECCC–CWS/DUC
Pump	1	ECCC–CWS
Water control structures	4	ECCC–CWS/DUC
<i>Public facilities</i>		
Gravel parking lot	150 m ²	ECCC–CWS
Wildlife viewing trail	2.5 km (length one way)	ECCC–CWS
Viewing tower – two-level	~ 3 m L x 4 m W x 4 m H	ECCC–CWS

Washroom (portable)	1	ECCC-CWS
<i>Other</i>		
Gravel driveway and access road to parking lot	1.6 km	ECCC-CWS/Municipality of Chatham-Kent
Gravel driveway to compound	~ 0.5 km	ECCC-CWS
Wood foot bridge	10 m L x 1.2 m W	ECCC-CWS
Gates – cross-dyke	2	ECCC-CWS
Gate – NWA driveway/municipal property	1	ECCC-CWS/Municipality of Chatham-Kent
Gate – non-NWA property/Balmoral Club property	1	ECCC-CWS/Balmoral Club
Gate – non-NWA property/St. Luke's Club property	1	ECCC-CWS/St. Luke's Club
Bear Creek Unit		
Type of facility or infrastructure	Approximate size or number	Responsibility holder or owner
<i>Signs</i>		
911 sign #8147 Meadowvale Line RR 6 Wallaceburg (entrance to air quality monitoring station/road)	1	Municipality of Chatham-Kent
911 sign – #8101 Meadowvale Line RR 6 Wallaceburg (Lozon-Pidgeon cell at west end of Meadowvale Line)	1	Municipality of Chatham-Kent
NWA identification signs	3	ECCC-CWS
NWA boundary signs	13	ECCC-CWS
NWA Entry Prohibited signs	28	ECCC-CWS
No Trespassing signs	22	ECCC-CWS
DUC dedication sign	1	DUC
EHJV partners – OPG dedication sign	1	ECCC-CWS
<i>Buildings</i>		
ECCC-MSC air quality station shelter	4 m x 5 m	ECCC-CWS
ECCC-MSC air quality meteorological tower	1.2 m W x 2.4 m D x 3 m H	ECCC-CWS
MOE precipitation monitoring station	3.7 m x 4.9 m area	MOE
<i>Dykes and water control structures</i>		
Dykes	~ 9 km	ECCC-CWS/DUC/adjacent landowners
Pumphouse	2.4 m ²	ECCC-CWS
Water control structures	5	ECCC-CWS/DUC
Water level gauges	4	ECCC-CWS
<i>Other</i>		
Fence	~ 0.5 km	ECCC-CWS
Gates	5	ECCC-CWS/adjacent landowners
Gravel driveway to ECCC-MSC/MOE station	~ 0.5 km	ECCC-CWS/ECCC-MSC/MOE

2 ECOLOGICAL RESOURCES

2.1 TERRESTRIAL AND AQUATIC HABITATS

The St. Clair Unit and Bear Creek Unit consist predominantly of marsh habitat (90%), with the Bear Creek Unit also containing a small remnant patch of tallgrass prairie (2%). The remaining area (8%) is a combination of upland shrubs and trees and grassed areas on top of dykes, dyke banks, and around buildings; cultivated tallgrass prairie (i.e., native tallgrass prairie seed nursery); old field (former cropland); and a small area of vegetable crops (e.g., carrots and tomatoes). Aquatic habitats within the NWA include open ditches and channels adjacent to the dykes, the Old Marden Dredge Cut and portions of the Maxwell and Little Bear Creeks, and areas of open water within the marshes.

2.1.1 Wetlands

Managed Wetlands

The majority of wetlands within the NWA (i.e., both the St. Clair and Bear Creek Units) are marshes within dyked impoundments, dominated by dense stands of cattails (*Typha* spp., predominantly Narrow-leaved Cattail (*Typha angustifolia*) and Hybrid Cattail (*Typha xglauca*)) interspersed with areas of shallow (< 2 m) open water and ponds (Figure 7). Jewelweed (*Impatiens capensis*), Tussock Sedge (*Carex stricta*), Swamp Rose-mallow (*Hibiscus moscheutos*) (species of Special Concern) and invasive non-native Purple Loosestrife (*Lythrum salicaria*) grow frequently within the cattail stands. Dense patches/large stands of cattails and non-native Phragmites/ European Common Reed (*Phragmites australis* subsp. *australis*) can be found around the edges of ponds and on dykes.

A variety of submergent and emergent plants are found within the shallow open-water areas within the impoundments, including pondweeds (*Potamogeton* spp.), bulrushes (*Schoenoplectus* spp.), bur-reed (*Sparganium* spp.), water lilies (various spp.), American Lotus (*Nelumbo lutea*), Pickerelweed (*Pontederia cordata*), Hardstem Bulrush (*Schoenoplectus acutus*), Muskgrass (*Chara* spp.) and wild celery.

Surveys of submergent and emergent vegetation in the St. Clair NWA found that the Fragrant or White Water Lily (*Nymphaea odorata*) was the most abundant vegetation species in both the St. Clair Unit (2007) and Bear Creek Unit (2006) (Friis 2008).

Within the St. Clair Unit, the marsh bottom is gently undulating with a series of beach ridges, formed by wave action (prior to dyking), running north-south across the marsh. The variation in water depths creates a desirable interspersed of emergent plants and open water. Non-native Phragmites and cattails grow along the tops of exposed ridges.



Figure 7: Managed Wetlands, St. Clair Unit, St. Clair National Wildlife Area, 2014

Photo: Dan Rokitnicki-Wojcik © Environment and Climate Change Canada

Coastal Wetlands

At the west corner, within the St. Clair Unit, there is a small (approximately 5 ha) area of undyked open water marsh on Lake St. Clair (Figure 2). This marsh is part of a contiguous coastal marsh that extends to the north and south of the NWA along the eastern shore of Lake St. Clair (Figure 2) occurring on sandy sediments. This area is subject to the natural water-level changes of Lake St. Clair, and the habitat varies from shallow open water to emergent marsh to dry mud flats. Willows and poplars grow on the channel banks, and during low-water periods, the soil is exposed and the area is dominated by non-native *Phragmites*. In high-water periods, open water dominates, and floating mats of vegetation (e.g., bur-reed, Hardstem Bulrush, Tussock Sedge, Purple Loosestrife and cattail) are common.

In the mid-1980s, Lake St. Clair water levels were so high that armourstone was placed along the shoreline dyke to prevent wave erosion. However, in 2011, with low water levels on Lake St. Clair, there was approximately 500 m of marsh between the dyke and the lake, dominated by non-native *Phragmites*.

Riverine Wetlands

There are approximately 4 ha of riverine marsh within the western portion of the Bear Creek Unit located at the mouth of the Little Bear Creek where it meets the Snye channel (Figure 3). This

marsh area is outside of the dyked impoundments (i.e., Snye and Maxwell cells) and is influenced by natural water-level changes in the Little Bear Creek and the Snye channel, and to a lesser extent in Maxwell Creek. The wetland vegetation species diversity is similar to that found within the dyked wetland impoundments, and drier areas are dominated by non-native *Phragmites*.

2.1.2 Watercourses

Portions of several watercourses, including channels, municipal drains and creeks, are located within the St. Clair NWA (Figures 2, 3).

A channel is maintained on the St. Clair Unit (west of the Lakeshore Dyke) and Balmoral Club property for the pumps to access water from Lake St. Clair for the St. Clair Unit and Balmoral Club Marsh (Figure 2). During periods of low and receding lake levels, the channel is dredged to maintain a connection to the lake.

Watercourses within the NWA include portions of the Maxwell and Little Bear Creeks: the boundary of the Bear Creek Unit extends to the centre of the Maxwell and Little Bear Creeks. Also within the Bear Creek Unit is the Old Marden Dredge Cut, which provides an outlet into the Little Bear Creek (Figure 3). The Maxwell and Little Bear Creeks are natural watercourses that also function as municipal drains into The Snye channel.

2.1.3 Tallgrass Prairie

Historically, during low water levels on Lake St. Clair, the extensive marshes along the eastern shore of the lake reverted to prairie. Today, remnant prairie plants are found along the top of dykes and dyke banks and drier areas within the NWA.

Within the Bear Creek Unit, the Orchid cell and a portion of the Corsini cell are remnant tallgrass prairie and are actively managed to promote prairie vegetation communities. Prairie vegetation in these cells is a mix of prairie grasses, forbs, asters (*Aster* spp.), goldenrods (*Solidago* spp.), and rare species including Riddell's Goldenrod (*Solidago riddellii*) (Special Concern) (Government of Canada 2015a).

The eastern half of the Corsini cell and the Corsini Upland segment contain common upland and prairie plants. A native prairie seed nursery was planted within the Corsini Upland segment and maintained to prevent soil loss and control weeds until the area is restored to prairie. Hedgerows of Eastern White Cedar (*Thuja occidentalis*) grow near the southeast boundary of the Corsini Upland segment.

2.1.4 Earthen Dykes and Uplands

Approximately 19 km of dykes are located within the St. Clair NWA. The dominant plants growing on top of the dykes and dyke banks are grasses, non-native Phragmites and wildflowers, including a variety of common prairie plants (e.g., Prairie Cordgrass (*Spartina pectinate*), Giant Ironweed (*Vernonia gigantea*), Tall Sunflower (*Helianthus giganteus*) and Big Bluestem (*Andropogon gerardii*)). Trees and shrubs such as willows (*Salix* spp.), Eastern Cottonwood (*Populus deltoides*), White Mulberry (*Morus alba*), sumacs (*Rhus* spp.) and dogwoods (*Cornus* spp.) are scattered along the top of the dykes, near the buildings and along the roads.

A number of nesting islands within the East cell of the St. Clair Unit established in 1980 to improve nesting opportunities for waterfowl are now covered in shrubs (e.g., Staghorn Sumac (*Rhus tyhina*), dogwoods), trees (e.g., willows, Eastern Cottonwood) and non-native Phragmites, and are surrounded by shallow water.

The native ash trees (*Fraxinus* spp.), which grew along the dykes and upland areas within the St. Clair Unit, were removed by Agriculture and Agri-Food Canada–Canadian Food Inspection Agency (AAFC–CFIA) in 2004 as part of the CFIA effort to slow the spread of the invasive Emerald Ash Borer (*Agrilus planipennis*). This non-native insect attacks and kills all species of ash trees and has destroyed millions of trees in southwestern Ontario, Michigan and surrounding states (AAFC–CFIA 2011).

2.2 WILDLIFE

2.2.1 Birds

Over 220 species of birds have been recorded at the St. Clair NWA since 1974, including 18 species at risk (EC–CWS 2013a; Government of Canada 2015a). The NWA and other Lake St. Clair marshes provide essential staging, stopover and feeding habitat for waterfowl and other migratory birds along the Atlantic and Mississippi flyways during spring and fall migration. The NWA also provides important breeding habitat for more than 60 species of birds (EC–CWS 2013a). Annual winter bird census data collected during Christmas Bird Counts (1981–2009) report an average of 70 bird species using the NWA and surrounding area during winter (Woodliffe 2009; P. A. Woodliffe, personal communication, 2011).

Waterfowl

Hundreds of thousands of waterfowl migrate through the Lake St. Clair region every spring and fall. At the height of migration in spring and fall, the lake, located on major bird migration corridors, supports tens of thousands of waterfowl including ducks, geese and swans. These birds congregate in the marshes and shallow waters of the eastern shore of the lake and at the southern end of the St. Clair delta. During spring migration, the numbers of waterfowl within the St. Clair NWA

peak at 1 500 birds (EC–CWS 2012a). On peak days in the fall, 8 600 waterfowl may be present at one time at the St. Clair NWA as they stop to rest and feed in the marshes on their migration south (EC–CWS 2012a, Figure 8). Staging waterfowl require open water areas, and thus the large majority (95%) of waterfowl using the St. Clair NWA are found within the St. Clair Unit (EC–CWS 2012a). These birds, together with the many thousands in the surrounding marshes and fields, present a tremendous wildlife spectacle. In the fall, the number of waterfowl in the Lake St. Clair region has approached 150 000, while in the spring, peak numbers have been as high as 60 000 birds (EC–CWS 2012a; Mullie et al. 1996). Larger numbers of waterfowl stage, rest and feed in the fall on the NWA and shoreline marshes to seek sanctuary from hunting (EC–CWS 2012a). In the spring, migrants disperse and feed in marshes and flooded fields throughout the area (Mullie et al. 1996).

Use of the St. Clair NWA by migrating birds is dominated by waterfowl. Over 20 species of ducks and geese have been recorded at the NWA, primarily puddle ducks, including Mallards (*Anas platyrhynchos*) and American Black Ducks (*Anas rubripes*) and Canada Geese (*Branta canadensis*) (southern James Bay population). Relatively smaller concentrations of other dabbling and diving duck species are also present during spring and fall migration. Ring-necked Ducks (*Aythya collaris*) are common migrants, and thousands use the NWA, particularly during fall migration (J. Haggeman, personal communication, 2011).

A large portion of the eastern population of Tundra Swans (*Cygnus columbianus*) passes through the NWA in the spring (March–April) on their way to breeding grounds in the Canadian Arctic and Alaska. At times during spring, approximately 20 000 Tundra Swans have been observed in the marshes and flooded fields adjacent to Lake St. Clair (J. Haggeman, personal communication, 2011). Other species that use the marshes for feeding and staging include the American Wigeon (*Anas americana*), Blue-winged Teal (*Anas discors*), Green-winged Teal (*Anas crecca*), Gadwall (*Anas strepera*), Wood Duck (*Aix sponsa*) and Canvasback (*Aythya valisineria*).



Figure 8: Staging waterfowl at the St. Clair National Wildlife Area.

Photo: © Environment and Climate Change Canada

ECCC–CWS conducts the annual Mid-winter Waterfowl Survey over wetlands and open ice holes along the shoreline of Lake St. Clair (which includes the St. Clair NWA). These aerial surveys document early winter use by waterfowl populations (S. Badzinski, personal communication, 2012). Several species of migrating waterfowl (e.g., Mallards, American Black Ducks and Canvasbacks) remain well into winter as long as some open water areas remain and food is available.

With the exception of temperate-breeding (resident) Canada Geese, breeding waterfowl within the NWA are not abundant. Other species most commonly found to breed in the NWA are Mallards and Wood Ducks. Rare breeders in the NWA include Blue-winged Teals and Redheads (*Aythya americana*). The NWA is also used by Mallards and Wood Ducks during the post-breeding moult in July and August. Invasive and non-native species reported nesting in the NWA include the Mute Swan (*Cygnus olor*).

Waterbirds

Over 30 different species of marsh-dependent waterbirds have been recorded at the St. Clair NWA, including the Pied-billed Grebe (*Podilymbus podiceps*), Great Blue Heron (*Ardea herodias*), Green Heron (*Butorides virescens*), American Coot (*Fulica americana*) and Common Gallinule (*Gallinula galeata*) [formerly Common Moorhen (*Gallinula chloropus*)] (EC–CWS 2013a; Friis 2008).

The St. Clair NWA marshes provide important breeding habitat for both common and rare marshbirds, such as the American Bittern (*Botaurus lentiginosus*), Black Tern (*Chlidonias niger*), Virginia Rail (*Rallus limicola*), the threatened Least Bittern (*Ixobrychus exilis*) and the endangered King Rail (*Rallus elegans*) (EC–CWS 2013a; Environment Canada 2014, 2012; Friis 2008; Government of Canada 2015; Meyer and Friis 2008; Timmermans 2007; Weseloh 2007; Woodliffe

2007a, 2007b). The preferred breeding habitat of secretive marshbirds such as the King Rail and Least Bittern is often densely vegetated shallow marshes. The cattail marshes along the St. Clair and Snye rivers and eastern shoreline of Lake St. Clair, including the St. Clair NWA, are believed to be a stronghold for the endangered King Rail in southwestern Ontario (COSEWIC 2011; Kozlovic 1998; Lang 2000; Woodliffe 2007b).

Great Egrets (*Ardea alba*) and Forster's Terns (*Sterna forsteri*) forage in the NWA and are known to breed in adjacent areas (Peck 2007; Moore et al. 2010). Double-crested Cormorants (*Phalacrocorax auritus*) also forage in the St. Clair Unit (EC–CWS 2013a).

Shorebirds

Several shorebird species have been observed at the NWA during migration. Common migrants include Greater Yellowlegs (*Tringa melanoleuca*), Lesser Yellowlegs (*Tringa flavipes*) and Spotted Sandpipers (*Actitis macularia*) (EC–CWS 2013a). The American Woodcock (*Scolopax minor*), Wilson's Snipe (*Gallinago delicata*) and Killdeer (*Charadrius vociferus*) are regular breeders at the NWA (EC–CWS 2013a).

In the spring, fields neighbouring the NWA attract thousands of migrant Black-bellied Plovers (*Pluvialis squatarola*) and American Golden-Plovers (*Pluvialis dominicus*), and the Lake St. Clair shoreline provides stopover habitat for many Semipalmated Plovers (*Charadrius semipalmatus*), Whimbrels (*Numenius phaeopus*), Ruddy Turnstones (*Arenaria interpres*), Dunlins (*Calidris alpina*) and Short-billed Dowitchers (*Limnodromus griseus*) (Friis 2010). In fall, hundreds of American Golden-Plovers utilize the region on their southbound migration (C. Friis, personal communication, 2011).

Over the past 20 years, shorebird species have shown consistent declines in Ontario. Specifically, local breeders such as Killdeer and Wilson's Snipe exhibit significant declining trends. The cause for declines within Ontario is unclear, but to some degree they are related to habitat loss and degradation on the breeding grounds, staging areas and wintering grounds (Cadman et al. 2007; Ross et al. 2012; Sauer and Link 2011). ECCC–CWS shorebird surveys in the Lake St. Clair region and on the NWA from 1974 to 2009 reported declines consistent with the *Ontario Breeding Bird Atlas* (Cadman et al. 2007; Ross et al. 2012). Within the NWA, the declines may in part be attributed to a decline in shorebird habitat availability and quality (C. Friis, personal communication, 2011).

Landbirds

In the spring and fall, numerous migrant landbirds and raptors move along Great Lakes' shorelines and stop to feed and rest at the NWA. In the spring, various species of landbirds (e.g.,

Yellow-rumped Warbler (*Dendroica coronata*), Least Flycatcher (*Empidonax minimus*) and Eastern Wood-Pewee (*Contopus virens*) feed on flying insects in the marshes and rest in the trees along the dykes (EC–CWS 2013a). A diversity of raptors such as Cooper’s Hawk (*Accipiter cooperii*), Sharp-shinned Hawk (*Accipiter striatus*) and Red-tailed Hawk (*Buteo jamaicensis*) and small numbers of owls such as Northern Saw Whet Owl (*Aegolius acadicus*) and Short-Eared Owl (*Asio flammeus*) (listed Special Concern) migrate through the NWA in spring and fall (EC–CWS 2013a; Government of Canada 2015a; J. Haggeman, personal communication, 2011; Table 3).

Landbirds recorded nesting in the NWA include the Northern Harrier (*Circus cyaneus*), Cooper’s Hawk (*Accipiter cooperii*), Belted Kingfisher (*Ceryle alcyon*), Eastern Phoebe (*Sayornis phoebe*), Eastern Kingbird (*Tyrannus tyrannus*), Eastern Screech Owl (*Otus asio*), Great Horned Owl (*Bubo virginianus*), Common Yellowthroat (*Geothlypis trichas*), Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*) and several species of swallows including the Cliff Swallow (*Petrochelidon pyrrhonota*) and Barn Swallow (*Hirundo rustica*) (Cadman et al. 2007; EC–CWS 2013a). The Yellow-headed Blackbird is of particular significance because it is provincially rare and is known to breed in only two locations in Ontario (i.e., northwestern Ontario near Lake of the Woods and the Lake St. Clair area) (Dunn 2007; Government of Ontario 2015; Table 3). The Yellow-headed Blackbird was reported as a regular breeder in the NWA from the mid-1970s to 2005; however, there are no nest records from 2006–2011 (EC–CWS 2013a; J. Haggeman, personal communication, 2011).

Local residents such as the threatened Red-headed Woodpecker (*Melanerpes erythrocephalus*), which is a local breeder and rare migrant in the NWA (EC–CWS 2013a; Government of Canada 2015; Table 3) and the provincially rare Bald Eagle (*Haliaeetus leucocephalus*) (Government of Ontario 2015; Table 3) can be seen foraging in the NWA and nesting nearby.

In recent years, the Wild Turkey (*Meleagris gallopavo*) has been sighted in both the St. Clair and Bear Creek Units, and breeds locally. This native species was extirpated from Ontario by 1909 due to habitat loss and over-hunting, and it was reintroduced to southwestern Ontario in 1984 (Cadman et al. 2007).

2.2.2 Mammals

Twenty-one species of mammals have been recorded in the St. Clair NWA. Raccoons (*Procyon lotor*), Skunks (*Mephitis mephitis*), Groundhogs (*Marmota monax*), North American Beaver (*Castor canadensis*), Coyotes (*Canis latrans*), Mink (*Mustela vison*), White-tailed Deer (*Odocoileus virginianus*), Virginia Opossum (*Didelphis virginiana*) and Muskrats (*Ondatra zibethica*) are some of the common mammals that frequent the NWA.

Muskrats are by far the most common mammal in the NWA, and they play a strong ecological role in the marsh environment at moderate population levels. Muskrats use the cattails as a major food supply and for lodge-building materials. They help to keep the encroachment of the cattail in the marsh ponds and channels in check, and maintain areas of open water used by staging waterfowl and waterbirds for breeding, foraging and resting (Errington 1963).

Current Muskrat population estimates for the St. Clair and Bear Creek Units are unknown. However, licensed trappers have reported as many as 1000 Muskrats harvested annually from the St. Clair Unit (J. Robinson, personal communication, 2012). While Muskrats can be helpful in reducing cattail density, they frequently burrow into the dykes, using them for dens, which can cause failure of dykes and induce significant water-level changes and damage to the marsh habitat.

Raccoons, skunks and mink are observed regularly in the NWA and are evidenced by predation of bird and turtle eggs and nests along the dykes. In recent years, the raccoon population in the NWA, and damage to eggs and nests, has increased noticeably, raising concerns about impacts of predation on endangered reptile populations (J. Haggeman, personal communication, 2011).

Historically, there have been confirmed records of the endangered American Badger *jacksoni* subspecies (*Taxidea taxus jacksoni*) within the NWA (1986) and on lands adjacent to the NWA (1979) and Kent and Lambton counties (2000–2008) (EC–CWS 2012b; Environment Canada 2013; Newhouse and Kinley, in press; Ontario American Badger Recovery Team 2010). Badger records near the NWA, large home ranges (240–850 ha) and the presence of suitable habitat within the NWA suggest that there is potential for badgers to use the NWA in future.

2.2.3 Reptiles and Amphibians

The marsh areas and shallow open water, and dyke banks and upland areas, of the NWA provide important overwintering, egg-laying, nursery and adult feeding habitats for amphibians and reptiles.

Frogs and toads are most easily detected in the spring and early summer. American Toad (*Bufo americanus*), Green Frog (*Rana clamitans*), Northern Leopard Frog (*Rana pipiens*) and Bullfrog (*Rana catesbeiana*) sightings and sound records have been reported during ECCC–CWS site visits, amphibian surveys and Marsh Monitoring Program routes (EC–CWS 2011a; Gillingwater and Piraino 2005).

The St. Clair NWA is a haven for snakes, including several species at risk in Canada (Government of Canada 2015). The five snake species found in the St. Clair NWA are the Eastern

Garter Snake (*Thamnophis sirtalis sirtalis*), the Dekay's Brownsnake (*Storeria dekayi*), the Northern Water Snake (*Nerodia sipedon sipedon*), the endangered Eastern Foxsnake (*Elaphe vulpina gloydi*) and the endangered Queensnake (*Regina septemvittata*) (Gillingwater and Piraino 2005; Government of Canada 2015). These snakes are found among cattails, in open water, basking on the dykes and/or around the buildings.

The extensive dyke system, driveways, sandy soils and low vegetation provide habitat for turtles to dig their nest holes. Turtles have been observed basking on mud flats and grassed tussocks (Gillingwater and Piraino 2005). Six species of turtles are found in the St. Clair NWA (Gillingwater and Piraino 2005). With the exception of the Midland Painted Turtle (*Chrysemys picta marginata*), which is abundant in the NWA, the turtle species recorded in the NWA are listed under the *Species at Risk Act* (Government of Canada 2015; Table 3).

2.2.4 Fish

Twenty-seven fish species have been reported within the St. Clair NWA (e.g., within the dyked wetland impoundments, channels, coastal and riverine wetlands, drains, and Maxwell and Little Bear Creeks) (EC–CWS 2013b; Mandrak et al. 2006, Marson et al. 2010). Common fish species include Yellow Bullhead (*Ameiurus natalis*), Common Carp (*Cyprinus carpio*) (and hybrids), Bluegill (*Lepomis macrochirus*), Bowfin (*Amia calva*) and Pumpkinseed (*Lepomis gibbosus*). Fish species such as the Northern Pike (*Esox lucius*) and Largemouth Bass (*Micropterus salmoides*) use the submergent marsh vegetation and shallow open water for cover, nursery and foraging. Invasive and non-native fish species reported within the NWA include the Common Carp and the Round Goby (*Neogobius melanostomus*) (J. Barnucz, personal communication, 2013; Mandrak et al. 2006).

Four fish species at risk occur in the NWA: the endangered Lake Chubsucker (*Erimyzon sucetta*) and Pugnose Shiner (*Notropis anogenus*) in the West cell of the St. Clair Unit, and the Pugnose Shiner, and special concern Pugnose Minnow (*Opsopoeodus emiliae*) and Blackstripe Topminnow (*Fundulus notatus*) (on the Maxwell and Little Bear Creeks) in the Bear Creek Unit (J. Barnucz, personal communication, 2013; COSEWIC 2009, 2012a, 2012b; Fisheries and Oceans Canada 2012; Mandrak et al. 2006, Marson et al. 2010; Staton et al. 2010.).

Some parts of the St. Clair NWA within impoundments, such as deep water areas (> 2 m) and excavated channels along dykes, act as a refuge for fish during extended periods of ice cover and low oxygen in winter. These deep water areas are important to maintain, as they provide sanctuary for fish and wildlife during water drawdowns, prior to reflooding, and are used as an indicator of water levels and circulation within impoundments.

Occasional winter fish kills occur within the dyked impoundments, as the result of severe winter conditions: when ice cover forms early in the season, then is covered with snow, and persists throughout the winter, oxygen is depleted and fish cannot survive. Despite occasional large fish kills in the winter, fish sampling has reported the presence of healthy populations of most common species (Marson et al. 2010).

2.2.5 Invertebrates

Invertebrates have not been extensively surveyed within the NWA. Nonetheless, the NWA supports a variety of invertebrates, as evidenced by the diversity and food preferences of birds, and, at particular times of the year, the large concentrations of insects that can be seen.

ECCC–CWS sampling of aquatic macroinvertebrates in the St. Clair NWA indicated that the NWA is above-average in the diversity and abundance of species, as compared with other sites assessed in 2007 from Lake Ontario and Lake St. Clair (Friis 2008, Grabas 2009). The wetlands produce numerous flying insects that fuel migration of insectivorous bird species in the spring and fall (EC–CWS 2013a).

Crustaceans, and crayfish in particular, are of particular interest in the NWA because they are known to be an important food source for a variety of wildlife (Hamr 1998, 2003), including the endangered King Rail and Queensnake (Government of Canada 2015a; COSEWIC 2011). However, there is limited information on the occurrence and distribution of crustaceans at the St. Clair NWA; records are limited to incidental observations.

The Monarch butterfly (*Danaus plexippus*), listed as Special Concern under the federal *Species at Risk Act*, has been reported breeding in the NWA (June to September) and uses the NWA as migratory and stopover habitat in the late summer and early fall. During migration, large aggregations of several thousand individuals move through the Lake St. Clair area in a single day, stopping to feed on plants, congregate, or roost in trees on their way south to their wintering grounds (COSEWIC 2010).

2.3 SPECIES AT RISK

Thirty-five species at risk, listed under the federal *Species at Risk Act* (SARA), have been reported at the St. Clair NWA, including 18 birds, 7 reptiles, 1 insect, 4 fishes, 1 mammal and 4 vascular plants (Table 3) (Cadman et al. 2007; COSEWIC 2010; EC–CWS 2013a; Gillingwater and Piraino 2005; Government of Canada 2015a; Mandrak et al. 2006, Marson et al. 2010).

To date, critical habitat² has been identified under SARA for Least Bittern, Lake Chubsucker, and Pugnose Shiner, plus one sensitive species³ (Environment Canada 2014; Fisheries and Oceans Canada 2012; Staton et al. 2010). It is anticipated that critical habitat may be identified within the NWA for a number of other species at risk (e.g., King Rail, Queensnake) (Environment Canada 2015, 2012).

Also observed at the NWA are Bank Swallow (*Riparia riparia*), Barn Swallow, Eastern Meadowlark (*Sturnella magna*) and Bobolink (*Dolichonyx oryzivorus*), designated as Threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), and the Eastern Wood-pewee (*Contopus virens*), designated as Special Concern (COSEWIC 2015; EC-CWS 2013a; Table 3). Not listed under SARA but of local importance and reported at this site are the Bald Eagle and Black Tern, listed as Special Concern under the Ontario *Endangered Species Act, 2007* (Government of Ontario 2015; Table 3). Appendix 1 provides links to more information on federal and provincial species at risk legislation in Ontario.

Table 3: Species at Risk Recorded at the St. Clair National Wildlife Area.

Common and Scientific Names of Species	Status		
	Canada		Ontario
	SARA ^a	COSEWIC ^b	ESA, 2007 ^c
Mammals			
American Badger <i>jacksoni</i> subspecies <i>Taxidea taxus jacksoni</i>	Endangered	Endangered	Endangered
Birds			
Bald Eagle <i>Haliaeetus leucocephalus</i>	No Status	Not at Risk	Special Concern
Bank Swallow <i>Riparia riparia</i>	No Status	Threatened	Threatened
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
Cerulean Warbler	Special Concern	Endangered	Threatened

² *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." (Government of Canada, 2002; <http://laws-lois.justice.gc.ca/PDF/S-15.3.pdf>)

³ Species names have been withheld from this Management Plan where there are location sensitivities (e.g., s.124 of the *Species at Risk Act*) or not in the best interest of the species.

Common and Scientific Names of Species	Status		
	Canada		Ontario
	SARA ^a	COSEWIC ^b	ESA, 2007 ^c
<i>Setophaga cerulea</i> / <i>Dendroica cerulea</i>			
Chimney Swift <i>Chaetura pelagica</i>	Threatened	Threatened	Threatened
Common Nighthawk <i>Chordeiles minor</i>	Threatened	Threatened	Special Concern
Eastern Meadowlark <i>Sturnella magna</i>	No Status	Threatened	Threatened
Eastern Whip-poor-will <i>Antrastomus vociferus</i> / <i>Caprimulgus vociferus</i>	Threatened	Threatened	Threatened
Eastern Wood-pewee <i>Contopus virens</i>	No Status	Special Concern	–
Golden-winged Warbler <i>Vermivora chrysoptera</i>	Threatened	Threatened	Special Concern
Hooded Warbler <i>Setophaga citrina</i> / <i>Wilsonia citrina</i>	Threatened	Not at Risk	Special Concern
Horned Grebe (Western population) <i>Podiceps auritus</i>	No Status	Special Concern	Special Concern
King Rail <i>Rallus elegans</i>	Endangered	Endangered	Endangered
Least Bittern <i>Ixobrychus exilis</i>	Threatened	Threatened	Threatened
Northern Bobwhite <i>Colinus virginianus</i>	Endangered	Endangered	Endangered
Peregrine Falcon <i>Falco peregrinus anatum</i>	Special Concern	Special Concern	Special Concern
Prothonotary Warbler <i>Protonotaria citrea</i>	Endangered	Endangered	Endangered
Red-headed Woodpecker <i>Melanerpes erythrocephalus</i>	Threatened	Threatened	Special Concern
Red-shouldered Hawk <i>Buteo lineatus</i>	Special Concern	Not at Risk	–
Rusty Blackbird <i>Euphagus carolinus</i>	Special Concern	Special Concern	–
Short-eared Owl <i>Asio flammeus</i>	Special Concern	Special Concern	Special Concern
Wood Thrush <i>Hylocichla mustelina</i>	No Status	Threatened	Special Concern
Yellow Rail <i>Coturnicops noveboracensis</i>	Special Concern	Special Concern	Special Concern
Yellow-breasted Chat <i>virens</i> subspecies <i>Icteria virens virens</i>	Special Concern	Endangered	Endangered
Reptiles			

Common and Scientific Names of Species	Status		
	Canada		Ontario
	SARA ^a	COSEWIC ^b	ESA, 2007 ^c
Eastern Foxsnake (Carolinian population) <i>Pantherophis gloydi</i>	Endangered	Endangered	Endangered
Northern Map Turtle <i>Graptemys geographica</i>	Special Concern	Special Concern	Special Concern
Queensnake <i>Regina septemvittata</i>	Endangered	Endangered	Endangered
Snapping Turtle <i>Chelydra serpentina</i>	Special Concern	Special Concern	Special Concern
Invertebrates			
Monarch <i>Danaus plexippus</i>	Special Concern	Special Concern	Special Concern
Fish			
Blackstripe Topminnow <i>Fundulus notatus</i>	Special Concern	Special Concern	Special Concern
Lake Chubsucker <i>Erimyzon sucetta</i>	Endangered	Endangered	Threatened
Pugnose Minnow <i>Opsopoeodus emiliae</i>	Special Concern	Threatened	Threatened
Pugnose Shiner <i>Notropis anogenus</i>	Endangered	Threatened	Threatened
Vascular plants			
Dense Blazing Star <i>Liatris spicata</i>	Threatened	Threatened	Threatened
Riddell's Goldenrod <i>Solidago riddellii</i>	Special Concern	Special Concern	Special Concern
Swamp Rose-mallow <i>Hibiscus moscheutos</i>	Special Concern	Special Concern	Special Concern

- 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).
- 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).
- ESA (*Endangered Species Act, 2007*), Species at Risk in Ontario List: Extirpated, Endangered, Threatened, Special Concern, or not classified.

3 MANAGEMENT CHALLENGES AND THREATS

3.1 WATER MANAGEMENT, CLIMATE VARIABILITY AND PROJECTED CLIMATE CHANGE

It is anticipated that water management issues at the St. Clair NWA, particularly in the St. Clair Unit, will be exacerbated by climate change and the continued variability of Lake St. Clair water levels.

In a completely enclosed area such as the St. Clair Unit, natural cyclical drying and flooding does not occur. A rejuvenation of the marsh soils must be artificially induced using a combination of drawdowns and flooding via water level management. Although dyked wetlands are less affected by fluctuating lake levels than coastal wetlands or watercourses, an adequate supply of water to marshes in the St. Clair Unit (from Lake St. Clair and the McFarlane Relief Drain) and to the Bear Creek Unit (from the Snye channel, Old Marden Dredge Cut and the Little Bear Creek) and associated infrastructure are critical to water level management.

Low water levels in Lake St. Clair and the inability to conduct drawdowns in the impoundments in the St. Clair Unit have contributed to an increase in floating-leaved vegetation (e.g., water lilies) expanding into areas that were previously open water. This increased density reduces open water areas and impedes water flow. The timing and duration of drawdowns must be carefully planned to consider the needs of species at risk and other sensitive species and to limit the potential expansion of non-native *Phragmites* or other invasive and non-native plant species that appear to thrive and proliferate in drier conditions.

The cost of maintaining current habitats within existing dyked wetlands are resource-intensive and requires technical expertise. Much time, money and disturbance is involved maintaining integrity and operability of the dyke infrastructure. All structures should be redeveloped every 20-30 years, and may require heavy equipment access, excavation, fill, and installation processes in a protected natural area, subject to environmental regulation (Section 3 of the Wildlife Area Regulations). Long term financial and resource commitments must be planned in advance, including regulatory compliancy, where appropriate.

In the face of projected climate change and continued variability, the resources required to maintain dykes, water control structures and pumps, and to manage invasive and non-native plant species are expected to increase (Galloway et al. 2006). Current models predict that climate change and variability will lead to warmer air temperatures, lower lake levels and warmer water temperatures due to a decrease in winter ice cover and subsequent increased evaporation. Although the impacts of climate change on the habitats and wildlife of the NWA are unknown, it is

expected that there will be changes in distribution, range and breeding behaviours of migratory birds and wildlife using the NWA.

3.2 INVASIVE AND NON-NATIVE PLANT SPECIES

A large number of non-native plant species occur within the NWA. However, some are well-established over decades and in essence are integrated into existing habitats. Problems arise with aggressive species that have the ability to rapidly spread and consequently displace native species and decrease biodiversity.

Within the St. Clair and Bear Creek Units, the expansion and invasive characteristics of three emergent species are of particular concern: cattails, non-native *Phragmites* and Reed Canary Grass (*Phalaris arundinacea*). These species have established dense stands in areas of shallow water and damp soil in the marsh (e.g., along edges of dykes), thereby reducing the open water needed for staging waterfowl to land and areas for birds such as the Great Blue Heron and Least Bittern to hunt and feed. Non-native *Phragmites* has expanded rapidly in the past 10 years, and overall wetland plant diversity and interspersed has declined (J. Haggeman, personal communication, 2011). The expansion of non-native *Phragmites* on the dyke banks has reduced suitable habitat for nesting Belted Kingfishers, Blue-winged Teal and Bank Swallows (J. Haggeman, personal communication, 2011). Areas within the NWA along the Lake St. Clair shoreline, frequented by shorebirds during migration, have been displaced by non-native *Phragmites* and high water levels, making these locations less favourable to shorebirds as stopover habitat (C. Friis, personal communication, 2011).

Determining effective management options to reduce the impacts of these species is often hampered by limited knowledge of the species and the ability of many of these species to adapt to Ontario growing conditions. Early detection is key to control and management of invasive plants before species are established and adapt to local conditions. Within the NWA, non-native *Phragmites* grows in both dry and wet substrates. Methods to control non-native and invasive plants growing in standing water (e.g., by cutting them) are labour-intensive or have limited success. There are currently no approved herbicides licensed in Canada that can be applied to plants growing in standing water.

Other non-native and invasive plant species (aquatic and terrestrial) in the St. Clair NWA that are of concern include Eurasian Watermilfoil (*Myriophyllum spicatum*), Frogbit or European frog-bit (*Hydrocharis morsus-ranae*), Flowering Rush (*Butomus umbellatus*), Sow Thistle (*Sonchus oleraceus* L.), Canada Thistle (*Cirsium arvense*), Prickly Lettuce (*Lactuca scariola*) and White Mulberry (*Morus alba*).

Although native species are not generally invasive, they can be difficult to reduce and remove once established. Some native species, notably the White Water Lily, have expanded into shallow open water areas (in both Units); this species is showing invasive characteristics (Friis 2008). The spread of White Water Lily has significantly reduced open water areas and decreased habitat for aerial foragers such as Forster's and Black Terns (J. Haggeman, personal communication, 2011).

3.3 OVERABUNDANT WILDLIFE

3.3.1 *Muskrats, Beavers, Groundhogs and Raccoons*

Several wildlife species are invasive and present monitoring and control challenges for NWA staff. Muskrats, Beavers, Groundhogs and Raccoons, all native to Ontario, can become overabundant and cause damage to dykes, berms and other wildlife. Muskrat, Beaver and Groundhog populations are informally surveyed on a regular basis. Muskrats are of particular concern in the St. Clair NWA: they dig and burrow into the dykes to create dens and tunnels, which cause erosion and holes allowing water to escape, thereby compromising the integrity of the dykes and potentially posing serious safety hazards. Muskrats are trapped annually in the St. Clair NWA by licensed trappers (J. Robinson, personal communication, 2012).

Occasionally sick, starving, or injured wildlife come in close contact with built facilities, workplaces, and sites where the public are invited. Risks of human attacks or disease transmission exist, as do the public-relation risks of seeing wildlife in this state without an interpretive context to explain that the phenomena may be completely natural. Methods to humanely deal with problem wildlife and to communicate with the public require knowledge of wildlife health, occupational health and safety, public safety, and communications expertise.

3.3.2 *Mute Swans*

The Mute Swan is an invasive and non-native bird from Eurasia that has rapidly expanded into the Lake St. Clair region since it first began colonizing the lower Great Lakes in the mid-1960s and 1970s (Petrie and Francis 2003).

Mute Swans have established breeding and wintering populations attracted to the emergent marsh habitat, shallow water and abundant food supply found in Lake St. Clair. The Mute Swan population at Lake St. Clair has increased significantly in recent years (EC–CWS 2013a, 2011b; Petrie and Francis 2003) and is expected to continue (EC–CWS 2011b). Within the NWA, Mute Swans have been recorded as breeding in small numbers and have exhibited aggressive behaviour, prevented breeding attempts of native breeding marshbirds (i.e., Forster's Tern and American Coot)

and caused significant damage to marsh vegetation as a result of feeding (EC–CWS 2013a, 2011b; J. Haggeman, personal communication, 2011).

This species is a growing concern, because Mute Swans compete for habitat and food with other native waterfowl species and have few natural predators (Petrie and Francis 2003). As such, the Mute Swan population is closely monitored within the NWA. Reducing the impacts of Mute Swans on native birds and habitat requires active management to prevent Mute Swans from nesting and establishing territories in the NWA.

3.3.3 *Temperate-breeding (resident) Canada Geese*

There is a need to balance the conservation of migrant Canada Geese with the need to manage abundant temperate-breeding (resident) Canada Geese within the NWA.

The NWA provides important habitat for migrant Canada Geese that breed and raise their young in remote northern locations, stopping in southern Ontario to rest and feed during spring and fall migrations between summer breeding grounds in southern James Bay and wintering areas in the United States.

Temperate-breeding Canada Geese nest and reside year-round in southern Ontario. The temperate-breeding Canada Goose population presents an ongoing challenge for maintenance of infrastructure and habitat management within the NWA, as well as outreach and communications with landowners in the local area and the public at large. In the NWA, the adults and young can pose a serious threat to newly seeded dykes and early spring growth by removing and trampling vegetation and cover for other wildlife. If this happens, the exposed dyke banks are prone to erosion, which can undermine the integrity of the dyke and be hazardous for staff and visitors. It can be difficult to prevent temperate-breeding Canada Geese from taking up residence each spring, and once the geese have nested successfully, they tend to return to the area in future years in growing numbers. Temperate-breeding Canada Geese have caused extensive damage to crops on properties neighbouring the NWA, and landowners have obtained permits under the *Migratory Birds Convention Act, 1994* to manage birds on their properties.

3.3.4 *Carp*

Of the 27 fish species found in the NWA, only the carp (Common Carp and hybrids) is known to have negative impacts upon the marsh. Carp are found in both NWA Units but are of particular concern in the St. Clair Unit and adjacent waterways where they are well established. High densities of carp in the NWA create poor water conditions. Carp cause damage to the dykes, and the increased turbidity created by their bottom-feeding habits inhibits the growth of submergent plants,

disturbs other wildlife, and reduces plant food available to waterfowl and other wildlife. At the St. Clair NWA, high densities of carp could become a threat to at-risk fish species such as Lake Chubsucker and Pugnose Shiner.

3.4 FERAL AND DOMESTIC ANIMALS AND RELEASE OF UNWANTED PETS AND WILDLIFE

Feral domestic cats and dogs have been documented within the NWA. These animals are typically feral strays and in some cases are unwanted pets (e.g., turtles and fish) and unwanted wildlife (e.g., Skunks, Raccoons and Groundhogs) that have been released illegally in the NWA (J. Haggeman, personal communication, 2011). Although the number of feral cats and dogs in the NWA may be low and their presence infrequent, these animals can exert significant predatory pressure on native wildlife through nest destruction and the eating of eggs and individuals (i.e., birds and turtles), the transfer of disease and pathogens to wild animals, and the disruption of natural habitats through soil disturbance, all of which require ongoing active management.

3.5 MAINTENANCE OF SAFE WATER SUPPLY

Limited data are available on water quality within the St. Clair NWA. To date, water quality studies in Great Lakes wetlands have been designed to assess the overall integrity of coastal wetlands at a regional, lake and basin-wide scale (e.g., Chow-Fraser 2006; Grabas 2009). Data on water quality within the St. Clair NWA have been collected as part of the Great Lakes Coastal Habitat Assessment and Monitoring Project (CHAMP) (Huron–Erie corridor sites) (Grabas 2009). CHAMP monitors nine water quality attributes known to affect wildlife habitat quality. The CHAMP survey protocol was used to monitor water quality in selected cells and drains in the St. Clair NWA in 2007; relative to other coastal wetland sites in the Lake St. Clair area, the NWA scores were among the highest (Friis 2008; EC–CWS 2007a). However, when compared with other wetlands in the lower Great Lakes basin, the Bear Creek sites scored as degraded (Friis 2008; EC–CWS 2007a, 2007b; Chow-Fraser 2006).

Additional site-specific information is needed to assess seasonal water quality of both the water used to flood the marsh and water within the marsh, and to identify potential sources of contaminants as well as options to improve water quality if required. Although the majority of the wetlands and prairie habitats within the NWA are contained by dykes, maintenance of these habitats is dependent on a clean and adequate water supply from Lake St. Clair and adjacent waterways. Nearby drains, Bear and Maxwell Creeks carry runoff from extensive agricultural lands. Runoff likely contains unused fertilizers and pesticides, which can cause nutrient loading of wetlands, but also contamination with residual herbicides, fungicides, and insecticides. Monitoring the potential effects on aquatic vegetation, invertebrates, and wildlife productivity would be ideal areas for long-term

research. The management of impacts of agricultural effluents requires regulatory and land use changes in the surrounding watershed.

In addition, there is a need to develop an emergency response plan to intervene in cases of spills and fire within or adjacent to the NWA. There is a risk of chemical and fuel spills in Lake St. Clair and the connecting channels (e.g., St. Clair River, Detroit River downstream of the lake) because there is high boat and shipping traffic and a high density of petrochemical industrial development located along the shore. Chemical and fuel spills pose a significant threat to wildlife and natural habitat, particularly at certain times of the year (e.g., waterfowl staging, fish spawning) (Environment Canada 1994).

3.6 WETLAND HABITAT LOSS AND FRAGMENTATION

In Ontario, the loss of pre-European settlement wetlands and conversion to agriculture is greatest in southern Ontario (Kent, Lambton and Essex counties) (Ducks Unlimited Canada 2010; EHJV 2001; Snell 1987). In Kent County, pre-European-settlement (circa 1800) wetland covered 56.4% of the county; by 1982, remaining wetland area was 3.7%; and by 2002 this percentage was reduced to 0.8% (Ducks Unlimited Canada 2010; Snell 1987). Between 1965 and 1984, much of the wetland areas along the eastern shore of Lake St. Clair were enclosed by dykes to enable management and control of water levels, and 30% of privately owned marshes were subsequently drained and converted to agriculture (McCullough 1985).

An increase in road and power line networks, proposals for wind power installations, infilling of coastal and inland wetlands or conversion to agriculture, and/or clearing of land for development continue to fragment habitat and reduce natural travel corridors for wildlife. Further wetland loss and degradation near the NWA may result in an increased use of the NWA by waterfowl and other wildlife. However, if wetland loss continues in the region, it is expected that overall biodiversity of the Lake St. Clair marshes and the NWA will decrease over the long term. In order to maintain North American waterfowl populations, it is critical to manage the NWA and sustain linkages to nearby wetlands as migratory refuges.

The costs of maintaining water control structures, dykes and ongoing management combined with high land values often thwart efforts to restore and protect wetlands in the region. Efforts to protect and restore wetlands in the Lake St. Clair region have not kept pace with wetland drainage and conversion to alternate land uses (Ducks Unlimited Canada 2010). Agricultural land in the area is sought after and valued for highly productive vegetable and cash crops. The pressure to convert marshes to farmland or sell the land to farming or development interests is expected to continue, and the future of the remaining marshes along the eastern shoreline is uncertain.

3.7 OTHER MANAGEMENT CHALLENGES

3.7.1 *Demand for Public Access and Services*

The moderate climate, access to Lakes Huron, St. Clair and Erie, and close proximity to the international border and cities such as Wallaceburg, Chatham, Windsor and Sarnia have sustained interest in the area for tourism, recreational boating, fishing and hunting, and marina and residential development. Since the NWA was established, population growth in nearby urban centres and increased public interest in outdoor recreation has resulted in a rise in the number of visitors to the NWA and an increased demand for services. Staff on-site offer information and interpretive services to those visitors and help contribute to the positive experience. A few tourists and visitors are responsible for dumping garbage or vandalizing facilities that take time and money to repair or clean up.

Increased visitation places more demands on infrastructure and to ensure availability of resources for maintenance of grounds and facilities (e.g., trails, parking lot, access roads, signs, washrooms) as well as development of outreach materials to promote compliance. This includes increased demands on ECCC–CWS as well as Environment and Climate Change Canada’s Wildlife Enforcement Directorate staff (ECCC–WED). The occurrence of prohibited activities in the St. Clair NWA, such as off-road ATVs and vehicle use, hunting, fishing, garbage dumping, vandalism and collection of plants and wildlife, places additional pressures on resources required to prevent and mitigate these activities and their impacts.

3.7.2 *Multi-species Conservation and Species at Risk*

Multi-species conservation and recovery is an ongoing challenge in the St. Clair NWA. The St. Clair NWA requires active management to maintain ecosystem functions and species diversity and abundance. Drawdowns and reflooding are imperative to sustain marsh habitat and control of invasive plants, and burning and water management are integral to sustaining prairie habitat. Many species have complex habitat requirements that are not well understood, and small and/or widely distributed populations are often under-represented in general research studies, and their site-specific habitat requirements are unknown. Critical habitat has been identified for a number of species in the NWA (e.g., Least Bittern, Lake Chubsucker) with species-specific habitat protection needs. A foreseeable challenge will be how to balance the varying habitat needs of multiple species, including both common species and species at risk.

4 GOALS AND OBJECTIVES

4.1 VISION

The long-term vision for the St. Clair NWA is conservation. The NWA is a continentally-significant staging area for migratory water birds and waterfowl, and a nationally-significant habitat supporting a concentrated diversity and abundance of waterbirds. Priority habitats for conservation are wetlands and interconnecting channels, and tallgrass prairie. Priority wildlife includes migratory birds, with an emphasis on waterfowl, waterbirds, and species at risk.

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

4.2 GOALS AND OBJECTIVES

Goal 1: Wetland habitats within impoundments will be managed to replicate an ecosystem driven by periodic water level fluctuations so that populations of migratory birds and resident flora and fauna, including species at risk, are sustained and/or habitats and residences are created, restored or maintained through active management.

Objectives:

1.1 Manage water levels to replicate an ecosystem driven by periodic water level fluctuations, achieving a diversity of wetland vegetation and a hemi-marsh composition of vegetation and water at 50:50, with patchy vegetation interspersed with areas of shallow open water, within the next five years and maintained over the long term.

1.2 Maintain, enhance and restore infrastructure (dykes, water control structures, access, roads) associated with water level management on impounded wetlands through the development and implementation of a 10-year maintenance plan, within the next three years.

1.3 Maintain and improve water flow and quality within wetlands, wetlands at Bear Creek Unit, lakes (non-impoundments), creeks and drains within the NWA. Develop and implement a water management strategy, within the next three years, which will include an emergency response to spills and adaptations to mitigate potential impacts of climate variability and projected climate change.

1.4 Continue to monitor the impacts of overabundant wildlife and feral and domestic animals on infrastructure and diversity of native flora and fauna. Maintain management of overabundant wildlife populations, if required, over the long term.

Goal 2: Terrestrial habitats will be restored and managed so that populations of migratory birds and resident flora and fauna, including species at risk, are sustained and/or habitats and residences are created, restored or maintained through active management.

Objectives:

2.1 Manage existing prairie and grasslands to replicate an ecosystem driven by periodic fire, using natural disturbance tools and restoration techniques to improve the structural and compositional heterogeneity on 15.75 ha, and increase the current extent of prairie habitat by 1 ha, over the next 10 years.

2.2 Maintain and increase the area of riparian buffers along watercourses and vegetated buffers adjacent to wetland, prairie, upland and other aquatic habitats within the NWA over the next 10 years.

2.3 Develop and implement a plan to reduce the extent and/ or rate of expansion of invasive and non-native plant species in areas of concern, within the next 5 years.

2.4 Reduce and prevent the expansion of non-native *Phragmites* in three priority areas within the next five years.

Goal 3: Protect and maintain natural habitats and significant features from the effects of regulatory non-compliance (e.g., unauthorized access) and evaluate the effects and benefits of human disturbance, both authorized and unauthorized.

Objectives:

3.1 Manage and monitor visitor (i.e., staff, researchers, the public and partners) activities in the NWA, to ensure a safe environment for visitors and staff and to reduce the ecological impacts of human uses on the NWA.

3.2 Coordinate with Federal Wildlife Enforcement personnel for compliance and promotion with respect to *Wildlife Area Regulations* and the *Species at Risk Act*, and reduce the number of incidents of prohibited activities within the NWA to no more than five per year.

Goal 4: Increase habitat connectivity in the vicinity of and between the St. Clair and Bear Creek Units, and support regional landscape level conservation efforts and partnerships.

Objectives :

4.1 Increase the connectivity of habitats and migration corridors by consolidating and, where possible, expanding the protected area land base, through partnerships. Identify and protect at least one priority conservation land parcel near or adjacent to the NWA within the next 10 years.

4.2 Ensure ECCC-CWS capacity to maintain relationships with government and non-government organizations, Walpole Island First Nation, and stakeholders (e.g. neighbours, local planning authorities, agricultural organizations, stewardship councils and conservation organizations), participate in community and stakeholder meetings and coordinate with adjacent land managers and stakeholders on shared issues and management approaches.

Table 4: Management Approaches for St. Clair National Wildlife Area

Management challenges and threats	Goals and objectives	Management approaches (actions, including level of priority ¹)
<ul style="list-style-type: none"> • Decline of interspersed and open water patches due to increased emergent vegetation, with associated loss of biodiversity • Reduction in biodiversity due to expansion of invasive and/or non-native plant species • Limited ability to manage water levels due to climate change and variability • Data deficiencies about site-specific habitat requirements for species at risk • Managing for varying species habitat needs • Maintain safe water supply • Predation pressures and habitat disruption 	<p>Goal 1: Wetland habitats within impoundments will be managed to replicate an ecosystem driven by periodic water level fluctuations so that populations of migratory birds and resident flora and fauna, including species at risk, are sustained and/or habitats and residences are created, restored or maintained through active management.</p> <p>1.1 Manage water levels to replicate an ecosystem driven by periodic water level fluctuations, achieving a diversity of wetland vegetation and a hemi-marsh composition of vegetation and water at 50:50 (i.e., hemi-marsh conditions), with patchy vegetation interspersed with areas of shallow open water, within the next five years and maintained over the long term.</p> <p>1.2 Maintain, enhance and restore infrastructure (dykes, water control structures, access, roads) associated with water level management on impounded wetlands through the development and implementation of a 10-year maintenance plan, within the next three years.</p>	<ul style="list-style-type: none"> • Conduct biological inventory for the NWA every six years to report on biological diversity and threats. (2) • Monitor habitat change (i.e., extent and quality, of wetland, prairie and upland vegetation communities, including the extent of invasive species (e.g. non-native Phragmites) and overabundant vegetation (e.g., White Water Lily) using aerial photography and site visits. (1) • Conduct ground-based monitoring to monitor water levels, site infrastructure, water chemistry and habitat and wildlife responses to management activities. (1) • Survey and monitor species at risk populations to evaluate effectiveness of management activities to protect and enhance critical habitats. (1) • Implement recommendations from recovery documents (recovery strategies, action plans, management plans, etc.) for species at risk where feasible. (1) • Continue to support established bird and amphibian population survey programs (e.g., Decadal Migrant Waterfowl Survey, Annual Mid-winter Waterfowl Survey, Annual Marsh Monitoring Program, Christmas Bird Count, Coastal Habitat Assessment and Monitoring Project) that occur at

Management challenges and threats	Goals and objectives	Management approaches (actions, including level of priority ¹)
by overabundant wildlife	<p>1.3 Maintain and improve water flow and quality within impounded wetlands, creeks and drains within the NWA. Develop and implement a water management strategy, within the next three years, which will include an emergency response to spills and adaptations to mitigate potential impacts of climate change.</p> <p>1.4 Continue to monitor the impacts of overabundant wildlife and feral and domestic animals on infrastructure and diversity of native flora and fauna. Maintain management of overabundant wildlife populations, if required, over the long term.</p>	<p>St. Clair NWA. Encourage and support monitoring and research projects that support NWA management objectives and address data and knowledge gaps. (2)</p> <ul style="list-style-type: none"> • Prepare a water management strategy and infrastructure maintenance plan for the St. Clair NWA, which would include the short- and long-term actions necessary to maintain and improve water conveyance, quality and supply within the St. Clair and Bear Creek Units, and an emergency response plan to respond to spills in Lake St. Clair, channels, ditches and wetland impoundments. (1) • Undertake planting of native species to restore disturbed sites and to increase riparian and vegetative buffers. (2) • Monitor and manage, where feasible, Muskrat, Mute Swan, temperate Canada Geese and carp populations and impacts on the NWA. (1)
<ul style="list-style-type: none"> • Loss of biodiversity due to invasion of non-native plant and wildlife species • Declines in availability and quality of habitats for wildlife 	<p>Goal 2: Terrestrial habitats will be restored and managed so that populations of migratory birds and resident flora and fauna, including species at risk, are sustained and/or habitats and residences are created, restored or maintained through active management.</p> <p>2.1 Manage existing prairie and grasslands to replicate an ecosystem driven by periodic fire, using natural disturbance tools and restoration techniques to improve the structural and compositional heterogeneity on 15.75 ha, and increase the area of prairie habitat by 1 ha over the next 10 years.</p> <p>2.2 Maintain and increase the area of riparian buffers along watercourses and vegetated buffers adjacent to wetland, prairie, upland and other aquatic habitats within the NWA over the next 10 years.</p> <p>2.3 Develop and implement a plan to reduce the extent and/or rate of expansion of invasive and non-native plant species in areas of</p>	<ul style="list-style-type: none"> • Develop and implement a comprehensive prairie habitat plan to include a range of management practices (weed and invasive species control, prescribed burns, cutting, monitoring techniques, etc.). (2) • Establish a baseline inventory and monitor habitat change (i.e., extent and quality, of prairie and upland vegetation communities, including the extent of invasive species (e.g. non-native Phragmites) using aerial photography and site visits. (1) • Undertake planting of native species to restore disturbed sites and to increase riparian and vegetative buffers. (2) • Prepare and implement an invasive species control plan for the NWA to reduce the spread of invasive and non-native species, where feasible, and preventing new invasive non-native plant species from establishing. (2) • Undertake targeted control to reduce the spread of invasive and non-native species where feasible. Consider best management practices and guidance documents, where available. (1)

Management challenges and threats	Goals and objectives	Management approaches (actions, including level of priority ¹)
	<p>concern, within the next 5 years.</p> <p>2.4 Reduce and prevent the expansion of non-native <i>Phragmites</i> in three priority areas within the next five years.</p>	
<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 3: Protect and maintain natural habitats and significant features from the effects of regulatory non-compliance (e.g., unauthorized access) and evaluate the effects and benefits of human disturbance, both authorized and unauthorized.</p> <p>3.1 Manage and monitor visitor (i.e., staff, researchers, the public and partners) activities in the NWA, to ensure a safe environment for visitors and staff and to reduce the ecological impacts of human uses on the NWA.</p> <p>3.2 Coordinate with Federal Wildlife Enforcement personnel for compliance and promotion with respect to <i>Wildlife Area Regulations</i> and the <i>Species at Risk Act</i>, and reduce the number of incidents of prohibited activities within the NWA to no more than five per year.</p>	<ul style="list-style-type: none"> • Post notices and install signs and maintain ECCC–CWS website, to promote compliance with the <i>Wildlife Area Regulations</i> and reduce unauthorized access and occurrence of prohibited activities, and avoid and reduce disturbance to wildlife and habitat. (1) • Conduct weekly/biweekly site visits to monitor and maintain facilities and infrastructure, assess human impacts on wildlife and habitat, and evaluate management actions. Results will be documented and reported on a regular basis to ECCC–CWS and ECCC–WED. (1) • Have ECCC–WED conduct regular site visits. (1) • Schedule periodic formal assessments of all facilities and infrastructure and identify contaminant or other risks (e.g., building condition reports). (1) • Communicate with visitors on the ecological values and protected status of the St. Clair NWA and safe practices, and provide outreach materials, as required. (1) • Review permits and collaborative arrangements, revise and renew as appropriate. (1)
<ul style="list-style-type: none"> • Fragmentation and degradation of habitats and travel corridors for wildlife as result of development pressures, conversion of wetland and prairie to agriculture, and residential land use. 	<p>Goal 4: Increase habitat connectivity in the vicinity of and between the St. Clair and Bear Creek Units and support regional landscape-level conservation efforts and partnerships.</p> <p>4.1 Increase the connectivity of habitats and migration corridors by consolidating and, where possible, expanding the protected area land base, through partnerships. Identify and protect at least one priority conservation land parcel near or adjacent to the NWA within the next 10 years.</p> <p>4.2 Ensure ECCC–CWS capacity to</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 options such as conservation easements, best management practices, partnerships with the private sector, land managers and non-governmental organizations. (2) • Participate in partnerships and collaborations to address conservation of adjacent lands and regional conservation initiatives. (1) • Formalize collaborative agreements revise and renew as appropriate. (1)

Management challenges and threats	Goals and objectives	Management approaches (actions, including level of priority ¹)
	maintain relationships with government and non-government organizations, Walpole Island First Nation, and stakeholders (e.g. neighbours, local planning authorities, agricultural organizations, stewardship councils and conservation organizations), participate in community and stakeholder meetings and coordinate with adjacent land managers and stakeholders on shared issues and management approaches.	<ul style="list-style-type: none"> • Complete outreach and education initiatives within neighbouring communities. (2)

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

4.3 EVALUATION

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

5 MANAGEMENT APPROACHES

Active management to maintain wetland, aquatic and prairie habitats and the associated species is required at the St. Clair NWA. The overall management philosophy for the St. Clair NWA is to protect, improve and restore wetland, prairie and upland habitats in order to provide staging and feeding habitat for waterfowl, and breeding habitat for other migratory birds, and in order to ensure the continued existence of wildlife and plants, including species at risk. Species habitat use, timing windows, critical habitats and other constraints will be considered within all management actions.

This section and Table 4 contain a description of approaches that could be used in the management of the St. Clair NWA. However, management actions will be determined during the annual work planning process and will be implemented as human and financial resources allow.

5.1 HABITAT PROTECTION AND MANAGEMENT

5.1.1 *Wetland Habitat Management*

Wetlands within the dyked impoundments will be managed to achieve hemi-marsh conditions, primarily through water level manipulation (i.e., drawdowns and flooding), and vegetation management to maintain open water and water flow. The water levels within the impoundments will continue to be artificially controlled using a system of pumps and water control structures. Water levels within the dyked impoundments (with the exception of the Orchid cell) will be managed following established normal operating levels (a range of low and high water levels) for individual cells, as is necessary to maintain hemi-marsh conditions (EC–CWS 2011c). To trigger a diversity of plant growth, water levels may be managed both seasonally and over a period of years to replicate the natural rise and fall of water levels in coastal wetlands that are open to the lake.

Biological management should be decided collaboratively, and based on annual evaluations of water levels and habitat changes, typically determined through site inspections and aerial photography. Management may include manipulation of water levels to control areas of over abundant vegetation or invasive species (particularly cattail, non-native *Phragmites* and Reed Canary Grass stands and more recently, White Water Lily) and increase the amount of edges and shallow water openings for the benefit of waterfowl and other marsh-related species, including species at risk.

Maintenance of dykes and control gates may include frequent inspections and the occasional use of heavy equipment for soil excavation and replacement, dredging and clearing of ditches, culvert replacement, and revegetation of disturbed sites. These activities should be consistent with

the *Federal Policy on Wetland Conservation*, and not result in significant adverse environmental effects under *Canadian Environmental Assessment Act, 2012*. Where activities may impact species at risk or migratory birds, permits are required. Monitoring species and habitat responses to management activities will help mitigate against potential impacts and support adaptive management decisions.

In both managed and unmanaged wetlands, regular monitoring will be conducted to track changes in wetland extent, vegetation community density and extent, biodiversity and wetland-dependent species at risk through site surveys, vegetation mapping using aerial photography, and collaborative monitoring (e.g. Coastal Habitat Assessment and Monitoring Program (CHAMP), bird monitoring programs).

5.1.2 Water Supply and Water Quality Protection

Water levels on Lake St. Clair, Little Bear Creek and the Snye channel are the primary factor affecting the extent and ecological integrity of coastal and riverine wetlands within the St. Clair NWA. Their water levels are primarily driven by climate. In recent years, low water levels have limited the ability to move water into impoundments and as a result, management activities have been delayed.

There is a need to develop a water management strategy for the St. Clair NWA to maintain key wildlife requirements for water supply and quality, with an emphasis on waterfowl, migratory breeding birds, aquatic species and species at risk. The strategy will strive to identify short- and long-term actions necessary to maintain and improve water conveyance and water quality within the St. Clair NWA. The strategy will describe the maintenance requirements of the facilities and infrastructure over the long term, and will outline the potential impacts and adaptations to address climate change and variability under high and low lake levels. Long term monitoring of vegetation communities on the NWA (using aerial photography) can retain a historical record of site changes and document significant climatic events. To address water quality issues, the strategy will outline mitigation options to reduce the spread of invasive aquatic and emergent plants to the wetland habitats from the water supply, identify areas where riparian and vegetative buffers can be improved through planting initiatives and also include an emergency response plan to reduce risk and respond to potential chemical and fuel spills (in Lake St. Clair, channels, ditches and wetland impoundments) and fire within the NWA.

ECCC–CWS will encourage the use of vegetated buffers and best management practices for agricultural and fish and wildlife habitat that occur along common boundaries (e.g., private property, roads, channels) bordering the NWA.

5.1.3 Terrestrial Habitat Management

The existing prairie areas, particularly the Orchid cell, will be maintained and improved through a combination of water level manipulation, controlled burns, mowing and weed control through planting. These natural disturbance techniques are necessary to maintain structural and compositional heterogeneity. The Corsini Upland segment will also be restored and managed as a tallgrass prairie but in the interim, cover crops such as native prairie grasses will be planted to reduce weeds and soil loss. Plants used for prairie restoration will be sourced locally and, where appropriate, taken from native seed and plant stock growing within the NWA.

All other terrestrial habitat types within the NWA, including shorelines, dykes, roadsides, embankments and office grounds will be monitored through routine site visits to identify emerging issues such as new invasive species that may require a management response. Changes in terrestrial habitat extent and composition will be monitored using aerial photography and vegetation mapping.

The top of dykes will be mowed regularly during the growing season. Brush will be removed to allow access, facilitate maintenance and safety. Weeds and invasive non-native plants will be controlled using a combination of cutting, pulling, herbicides, controlled burning and water level management, employing the Ontario guidance on best management practises (e.g., for non-native *Phragmites* (OMNR 2011b) where appropriate. Existing non-native trees and shrubs within the NWA will be removed, and native species will be replanted where appropriate.

A long-term management strategy to remove and reduce invasive and non-native plants on the NWA is needed. This should include an inventory of species (known problem species include: non-native *Phragmites*, Reed Canary Grass, Purple Loosestrife, Eurasian Watermilfoil, European Frog-bit, White Water Lily, Flowering Rush, White Mulberry, Canada Thistle and Sow Thistle) and monitoring the extent and rate of expansion using site surveys and aerial photography and the effectiveness of management and impacts on other species should be evaluated. Non-native plant species will not be deliberately introduced to the NWA. If a new non-native plant species with the potential to become invasive is detected, and monitoring and research determines that these or other species are limiting the ecological integrity of wetland, prairie and/or upland habitats, or are detrimental to wildlife use, control or removal methods will be considered. Efforts will be made to control and/or remove invasive plants within two years of detection.

All plantings will be for the optimum benefit of wildlife, and only those species native to southwestern Ontario will be used. Grasses may be planted on the dykes to provide suitable cover for wildlife and to stabilize embankments. Grasses will be selected on the basis of their growth characteristics and, where feasible, will be native to the area so as not to detract from the present

remnant prairie element. Trees and shrubs may be planted to provide wildlife corridors, as visual barriers to minimize disturbance to staging birds, to establish wind breaks, or to provide the necessary habitat components for songbirds or other wildlife.

The AAFC–CFIA wood and wood product movement restrictions are in effect in the Municipality of Chatham–Kent and Lambton County (AAFC–CFIA 2011)., and will be followed on the St. Clair NWA in an effort to curtail the spread of Emerald Ash Borers.

5.2 WILDLIFE MANAGEMENT

5.2.1 *Waterfowl and Migratory Birds*

The St. Clair NWA habitats are predominately managed as a staging area and resting site for migratory waterfowl. The management strategy will place emphasis on those species of waterfowl that require a marsh environment for refuge from disturbance, particularly during fall. Wetlands managed for hemi-marsh conditions will foster a variety of submergent plants such as *Chara* spp. (i.e., stonewort and muskgrass) and wild celery, which are favoured foods of such species as Gadwalls, Green-winged Teals, American Wigeons and other marsh-dependent species (that do not utilize agricultural grains).

5.2.2 *Management of Overabundant Wildlife, and Feral and Domestic Animals*

The annual trapping of Muskrats on a sustainable population basis will be undertaken to reduce damage to the dykes, thereby reducing maintenance activities and their associated costs. The trapping program will be monitored closely to reduce adverse impacts upon the resident Muskrat populations, minimize damage and document contributions to the local economy. Trapping will take place under the authority of a CWA permit, using approved techniques by trappers licensed through the OMNRF. The management or harvesting of other mammals such as Beaver, Raccoon and Groundhog may also occur as population conditions warrant.

Mute Swans and temperate-breeding Canada Geese will be monitored on a regular basis. Birds will be discouraged from nesting and will be removed if damage or numbers present problems for other wildlife or compromise safety of visitors to the NWA.

Carp numbers and behaviour will be monitored visually at water control structures during water level manipulations throughout the year. If evidence of damage becomes evident and carp numbers become too high, carp may be controlled or removed using nets to reduce the population.

Where routine monitoring of the NWA identifies particular problems with feral wildlife, removal of problem animals may be undertaken by ECCC–CWS. Outreach to promote compliance

with *Wildlife Area Regulations* will be undertaken. People releasing or feeding wild or feral animals will be reported to ECCC–WED.

5.3 SPECIES AT RISK

Species at risk and habitat requirements for species' persistence, breeding, stopover and recovery within the NWA will be identified and protected. The annual planning for impoundment management and maintenance considers requirements for Least Bittern, Lake Chubsucker, Pugnose Shiner and other identified critical habitats. ECCC–CWS works closely with Fisheries and Oceans Canada (DFO) and the Ontario Ministry of Natural Resources and Forestry (OMNRF) to identify and monitor aquatic species (e.g., fish, mussels, crustaceans, benthic invertebrates) in managed and coastal wetlands, channels and ditches in the St. Clair NWA and adjacent waters of Lake St. Clair and the Snye channel, with an emphasis on species at risk.

Species and habitats will be monitored to evaluate the effectiveness of management activities to protect and enhance critical habitat. In addition, recommendations from species at risk recovery documents (recovery strategies, action plans, management plans, etc.) will be implemented where feasible, and based on guidance from responsible jurisdictions and species experts.

5.4 MULTI-AGENCY LAND MANAGEMENT PARTNERSHIPS

Efforts to maintain or increase capacity of ECCC-CWS staff to establish and maintain relationships with neighbours, local planning authorities, conservation organizations, government and non-government organizations, Walpole Island First Nation, other stakeholders (e.g., agricultural organizations, stewardship councils) and enforcement personnel will facilitate a holistic and coordinated approach for the management and conservation of the St. Clair marshes.

The maintenance of drains, ditches and channels bordering the NWA is shared between ECCC–CWS and adjacent landowners. Land management on the NWA is also a collaborative effort, carried out using a number of agreements, permits and collaborative arrangements in compliance with the *Canada Wildlife Act*. Where cooperative management occurs or is desired, formal agreements may be needed, renewed or revised to clarify roles and responsibilities, sharing of equipment and dispute resolution.

ECCC-CWS will need to :

- assess and update a formal agreement (1982) with DUC to undertake maintenance and repairs to the dykes, pumps or other installations constructed or installed by them within the St. Clair NWA. This agreement was updated in 2003 to include properties within the Bear Creek Unit. Updates to this agreement may identify opportunities to address current and future

management challenges and threats, including regional wetland and prairie conservation, waterfowl conservation, multi-species conservation, control of invasive and non-native species, Lake St. Clair marshes conservation, adaptations to climate change and variability, and species at risk recovery.

- assess formal and informal agreements with the OMNRF, Rural Lambton Stewardship Network and the Stewardship Ranger Program for habitat and species management activities, including wetland management, species at risk recovery, prairie restoration, prescribed burn planning and operations, and invasive species control. Agreements will be modified or maintained as appropriate.
- assess formal and informal agreements with the Municipality of Chatham–Kent for maintenance of the municipal road allowance along Balmoral Line, and with Ontario Hydro and Bell Canada for service lines. Agreements will be modified or maintained as appropriate.
- assess formal and informal agreements with ECCC–MSC and MOE to operate an air quality station in the Bear Creek Unit. Agreements will be modified or maintained as appropriate
- assess informal agreements with local landowners to plant cover crops (e.g., vegetable crops and prairie grasses in Bear Creek Unit) to reduce weeds and prevent soil loss, and/or maintenance activities of drains, ditches and channels which will be reviewed annually and modified or maintained as appropriate.

5.5 MONITORING AND SURVEYS

Monitoring and surveys at the St. Clair NWA may be authorized for ECCC–CWS staff, ECCC–WED, and other federal and provincial agencies and researchers where it supports identified research and management needs. Effective and efficient monitoring requires careful planning and a coordinated approach. For species at risk, locations (e.g., resident, breeding and migrant) in the NWA will be identified and monitored over time to assess population size and distribution as well as potential and existing threats. Monitoring methods and priorities will be in accordance with animal care protocols and species recovery strategies, management plans, action plans and other relevant policies. Ongoing monitoring needs are as follows, and will be conducted on an as-needed basis:

1. establish a baseline for and track changes in wetland, prairie and aquatic habitats (i.e., extent and quality, biodiversity, and habitat-dependent species at risk);
2. establish baseline population and distribution estimates for key plant and animal species within the NWA;
3. assess the overall ecosystem quality of the area for a range of wildlife and plant species, with an emphasis on habitats required by staging waterfowl, marsh-dependent wildlife, migratory birds and species at risk, as well as other provincially rare species; monitor responses to threats;

4. assess migratory bird habitat use within the NWA and nearshore waters and wetlands adjacent to the NWA, with an emphasis on waterfowl and marshbirds;
5. assess the effectiveness of current or future management practices;
6. monitor and assess the impacts of visitation and access to the NWA;
7. assess the changes in extent and density of invasive and non-native species, and the applicability of control and eradication methods; and
8. assess the vulnerability of wetland and prairie plant and wildlife communities to climate change and water level variability.

Currently ongoing surveys conducted using established protocols, at specific times of the year (and providing valuable data at the site, region and provincial scales) include the following:

- Decadal Migrant Waterfowl Survey
- Annual Mid-winter Waterfowl Survey
- Mute Swan Survey (every 3 years)
- Annual Volunteer Christmas Bird Count
- Annual Great Lakes Marsh Monitoring Program (birds and amphibians)
- Great Lakes Coastal Habitat Assessment and Monitoring Project (water quality, aquatic macro-invertebrates, breeding birds, submerged aquatic vegetation)
- Air quality and precipitation station monitoring
- Monarch butterfly monitoring (new)

Many of the biological questions and issues identified from periodic surveys and research may be beyond the influence of localized management options. For example, changes in food resources, weather events, and increased incidence of botulism, toxics, disease and bird mortality can affect waterfowl and migratory bird numbers and species at risk populations. Should changes in population numbers or events be recorded, this information will be forwarded to the appropriate management authority (e.g., Canadian Cooperative Wildlife Health Centre, ECCC–CWS Population Conservation Section and ECCC–CWS Species at Risk Unit) and will be used to assist in directing mitigation, research or population recovery.

5.6 RESEARCH

Environment and Climate Change Canada may support research activities within the NWA if their results are likely to provide data and information on topics of interest, including waterfowl and migratory bird population monitoring, habitat supply and quality, protection or recovery of species at risk, habitat restoration, the effects of climate change and water level variability on water-level management, and the effects of invasive and non-native species on habitat and wildlife.

ECCC–CWS CWA permits are required under the *Wildlife Area Regulations* to conduct research and monitoring in the St. Clair NWA. All research requests must be made in writing. Refer to Appendix 2: Canadian Wildlife Service (Ontario): Conditions of Research Requests (in National Wildlife Areas). To obtain a permit to conduct research in St. Clair NWA and to receive instructions concerning guidelines for a research proposal, please contact:

Environment and Climate Change Canada - Canadian Wildlife Service
Ontario Region Permit Office
867 Lakeshore Road
Burlington ON L7R 4A6
Tel.: 905-336-4464
Fax: 905-336-4587
Email: wildlife.ontario@canada.ca

Upon completion of the activity, permit holders are required to submit all data/information collected as a result of a permit to ECCC–CWS.

5.7 PUBLIC ACCESS, INFORMATION AND OUTREACH

Limited public access and certain outreach activities are permitted in the St. Clair NWA. These activities are designed to enhance public understanding and appreciation of the NWA's important conservation role for migratory birds and to encourage public cooperation in wildlife and habitat conservation.

Goals for public information and outreach include the following:

- a) Explaining the nature of NWAs, their local and regional importance of establishing them, and the general role of the ECCC–CWS Protected Areas Network and national habitat program;
- b) Explaining the natural and historical human phenomena leading to the diversity of habitats now encountered in the NWA;
- c) Explaining the importance of different NWA habitats to migratory birds, and emphasizing the importance of the area's geographic location to annual migration patterns;
- d) Outlining the importance of the NWA habitats for other wildlife species, including species at risk (reptiles, amphibians, mammals, fishes, plants, etc.);
- e) Promoting appreciation for habitat and wildlife at the St. Clair NWA and the public's role in ongoing protection of the site;
- f) Increasing awareness of and promoting compliance with the CWA and *Wildlife Area Regulations*.

To meet these goals, ECCC–CWS has developed printed materials such as the St. Clair NWA fact sheet and bird checklist, which are available to visitors, and has installed interpretive

signs in public access areas. In addition, ECCC–CWS staff deliver presentations profiling the NWA to local groups.

Because the NWA's main purpose is the conservation of staging waterfowl, public access is limited to portions of the St. Clair Unit. A self-guided walking trail (2.5 km in length) along the top of the cross-dyke, a wildlife viewing tower and other infrastructure (i.e., the parking lot, interpretive signage and public washrooms) provide opportunities for low-impact recreation in the St. Clair Unit (Figure 2). The trail is open to the public during daylight hours (day-use only), but access may be periodically restricted to avoid excessive disturbance at peak periods.

On-site awareness programs are not planned. Awareness is generated through a CWS website and via printed materials available on the Environment and Climate Change Canada protected area website at <https://www.canada.ca/en/environment-climate-change/services/national-wildlife-areas/locations.html>.

6 AUTHORIZATIONS AND PROHIBITIONS

In the interest of wildlife and wildlife habitat, human activities are minimized and controlled in NWAs through the implementation of the *Wildlife Area Regulations*. These regulations set out activities that are prohibited (subsection 3[1]) in the wildlife area, and provide mechanisms for the Minister of Environment and Climate Change to authorize certain activities to take place in NWAs that are otherwise prohibited. The regulations also provide the Minister with the authority to prohibit entry into NWAs.

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

The Minister has the legislative authority to permit activities in the NWA according to the following acts and regulations:

- *Canada Wildlife Act* (section 12 (g)) and *Wildlife Area Regulations* (sections 3(2), 4 and 8)
- *Species at Risk Act* (sections 73 and 74)

For greater certainty, nothing in this management plan shall be construed so as to abrogate or derogate from the protection provided for existing Aboriginal rights 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*.

6.1 PROHIBITION OF ENTRY

Under the *Wildlife Area Regulations*, the Minister may publish a notice in a local newspaper, or have notices posted at the entrance of any wildlife area or on the boundary of any part thereof, prohibiting entry to any wildlife area or part thereof. These notices can be posted when the Minister is of the opinion that entry is a public health and safety concern or when entry may disturb wildlife and their habitat.

For St. Clair NWA, entry is prohibited to portions of the wildlife area. Authorized activities and those activities that may be considered for permitting are described below.

6.2 AUTHORIZED ACTIVITIES

The majority of the St. Clair NWA, comprising the entire Bear Creek Unit and portions of the St. Clair Unit, are closed to the public, except for research and monitoring purposes authorized by a permit under the *Wildlife Area Regulations*. Access and recreational activities are restricted in the St. Clair NWA because a key conservation purpose is to provide undisturbed staging habitat for migratory waterfowl. However, limited public access for the purposes of interpretation and limited recreation is authorized in portions of the St. Clair Unit and for day-use only. Authorized activities without special restrictions within each Unit are described below.

St. Clair Unit

Signs and notices authorizing the activities below are located in the St. Clair Unit at the parking lot (Figure 2), on the west side of the public access road, and in public areas.

The following public access and authorized activities are allowed in designated areas within the St. Clair Unit between sunrise and sunset daily, and do not require a permit:

- Entry to the St. Clair Unit at the main entrance at 5633 Balmoral Line (Figure 2)
- Parking within the designated parking lot
- Picnicking (no open fires or charcoal barbecues)
- Hiking, skiing and snowshoeing (on the designated trail along the cross-dyke)
- Bird and wildlife watching (from the road, designated trail and viewing tower)
- Photography (from the road, designated trail and viewing tower)

Refer to Figure 2 for the location of the NWA main entrance, public access road, public parking lot, designated trails and viewing tower.

Bear Creek Unit

Within the Bear Creek Unit, recreational boating and fishing (no lead sinkers, no spears) and wildlife viewing are authorized in Maxwell and Little Bear Creeks. Access to these watercourses occurs via the Snye channel and the municipal road adjacent to the Bear Creek Unit (Figure 3).

There is no other authorized public access to the Bear Creek Unit without restrictions (i.e., CWA permit for research and monitoring purposes).

For greater certainty, overnight camping, open fires and charcoal barbecues, hunting, and use of off-road vehicles are prohibited at all times in accordance with the CWA and *Wildlife Area Regulations*. Periodic visits by Environment and Climate Change 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 authorizing the activity.

6.3 AUTHORIZATIONS

Permits and notices authorizing an activity may be issued only if the Minister is of the opinion that the activity is scientific research relating to wildlife or habitat conservation, or the activity benefits wildlife and their habitats or will contribute to wildlife conservation, or the activity is not inconsistent with the purpose for which the NWA was established and is consistent with the most recent management plan. The Minister may also add terms and conditions to permits 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.

All requests to ECCC-CWS for CWA permits must be made in writing at least 7 weeks prior to the date of requirement to the following address. Refer to Appendix 2 for conditions of research permits in St. Clair NWA.

Environment and Climate Change Canada - Canadian Wildlife Service
Ontario Region Permit Office
867 Lakeshore Road
Burlington ON L7R 4A6
Tel.: 905-336-4464
Fax: 905-336-4587
Email: wildlife.ontario@canada.ca

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 and Climate Change Canada - Canadian Wildlife Service
Ontario Region Permit Office
867 Lakeshore Road
Burlington ON L7R 4A6
Telephone: 905-336-4464
Fax: 905-336-4587
Email: wildlife.ontario@canada.ca

Fisheries Act and Species at Risk Act:

Fisheries and Oceans Canada
Central and Arctic Region
520 Exmouth Street

Sarnia, ON N7T 8B1
Telephone: 519-383-1813 or
Toll-Free 1-866-290-3731
Fax: 519-464-5128

Provincial:

Fish and Wildlife Conservation Act, Endangered Species Act

Ontario Ministry of Natural Resources and Forestry
Natural Resources Information Centre
300 Water St
Peterborough ON K9J 8M5
Telephone: 1-800-667-1940 (toll-free)
TTY: 1-866-686-6072

For further information, please consult the Environment and Climate Change Canada Policy when Considering Permitting or Authorizing Prohibited Activities in Protected Areas Designated Under the *Canada Wildlife Act* and *Migratory Birds Convention Act, 1994* (December 2011) (Environment Canada 2011). This policy document is available on the Environment and Climate Change Canada Protected Areas website at <https://www.canada.ca/en/environment-climate-change/services/national-wildlife-areas/locations.html>.

6.4 EXCEPTIONS

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

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

7 HEALTH AND SAFETY

Visitors to the St. Clair NWA may encounter severe weather (e.g., wind, heat, storms), dense vegetation, uneven ground, biting insects, and access to the marshes and open water areas can be difficult. In general, authorized visitors must seek and heed expertise to operate in these environments.

Management activities directed at improving health and safety and reducing the risk of a hazardous occurrence in the NWA can include the following:

- 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 abandoned building materials and debris
- Preparation of an NWA emergency response plan for fire and spill response

Site visits by ECCC–CWS staff will be conducted at the St. Clair Unit weekly, and at the Bear Creek Unit at least twice per month, to monitor facilities and infrastructure, general site and habitat conditions, human use, and prohibited activities. Periodic formal assessments of all facilities and infrastructure will be performed by federal agencies.

ECCC–CWS works with Environment and Climate Change Canada's Contaminated Sites Program to conduct site audits in order to identify contaminants assess risks and remediate environmental contaminants on federal lands. Phases I, II and III site assessments of the St. Clair NWA were completed by Environment and Climate Change Canada's Contaminated Sites Program between 2009 and 2011 to assess legacy issues (e.g., vacant structures, waste and debris) (DST Consulting Engineers Inc. 2009; Franz Environmental Inc. 2011). Issues identified in the 2011 Phase III report will require remedial actions, implemented on a priority basis.

All reasonable efforts will be made to protect the health and safety of the public, including adequately informing visitors of any known or anticipated hazards or risks. Furthermore, Environment and Climate Change Canada staff will take all reasonable and necessary precautions to protect their and their co-workers' health and safety. However, visitors (including researchers and contractors) should make all reasonable efforts to inform themselves of risks and hazards, and should be prepared and self-sufficient. Because natural areas contain some inherent dangers, proper precautions should be taken by visitors, recognizing that Environment and Climate Change Canada staff neither regularly patrol, nor offer services for visitor safety in, NWAs.

In case of emergency at the St. Clair NWA, call 911 immediately.

In the case of environmental emergencies, contact will be made with the Canadian Environmental Emergencies Notification System by calling the following 24-hour telephone::

Ontario Spills Action Centre

Ontario Ministry of the Environment

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

Refer to: <http://www.ec.gc.ca/ee-ue/default.asp?lang=En&n=EED2E58C-1>

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 St. Clair NWA should be reported to:

Environment and Climate Change Canada – Canadian Wildlife Service

Ontario Region

4905 Dufferin Street

Toronto ON M3H 5T4

Telephone: 1-800-668-6767

Email: enviroinfo@canada.ca

8 ENFORCEMENT

The management of NWAs is based on three acts and the associated regulations:

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

To promote compliance with the *Canada Wildlife Act* and *Wildlife Area Regulations*, and the *Migratory Birds Convention Act, 1994* (Appendix 1), ECCC–CWS posts signs along the NWA boundaries and at main access points to identify authorized activities within each NWA and any conditions placed on those activities.

ECCC–WED is responsible for the enforcement of federal and provincial wildlife laws, and will perform on-site inspections and investigations, patrol the NWA to promote compliance, and prevent prohibited activities within the NWA.

ECCC–WED officers monitor compliance with the federal *Canada Wildlife Act*, *Wildlife Area Regulations*, *Migratory Birds Convention Act, 1994*, *Species at Risk Act*, the *Fisheries Act* and the provincial *Fish and Wildlife Conservation Act, 1997* and Ontario's *Trespass to Property Act* on an ongoing basis, and will initiate investigations when required. ECCC–CWS Ontario staff provide details from site inspections to ECCC–WED that may require enforcement action.

9 PLAN IMPLEMENTATION

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

The framework by which St. Clair NWA is managed is clearly delineated by the *Canada Wildlife Act*. Close liaison between government agencies and non-government wildlife organizations is essential for effective long-term management of the NWA and its surrounding environment. Topics of mutual interest to the federal and provincial governments include management of game and nongame wildlife, species at risk, and production of special publications relevant to the NWA/MBS.

Table 5: St. Clair National Wildlife Area Management Plan Implementation Strategy 2016–2025

Activity	Year									
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Site inspection at St. Clair Unit (weekly)	x	x	x	x	x	x	x	x	x	x
Site inspection at Bear Creek Unit (bi-weekly)	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
Monitor visitor use	x	x	x	x	x	x	x	x	x	x
Monitoring to identify threats and issues	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
Document and report number and nature of incidents of illegal activities	x	x	x	x	x	x	x	x	x	x
Review permits, memorandums, agreements and collaborative arrangements, formalize, revise or renew, as appropriate	x	x	x	x	x	x	x	x	x	x
Prepare an infrastructure maintenance plan			x							

Meet with collaborators, neighbours	x	x	x	x	x	x	x	x	x	x
Conduct biological inventory to report on biological diversity and threats			x						x	
Monitor the extent and quality of vegetation communities and changes through time		x			x			x		
Map distribution and percent cover of invasive and non-native plants		x			x			x		
Assess and apply targeted control to reduce spread of invasive and non-native species	x			x			x			x
Monitor and remove Muskrat and other mammals as needed	x	x	x	x	x	x	x	x	x	x
Baseline assessments and ecological monitoring	x		x		x		x		x	
Develop and implement a prairie habitat management plan					x					
Develop a water management strategy			x							
Assess and implement species at risk recovery actions		x		x		x		x		x
Identify priority lands in the region for conservation and protection	x									x
Decadal Migrant Waterfowl Survey						x				
Mid-winter Waterfowl Survey	x	x	x	x	x	x	x	x	x	x
Mute Swan Survey		x			x			x		
Coastal Habitat Assessment and Monitoring Program	x			x			x			x
Review public outreach and education	x			x			x			x

9.1 MANAGEMENT AUTHORITY AND MANDATE

ECCC–CWS (Ontario) is responsible for site management of the St. Clair NWA.

9.2 MANAGEMENT PLAN REVIEW

Evaluation will take the form of an annual review of data obtained from monitoring, surveys, research projects and collaborative agreements. Monitoring, surveys and research in the St. Clair NWA will be performed within the limits imposed by financial and human resources. The data collected will be reviewed annually and will be used to inform future management at the NWA. Furthermore, these data will be used to evaluate federal contributions toward accomplishing the mandates specific to ECCC–CWS, for which the protected area was established.

This management plan will be reviewed 5 years after its formal approval by ECCC–CWS and every 10 years thereafter.

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

10 COLLABORATORS

ECCC–CWS works with neighbouring land managers, and a number of government and non-governmental organizations, to meet goals for on-site management and contribute to landscape conservation. Current and past partners include DUC, OMNRF, Ontario Ministry of Environment (MOE), Ontario Ministry of Agriculture, Food and Rural Affairs, St. Clair Region Conservation Authority (SCRCA), Lower Thames Valley Conservation Authority (LTVCA), ECCC–WED, Environment and Climate Change Canada's Meteorological Service of Canada, DFO, Parks Canada Agency, Walpole Island First Nation, Municipality of Chatham–Kent, Township of Dover, Nature Conservancy of Canada, Wildlife Habitat Canada, Rural Lambton Stewardship Network, Stewardship Kent, Sydenham Field Naturalists, Lambton Wildlife, Essex County Field Naturalists, Bird Studies Canada, Western University, local landowners, and volunteers. 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.

In particular, Environment and Climate Change Canada's Canadian Wildlife Service (ECCC–CWS) works in coordination with the neighbouring landowners of the various units (e.g., St. Clair Unit, Balmoral Club, St. Luke's Club, Municipality of Chatham–Kent and Bear Creek Unit), DUC, OMNRF, MOE, and DFO to manage water levels within the channels and dyked impoundments.

ECCC–CWS works closely with DFO, OMNRF, LTVCA and SCRCA to identify and monitor aquatic species (e.g., fish, mussels, crustaceans, benthic communities) in managed and coastal wetlands, channels and ponds in the St. Clair NWA and adjacent waters of Lake St. Clair and the Snye channel, with an emphasis on species at risk.

Informal collaborative arrangements have been established with DFO, Parks Canada Agency, OMNRF, Rural Lambton Stewardship Network, Stewardship Kent, SCRCA and LTVCA to monitor and share information on wetland and prairie habitat management, species at risk conservation, and the control of invasive species.

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APPENDIX 1: LEGISLATION

Federal Legislation

Canada Wildlife Act (R.S.C., 1985, c. W-9)

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

Fisheries Act (R.S.C., 1985, c. F-14)

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

Migratory Birds Convention Act, 1994 (S.C. 1994, c. 22)

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

Species at Risk Act (S.C. 2002, c. 29)

<http://laws-lois.justice.gc.ca/eng/acts/S-15.3/page-1.html>

Species at Risk Act – Listing

<http://www.registrelep-sararegistry.gc.ca/default.asp?lang=En&n=CA7DCECA-1>

Species at Risk Public Registry

<http://www.sararegistry.gc.ca/default.asp?lang=En&n=24F7211B-1>

Wildlife Area Regulations (C.R.C., c. 1609)

http://laws-lois.justice.gc.ca/eng/regulations/C.R.C.%2C_c._1609/index.html

Provincial Legislation – Ontario

Endangered Species Act, 2007, S.O. 2007, c. 6

<https://www.ontario.ca/laws/statute/07e06>

O. Reg. 230/08: SPECIES AT RISK IN ONTARIO LIST

<https://www.ontario.ca/laws/regulation/080230>

Fish and Wildlife Conservation Act, 1997, S.O. 1997, c. 41

<https://www.ontario.ca/laws/statute/97f41>

Trespass to Property Act, R.S.O. 1990, c. T.21

<https://www.ontario.ca/laws/statute/90t21>

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

Permission under the *Wildlife Area Regulations* of the *Canada Wildlife Act* to undertake research at National Wildlife Areas 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 National Wildlife Area (NWA), potential detractors and proposed mitigation measures. All proposals may be subject to a review by the Animal Care Committee of either Environment and Climate Change Canada or the submitting institution.
2. No research shall be undertaken without a permit issued under the *Canada Wildlife Act - Wildlife Area Regulations*, and the research must be consistent with the NWA management plan for the site and other relevant legislation (e.g., *Species at Risk Act*, *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 and Climate Change Canada, Canadian Wildlife Service (ECCC-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 ECCC-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 ECCC-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 NWA are subject to environmental screening and, if necessary, to further steps in the Environmental Assessment and Review Process (Environment and Climate Change Canada).

APPENDIX 3: CONTACTS FOR THE ST. CLAIR NATIONAL WILDLIFE AREA, ONTARIO

Contacts for St. Clair National Wildlife Area, Ontario Administered by Environment and Climate Change Canada – Canadian Wildlife Service (Ontario) St. Clair Unit Latitude 42.366334/Longitude -82.405108 Bear Creek Unit Latitude 42.533290/Longitude -82.396169	
In case of emergency: Call 911 General inquiries: Use local telephone numbers, not 911	
Note: There are three civic addresses for St. Clair National Wildlife Area civic	Bear Creek Unit
Emergency (911) address: 5633 Balmoral Line RR 1 Pain Court Ontario St. Clair NWA – main entrance	Emergency (911) address: 8147 Meadowvale Line RR 6 Wallaceburg Ontario Pump laneway entrance to air quality monitoring station/road
	Emergency (911) address: 8101 Meadowvale Line RR6 Wallaceburg Ontario Lozon-Pidgeon cell at the west end of Meadowvale Line
Any life-threatening emergency	911
Police-fire-ambulance	911
Ontario Provincial Police	1-888-310-1122
Marine and Air Search and Rescue (Emergency Only)	
Royal Ontario Mounted Police (RCMP) Ontario Division	519-640-7267
To report a spill to air, land, or water, call Ontario Spills Action Centre, 24/7	1-800-268-6060 or 416-325-3000
Poison Control Centers (Emergencies)	1-800-268-9017
Environment and Climate Change Canada - Ontario	
Canadian Wildlife Service (Ontario) Region Office	1-800-668-6767
Canadian Wildlife Service (Ontario) Permit Office	905-336-4464
Wildlife Enforcement Directorate (Ontario)	905-336-6410
General Contacts	
Ontario Ministry of Natural Resources and Forestry (Conservation Officer) (General Inquiry)	1-877-847-7667
Ontario Ministry of Natural Resources and Forestry (Conservation Officer) (General Inquiry)	1-800-667-1940
Ontario Ministry of Natural Resources Aylmer District office	519-773-9241
Municipality of Chatham–Kent	519-360-1998
Hospital: Chatham–Kent Health Alliance 80 Grand Avenue West Chatham ON N7M 5L9	519-352-6400