

3.7 Ecosystems

A variety of ecosystems can be found along the Ottawa River. Numerous provincial parks, conservation areas, ecological reserves, and Areas of Natural and Scientific Interest (ANSI) have been established along the river's course. Twenty-nine environmentally sensitive areas have been identified between Lac Dollard des Ormeaux and Lac la Cave on both the Ontario and Quebec shores (Haxton and Chubbuck 22). Each of these communities contains a fascinating array of species that interact in unique ways to produce a variety of distinct natural communities.

Often, conservation groups and governmental organizations are working in tandem for the protection of these ecosystems. In many cases, these same groups provide excellent educational opportunities for the public through on-site visits and guided tours. However, when ecosystems are highly sensitive, visitors must be cautious of making even seemingly small impacts on the natural environment.

3.7.1 Riverine Systems

Rivers shape neighbouring ecosystems by providing drinking water, microclimates, barriers to migration, and food. Dams and reservoirs along the Ottawa create significant changes to the river's ecosystems. Dams have benefited Walleye along the river because they spawn in the resulting turbid waters. However, dams disrupt the migration and survival of other fish species, such as the River Redhorse. This fish is highly sensitive to siltation and pollution – siltation often occurs upstream of dams. The Northern Brook Lamprey, another species of concern, is adversely affected by changes in the average water temperature due to lowering water levels, often a result of dam functioning (CWS: "Species at Risk").

Figure 3.39 Along the Ottawa River



Source: Francis Lavigne

The McLaurin Bay Project

The McLaurin Bay project in Gatineau aims to ensure the protection and the enhancement of habitats with fauna of particular interest. It presently encompasses 520 hectares of wetland and riverine habitats, and is part of a larger project seeking to protect the north shore of the Ottawa River between Hull and Calumet, a stretch within which a great deal of the wetlands of the Ottawa River are found. The project is working to acquire privately owned lands in order to consolidate the properties presently belonging to the Quebec government. One desired outcome of this would be the creation of further wetlands in order to increase the biological productivity of the region.

3.7.2 Lacustrine (Lake) Systems

The Ottawa River flows through numerous lakes, the largest of which are Grand Victoria, Simard, Temiskaming, Allumette, Chats, and Deschênes. Many of these lakes have been formed by dams

that flooded immense forested areas. Flow regulation for hydroelectric production results in the conversion of lotic ecosystems to lentic ecosystems upstream of dams. In other words, water accumulates upstream of dams and floods the land, creating a lake in which water is relatively static and in which sediment accumulates with time. Downstream of the dam, water is generally in constant movement.

Rare plant species can be found in various lakes along the Ottawa River, including Braun's Quillwort, Bald Rush, Torrey's Bald Rush, Water Crowfoot and four species in the potamogeton family (*Potamogeton pusillus*, *Potamogeton perfoliatus*, *Potamogeton robbinsii* and *Potamogeton spirillus*). Ontario has identified the Map Turtle as a species at risk. Increases in shoreline development, declines in habitat quality, and increases in human disturbances are probable culprits. Alternately, invasive Zebra Mussels may be responsible, as this species has reduced the population of the Map Turtle's traditional prey (ROM: "Species at Risk").

3.7.3 Wetlands

Figure 3.40 Wetland Along the River



Source : Claude Beaudoin

Wetlands are the most productive and diversified ecosystems along the Ottawa River. They act as purifying sponges, filtering pollutants and excess nutrients. They also retain water, and then slowly replenish ground water sources as they diminish. Wetlands are vital to many microbes, plants, fish and wildlife, some rare or threatened, as these unique systems provide feeding and breeding grounds, habitat, migration halts, and shelter. There are five types of wetland: swamps, marshes, bogs, and fens. Each type is found at various points along the Ottawa River.

Swamps

Swamps are flooded areas that support ligneous (woody) species. Water levels are often high in the spring and then quite low in the summer. In springtime, swamps are true outdoor concert-halls, as they are important reproduction sites for various species of frogs and salamanders. The Wood Street Swamp, a municipal park, protects one of the Ottawa River's southern swamps. The Westmeath Provincial Park has a significant swamp that is alive with migrating ducks in spring and autumn.

Stony Swamp Conservation Area

Stony Swamp Conservation Area is located just south of the Ottawa River in the National Capital Greenbelt. The area comprises almost 2000 hectares of woodland, wetland and regenerating old field, and represents over 700 species of plant. Many interesting plant communities can be found here including a Sugar Maple forest, small alvar clearings, marsh wetlands and beaver ponds, and regenerating pastures. Stony Swamp Conservation Area also supports a large variety of wildlife, including Canada Geese and other waterfowl, Beaver, woodland birds and the Northern Flying Squirrel (NCC: "Stony Swamp").

Marshes

Marshes are wetlands that are frequently or continuously inundated with standing or slow-moving water (in the shallow water along the boundaries of lakes, ponds, and rivers). They are considered the most productive of all wetlands, and are characterized during the summer months by emergent soft-stemmed vegetation that is adapted to saturated soil conditions.

Several protected areas have been established to conserve the numerous marshes found along the Ottawa River. Muskellunge and Pike are known to spawn in the marshes of the Ottawa River. The Eastern Spiny Softshell Turtle is one of the rarest turtles in Canada, and is at risk both provincially and nationally. These turtles have been found along the Ottawa River in a variety of marshy habitats, including marshy creeks, marshy lagoons, ditches, and nearby ponds.

Bogs

Bogs are covered with a layer of floating vegetation that looks like solid ground, and are usually found in northern territories. Exceptions to this rule, the Alfred Bog and the Mer Bleue Bog are two boreal peat bogs along the Ottawa River. Both are situated near the Ottawa River, east of the city of Ottawa. A number of the plants and animals in these park areas are considered rare, either regionally, provincially or nationally. Drainage around the margins of the bogs threatens the health of these unique ecosystems.

Alfred and Mer Bleue Bog

Alfred Bog

The Alfred Bog is a boreal peat bog hundreds of miles south of anything like it. At 4,200 hectares (10,000 acres), it is the largest bog of its kind in southern Ontario, large enough to give refuge to many plants and animals that were stranded as the warming climate caused the boreal forest to retreat northward with the end of the last Ice Age.

This peat bog has been accumulating for 10,000 years, and shelters many plants and animals that are rare or endangered, some of which are of national significance. Examples include the Bog Elfin Butterfly, Fletcher's Dragonfly, Spotted Turtle, White Fringed Orchid, Atlantic Sedge and Rhodora. In fact, the bog has been designated by the Ontario Ministry of Natural Resources as a "Class 1 Wetland" and an "Area of Natural and Scientific Interest (ANSI)".

Being a domed peat bog, the Alfred Bog is unlike the kettle bogs most commonly encountered south of the Hudson's Bay lowlands. Domed bogs, unlike kettle bogs, drain in all directions from the dome and only receive nutrients from rain and snow. The dominant vegetation in both types of bog is Sphagnum Moss, known to gardeners as peat moss. Sphagnum Moss thrives in the interior of bogs where cool, wet, oxygen starved, nutrient poor, acidic conditions prevail. The dome is formed over millennia as sphagnum moss gradually wicks up water from below.

Alfred Bog lies in the east end of an abandoned channel of the Ottawa River. This was once the main channel of a great river flowing down the Ottawa Valley and into the Atlantic Ocean, draining a glacial lake centred in Manitoba. Because of reduced flow and glacial rebounding, the river abandoned its old channel and moved to its present location.

The most significant impact upon Alfred Bog over the years has been the conversion of bog land for agricultural purposes. The first settlers in the area found the bog to be of little use for farming and an obstacle to building roads. Nevertheless, over the years, drainage around the margins has reduced it to about a third of its original size (Pope: "Alfred Bog").

Mer Bleue Bog

The Mer Bleue Bog is Alfred Bog's "smaller twin." It is designated as an Ontario Provincial Conservation Area, and is situated in the eastern portion of the National Capital Region less than 10 kilometres from Ottawa. Like Alfred Bog, it is of great ecological value as an example of a northern ecosystem, justifying its designation as an Internationally Significant Wetland under the United Nations' Ramsar Convention (NCC: "Mer Bleue Bog").

Approximately 50% of Mer Bleue is a raised boreal peat dome, or *Sphagnum* bog, a system typically occurring in the boreal forests of northern Canada. The bog's hydrological features are unusual, with saline groundwater sources as well as peat deposits of up to six metres thick. Much of the border of the bog has been transformed by beaver dams into ponds and marshlands. Underlying clay deposits further reduce drainage, such that water levels remain at or near the surface of the bog for most of the year (Ramsar: "Canada").

The bog is particularly striking because of the bog mat itself, a "sea" of deep, saturated peat covered by open heath. The mat is home to a variety of plants, some of which are rare, and almost all of which exhibit unusual characteristics enabling them to survive under the bog's challenging conditions. These include the Sundew, Pitcher Plant, Bog Rosemary, Labrador Tea, several species of rare orchid and of Cotton Grass, as well as a variety of low heath shrubs. Also present are stunted to moderate-sized Black Spruce and Tamarack trees (Ramsar: "Canada").

Due to the relatively undisturbed and unique habitat, numerous significant or rare fauna are also found in the conservation area, including 22 species of mammals (Ramsar: "Canada"). The area provides habitat for the nationally rare Spotted Turtle, and Fletcher's Dragonfly, an insect observed in only a handful of sites worldwide. Some of the site's more common inhabitants include the Snowshoe Hare, Beaver, and Muskrat, as well as a variety of waterfowl (NCC: "Mer Bleue").

Figure 3.41 Aerial View of the Alfred Bog



Source: Ottawa River Legacy Landmark Network

Fens

A fen is a type of peatland that resembles a bog but also contains at least 40 centimetres of peat. However, fens support marsh-like vegetation including sedges and wildflowers. The main differences between fens and bogs are in their flora, hydrology and water chemistry. Both bogs and fens along the Ottawa River foster the growth of similar insects, including the smallest dragonfly in the north, the Elfin Skimmer. The Skillet Clubtail is a rare species that had not been observed for many years, although it may still inhabit the fens and bogs of the Ottawa River.

Wetland Restoration in Atocas Bay

Partnerships and volunteer work have been the basis for the successful restoration of the wetlands of Atocas Bay in the community of Lefaivre along the Ottawa River. In 1999, Atocas Bay was a “forgotten stretch of farmland” with only two or three pairs of ducks nesting on the property. Now this habitat on the north-south Atlantic flyway is considered to be one of the most productive sites in Ontario for breeding waterfowl. Through \$1 million in funding and after restoring over 250 wetland basins on the unique undulating landscape, surveys indicate the presence of 11 species of nesting ducks and a variety of other bird species, as well as Moose, White-tailed Deer, and Short-eared Owls.

This project demonstrates that both conservation goals and agricultural priorities can be achieved if appropriate agricultural methods are put in place, such as rotational pasturing and late-season haying. Partners in this project included Environment Canada's Canadian Wildlife Service, Ducks Unlimited Canada, the Ontario Ministries of Natural Resources and Agriculture and Food, the Nature Conservancy of Canada, and Wildlife Habitat Canada. Contributions for Atocas Bay came from all of the partners in the form of direct dollars and in-kind support (WetKit: “Successful Wetland Restoration”).

3.7.4 The Riparian Zone

Riparian zones are the transition areas between terrestrial and aquatic ecosystems. They are also called *vegetated buffer zones* because vegetation in these zones is strongly influenced by the presence of water. In riparian zones, upland areas merge with water bodies, enabling a crucial exchange of energy and matter, and providing diverse habitats for plants, fish, and other wildlife.

Along the Ottawa, numerous islands have been formed from sandbars, including Kettle Island and Petrie Island. Such islands provide excellent examples of riparian ecosystems. The size of the islands varies greatly, and some include human residences or other signs of development while others remain relatively untouched. These islands support the existence of Blue Herons, Kingfishers, and a variety of ducks, which use the submergent vegetation found along the islands. Several mammal species also use these islands for breeding. They support many rare plants (Rivers, Inc.: “Ottawa River”).

Along the shore of the wider, slower flowing reaches of the Ottawa River, natural and artificial beaches can be found, including Norway Beach and Britannia Beach. Agricultural lands also occur along the river. Some shoreline areas are privately owned and are increasingly occupied by cottages and homes. The riparian zone is important to the health of the river system because it forms a buffer between the channel of the river and more developed areas or pasturelands. In particular, the zone serves to filter runoff from the land before it drains into the river.

Many of the Ottawa River's islands contain unique floodplain habitat. These, such as Petrie, Kettle, and Duck Islands, are almost completely flooded in the spring, a special feature to which many species are adapted and, in several cases, is even required to maintain healthy populations. A process of continual erosion and deposition of sediments around the islands provides a renewal of shoreline habitats and enables plant and animal communities to evolve. The islands' quiet backwaters are also extremely rich habitats, providing shelter and nutrients to a wide variety of plants and animals not found in the open river (Hanrahan and Darbyshire).

Many plant species can only be found in the region along the floodplain of the Ottawa River. Some of these plants require water systems and flooding for their seeds to be dispersed. Some need the continual shifting of shoreline sediments, while others require that their habitat be inundated in the spring but dried out in the fall. All of the plant communities found on the Petrie Islands, for example, are specially adapted to extensive spring flooding (Hanrahan and Darbyshire). Prairie-like conditions as well as alvars can be found along the Ottawa River and are maintained by spring flooding. Please refer to Chapter 3.5.2: Riparian Vegetation for a more complete description.

Petrie Island

Petrie Island on the Lower Ottawa River near Cumberland, Ontario, just east of the city of Ottawa may leave visitors feeling like they have “entered another world” (Rivers, Inc.: “Ottawa River”).

Petrie Island was formed by sand deposited at the end of the last ice age; over thousands of years, the sand was eroded into marshes, beaches, dunes, and riverside thickets. Now only 12 kilometres in length, the island complex is a tiny vestige of the vast delta that covered the area more than 8,000 years ago.

The flood-prone area supports at least 29 rare species of plant, including Gattinger's Panic Grass, Moss-Like Love Grass, Wild Madder, and the only major stand of Hackberry trees in the region. (Hackberries are common in the American South.) Many plants depend upon the Ottawa River's annual spring flooding and continual shifting of shoreline sediments for their survival, and have adapted their reproduction and growth patterns to this cyclical water inundation.

The quiet backwaters, flooded forests and sandy dunes of the Petrie Island ecosystem attract a wide variety of resident and migratory birds, including the Red-winged Blackbird, Bonaparte's Gull, the Black Tern and the Marsh Wren. Bird watchers have recorded in the area at least 16 species of warblers, including Magnolia Warblers, the Northern Waterthrush, and the Ovenbird. Woodcocks can be observed in the wooded areas.

The uniqueness of the Petrie Island environment has been recognized by a number of official designations, including classification as a Provincially Significant Wetland (Class I, the highest rating in the Ontario system) and as a regionally significant area of natural and scientific interest. Since 1998, Friends of Petrie Island, a local volunteer organization, has promoted conservation and passive recreation in the area. Recent proposals to expand nature trails and active recreational activities have drawn further attention to the exceptional and fragile nature of this unique natural environment.

3.7.5 Forest Ecosystems

Both the boreal forest and the mixed wood plains ecozones border the Ottawa River. Both of these forest types provide a range of vital ecosystem services, such as air purification, storage of carbon dioxide, stabilization of riverbanks, and reduction of erosion. Forests along the shores of rivers such as the Ottawa also serve as filters, helping to protect the river from runoff carrying excess nutrients and pollutants. Furthermore, forests provide habitat for a variety of wildlife species, some of which are endangered or at risk. These forests also provide excellent recreational opportunities for humans, and fuel the region's forestry economy.

Logging has significantly altered the landscape of the Ottawa Valley. The booming squared timber business, succeeded by the lumber industry was, by the 1880s, responsible for the disappearance of about 75% of the region's forests. Today, along the Ottawa River's shore, most of the forests are less than a century old (Rivers, Inc.: "Ottawa River").

The Boreal Forest

Because it is located along the northern stretches of the Ottawa River, the boreal forest is less threatened by urban development than the mixed wood plains forests to the south. However, it contains highly valuable lumber. Canada's boreal forest is one of the world's ancient forests, but its southern reaches, such as those along the northern portions of the Ottawa River, are increasingly fragmented (The Nature Conservancy).

The Mixed Wood Plains Forest

The mixed wood plains region, located in the lowland part of the river, is also called the Great Lakes-St. Lawrence Forest. Centuries ago, when the area was heavily forested, it may have supported the greatest vegetal biodiversity in the country. Today, the mixed wood forest of the Outaouais region is still considered the richest forest area in Quebec.

This region is now extensively occupied by humans. Forests have been cleared for orchards and other agricultural purposes, lumbering and mining activities, and highways and cities. The Ottawa River Valley was once famous for its White and Red Pine forests. Today, only remnants of these can be found, such as Gillies Grove near Arnprior.

Figure 3.42 Large Flowered Trillium



Source : Ottawa River Legacy Landmark Network

Gillies Grove

Gillies Grove is home to one of the tallest White Pines in Ontario, reaching 50 metres, and still only middle-aged. The grove contains many examples of the Ottawa Valley's legendary huge White Pine, and is also comprised of Eastern Hemlock, Sugar Maple, Yellow Birch, American Beech, and Basswood. This unique forest habitat is a haven for a wide variety of bird species, including Downy, Hairy and Pileated Woodpeckers, Northern Flickers, Yellow-bellied Sapsuckers, White and Red-breasted Nuthatches, Black-capped Chickadees, Purple Finches, Pine Siskins, American Goldfinches, Cardinals, and the elusive Red-shouldered Hawk. Today the grove is open to the public as an "outdoor museum."