



Figure 1. Northern Pintail are one migratory bird species frequenting these Wetlands of International Importance. (Photo: Eddy Edwards, U.S. Fish and Wildlife)

Missisquoi Delta and Bay Wetlands Ramsar Site Designated in Vermont

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The Missisquoi National Wildlife Refuge and the U.S. Fish and Wildlife Service's Lake Champlain Fish and Wildlife Resources Office worked with Vermont Fish and Wildlife Department to designate the refuge along with three State Wildlife Management Areas as *Wetlands of International Importance under the Ramsar Convention on Wetlands*. The application was approved and Missisquoi Delta and Bay Wetlands were officially designated as a *Wetland of International Importance* on November 20, 2013.

The Ramsar Convention is a 42 year-old intergovernmental treaty, signed by over 160 countries, to promote voluntary international cooperation for wetland and waterfowl conservation. The Convention's mission centers on the wise use and conservation of wetlands around the globe focusing on local and national action and international cooperation. The treaty recognizes the importance of wetlands and offers to recognize sites considered a *Wetland of International Importance* based on a number of specific attributes, such as rare or unique wetlands, biological diverse plant or animal communities, large or diverse waterbird and fish populations.



Figure 2. View of Missisquoi marshes. (Photo: Ken Sturm, U.S. Fish and Wildlife Service)

The first such site in Vermont, Missisquoi Delta and Bay Wetlands encompass 7,665 acres, and includes the Missisquoi National Wildlife Refuge and the Vermont Fish and Wildlife Department's Maquam, Carmen's Marsh and Rock River Wildlife Management Areas. There are currently 35 other designated sites in the U.S. and over 2,000 around the world. The Missisquoi Delta and Bay Wetlands join the ranks of other important wetland areas such as the Everglades and San Francisco Bay with this designation. Missisquoi National Wildlife Refuge is the 20th national wildlife refuge to be designated under the Ramsar Convention.

Established in 1943 for the protection and management of migratory birds, the Missisquoi National Wildlife Refuge is at the heart of the newly designated Ramsar site comprising almost 90% of the total acreage. Refuge wetlands provide habitat for more than 200 species of birds, including thousands of migratory waterfowl during fall migration (Figure 1). The refuge is also an important regional breeding area for waterfowl and other migratory birds. Fall populations of waterfowl on the refuge often peak at

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20,000. The largest great blue heron rookery on the Vermont side of Lake Champlain is located on the refuge's Shad and Metcalfe Islands. These wetlands also support breeding populations of numerous other species, such as rails, bitterns, common moorhens, pied-billed grebes, and numerous grassland, wetland and forest passerine species. The refuge also supports a diversity of native wildlife, including 35 species of mammals.

The Missisquoi River delta is the largest wetland complex in the Lake Champlain Basin. As it flows toward the lake, the Missisquoi River passes through the largest and perhaps highest quality silver maple (*Acer saccharinum*) floodplain forest in the State of Vermont as well as natural and managed marshes of wild rice (*Zizania aquatica*), buttonbush (*Cephalanthus occidentalis*), and tussock sedge (*Carex stricta*) (Figure 2). The river harbors rare freshwater mussels, turtles, and fish. Its delta is a critical link for migratory birds along the Atlantic Flyway. These wetlands host the largest concentration of waterfowl in Vermont and approximately half of the waterfowl in the Champlain Valley during early October. Also inside the Missisquoi Delta and Bay Wetland site is the Maquam Bog, a mixed shrub-sedge bog which is one of the largest ombrotrophic bogs in New England. The Pitch Pine Woodland Bog (*Pinus rigida*) is also found here and is the only example of this natural community type in Vermont (Figure 3).

The Missisquoi Delta and Bay Wetlands also provide food and spawning habitat for numerous fish species. As a site that includes an extensive river delta and associated wetlands, there are numerous ecological interactions between the



Figure 3. Maquam Bog, Vermont's only Pitch Pine Woodland Bog. (Photo: Ken Sturm, U.S. Fish and Wildlife)



Figure 4. Lake Sturgeon (*Acipenser fulvescens*). (Photo: Vermont Fish and Wildlife Department) For information on sturgeon spawning in the Missisquoi River see U.S. Fish and Wildlife Service report http://www.vtfishand-wildlife.com/library/Reports_and_Documents/Fish_and_Wildlife/Spawning_Habitat_Suitability_for_Walleye_and_Lake_Sturgeon_in_the_Missisquoi_River.pdf

fish and birds (such as ospreys, bald eagles and herons) of the wetland as well as between prey fish found in the wetland and the predator fish of the lake and river. The lower Missisquoi River is one of the few remaining spawning grounds for the state-listed endangered lake sturgeon (*Acipenser fulvescens*; Figure 4) and provides habitat for the state threatened sand darter (*Ammocrypta pellucida*).

This new designation creates added significance to the state's most important wetland complex. Given the troubled waters which feed these wetlands, this designation may add fuel to the grassroots efforts aimed at improving water quality throughout the 393,000-acre Missisquoi River watershed and ultimately Lake Champlain itself. Through combined and cooperative management between the

U.S. Fish and Wildlife Service and the Vermont Department of Fish and Wildlife, the Missisquoi Delta and Bay Wetlands will continue to provide the irreplaceable ecosystem benefits for generations to come. ■