State of Wildlife Report

2007

Prince Edward Island
CANADA

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Appendix

1.0 Introduction

Prince Edward Island's wildlife and habitats have intrinsic value, which obliges us to respect them in the choices we make (Wildlife Policy for Prince Edward Island, 1995). Wildlife is a key indicator of the health of our environment. All Islanders have a stewardship responsibility for Prince Edward Island's wildlife heritage, though governments are accountable for its conservation and management. The PEI Wildlife Conservation Act mandates a report each decade which includes the status of wildlife and habitat, a summary of programs and an analysis of the effects of land use.

This report covers the years 1997-2007. While most of the information contained in this first report will serve as a benchmark for subsequent editions, it will also offer detailed information on trends for many different species and issues. Information for this report was gathered from a variety of sources including hunter and angler surveys, expert opinion, wildlife population studies, land use inventories, migratory bird studies, and reference material. The information was collected by provincial and federal government departments, university researchers, volunteers, and other conservation agencies.

In keeping with federal and provincial wildlife policies, the term "wildlife" refers to both plants and animals.

1.1 Background information

1.1.1 Location

Prince Edward Island encompasses approximately 5,700 km². Located at latitude of 46°–47° N, the Island is situated about halfway between the Equator and the North Pole and is completely within the Atlantic Maritime ecozone.

1.1.2 Climate

Prince Edward Island is located close to the boundary of the Gulf Stream and Labrador currents. Major weather systems from the U.S. and western Canada frequently merge in this area, pulling warm, moist air up from the south or cold dry air down from northern Quebec and Labrador. In most years, Island winters are marked by heavy snows and temperatures which range from +5°C to -25°C. Prince Edward Island is surrounded by the salt waters of the Gulf of St. Lawrence and the Northumberland Strait. From December to April, these waters are usually covered by thick sea ice which delays spring. This means that trees leaf out several weeks later than on the nearby mainland. Summers are mild to warm with an average daytime temperature of 19°C. Because the surrounding Gulf warms to nearly 20°C during the summer, residual heat often extends into October on PEI.

1.1.3 Geology and Soils

Prince Edward Island forms part of the Maritime Carboniferous Basin formed some 220-300 million years ago from a collection of eroded material that washed off the

surrounding highlands into a large prehistoric ocean basin. As well, tectonic activity helped to elevate the Island above sea level. Today most of the island is covered by loose material deposited by glaciers (known as “glacial till”) some 10,000 to 15,000 years ago.

The Island has areas of gently rolling hills through the central and eastern portions of the province and low lying sections along the coast and in western PEI. The coast is marked by red sandstone cliffs, salt water ponds and extensive barrier sand dune systems, particularly along the Gulf of St. Lawrence. Most of the rock is sedimentary and susceptible to coastal erosion of up to 1-2 m/year in some areas.

1.1.4 Land Use

In the 1700s, forests, sand dunes and wetlands covered nearly 100% of the Island. Over the next 150 years, much of the Island’s forest and wetlands were converted to farmland, towns and roads. By 1900, only about 30% of the original forest area remained (Figure 1). Much of the remaining woodland was heavily cut-over for a variety of products such as building materials and fuel wood, and many areas had been burned, sometimes several times.

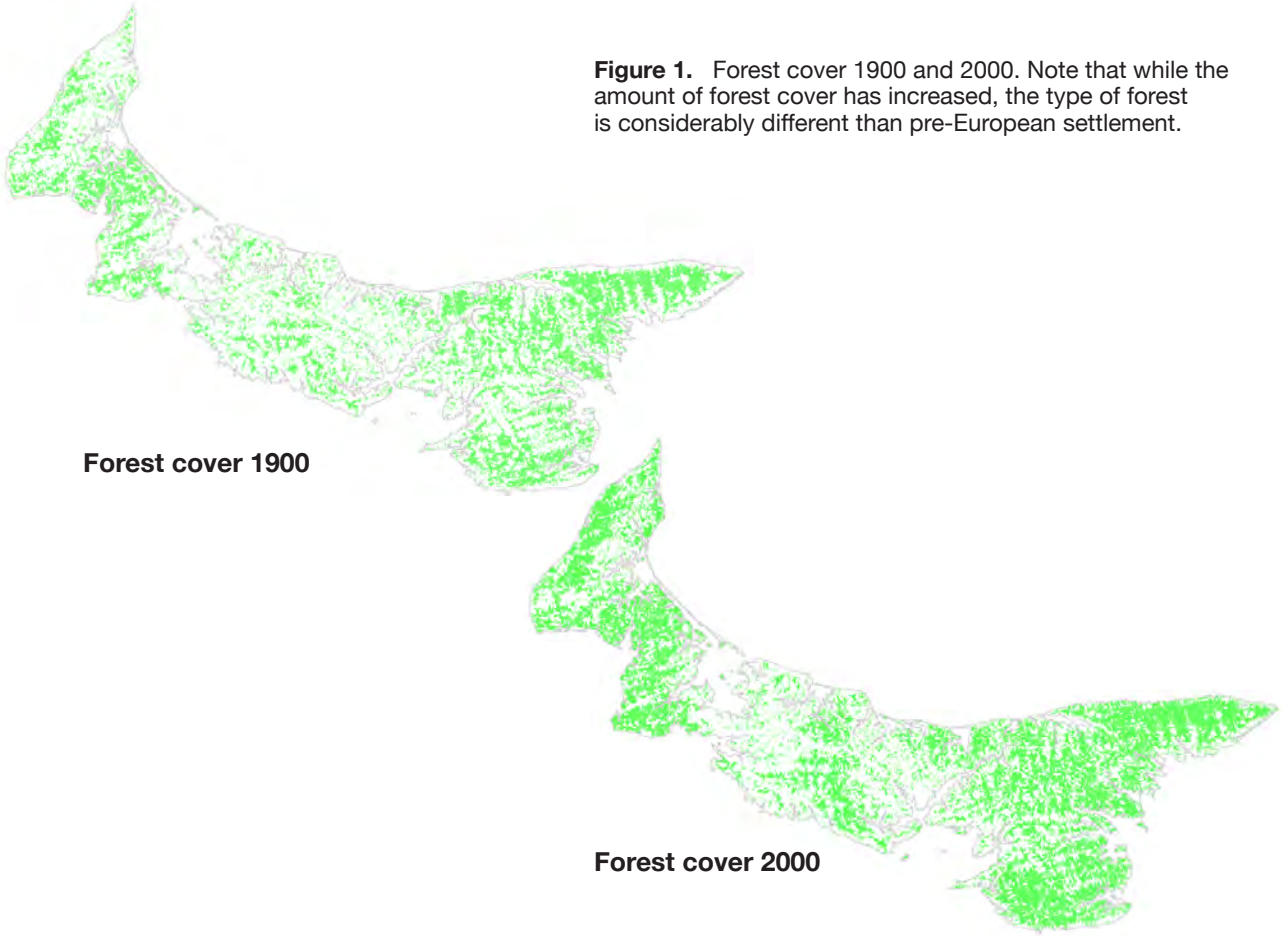


Figure 1. Forest cover 1900 and 2000. Note that while the amount of forest cover has increased, the type of forest is considerably different than pre-European settlement.

The 2000 Corporate Land Use Inventory (CLUI) determined that forest cover represented 45% of PEI (of which 88% was privately owned). Agricultural land accounted for 39% (with the dominant crop being potatoes). Wetland and sand dunes represented 6% and 0.6% respectively.

The remaining land was classified as urban area, roads, shale pits and other human developments (Figure 2).

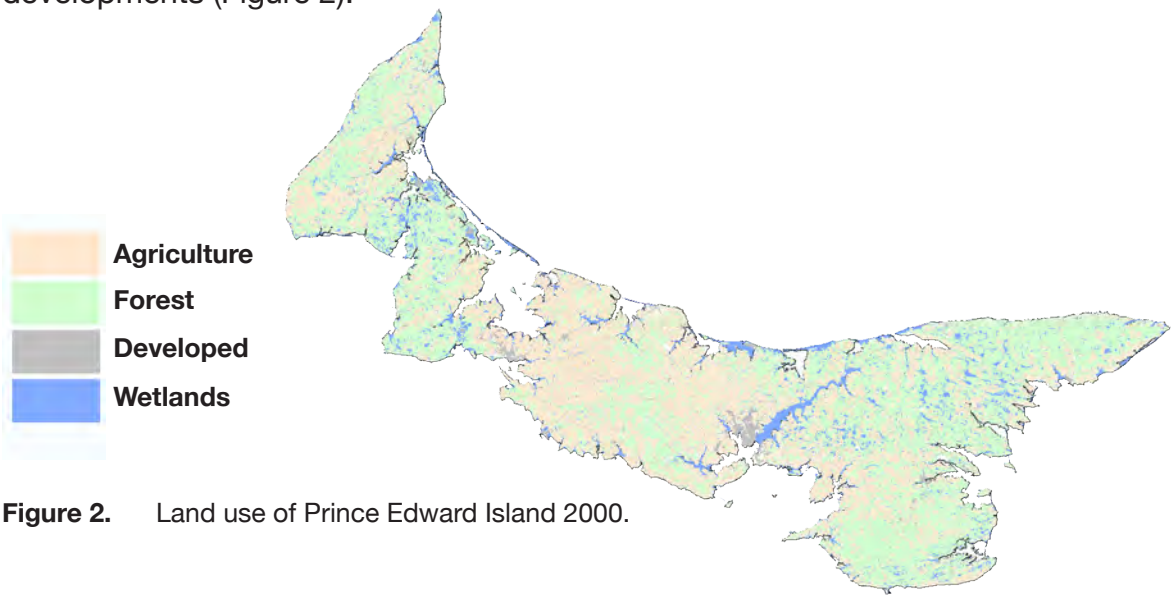


Figure 2. Land use of Prince Edward Island 2000.

Land use changes affect wildlife. Over the last few centuries, land use has changed dramatically. Consequently, the Island has experienced the loss of many native species such as the Passenger Pigeon and Woodland Caribou and the introduction of new species such as raccoons, skunks and starlings. Today an estimated 36% of plants found in Prince Edward Island are non-native species.

1.1.5 History of Wetlands in Prince Edward Island

Land clearing during and following settlement over the past 300 years has resulted in a loss of wetlands in Prince Edward Island. Draining of salt marshes was initiated by the Acadians and perpetuated by successive occupants. Undoubtedly, there was and continues to be a pattern of wetland drainage and infilling for agriculture, urbanization and development. This has been offset to a degree by the development of wetlands associated with mills and dams constructed in streams and rivers, which also helped to compensate for the lack of natural ponds on the Island.

More recently, numerous small wetlands have resulted from the construction of livestock watering ponds and borrow pits in areas with high water tables. During the early and mid 20th century, dams were constructed in many Island streams for fish and wildlife interests. As well, farm pond programs sponsored by the Federal government contributed to the creation of wetlands during the 1960s. Over the past 30 years, Ducks Unlimited Canada, in cooperation with the Province and private interests, has created more than 100 wetlands in the province.

1.1.6 Rivers and Streams

Prince Edward Island's coastline is deeply indented with bays and estuaries fed by many relatively small rivers and streams. There are approximately 260 drainage basins, with some 5072 km of stream. Over two-thirds of the volume of water in PEI streams originates from groundwater rather than surface water. Groundwater input has a stabilizing effect on both stream flow and water temperature, and in most cases, the quality of groundwater on PEI is ideal for cold water fish. Whereas acid rain can be a serious issue in inland waters of Nova Scotia, the buffering capacity of Island soils assists in maintaining higher pH levels in most river systems.

Bristol Creek

2.0 Habitat

Simply defined, habitat is an area that provides food, cover, water and space, arranged in a way that is useful for wildlife. Different wildlife have differing habitat needs, and not all habitat types are equal in their ability to sustain wildlife.

It is generally accepted that the long term sustainability of most wildlife populations is directly linked to available habitat. For this reason, habitat inventories can provide valuation information about the likely state of wildlife populations. In some cases direct relationships exist between habitat types and wildlife populations. For example, increases or decreases in the amount of freshwater marsh will have an impact on nesting waterfowl populations such as Black Ducks in Prince Edward Island.

2.1 Status of Forests

2.1.1 Forest inventory

To find out more about our forests, infrared aerial photography was flown in July and August 2000 at a scale of 1:17,500. The images were scanned digitally and used to create the first provincial coverage of digital orthorectified airphotos (corrected for distortion) of such a scale in Canada. The aerial photography was interpreted for land use/land cover. Aerial photography provides information on forest area and composition, while ground plots provide additional information on species and quality.

Figure 3.
Sample of data available from the 2000 Forest Inventory. Data is available for the entire province.

2.1.2 Forest Communities

A forest community can be defined by the types of plants and animals present, and the way they interact. Forests vary in ecological and economic value according to their community structure and complexity.

Between 1990 and 2000, the area of the province's "natural" and more biologically diverse forest communities - upland forest, rich wet forest and black spruce forest - decreased, while the more "disturbed" forest communities – human-made types such as plantations, old field white spruce and cut-over areas – increased (Figure 4).

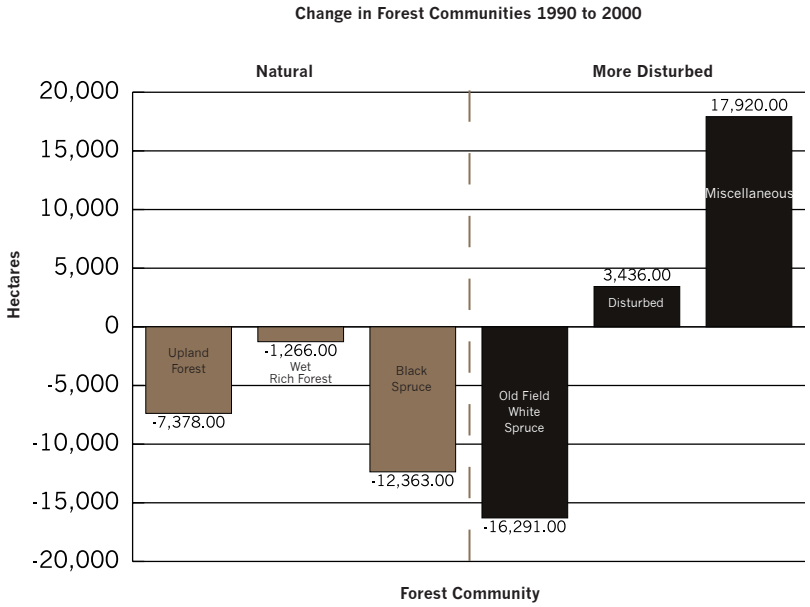


Figure 4.

Changes in natural and human-made forest communities from 1990-2000. Upland Forest, Rich Wet Forest and Black Spruce are natural communities growing on land that has never been cleared and farmed. Old Field White Spruce, and Disturbed and Miscellaneous forest communities result from human land uses. Old Field White Spruce is regenerating farmland, Disturbed forests are cut-overs with regenerating aspen and/or birch, and Miscellaneous forests are plantations, burned areas, windfalls and alders.

Interpreting the contribution of forests to biodiversity must go beyond the traditional statistics of softwood or hardwood cover type. Age and species composition and community type are critical components of any analyses.

Upland forest, wet rich forest and black spruce forest are communities growing on land that has never been cleared and farmed. These unploughed areas are important reservoirs of soil, species and genetic diversity, complex ecological interactions and carbon.

For example, these communities:

- have the only remaining associated forest soil biodiversity (e.g. insects, bacteria, fungi) on Prince Edward Island;
- are home to many hundreds of native plant species, including many that are important for ecological or economic reasons, and that are not found in other Island forest communities; and
- are better able to resist disturbances such as disease, fire and insects because they are comprised of a diversity of species and ages.

2.2.1 Impoundments and Fish Habitat

Impoundments – ponds built by humans or beavers – have advantages and disadvantages. They provide habitat for wetland species and can create opportunities for people to participate in a variety of outdoor activities. Deep water behind dams can increase the habitat for some fish. However, it also decreases water velocity and covers stream spawning habitat, which can negatively affect Atlantic Salmon. Some ponds impair water quality, and restrict or eliminate the upstream migration of fish. Impoundments also act as silt traps. Increased siltation from land based activities accelerates the natural evolution of a pond degrading wildlife habitat. Silt removal is a very expensive and difficult undertaking.

The size of an impoundment, its location, and the number of impoundments within the watershed can all affect habitat quality. Salmonids thrive in water with temperatures between 13°C and18°C. At some impoundments temperatures have exceeded 25°C.

2.2.2 Fish Passage

Many species of freshwater fish on PEI move between fresh and salt water at various stages of their life cycle. Some Brook Trout, for example, spend time in estuaries where they grow quickly and become known as “sea trout”. Atlantic Salmon move out of freshwater when they are two or three years of age, returning in a year or more to spawn. Gaspereau and smelts enter freshwater streams in spring to spawn. The unrestricted movement of fish into and out of rivers is a crucial to the overall health of these populations.

Most of the watercourses on PEI have culverts, bridges and man-made dams. Some of these structures act as obstructions to fish passage. The most serious blockages occur at or near the head of tide, which may result in fish losing access to spawning in much of a river. In many cases fish passage has been restored. An example of this is the former mill dam on the Pisquid River which posed a partial obstruction to brook trout and a complete barrier to smelts moving upstream. In 2005 the PEI Trappers Association, in partnership with the Province, the Atlantic Salmon Federation, and the PEI Wildlife Conservation Fund, successfully restored fish passagespecies and quality. by removing the dam and constructing a series of rock pools to serve as a “fish ladder”. Smelts are now able to ascend the river, something they were prevented from doing for approximately 120 years.

Rock pool fish passage structure on the Pisquid River

2.3.1 Freshwater Wetlands

In 2000, the Corporate Land Use Inventory reported 21,832 ha of freshwater wetland divided into seven classes (Figure 5). About 30% of freshwater wetlands in Prince Edward Island are bogs. Three of the Island's largest bogs at Black Banks, Bideford and Miscouche are being mined commercially for peat moss. Additional pressures have been exerted recently through interest in developing bogs for cranberry production. Current development pressures continue to degrade both the quantity and quality of freshwater wetlands, reducing the capacity of wetlands to capture and filter runoff from the land. This can have negative results downstream.

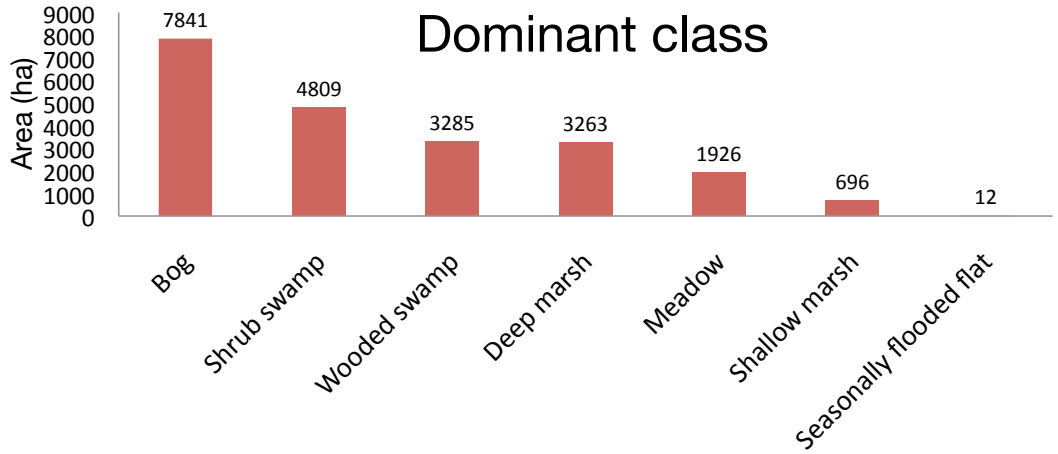


Figure 5. Area of freshwater wetland in 2000 categorized by dominant class.

2.3.2 Coastal wetlands and estuaries

Salt marshes are very productive ecosystems that support essential habitat for terrestrial and aquatic wildlife, provide nursery areas for commercially important fish species, and contribute globally to carbon sequestration. However, many of PEI's salt marshes and coastal wetlands have been lost through drainage, flooding and infilling for urban, industrial or agricultural purposes. Although PEI has nearly 3,000 km of coastline, the province has comparatively little salt marsh. In 2000, the Corporate Land Use Inventory reported 6,865 ha of salt marsh, the majority of which is located on the south shore where tidal amplitude is greatest. Salt marshes continue to be threatened by coastal developments, particularly cottage subdivisions and municipal projects. Degradation of coastal wetlands also continues to occur as a result of terrestrial runoff and sedimentation.

Freshwater wetland in the Forest Hill Wildlife Management Area

Salt marsh at Savage Harbour

2.4 Status of Sand Dunes

Sand dunes are a rare but important feature of the Island's environment. They form long chains of barrier islands and spits along the PEI coast. In 2000, the total area of classified as sand dune on PEI was 3,500 ha or 0.62% of the Province. Sand dunes include:

- Barrier-bay mouth dunes which form a barrier across a bay or lagoon (i.e., the sandpits at Gascoigne Cove or Basin Head);
- Islands, such as the Conway Sandhills on the north shore, or the Indian Point Sandhills on the south shore; and
- Barrier beach (barrachois) dunes which provide a barrier to inundation, and enclose ponds and river mouths (i.e., Miminegash and North Lake).

Dune habitats are vegetated primarily with marram grass. This natural grassland is home to birds such as the Horned Lark and the Savannah Sparrow while the Red-breasted Merganser specializes in nesting on isolated sand spits or islands near nesting colonies of gulls and terns. These sites may also be home to rare plants. For example, the threatened Gulf of St Lawrence Aster can be found on a few north shore dunes near the high water mark.

The age of dunes can vary from very young to ancient. The complex dune system at Basin Head consists of approximately 30 beach ridges that are estimated to be approximately 3,000 to 5,000 years old and are vegetated with low heath plants including Broom-crowberry, Black- and Red Crowberry, Woolly Hudsonia and Reindeer Lichens. Such coastal "Corema" communities are unique to the Gulf of St Lawrence. They are found at Basin Head and Hog Island in PEI and at five locations in the Magdalen Islands. They merit special protection, and the Province secured a considerable portion of Basin Head during the reporting period.

Dunes at Lakeside

Comera covered dunes at Hog Island

Cottage subdivisions and other coastal developments often impinge on dune communities and intense beach use often spreads to dunes. As well, all terrain vehicle (ATV) traffic has been a particular problem at some locations in western PEI.

Dune erosion has become a significant issue. An examination of the factors affecting dunes on the PEI north shore determined that relative sea level rise was the biggest single factor affecting erosion rates and the loss of width of dune systems through the decades. It has averaged 0.3 m/year over 6000 years and was 0.32 m/year at Charlottetown over the last 100 years. Coastal retreat is now averaging 0.5 m/year, with great variation by locality and in step with storm events.

A storm on January 21, 2000 with a record-setting surge was particularly destructive, but ice in the Gulf limited wave build-up; most damage was from ice being pushed ashore. Storm events of October 29, 2000 and November 7, 2001 in an ice free gulf caused considerable wash-over of dunes and coastal retreat, Climate change may accelerate coastal retreat in the future and a worst case prediction is that there could be relative sea level rise of up to 1.1 m in this century. With an ice-free gulf predicted by 2045, accelerated rates of shoreline erosion, including dune erosion are expected.

2.5 Status of Public Lands

2.5.1 Public Ponds

Currently, there are approximately 550 impoundments on PEI, of which 115 are managed, either solely or cooperatively, by the Province and/or Ducks Unlimited Canada. Impounded wetlands represent 6.4% of the total number of wetlands in Prince Edward Island and 11.9% of total wetland area on PEI, occupying approximately 3830 ha.

Impoundments constitute a significant portion of the high quality open water habitat in the province providing easy access to fishing areas for recreational angling. Access to hunting, trapping and other activities that lead to an appreciation of the province's wildlife resources is also provided. The following map shows the location of the provincially managed/co-managed ponds throughout the province, intended to provide opportunities to an equally wide distribution of Islanders.

Bedeque Pond, one of many with water control structures and fish passage facilities.

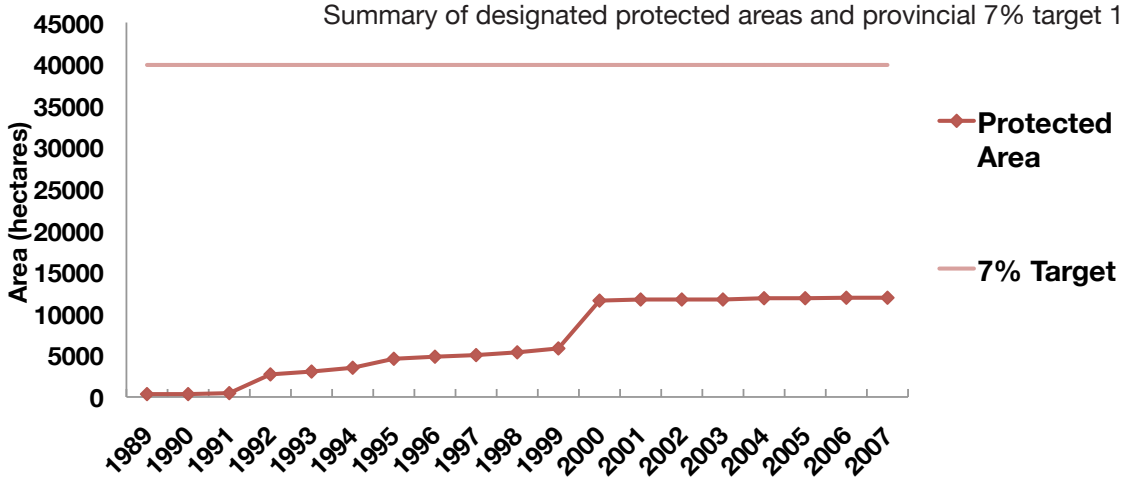
2.5.2 Provincial Forests

Provincial forests are public lands managed for timber and non-timber forest products, recreation, research and education. The provincial forest system covers some 18,900 ha and consists of 22 provincial forests, six demonstration woodlots and 187 satellite properties which are scattered among these sites. The satellite properties contain research plots, tree improvement orchards, and other important forested sites.

2.5.3 Natural Areas

Natural Areas are legally designated lands representative of PEI's natural habitats. They also protect unique ecotypes, rare plants, and special plant communities. From the passage of the *Natural Areas Protection Act* in 1988 until 2007, 228 properties were designated under NAPA totalling 6,458 ha (Figure 6). These areas include forests, ponds, bogs, riparian zones, fresh marshes, salt marshes, offshore islands and coastal cliffs. Prince Edward Island has committed to protecting 7% of its land as Protected Area; to date, 3% has been reached.

Figure 6.
Summary of designated protected areas and provincial 7% target 1989-2007.



East Lake Natural Area

Bird Island Natural Area

2.5.4 Wildlife Management Areas

Wildlife Management Areas (WMA) are blocks of properties, acquired and designated under the *Wildlife Conservation Act* to preserve wildlife habitat and for public use. Prince Edward Island has two types of Wildlife Management Areas:

1. "No hunting" WMAs include large areas of land and/or water, often bordered by roads, where hunting is prohibited. The purpose of many of these WMAs is to provide refuge areas for Canada Geese and ducks, and to enhance local hunting opportunities outside the WMA. There are seven of these WMAs and most of the land within them is privately owned.

2. Other WMAs provide habitat protection while being available for both consumptive and non-consumptive public uses. Nine of these WMAs were established in 2000 (Figure 7) and they are located on public land, much of which was acquired through the Eastern Habitat Joint Venture program.

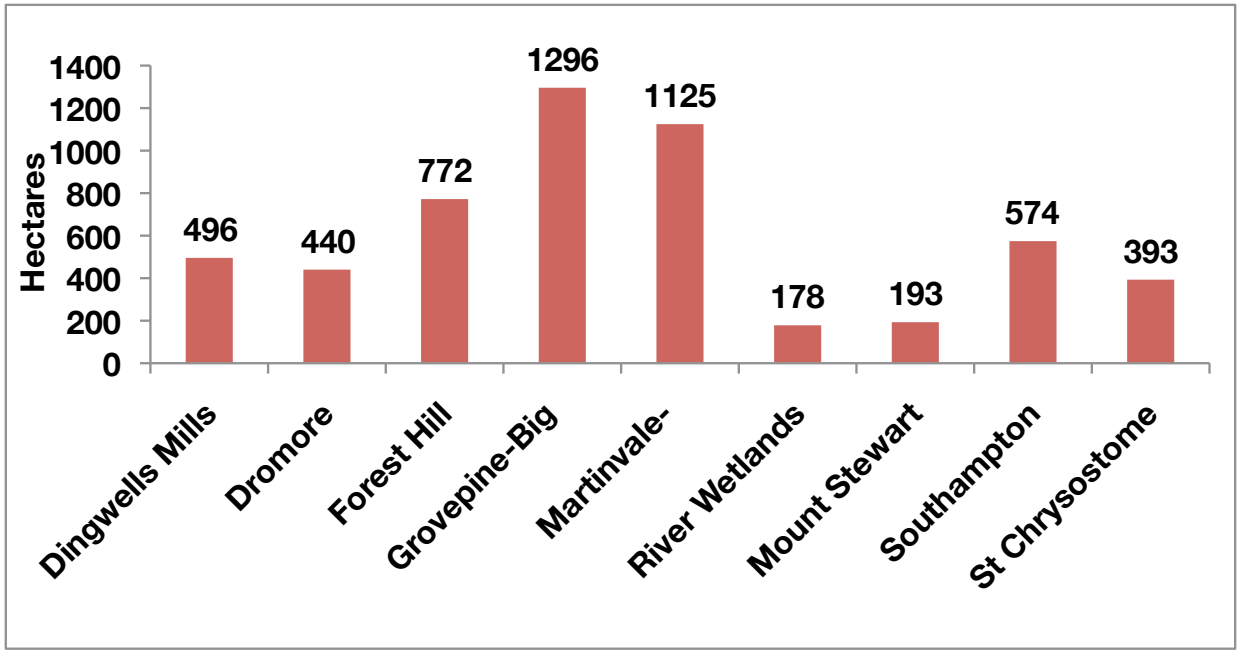


Figure 7.
Area of land in each "habitat protection/public use" Wildlife Management Area.

The Eastern Habitat Joint Venture is a unique cooperative wetland conservation program designed to address waterfowl management concerns in Canada, the United States and Mexico by working with different levels of government, private sector partners and private land owners to ensure the conservation of healthy waterfowl populations. The EHJV is an operational vehicle for the North American Waterfowl Management Plan. It funds land acquisition, in particular for important wetland habitats. Many of these properties form the basis of Wildlife Management Areas and are managed with input from Ducks Unlimited Canada.

Martinvale – Corraville Wildlife Management Area

2.5.5 Community Partnerships

Community partnerships are invaluable when trying to raise understanding of the importance of wildlife habitats and encourage public use of public land. For example, the Mount Stewart Wildlife Management Area is managed with input from the Village of Mount Stewart and the Hillsborough River Area Development Corporation. The Forest Hill Wildlife Management Area is managed with the cooperation of the Boughton River Watershed Enhancement Association and the Central Kings Development Corporation. Within the Provincial Forest system, approximately 800 ha in the Orwell / Caledonia area is being managed by the Macphail Woods Ecological Forestry Project.

Allisary Creek Impoundment inside the Mount Stewart Wildlife Management Area

3.0 State of Wildlife Resources

Island wildlife has many values: food, fur, recreational, and aesthetic, among others. Wildlife contributes to the health of our forests, the quality of our soils, and the pollination of our crops. This section presents data on the general status of the Island's wildlife and specific information related to game species and species of concern.

3.1 General Status of Wildlife

The historical record of the wild species found on PEI is often limited to a general description of birds, mammals, fish and trees. Information on population numbers and distribution is strictly anecdotal. Certain themes can be found in the letters and journals of early French and English settlers, as well as the oral traditions of the Mí'kmaq, providing a general picture of wildlife species and changes over the last several hundred years.

In 1990, plants were officially recognized by Canadian Governments as wildlife, and PEI's definition of wildlife now includes most living things. To conserve species, it is necessary to know which species are here, and to set priorities for conservation action based on species status.

Painted Trillium

Through the program General Status of Wild Species in Canada, a total of 1534 PEI species were reported on in 2005 (Appendix I). Each species received a general status rank which ranged from "Extinct" meaning they no longer exist anywhere in the world to secure meaning relatively widespread or abundant.

The percent of species deemed secure on PEI ranged from 36% of Odonates (Dragonflies and Damselflies) and vascular plants to 90% for amphibians (Table 1).

Species deemed to be "at risk" have undergone a formal detailed risk assessment which determined that the species to be at risk of extinction or extirpation.

The percent of species deemed "at risk" or "may be at risk" on PEI ranges from 4% for birds to 38% for Odonates (Dragonflies and Damselflies) (Table 1).

Table 1.
Status of species in each taxonomic category by percent.

Status Rank	Vascular Plants	Freshwater Mussels	Tiger Beetles	Odonates (Dragonflies, Damselflies)	Freshwater Fish	Amphibians	Reptiles	Birds	Mammals
Extinct	0	0	0	0	0	0	0	0	0
Extirpated	0	0	0	0	0	0	0	0	14
At risk	0	0	0	0	4	0	0	0	0
May be at risk	15	0	0	38	7	0	0	4	0
Sensitive	6	0	0	18	7	0	0	4	3
Secure	36	50	60	36	44	90	67	45	57
Undetermined	7	50	40	6	4	10	33	1	9
Not assessed	0	0	0	0	4	0	0	0	0
Exotic	36	0	0	0	19	0	0	2	14
Accidental	0	0	0	2	11	0	0	43	3

Notes on the general status of wildlife

Thirty-six percent of the Island's plant species are exotics, a number very similar to that found on the mainland. Many of these plants were brought here deliberately as agricultural crops or for horticulture. Others arrived accidentally by ship or on passenger vehicles, trucks and trains. Some exotic plants such as Japanese Knotweed, Wild Cucumber, Lupines and Glossy Buckthorn are widely distributed on PEI and are considered to be very aggressive.

Another group of wildlife – dragonflies which hatch in fast-moving streams – are mostly absent from PEI, although habitat appears to be available. It is possible that they did occur here once but were extirpated (no longer present in the province). Fifty-six percent of PEI Odonates (dragonflies and damselflies) are categorized as "sensitive" or "may be at risk". As aquatic species, they may be especially sensitive to chemical contamination and sediment overloads. Status ranks were given based on the collection (mostly by private individuals) of 1288 specimens over several years, as well as on historical records. Larger sample sizes are needed to provide more information.

Freshwater fish, including those that spend a part of their life in salt water, seem to be more susceptible to human impacts. For example, Striped Bass has recently been declared as a threatened species, and 18% of the Island's total fresh water fish are in categories of concern including, "at risk", "may be at risk", and "sensitive".

Wild Cucumber in the Dunk River watershed

The recent introduction of Brown Bullhead to PEI may negatively influence the health of native fish populations. As well, the deliberate but misguided spread of some introduced species like Golden Shiner is additional cause for concern as these fish will eat young native Brook Trout.

It is still possible to discover new species on PEI. For example, the Pickerel Frog Slimy Sculpin, and Northern Long-eared Bat have all been discovered on PEI since 1987, though it is likely they were always here. As well, 71 new native plant species have been recorded since 2000 by staff of the Atlantic Canada Conservation Data Centre, the Island Nature Trust, and others. This points out the limitations on our knowledge of even the most studied wildlife groups.

Of the 337 bird species, 145 (43%) are accidentals, possibly adventurous males looking for new territories, birds blown in on storm winds, or as "wrong-way" young birds on migration. Birds are relatively well-studied and lists are updated from records of the Natural History Society of PEI and the University of Prince Edward Island (UPEI) Bird List Service. Bird Studies Canada compiles records from Christmas Bird Counts, Feeder Watch Projects and the Maritimes Breeding Bird Atlas Project. With the exception of exotic birds, raptors and some fish eaters, most species are protected under the Federal Migratory Birds Act.

Large native mammals such as the Black Bear and Woodland Caribou and furbearers including Canada Lynx, Pine Marten, and River Otter have been extirpated from the Island. Black Bear was the last survivor, and it was viewed as a danger to livestock. Today there are nine species of furbearers (mammals with a commercially valuable fur): beaver, coyote, red fox, mink, muskrat, raccoon, striped skunk, red squirrel and short-tailed weasel.

Exotic mammals, including the feral cat, make up 14% of today's mammalian fauna. Mammals are hard to study and the historical record is still poor; therefore fully five of the 35 mammals listed are shown as "status undetermined". A recent natural invader, the Eastern Coyote, is listed as a native species while Raccoon and Striped Skunk were introduced in the early 1900s. The Bobcat has been illegally introduced and sightings and signs are occasionally reported.

3.2 Species at Risk

The following Prince Edward Island terrestrial species (including those that spend part of their life cycle on land or in freshwater systems) are listed under the *Federal Species at Risk Act* (SARA).

Extinct:	Passenger Pigeon
Extirpated:	Atlantic Walrus
Endangered:	Piping Plover, Eskimo Curlew
Threatened:	Gulf of St Lawrence Aster
Special concern:	Harlequin Duck, Barrows Goldeneye, Short-eared Owl, Monarch Butterfly

The following terrestrial and freshwater species are listed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), but not listed under SARA.

Endangered: Red Knot rufa subspecies (2007)

Threatened: Common Nighthawk (2007), Olive-sided Flycatcher (2007), Striped Bass (2004)

Special concern: Rusty Blackbird (April 2006), American Eel (April 2006),

It is also possible to list species at risk through the *PEI Wildlife Conservation Act* (WCA). Under the National Accord for the Protection of Species at Risk, the intention is that provinces will provide complementary listing for those species listed under SARA. No species were listed under the WCA by the Province during the reporting period.

3.2.1 Piping Plover

Piping Plover habitat is often the same as "beach-going public" habitat. Therefore, the plover is a "conservation dependent" species which will always require programs that lessen the impacts of human beach use on the population. The efforts of the Island Nature Trust's Piping Plover Guardian Program have helped to keep the Island's population at an average of approximately 100 adult birds (Figure 10).

Piping Plover

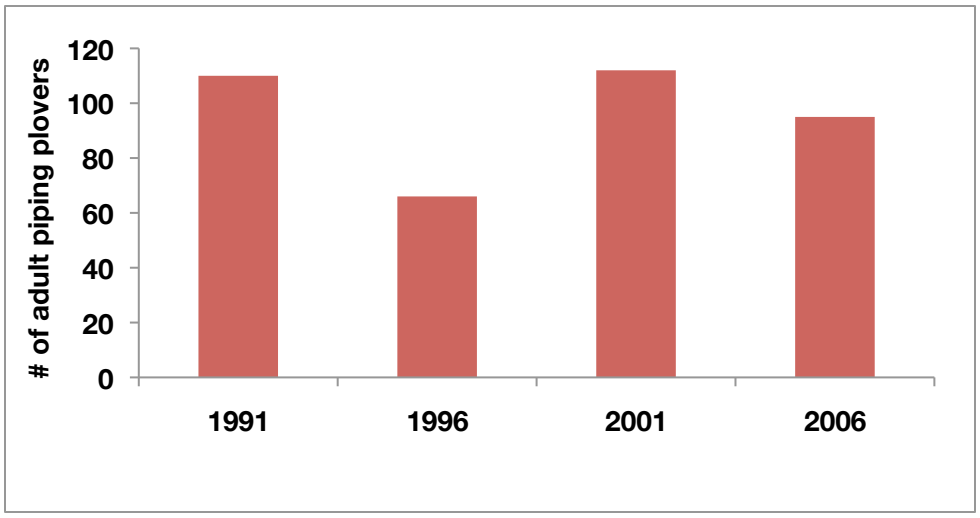


Figure 10.
The International Piping Plover Census Index Counts for Prince Edward Island.

3.3 Selected Wildlife Species

3.3.1 Fresh Water Fish

Brook Trout

The most sought after fish in freshwater in Prince Edward Island is the Brook Trout, also called Speckled Trout. This fish can be found in virtually all flowing water, absent only in a handful of small coastal streams with steep cliffs at the shore. Annual monitoring of juvenile brook trout abundance is carried out on six index rivers: Mill, Little Trout, Wilmot, West, Morell and Souris (Figure 11). Surveys are also conducted on rivers impacted by fish kills to monitor recovery. The groundwater based, nutrient-rich waters on PEI are ideal for this species and densities of Brook Trout average about 100 fish per 100m^2 but have been recorded as high as 400 fish per 100m^2. These densities are high when compared with brook trout densities in mainland rivers.

Some Brook Trout spend a short while in salt water, normally moving downstream into estuaries and bays along the coast for a few weeks in the spring. These trout take advantage of the plentiful food available and grow rapidly, ranging in size from 200g to 3.5kg. Brook Trout numbers in Prince Edward Island can be reduced due to a variety of pressures including habitat alteration, pollution and exploitation.

Brook Trout caught by angler

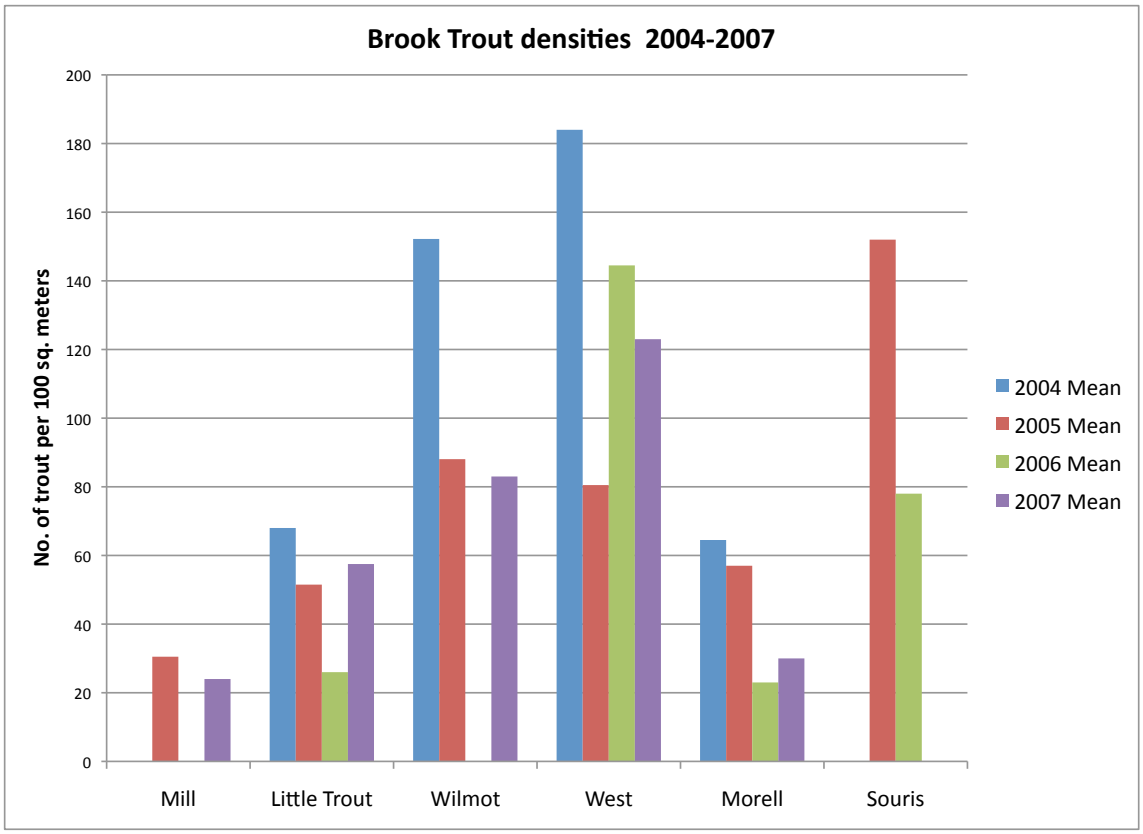


Figure 11.

Graph of electro fishing results for brook trout for six index rivers. There is considerable variation from year to year, however in the long-term, these data provide a good comparison of densities among sites and can indicate trends.

Brook trout brood stock are collected annually from a number of rivers. Offspring are stocked to boost populations in rivers affected by fish kills or in rivers which experience heavy angling pressure. Fish are also stocked into ponds to provide opportunities for youth fishing, particularly in urban settings.

Kids Fishing Day

Atlantic Salmon

At the beginning of European colonization, it is estimated that 71 rivers in Prince Edward Island would have had runs of Atlantic salmon. In 2007, remnant runs of Atlantic Salmon could only be found in 22 rivers (Figure 12), down from 28 rivers in 2002.

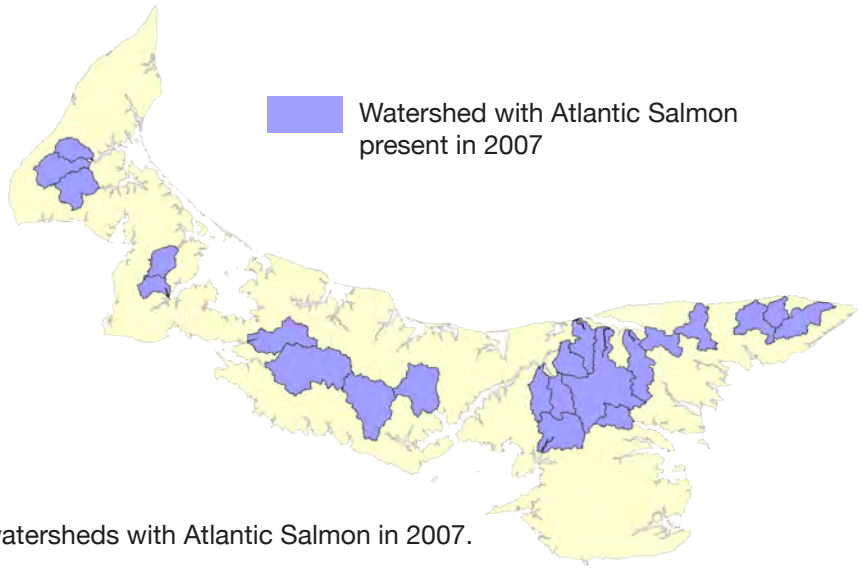


Figure 12. Map of watersheds with Atlantic Salmon in 2007.

The decline in Atlantic Salmon throughout its range has been attributed to many factors. Ocean mortality is a particular concern along with freshwater habitat loss, dams, and over-exploitation. In Prince Edward Island, sedimentation, blockages to fish passage by dams and culverts, and pesticide contamination are the primary threats to salmon populations.

Juvenile densities of Atlantic Salmon are monitored by electrofishing at six index rivers: Mill, Little Trout, Wilmot, West, Morell and Souris. These surveys identify presence of absence of salmon at selected locations and in the long term, can reveal trends in abundance. Salmon populations on the Little Trout River, for example, are severely depressed and are in danger of disappearing (Figure 13).

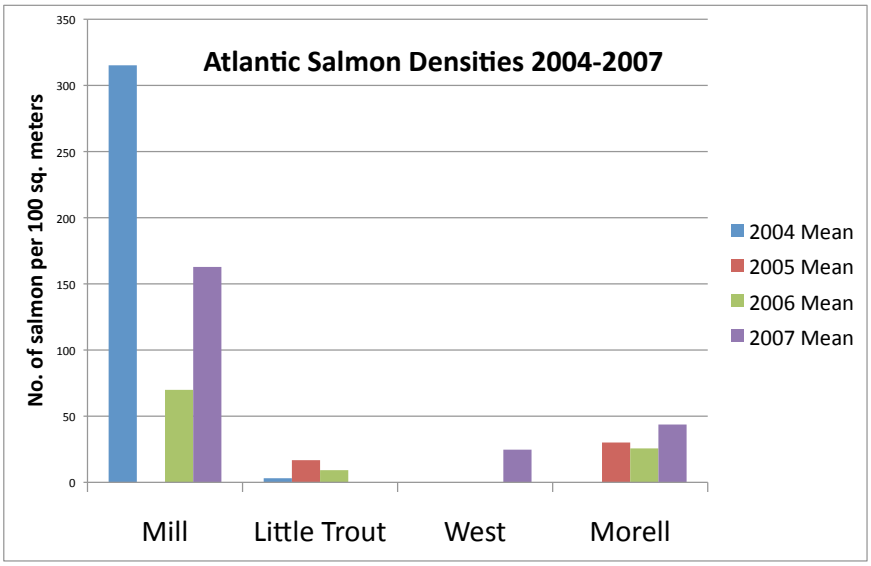


Figure 13. Graph of electro fishing data results for Atlantic Salmon on four rivers over four years.

Salmon redds (salmon nesting sites in the stream bed) have been surveyed periodically on the Little Trout River, West River, Morell River, Cross River, Bristol Creek, Pisquid River and North Lake Creek. Redds are large and quite visible in November and December, allowing an accurate index of spawning effort from year to year. These counts can be used to compare populations among rivers and provide baseline data to monitor changes. The low numbers of salmon redds on Bristol Creek; for example, indicate that the population is greatly reduced from the runs reportedly present in the past. Redd counts may reflect changes in at sea survival; however they can also vary depending upon habitat conditions or access to habitat. In North Lake, the number of salmon redds decreased from 2003 to 2007, a period in which beaver dams frequently blocked access to a principal spawning area and spawning effort within the flooded zone was reduced, even when water levels were sufficient to allow upstream migration (Figure 14).

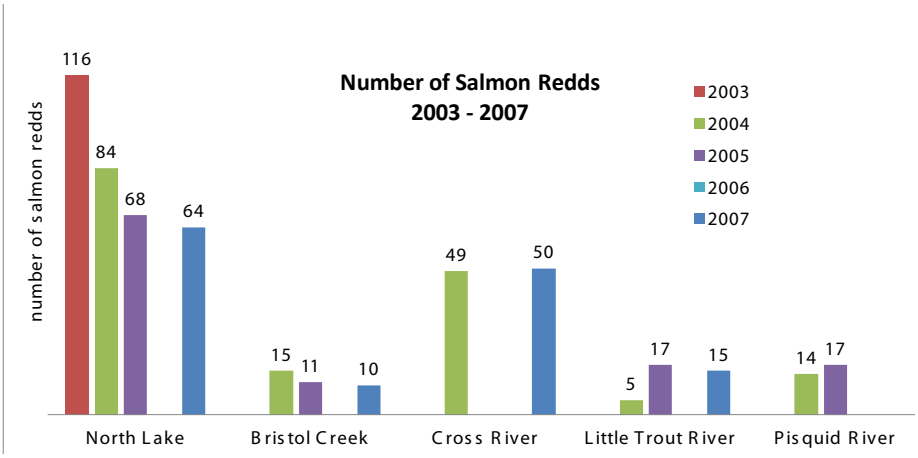


Figure 14. Atlantic salmon redd counts on five rivers 2003-2007.

Because native stocks are fall run fish and never found in large numbers for angling, in recent decades they were supplemented with early-run fish from Miramichi River, New Brunswick, to meet the demands of anglers. The Morell River, the Island's best known salmon river, was regularly stocked with semi-naturally reared salmon smolts until 2006. Without regular stocking, numbers of salmon returning from sea become too low to support a summer recreational harvest.

Atlantic Salmon returning to spawn

Rainbow Trout

Rainbow Trout are a west coast species which were brought into PEI in the early 1900s. Currently, there are approximately 21 rivers which have populations of Rainbow Trout (Figure 15). A Rainbow Trout fishery in O'Keefe's and Glenfinnan Lakes had been supported by annual stocking. Rainbow trout on P.E.I. have established self sustaining runs in a number of watercourses, a trend not seen in other Atlantic provinces.

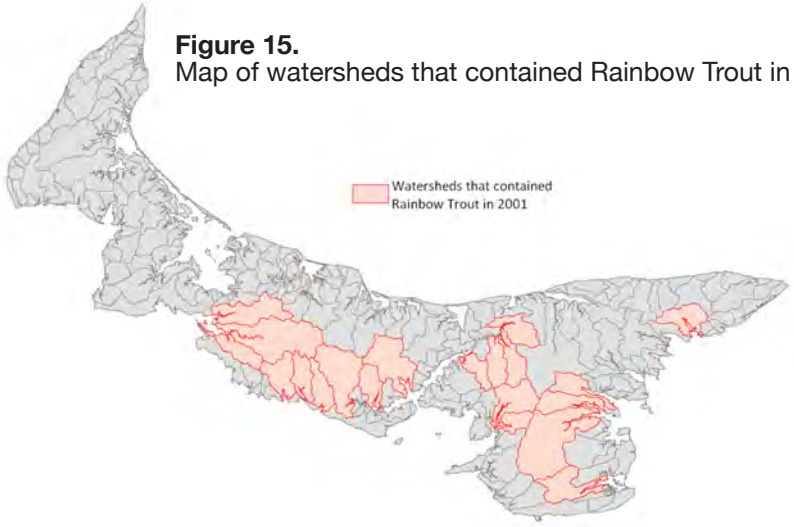


Figure 15.
Map of watersheds that contained Rainbow Trout in 2001.

3.3.2 Waterfowl

Waterfowl are an important component of wildlife on PEI. Canada Geese and Black Ducks the two most sought after game species and are hunted extensively by both residents and non-residents. The migratory populations are monitored using an annual aerial survey in mid-November, timed to coincide with peak fall migration. Many factors influence the survey results including breeding success, survey timing, surveyors and weather. Consequently the survey is not used as a population index but does provide an important snap shot in time. The number of Canada Geese observed during the reporting period ranged between 20,000 and 50,000 (Figure 16). The number of Black Ducks observed also ranged widely from 5000 to 27,000 (Figure 17).

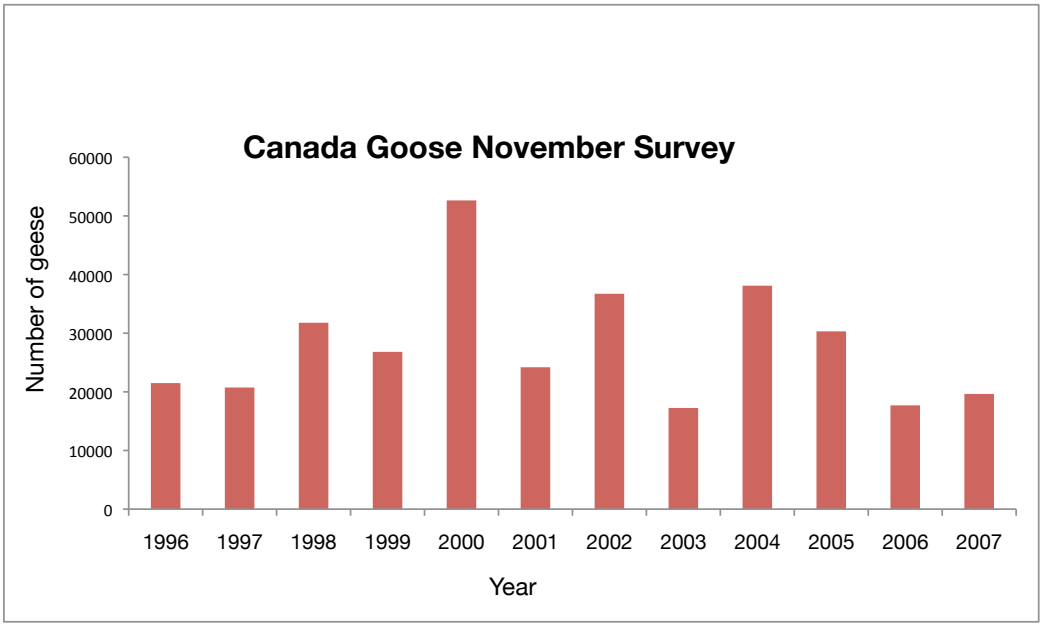


Figure 16. Number of geese counted on the PEI mid-November aerial survey.

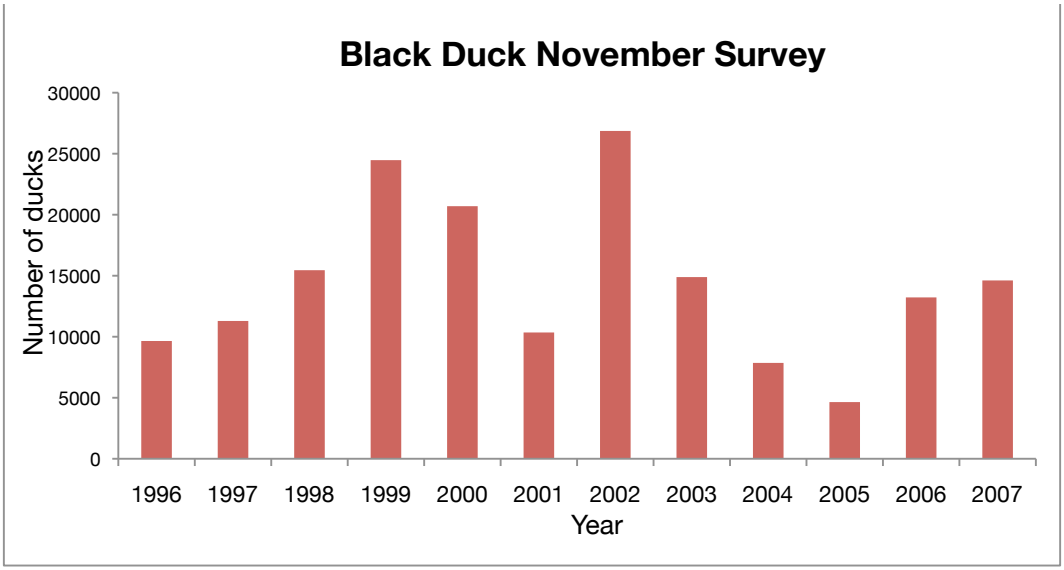


Figure 17. Number of black ducks counted in the Prince Edward Island mid-November aerial survey.

3.3.3 Upland Game

The status of Ruffed Grouse and other game species in PEI is assessed indirectly through annual hunter surveys through which average kill and estimates of total harvest are determined (Figure 18). Generally, upland game population densities are directly related to habitat quantity and quality. Land use and land cover maps are produced every decade and offer valuable information to estimate habitat status. Annual hunter surveys estimate the proportion of hunters that pursue each species and the average annual harvest which enables an estimate of total annual harvests. Survey results indicate that the PEI Ruffed Grouse population operates on a 10-year cycle reaching a "high" in the middle of each decade (Figure 18).

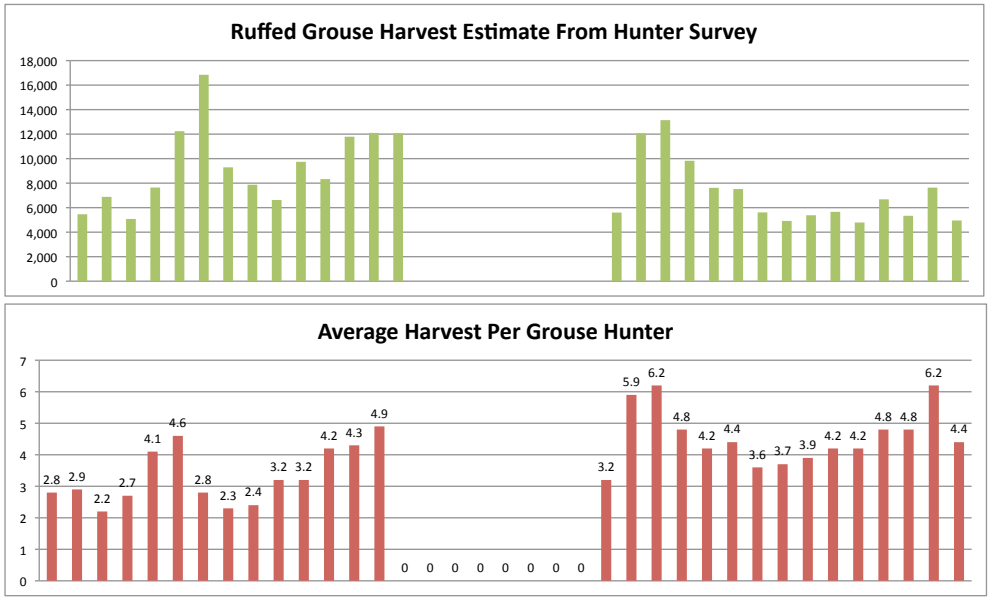


Figure 18. Average ruffed grouse killed per year per hunter and total harvest estimated from hunter survey: 1971 to 2007. (No survey 1985 to 1992)

3.3.4 Cormorants

Cormorants feed on a wide variety of fish. Two species of cormorants nest on the Island but their populations are dramatically different, both in number and in trend. The number of Great Cormorant nests has declined by approximately 20% from 1997 to 2007 with the sharpest decline occurring between 1992 and 1993 (Figure 19). Most of the initial decline is attributed to an open hunting season in 1992. Despite the protection of a closed season the Great Cormorant population has not recovered.

The number of Double-crested Cormorant nests has increased by approximately 30% (Figure 20).

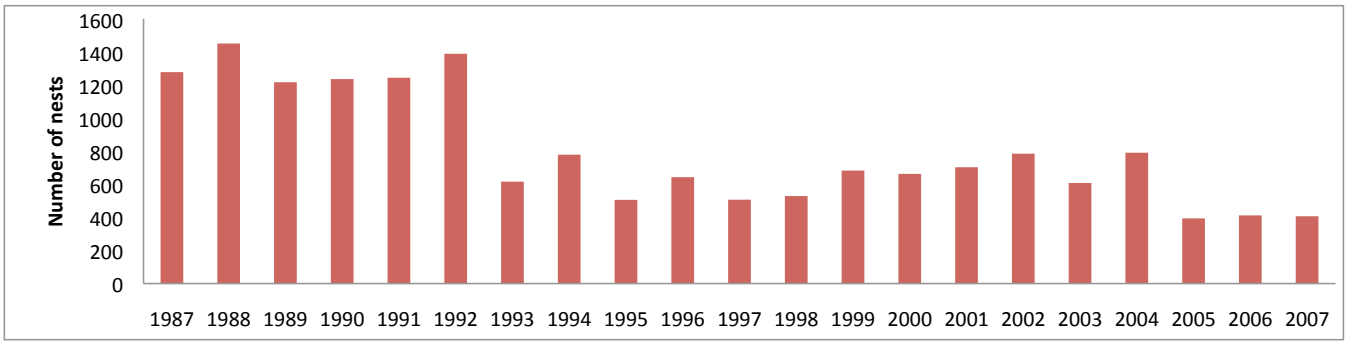


Figure 19. Number of Great Cormorant nests 1987-2007.

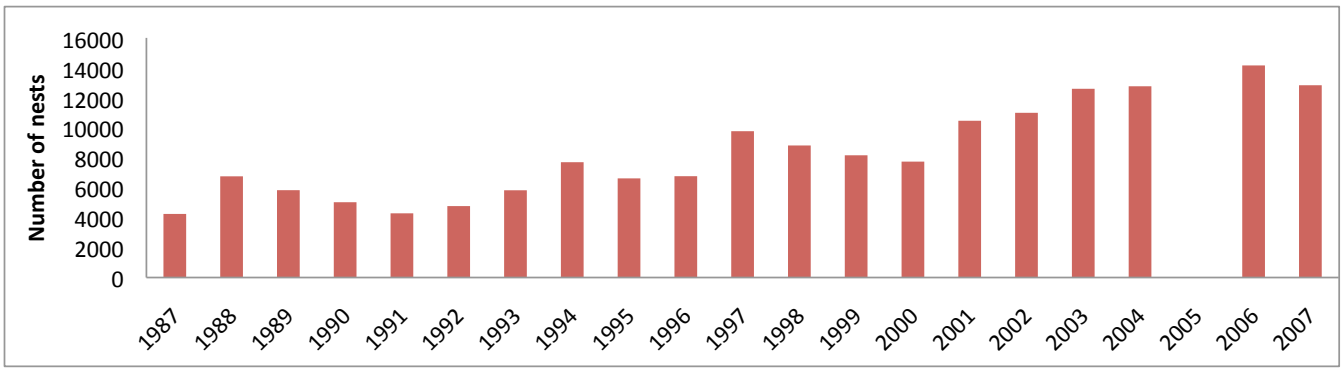


Figure 20. Number of Double-crested Cormorant nests 1987-2007.

Great Cormorant colony at East Point

Double-crested Cormorants on Little Courtin Island.

3.3.5 Bald Eagle

From 1944 to 1966, nesting eagles were absent from PEI. In 1966, a nest was reported in the Brudenell area and in 1967 it was confirmed that the nest was active. Unfortunately, one of the adult eagles was shot in 1968, and was not until 1978 that another active nest was located. In 1982, a second nesting territory was located on the north shore, near Savage Harbour and since then the Island's eagle population has seen a steady increase (Figure 21). As of 2006, 50 Bald Eagle nesting sites have been identified across the Island from the Souris area westward to Alberton.

The increase in the number of Bald Eagle sightings and breeding pairs is attributed to increased public sentiment in favor of protecting eagles, their protection under the *Fish and Game Protection Act* in the 1960s and the ban on the pesticide DDT.

While DDT was probably not responsible for the disappearance of Bald Eagles on PEI, banning it likely made conditions more suitable for accelerated population growth.

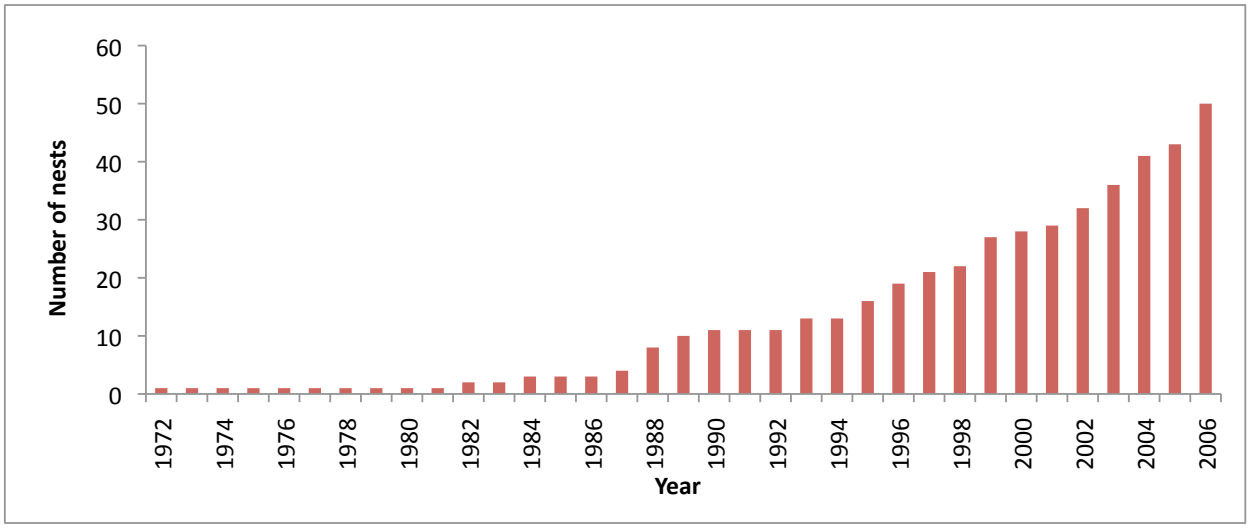


Figure 21. Number of known Bald Eagle nests from sightings and informal surveys, PEI 1972-2006.

Bald Eagle nest

Young Bald Eagle in nest

3.3.6 Owls

Since 2001, dedicated volunteers and staff from the Department of Environment, Energy and Forestry have assisted Bird Studies Canada in conducting nocturnal owl surveys to develop an index of owl abundance (Figure 22). Owl responses to playback of owl calls have fluctuated from year to year. Results are shown for three common owls, Barred, Great Horned and Northern Saw-whet.

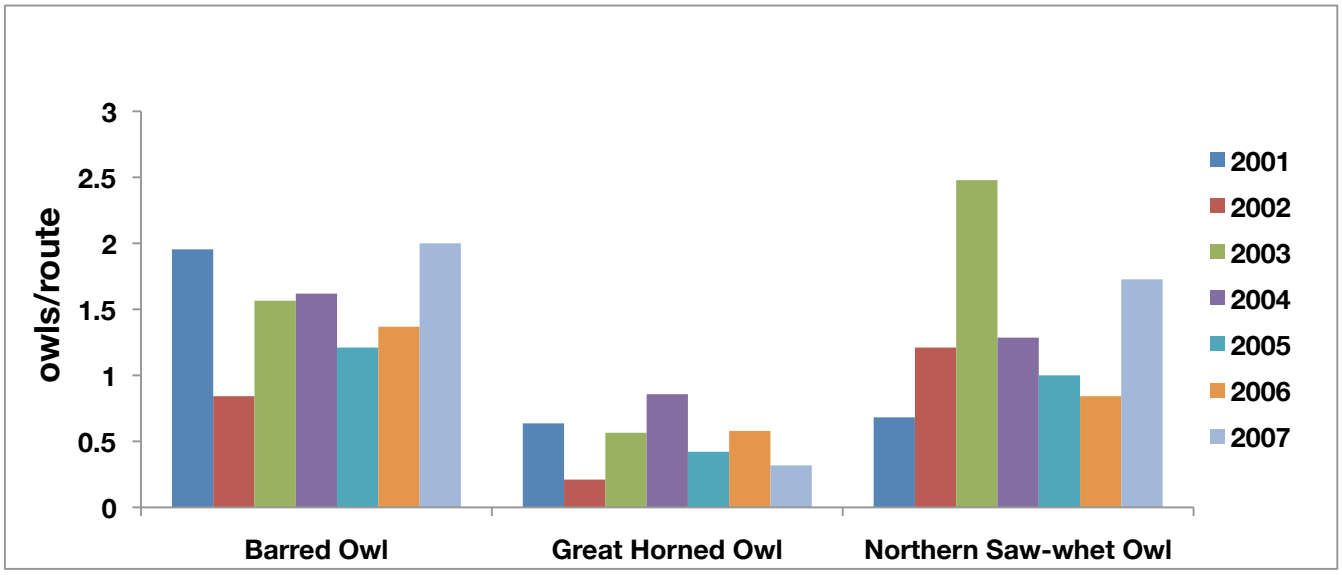


Figure 22.
Results from nocturnal owl survey 2001-2007. Survey dates are centered on the Barred Owl nesting peak. (Courtesy of Bird Studies Canada)

3.3.7 Furbearers

Muskrat have traditionally been the "bread and butter" furbearer for trappers in Prince Edward Island. While the number of muskrats trapped has declined significantly over the last thirty years (from a high of 9886 (1984) to the current level of 3291 (2007)) it remained relatively constant from 1991-2007 (Figure 23). The annual harvest of foxes and raccoons, the next two most harvested furbearers, varied considerably during the reporting period (Figure 24). Both experienced a sharp drop between 1997 and 2000 (59% and 73% respectively) likely reflecting a downturn in the fur industry.

The average harvest over the last thirty years was 882 for foxes and 994 for raccoons. The beaver is also an important furbearer on PEI. Not only does its pelt have commercial value, it modifies the environment to create habitat for many other species. Beavers also create problems by impounding water: damaging roads, flooding adjacent land, and blocking fish migration. The number of beavers harvested dropped below the thirty year average of 447 for a number of years between 1997 and 2007, likely also reflecting a downturn in the fur industry (Figure 24).

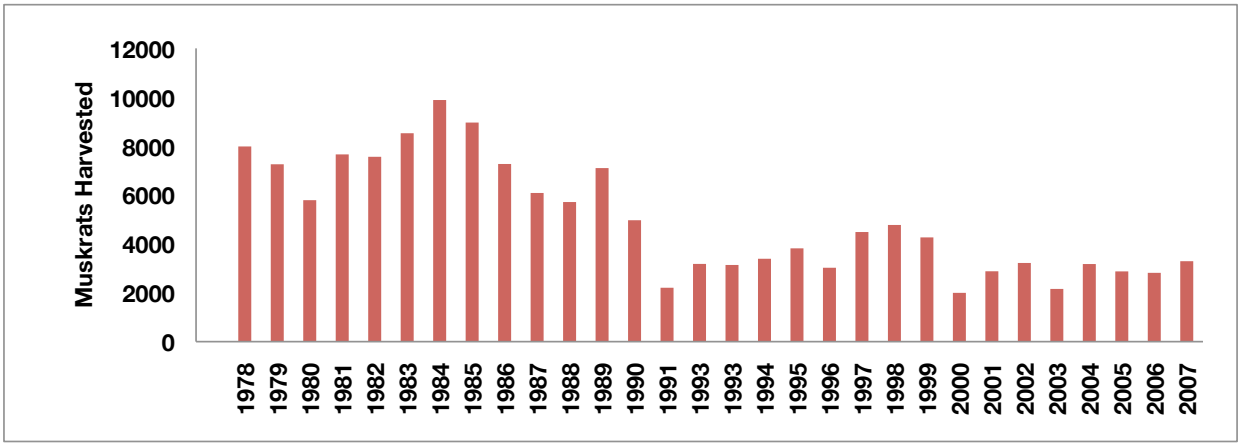


Figure 23. Muskrats harvested 1978-2007.

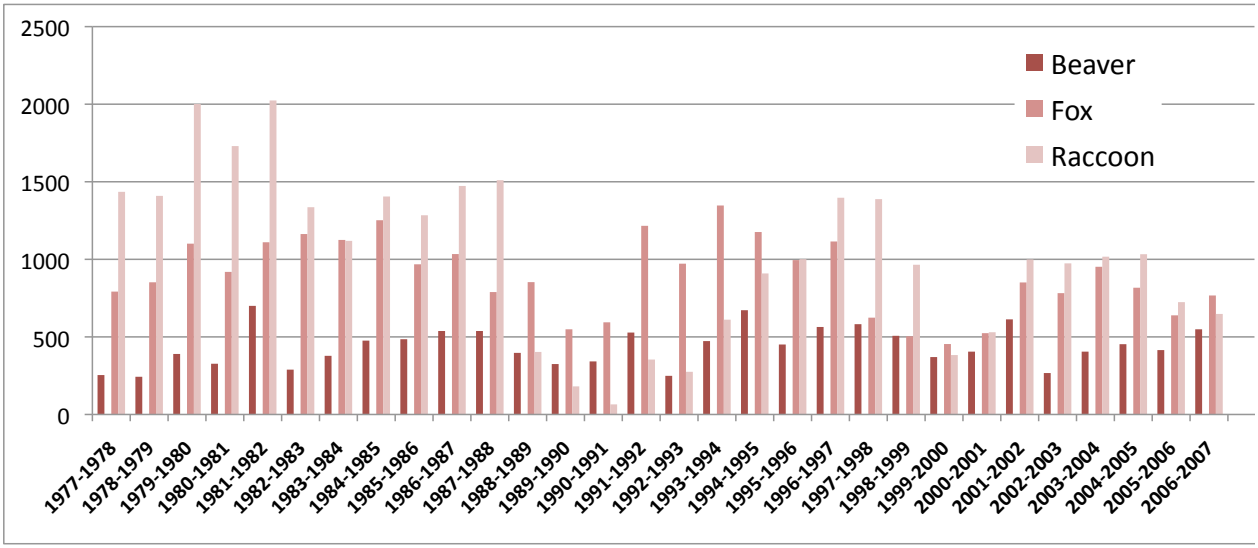


Figure 24. Average number of raccoon, fox and beaver pelts shipped to the fur industry, 1978-2007.

Although beavers are a keystone species possessing a unique ability to modify the environment, they can cause conflict for people and infrastructure in many ways. Another index of abundance for the beaver is the number of "beaver problems" handled cooperatively by the Department of Environment, Energy and Forestry and the Department of Transportation and Infrastructure Renewal requiring direct action. The beaver management program handled an average of 120 problems per year from 1999-2007.

The majority of beaver problems occurred in Prince and Kings Counties likely representing the most desirable beaver habitat (Figure 25).

Road damaged by beaver activity

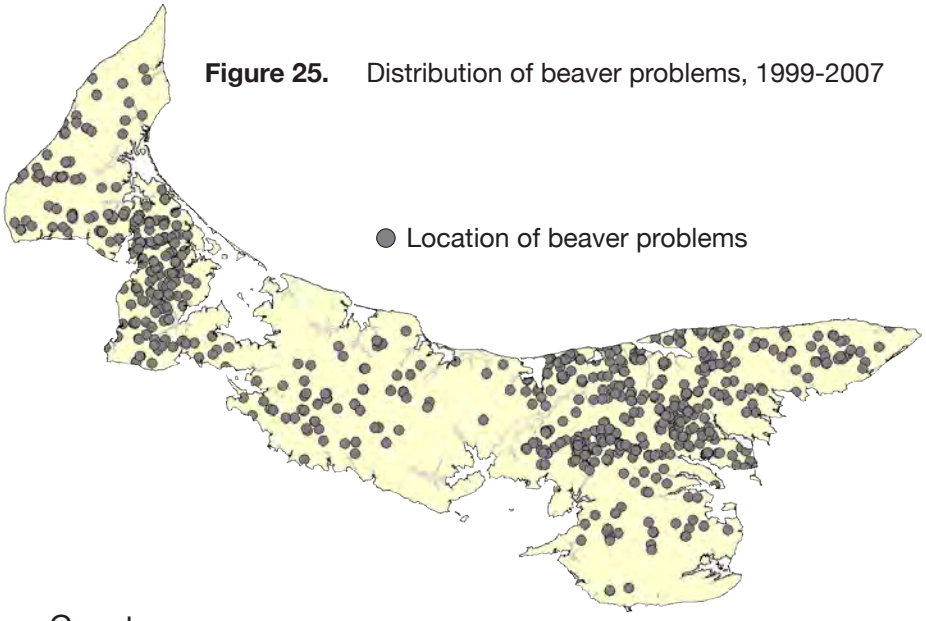


Figure 25. Distribution of beaver problems, 1999-2007

Coyotes

Coyotes are a relatively new furbearer on the Island and are harvested annually by trappers and hunters. The number of coyotes harvested ranged widely, showing a relatively sharp increase in 1999-2004 (Figure 26). The increasing trend in coyote harvest is likely an index of the increasing population combined with increased knowledge, expertise and effort in trapping and hunting methods.

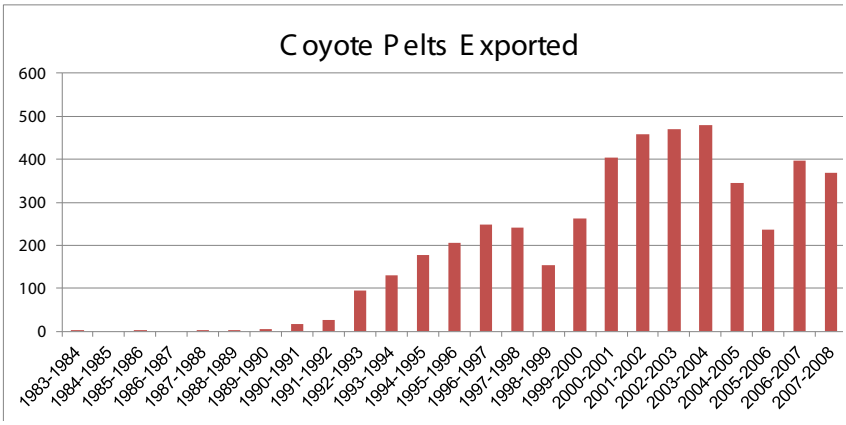


Figure 26. Coyote pelts exported 1983 - 2007

Pelts prepared for shipping

3.4 Response to Public Concerns for Wildlife

Fish and Wildlife staff handles calls on a variety of wildlife and wildlife related questions and concerns. In 2001 type and frequency of calls began to be recorded. Figure 27 demonstrates that the species of most concern was the crow. This is likely related to the program to pick up and analyze crows for West Nile Virus rather than actual complaints about nuisance crows. Calls related to fox, raccoon, and coyote were the next most frequent. The types of calls vary by season. The public has a concern for injured and abandoned young animals. These calls peak during the spring and early summer.

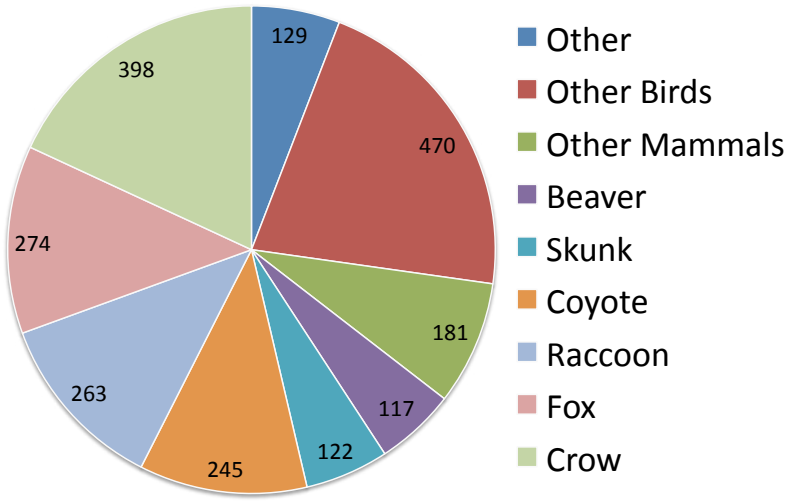


Figure 27. Summary of wildlife related calls. PEI, 2001-2007.

Red Fox

4.0 Wildlife Programs

The Forests, Fish and Wildlife Division is mandated to manage, conserve and protect wildlife and wildlife habitat throughout the province. To carry out this mandate, various policies, partnerships and programs are undertaken. This section summarizes some of those programs.

4.1 Licences and Permits

The Forests, Fish and Wildlife Division issues licenses for most consumptive uses of wildlife: hunting, trapping and angling. It also includes permits to remove nuisance wildlife, keep wildlife in captivity or take wildlife for scientific purposes. The number of licenses issued in a given year is a good indicator of resource use.

4.1.1 Angling

The number of anglers on PEI reached a peak in the early 1980s and has been steadily declining since. There was a 32% drop in angling licenses between 1997 and 2007 (Figure 28).

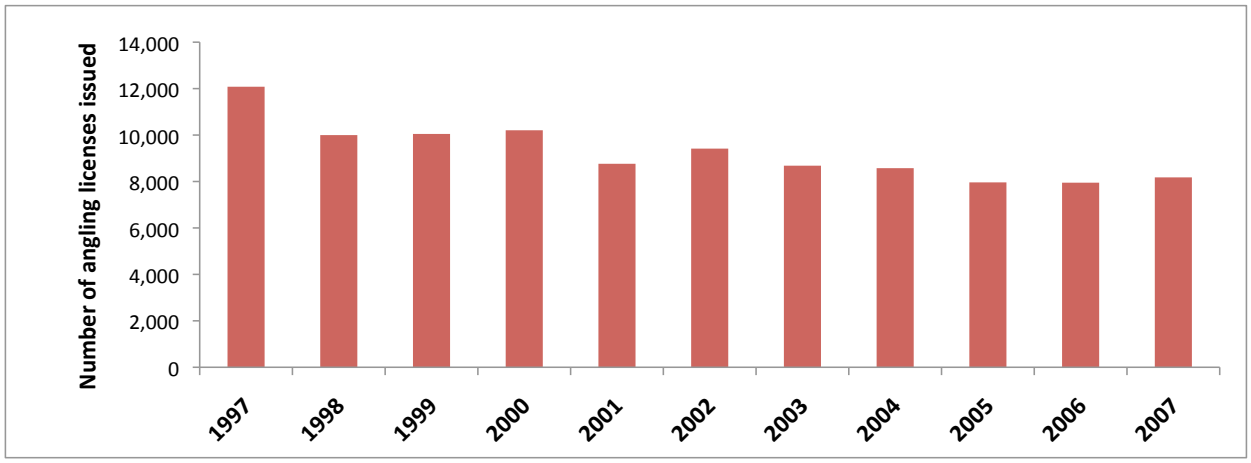


Figure 28. Angling licenses issued from 1997-2007.

Changing demographics, competing activities for youth, and a perception that the angling experience has diminished have been blamed for this decrease in angling activity. The 2005 Survey of Recreational Fishing in Canada documented that, nationally, anglers spent $7.5 billion on angling related activities. In Prince Edward Island, $4.8 million in spending was wholly or partly attributable to the recreational fishery. The average age of anglers on PEI is 49 for males, 43 years of age for females, with males making 94 % of licensed anglers. The average resident angler puts in 24 days fishing, as compared to the national average of 15.

In an effort to increase angler numbers, Government has sponsored a “Family Fishing Weekend” in the long weekend in May. The license requirement is waived for four days and families are encouraged to discover the fun that angling can provide. Some angling and wildlife groups are also encouraging new anglers by stocking ponds for youth fishing events or holding fishing camps or fly fishing clinics.

While angling effort may be decreasing in some regions of PEI, anglers will travel considerable distances to reach popular angling spots. A creel survey conducted on the Morell River in the opening days of the angling season in 2006 and 2007 indicated that 84% of the anglers came from Queens and Prince Counties. Survey data from these years indicate that anglers fishing the Morell River in the first week of the season caught an average of 2.5 fish, with an average length of 29cm.

Opening day on the Morell River

4.1.2 Hunting

The number of hunters on PEI reached a peak in the early 1980s but has been steadily declining since. Decreased participation in hunting has been linked to many of the same factors as angling but also has likely been affected by increased regulation of firearms and an associated increase in cost to participate.

Annual surveys of licensed hunters are conducted to determine participation rates, average season harvests and estimates of overall harvests. The total resident license sales (Resident, Fisher/Farmer, and Youth) have declined steadily since 1996 (Figure 29).

Fisher/Farmer licenses were introduced in 1994 but were free until 2005. Non-resident license sales rose during the late 1990s but have declined since 2000. Since 1997 hunting license sales have declined 38%.

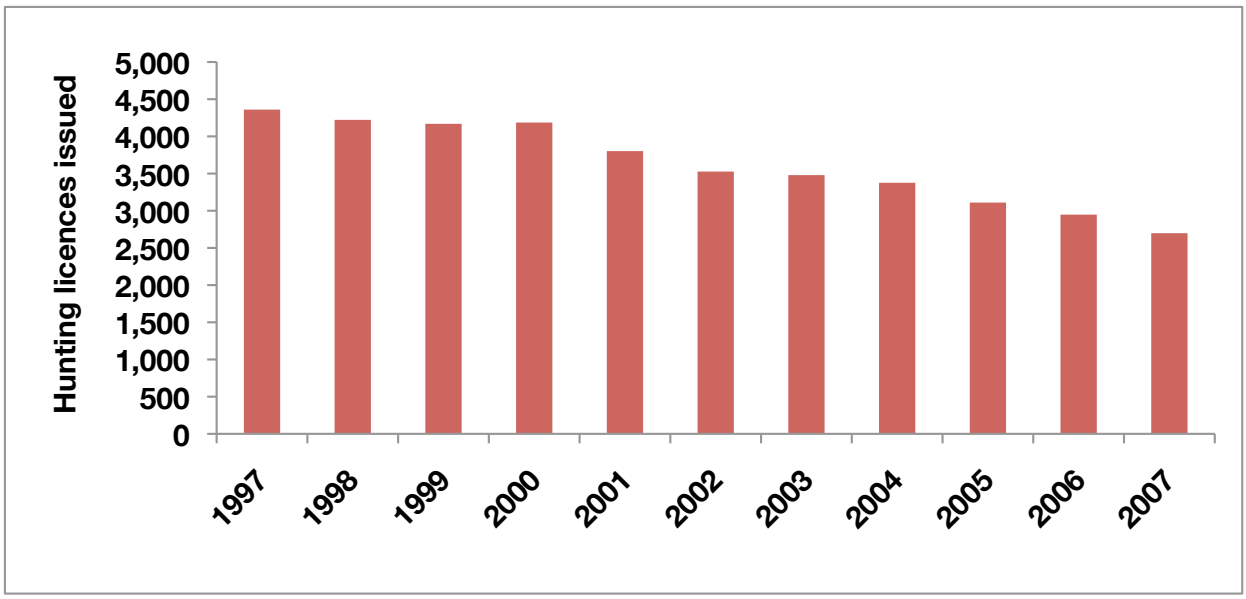


Figure 29. Hunting licenses issued from 1997 to 2007.

Hunters returning after a successful morning hunt

Since 2000, the Forests, Fish and Wildlife Division - in cooperation with various partners - has sponsored a Youth Waterfowl Hunting Workshop to introduce youth between the ages of 12 and 17 with all aspects of safe, responsible hunting. Attendance has averaged 90 youth each year (Figure 30).

Youth are also given the opportunity to experience a mentored waterfowl hunt before the opening of the regular waterfowl season. Waterfowler Heritage Day was created in 2001 by the Canadian Wildlife Service in cooperation with the provinces.

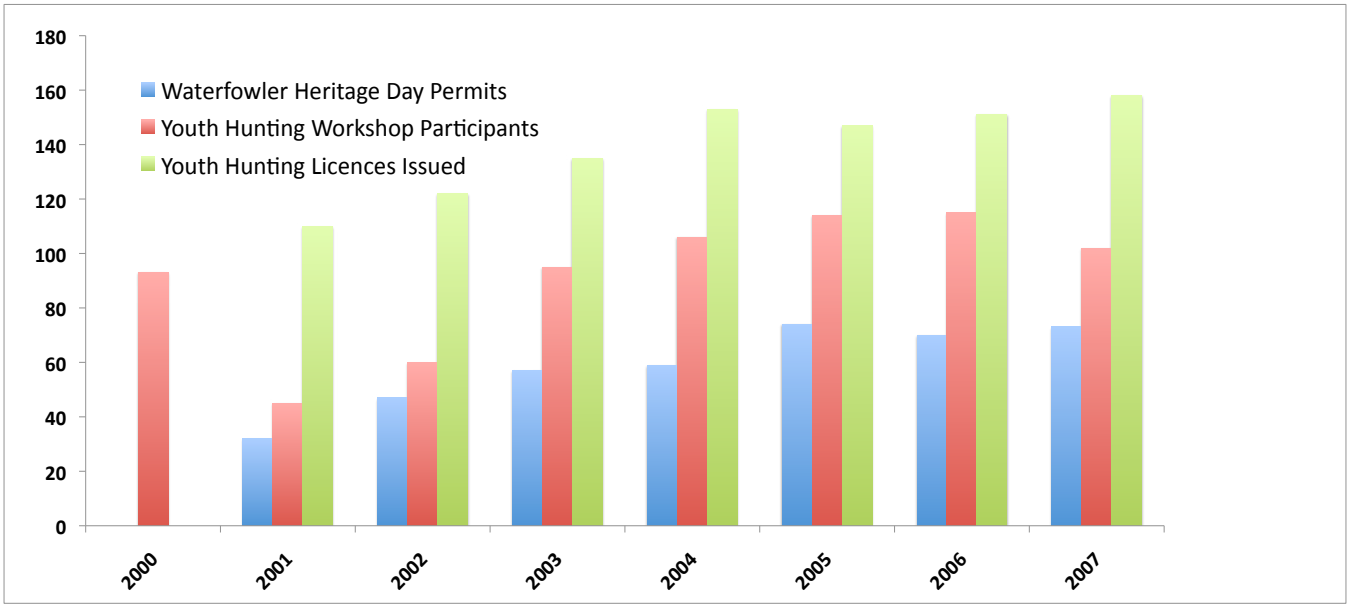


Figure 30.
Number of youth that participated in Youth Waterfowl Workshop, Waterfowler Heritage Day and number of youth hunting licenses issued from 2000-2007.

Tracked by a one day permit, participation in this event has more than doubled between 2001 and 2006 (Figure 30).

A youth hunting license, issued free of charge to youth ages 12 to 16, was introduced in 2001 as a way to track participation. An increase of 37% was observed between 2001 and 2007 (Figure 30).

Participants in the annual Youth Waterfowl Hunting Workshop

4.1.3 Trapping

The number of trappers on PEI reached a peak in the early 1980s but has been steadily declining since. Economic factors are often linked to participation in trapping, and license sales closely follow international fur prices. The number of trapping licenses has declined by 25% between 1997 and 1999 and has averaged 110 since then.

4.2 Funding Programs Available to the Public

The province supports or participates in a number of programs designed to conserve and protect wildlife habitat.

Since 1992, the Department has provided funding to community based groups working on a particular river or within a particular watershed. More information about Watershed Management can be found at: www.gov.pe.ca/wmf

The Prince Edward Island Wildlife Conservation Fund (WCF) was created in 1998. Money for the fund comes from a contribution made once per year by each licensed angler, hunter and trapper. Youth under 16 are not required to pay into this fund.

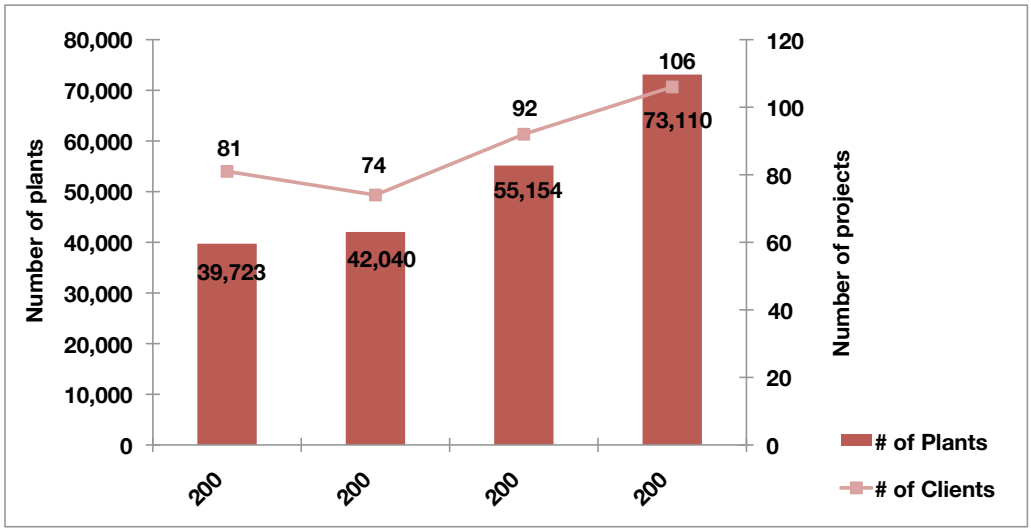
In 2006, the Department of Environment, Energy and Forestry transferred administration of the fund to the Wildlife Conservation Fund Committee consisting of members of the angling, hunting and trapping community, community watershed groups, birders and hikers, and the Department of Environment, Energy and Forestry. The most recent report can be found at: *www.gov.pe.ca/forestry/wcf*

4.3 Greening Spaces Program *www.gov.pe.ca/forestry/gsp*

Greening Spaces Program provides tree and shrub materials as well as technical advice and some funding to schools and communities. It promotes planting of native plants to create healthy places to work live and learn. The Department of Environment, Energy and Forestry, in cooperation with the Department of Agriculture, also provides assistance to landowners who want to establish hedgerows for soil conservation, stream bank stabilization, and windbreaks for buildings and livestock. The program is open to both farmers and other land owners.

The program has increased both in numbers of clients and in plants in the ground (Figure 31).

Figure 31. Participation in Greening Spaces Program (all categories) 2004-2007.



4.4 Staffing and Administration

In order to manage wildlife and public lands assigned to it, the Department of Environment, Energy and Forestry employs the services of wildlife and fisheries biologists, botanists, forest technicians and foresters, as well as technical staff and conservation officers. The Department also relies on considerable support from conservation based volunteer groups.

In 2006 the Fish and Wildlife Division and the Forestry Division were amalgamated to create the Forests, Fish and Wildlife Division.

5.0 The Effect of Land Use on Wildlife and Wildlife Habitat

Population density and related land use – urbanization, agriculture, tourism and development – place enormous stresses on PEI wildlife and habitat. Habitat may be changed from one type to another (benefiting some species and harming others) or it may be replaced altogether. Our use of the land allows us to live on PEI. Unfortunately, it can also cause forest conversion to agriculture and other human developments, loss of other habitats and species, fish kills and water quality problems.

5.1 Conversion of Forest

Forests contribute to water quality and quantity, air quality, and habitat and species diversity. For example:

- Watersheds with more forest often have better water quality. For example, streams in the Dunk River – a heavily farmed watershed where forest cover has been reduced to 27% – had more than 2.2 mg/L of nitrate, compared to less than 0.2 mg/L in the Morell River, which is within a watershed that is 67% forested.
- Forests along streams and rivers not only help filter runoff, they also provide important wildlife habitat, keep the water from getting too warm for the plants and animals that live there, and contribute leaves and other organic matter that is the base of the aquatic food chain. These riparian forests can be among the most productive areas in the province and are critically important for both surface water quality and wildlife. An example is the selective use of riparian areas for foraging by the long-eared bat, well away from its roosting and maternity areas
- Trees help filter air, removing pollutants such as sulphur dioxide and carbon monoxide, heavy metals and tiny particles that can cause respiratory problems.
- Forests provide critical habitat for many of Prince Edward Island's native plants and animals. Environment Canada has suggested that at least 30% of any watershed should be in forest cover. The vast majority of PEI's native species rely directly on forests, or on wetlands that depend on forests for water quality and quantity.

5.2 Consequences of Wetland Loss

Prince Edward Island's Wetland Policy aims to ensure no net loss of wetlands or their functions. When wetlands are lost or their functions diminished, the natural capacity to filter and purify agricultural and domestic runoff is decreased. The impacts of high nutrient loads, over-enrichment (eutrophication), and oxygen depletion on rivers and estuaries are increased. Wetland loss results in a loss of wildlife habitat and reduced productivity. Loss of wetland also decreases wetlands' ability to recycle carbon, nitrogen and sulphur, as well to store carbon.

5.3 Loss of Species

The historic loss of large mammals on PEI was directly related to land use, especially loss of forest cover. Other species such as plants and forest-dependant birds may also have been extirpated with the conversion of forest to agricultural land, but this was not documented.

Species extinctions are accelerating worldwide and PEI is not immune to the current trend. The recent extirpation of the Cliff Swallow (not to be confused with the Bank Swallow) as a breeding bird in PEI may be related to competition from the exotic House Sparrow, or it may be seen in the light of widespread declines of aerial insectivores, implying a decline in insects and a disruption of the food chain. As elsewhere in the world, habitat loss is the major cause of loss of biodiversity. Invasive species are recognized as the second most serious cause of species disappearance. Wildlife that is confined to a small area or is rare is most prone to extinction; island populations are particularly sensitive.

5.4 Sedimentation

Massive inputs of sand and silt can impact all life stages of fish and many other aquatic creatures. Growth rate may be affected because of decreased visibility and the resulting difficulty in finding food. Of particular concern for trout and salmon is the effect sedimentation may have on breeding success. These fish lay their eggs in gravel and cobble. If sediment fills the spaces between the rocks, it can interfere with oxygenation of the eggs and can prevent surviving fish from leaving the stream bed upon hatching.

5.5 Fish Kills

Fish kills can occur as a result of natural or human-related causes. For example when smelt and gaspereau enter fresh water streams in large numbers to spawn in the spring of the year, inevitably, some of these fish are weakened and will die after spawning. While it can be alarming to see hundreds of dead fish littering a stream bottom, it is a completely natural occurrence.

There are also fish kills caused by reduced oxygen at certain times of the year. On PEI, this commonly occurs in coastal ponds that have a dense layer of salt water overlaid by a layer of fresh water. Oxygen levels can become diminished, especially under heavy ice cover. When the ice melts and the water mixes, the entire water column can become “anoxic” or depleted of oxygen. It is not uncommon to see thousands of dead fish, particularly White Perch, in a pond which experiences this type of event.

Unfortunately, the most notable fish kills on PEI are caused by human activity.

5.5.1 Anoxic Events in Estuaries

Nitrates used on agricultural land and golf courses or leaching from septic systems have contributed to nutrient over-enrichment in estuaries and bays. In watersheds with extensive forest cover and little agriculture, nitrate concentrations in ground and surface water are low. There is a correlation between potato production and the amount of nitrate in the water.

Similarly, many estuaries on PEI experience poor water quality, especially in summer. Nutrients originating from land use activities lead to massive growths of algae, particularly Sea Lettuce which dies and decomposes using up oxygen in the process. Estuaries are extremely productive and serve as nursery areas for a number of commercial and recreational fish species. The algae blooms and resulting anoxic conditions have been blamed for fish and shellfish mortality, and the noxious odours reduce the quality of living for people in these areas.

5.5.2 Pesticide-related Fish Kills

Pesticide-related fish kills have received the greatest public attention in recent years. Between 1997 and 2007 there were 25 documented fish kills on PEI that were either proven or suspected to have been caused by pesticides (Figure 32). At least 10 of these fish kills were attributed to the pesticide azinphos-methyl.

In 2002, the province restricted the use of this organo-phosphate on fields that border waterways.

It is difficult to obtain conclusive evidence that pesticides have been responsible for every fish kill because of the delay between the actual kill and the time that it is reported to authorities. By the time water samples are taken, any chemicals which may have entered the watercourse from surrounding land have been diluted and carried away.

Brook Trout recovered after fish kill

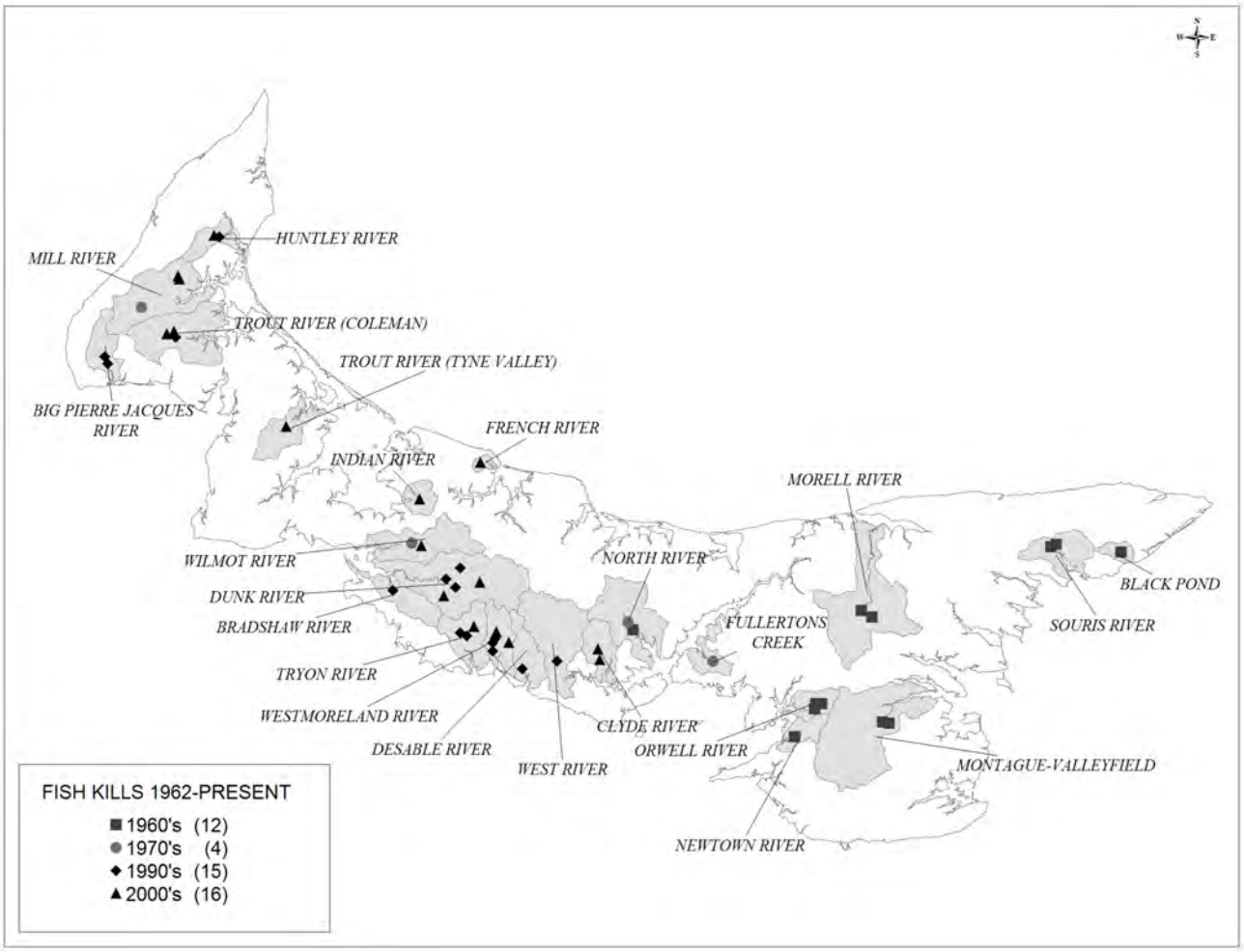


Figure 32. Map of suspected pesticide related fish kills 1962 to present

The impact of a fish kill can be severe and long lasting as the number of fish killed is many times greater than the number of dead fish retrieved during the clean-up. For example, while roughly 700 fish were collected in the Tryon River following the 2007 fish kill, it is estimated that 10,000 fish were actually killed. Most of the dead fish are buried in sediment or removed by scavengers.

There are differences in the way that fish react to chemicals. Researchers monitoring the 2002 fish kills on the Wilmot River found that Brook Trout suffered higher mortality than Rainbow Trout. Younger trout are also more affected than older fish, thus it can take several years for fish populations to recover to pre-kill levels.

6.0 Conclusions and Commitments

Documenting the State of Wildlife in the province is a huge, but important, task. We need to understand what we once had, what we have now, and the current trends in order to make decisions in the best interest of all Islanders. Loss of habitat, species, and environmental health – our natural capital – affects each of us. Conserving and protecting wildlife habitat has a direct benefit to people.

Healthy ecosystems, such as wetlands, provide habitat for wetland dependant species such as Black Ducks, Northern Leopard Frogs, Muskrats, Brook Trout, and countless invertebrates. Wetlands also provide water purification, nutrient management, flood protection and groundwater stabilization. Protecting habitat for wildlife helps everyone.

Pollinating insects perform an integral function for the agricultural industry, so healthy, diverse ecosystems support pollinators.

Land use is the dominant factor influencing where wildlife species live. In many cases, changes in land use will benefit some species, but harm others. Species such as Ruffed Grouse prefer a mixed forest landscape including early succession trees and open areas. Others, such as Barred Owls, prefer large blocks of forest cover.

Balancing healthy wildlife populations and human interests is challenging. A species such as beaver can be flourishing, yet because of social concern about some of its activities, the population may be perceived in a negative way. Similarly, crows that occupy a communal winter roost in Charlottetown may have ecological benefits but are perceived negatively by residents in that area.

Due to negative human impacts on wildlife and habitat, wildlife needs our help. This help can come from many sources including the many conservation organizations in the Province. As our population continues to urbanize, there is less connection between people and the environment. It is important to recognize that we all interact with and enjoy wildlife in a variety of ways. Hunters, anglers and trappers are front line conservationists with intimate and direct knowledge of the state of the resource; the decline in participation in these activities is of particular relevance. Birding is practiced by a dedicated group of enthusiasts keenly observing local trends in bird populations; avid hikers and other outdoor enthusiasts see the changes in our landscape and habitats over time.

A knowledge gap remains for many non-harvested species. The Maritimes Breeding Bird Atlas, expected in 2012, will provide good information on our breeding bird populations. The Island Nature Trust began collecting data in 2003 for a new book on PEI plants.

Species at Risk

Currently there are no Island species listed as endangered, threatened or special concern species, though candidates have been identified. The Forests, Fish and Wildlife Division will recommend that Government list the Piping Plover as “endangered” under the Wildlife Conservation Act and review other species that may qualify for listing as species at risk.

Forest Habitat

Unploughed or old growth forest habitat is in decline. The Forests, Fish and Wildlife Division will continue to implement Prince Edward Island's Forest Policy and aim to acquire and conserve old growth forests in particular.

Morell River riparian zone

Riparian Habitat

There are many initiatives underway to enhance riparian habitat. Mandatory buffer zones around watercourses, taking marginal land out of row crop production, fencing livestock out of watercourses and improving fish passage designs are some of these. However, unimpeded river systems are scarce in the province. The Forests, Fish and Wildlife Division will categorize Island rivers and develop a policy for conservation.

Wetlands and Sand Dunes

In 2003 the Department created a policy for all wetlands in the province "A Wetland Policy for Prince Edward Island". This policy recommends a mitigation sequence to avoid negative impacts and The Forests, Fish and Wildlife Division will continue to implement it.

"Shoreline squeeze" is a concern to many jurisdictions. It occurs when developed shorelines leave no room for dunes and salt marshes to migrate inland. With rising sea levels and increased shoreline erosion as a result of climate warming, this becomes increasingly important. Policy that improves setback distance for development, and limits shoreline fortifications will permit healthy coastlines to continue to provide habitat for wildlife while reducing costs to landowners.

Climate Change

The Earth's climate is warming more rapidly now than ever before. Current climate model projections lack precision and the impact of climate change on Island wildlife and wildlife habitat is difficult to predict. History has shown that some wildlife species are extremely sensitive yet many species have proven resilient in the face of adversity.

Rising sea levels and an increase in heavy storm activity and wave energy will affect shoreline stability and sensitive ecosystems. Cliff and shore nesting birds are particularly vulnerable.

Warmer weather may also lead to changes in forest composition impacting all forest dependant wildlife. Other potential negative impacts include increased forest fires and the northward migration of pests. All Island plants and animals will have to adapt to the new conditions, or face extirpation.

The Department's response to the challenges resulting from climate change requires new policies and actions across a full range of activities. Wildlife Management Areas and Natural Areas that have been set aside for wildlife conservation may no longer suit the wildlife communities they were intended to support. Some ecosystems may actually disappear and be replaced by new ones.

Clearly, Prince Edward Island is extremely sensitive to climate change. Despite the unknowns, it is generally accepted that the sooner strategic actions are taken, the better the chances of maintaining biodiversity, protecting wildlife habitat and reducing the number of potential wildlife species to become threatened, endangered or extirpated.

7.0 Suggested Reading

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Appendix

Appendix I

GENERAL STATUS OF SPECIES IN PRINCE EDWARD ISLAND, 2005

Name	Scientific Name	General Status
FRESHWATER MUSSELS		
Eastern Pearlshell	*Margaritifera margaritifera*	May be at Risk
Eastern Floater	*Pyganodon cataracta*	Secure
DRAGONFLIES AND DAMSELFLIES		
Canada Darner	*Aeshna canadensis*	Secure
Lance-tipped Darner	*Aeshna constricta*	Sensitive
Lake Darner	*Aeshna eremita*	Sensitive
Variable Darner	*Aeshna interrupta*	Secure
Subarctic Darner	*Aeshna subarctica*	May be at Risk
Black-tipped Darner	*Aeshna tuberculifera*	Sensitive
Shadow Darner	*Aeshna umbrosa*	Secure
Common Green Darner	*Anax junius*	Secure
Springtime Darner	*Basiaeschna janata*	May be at Risk
Ocellated Darner	*Boyeria grafiana*	Undetermined
Fawn Darner	*Boyeria vinosa*	Undetermined
River Jewelwing	*Calopteryx aequabilis*	Secure
Ebony Jewelwing	*Calopteryx maculata*	May be at Risk
Aurora Damsel	*Chromagrion conditum*	May be at Risk
Taiga Bluet	*Coenagrion resolutum*	Sensitive
Azure Bluet	*Enallagma aspersum*	May be at Risk
Boreal Bluet	*Enallagma boreale*	Sensitive
Tule Bluet	*Enallagma carunculatum*	May be at Risk
Familiar Bluet	*Enallagma civile*	Sensitive
Northern Bluet	*Enallagma cyathigerum*	Secure
Marsh Bluet	*Enallagma ebrium*	Secure
Hagen's Bluet	*Enallagma hageni*	Secure
Little Bluet	*Enallagma minusculum*	May be at Risk
Eastern Forktail	*Ischnura verticalis*	Secure
Sphagnum Sprite	*Nehalennia gracilis*	May be at Risk
Sedge Sprite	*Nehalennia irene*	Secure
Twin-spotted Spiketail	*Cordulegaster maculata*	Sensitive
American Emerald	*Cordulia shurtleffii*	Secure
Petite Emerald	*Dorocordulia lepida*	May be at Risk
Racket-tailed Emerald	*Dorocordulia libera*	May be at Risk
Beaverpond Baskettail	*Epitheca canis*	Secure
Spiny Baskettail	*Epitheca spinigera*	May be at Risk
Lake Emerald	*Somatochlora cingulata*	May be at Risk

Ski-tailed Emerald	*Somatochlora elongata*	Sensitive
Delicate Emerald	*Somatochlora franklini*	May be at Risk
Incurvate Emerald	*Somatochlora incurvata*	May be at Risk
Kennedy's Emerald	*Somatochlora kennedyi*	May be at Risk
Ocellated Emerald	*Somatochlora minor*	May be at Risk
Brush-tipped Emerald	*Somatochlora walshii*	May be at Risk
Williamson's Emerald	*Somatochlora williamsoni*	May be at Risk
Dusky Clubtail	*Gomphus spicatus*	May be at Risk
Spotted Spreadwing	*Lestes congener*	Secure
Common Spreadwing	*Lestes disjunctus*	Secure
Emerald Spreadwing	*Lestes dryas*	Secure
Amber-winged Spreadwing	*Lestes eurinus*	May be at Risk
Sweetflag Spreadwing	*Lestes forcipatus*	May be at Risk
Lyre-tipped Spreadwing	*Lestes unguiculatus*	Secure
Calico Pennant	*Celithemis elisa*	May be at Risk
Frosted Whiteface	*Leucorrhinia frigida*	May be at Risk
Crimson-ringed Whiteface	*Leucorrhinia glacialis*	Sensitive
Hudsonian Whiteface	*Leucorrhinia hudsonica*	Secure
Dot-tailed Whiteface	*Leucorrhinia intacta*	Sensitive
Red-waisted Whiteface	*Leucorrhinia proxima*	Secure
Chalk-fronted Corporal	*Libellula julia*	Sensitive
Common Whitetail	*Libellula lydia*	Secure
Four-spotted Skimmer	*Libellula quadrimaculata*	Secure
Wandering Glider	*Pantala flavescens*	May be at Risk
Variegated Meadowhawk	*Sympetrum corruptum*	Accidental
Saffron-winged Meadowhawk	*Sympetrum costiferum*	Secure
Black Meadowhawk	*Sympetrum danae*	May be at Risk
Cherry-faced Meadowhawk	*Sympetrum internum*	Secure
Jane's Meadowhawk	*Sympetrum janeae*	Undetermined
White-faced Meadowhawk	*Sympetrum obtrusum*	Secure
Ruby Meadowhawk	*Sympetrum rubicundulum*	Undetermined
Band-winged Meadowhawk	*Sympetrum semicinctum*	Sensitive
Yellow-legged Meadowhawk	*Sympetrum vicinum*	Secure
TIGER BEETLES		
Twelve-spotted Tiger Beetle	*Cicindela duodecimguttata*	Undetermined
Hairy-necked Tiger Beetle	*Cicindela hirticollis*	Secure
Boreal Long-lipped Tiger Beetle	*Cicindela longilabris*	Undetermined
Bronzed Tiger Beetle	*Cicindela repanda*	Secure
Oblique-lined Tiger Beetle	*Cicindela tranquebarica*	Secure
FRESHWATER FISH		
Atlantic Sturgeon	*Acipenser oxyrinchus*	Accidental
American Eel	*Anguilla rostrata*	Secure
Atlantic Silverside	*Menidia menidia*	Secure
Blueback Herring	*Alosa aestivalis*	Secure
Alewife	*Alosa pseudoharengus*	Secure

American Shad	*Alosa sapidissima*	Accidental
Golden Shiner	*Notemigonus crysoleucas*	Exotic
Northern Redbelly Dace	*Phoxinus eos*	Sensitive
Banded Killifish	*Fundulus diaphanus*	Sensitive
Mummichog	*Fundulus heteroclitus*	Secure
Atlantic Tomcod	*Microgadus tomcod*	Secure
Fourspine Stickleback	*Apeltes quadracus*	Secure
Threespine Stickleback	*Gasterosteus aculeatus*	Secure
Blackspotted Stickleback	*Gasterosteus wheatlandi*	Undetermined
Ninespine Stickleback	*Pungitius pungitius*	Secure
Capelin	*Mallotus villosus*	Not Assessed
White Perch	*Morone americana*	Secure
Striped Bass	*Morone saxatilis*	At Risk
Sea Lamprey	*Petromyzon marinus*	Accidental
Rainbow Smelt	*Osmerus mordax*	Secure
Rainbow Trout	*Oncorhynchus mykiss*	Exotic
Atlantic Salmon	*Salmo salar*	May be at Risk
Brown Trout	*Salmo trutta*	Exotic
Arctic Char	*Salvelinus alpinus*	Exotic
Brook Trout	*Salvelinus fontinalis*	Secure
Slimy Sculpin	*Cottus cognatus*	May be at Risk
Brown Bullhead	*Ameiurus nebulosus*	Exotic
AMPHIBIANS		
American Toad	*Bufo americanus*	Secure
Spring Peeper	*Pseudacris crucifer*	Secure
Green Frog	*Rana clamitans*	Secure
Pickerel Frog	*Rana palustris*	May be at Risk
Northern Leopard Frog	*Rana pipiens*	Secure
Wood Frog	*Rana sylvatica*	Secure
Blue-spotted Salamander	*Ambystoma laterale*	Secure
Spotted Salamander	*Ambystoma maculatum*	Secure
Northern Red-backed Salamander	*Plethodon cinereus*	Secure
Eastern Newt	*Notophthalmus viridescens*	Secure
REPTILES		
Smooth Greensnake	*Opheodrys vernalis*	Undetermined
Red-bellied Snake	*Storeria occipitomaculata*	Secure
Common Gartersnake	*Thamnophis sirtalis*	Secure
BIRDS		
Wood Duck	*Aix sponsa*	Secure
Northern Pintail	*Anas acuta*	Secure
American Wigeon	*Anas americana*	Secure
Northern Shoveler	*Anas clypeata*	Secure
Green-winged Teal	*Anas crecca*	Secure
Blue-winged Teal	*Anas discors*	Secure

Eurasian Wigeon	*Anas penelope*	Accidental
Mallard	*Anas platyrhynchos*	Secure
Garganey	*Anas querquedula*	Accidental
American Black Duck	*Anas rubripes*	Secure
Gadwall	*Anas strepera*	Secure
Greater White-fronted Goose	*Anser albifrons*	Accidental
Pink-footed Goose	*Anser brachyrhynchus*	Accidental
Lesser Scaup	*Aythya affinis*	Accidental
Redhead	*Aythya americana*	Accidental
Ring-necked Duck	*Aythya collaris*	Secure
Tufted Duck	*Aythya fuligula*	Accidental
Greater Scaup	*Aythya marila*	Secure
Canvasback	*Aythya valisineria*	Accidental
Brant	*Branta bernicla*	Secure
Canada Goose	*Branta canadensis*	Secure
Barnacle Goose	*Branta leucopsis*	Accidental
Bufflehead	*Bucephala albeola*	Secure
Common Goldeneye	*Bucephala clangula*	Secure
Barrow's Goldeneye	*Bucephala islandica*	May be at Risk
Snow Goose	*Chen caerulescens*	Accidental
Long-tailed Duck	*Clangula hyemalis*	Secure
Tundra Swan	*Cygnus columbianus*	Accidental
Fulvous Whistling-Duck	*Dendrocygna bicolor*	Accidental
Harlequin Duck	*Histrionicus histrionicus*	May be at Risk
Hooded Merganser	*Lophodytes cucullatus*	Secure
White-winged Scoter	*Melanitta fusca*	Secure
Black Scoter	*Melanitta nigra*	Secure
Surf Scoter	*Melanitta perspicillata*	Secure
Common Merganser	*Mergus merganser*	Secure
Red-breasted Merganser	*Mergus serrator*	Secure
Ruddy Duck	*Oxyura jamaicensis*	Accidental
Common Eider	*Somateria mollissima*	Secure
King Eider	*Somateria spectabilis*	Accidental
Chimney Swift	*Chaetura pelagica*	May be at Risk
Ruby-throated Hummingbird	*Archilochus colubris*	Secure
Whip-poor-will	*Caprimulgus vociferus*	Accidental
Common Nighthawk	*Chordeiles minor*	Sensitive
Razorbill	*Alca torda*	Accidental
Dovekie	*Alle alle*	Accidental
Black Guillemot	*Cepphus grylle*	Secure
Atlantic Puffin	*Fratercula arctica*	Accidental
Common Murre	*Uria aalge*	Accidental
Thick-billed Murre	*Uria lomvia*	Accidental
Piping Plover	*Charadrius melodus*	At Risk
Semipalmated Plover	*Charadrius semipalmatus*	Secure

Killdeer	*Charadrius vociferus*	Secure
American Golden-Plover	*Pluvialis dominica*	Secure
Black-bellied Plover	*Pluvialis squatarola*	Secure
Northern Lapwing	*Vanellus vanellus*	Accidental
American Oystercatcher	*Haematopus palliatus*	Accidental
Black Tern	*Chlidonias niger*	Accidental
Herring Gull	*Larus argentatus*	Secure
Laughing Gull	*Larus atricilla*	Accidental
Mew Gull	*Larus canus*	Accidental
Ring-billed Gull	*Larus delawarensis*	Secure
Lesser Black-backed Gull	*Larus fuscus*	Accidental
Iceland Gull	*Larus glaucoides*	Secure
Glaucous Gull	*Larus hyperboreus*	Accidental
Great Black-backed Gull	*Larus marinus*	Secure
Little Gull	*Larus minutus*	Accidental
Bonaparte's Gull	*Larus philadelphia*	Secure
Black-headed Gull	*Larus ridibundus*	Accidental
Thayer's Gull	*Larus thayeri*	Accidental
Ivory Gull	*Pagophila eburnea*	Accidental
Black-legged Kittiwake	*Rissa tridactyla*	Accidental
Black Skimmer	*Rynchops niger*	Accidental
Parasitic Jaeger	*Stercorarius parasiticus*	Accidental
Pomarine Jaeger	*Stercorarius pomarinus*	Accidental
Caspian Tern	*Sterna caspia*	Secure
Common Tern	*Sterna hirundo*	May be at Risk
Royal Tern	*Sterna maxima*	Accidental
Arctic Tern	*Sterna paradisaea*	May be at Risk
Sabine's Gull	*Xema sabini*	Accidental
Black-necked Stilt	*Himantopus mexicanus*	Accidental
American Avocet	*Recurvirostra americana*	Accidental
Spotted Sandpiper	*Actitis macularius*	Secure
Ruddy Turnstone	*Arenaria interpres*	Secure
Upland Sandpiper	*Bartramia longicauda*	May be at Risk
Sanderling	*Calidris alba*	Secure
Dunlin	*Calidris alpina*	Secure
Baird's Sandpiper	*Calidris bairdii*	Accidental
Red Knot	*Calidris canutus*	Sensitive
Curlew Sandpiper	*Calidris ferruginea*	Accidental
White-rumped Sandpiper	*Calidris fuscicollis*	Secure
Stilt Sandpiper	*Calidris himantopus*	Accidental
Purple Sandpiper	*Calidris maritima*	Accidental
Western Sandpiper	*Calidris mauri*	Accidental
Pectoral Sandpiper	*Calidris melanotos*	Sensitive
Least Sandpiper	*Calidris minutilla*	Secure
Semipalmated Sandpiper	*Calidris pusilla*	Secure

Willet	*Catoptrophorus semipalmatus*	Secure
Wilson's Snipe	*Gallinago delicata*	Secure
Short-billed Dowitcher	*Limnodromus griseus*	Secure
Long-billed Dowitcher	*Limnodromus scolopaceus*	Accidental
Marbled Godwit	*Limosa fedoa*	Accidental
Hudsonian Godwit	*Limosa haemastica*	Secure
Black-tailed Godwit	*Limosa limosa*	Accidental
Eskimo Curlew	*Numenius borealis*	Extirpated
Whimbrel	*Numenius phaeopus*	Secure
Red Phalarope	*Phalaropus fulicarius*	Accidental
Red-necked Phalarope	*Phalaropus lobatus*	Accidental
Wilson's Phalarope	*Phalaropus tricolor*	Accidental
Ruff	*Philomachus pugnax*	Accidental
American Woodcock	*Scolopax minor*	Secure
Lesser Yellowlegs	*Tringa flavipes*	Secure
Greater Yellowlegs	*Tringa melanoleuca*	Secure
Solitary Sandpiper	*Tringa solitaria*	Sensitive
Buff-breasted Sandpiper	*Tryngites subruficollis*	Accidental
Great Egret	*Ardea alba*	Accidental
Great Blue Heron	*Ardea herodias*	Secure
American Bittern	*Botaurus lentiginosus*	Secure
Cattle Egret	*Bubulcus ibis*	Accidental
Green Heron	*Butorides virescens*	Accidental
Little Blue Heron	*Egretta caerulea*	Accidental
Snowy Egret	*Egretta thula*	Accidental
Least Bittern	*Ixobrychus exilis*	Accidental
Yellow-crowned Night-Heron	*Nyctanassa violacea*	Accidental
Black-crowned Night-Heron	*Nycticorax nycticorax*	Accidental
Turkey Vulture	*Cathartes aura*	Accidental
Black Vulture	*Coragyps atratus*	Accidental
White Ibis	*Eudocimus albus*	Accidental
Glossy Ibis	*Plegadis falcinellus*	Accidental
Rock Pigeon	*Columba livia*	Exotic
Passenger Pigeon	*Ectopistes migratorius*	Extinct
Mourning Dove	*Zenaida macroura*	Secure
Belted Kingfisher	*Ceryle alcyon*	Secure
Yellow-billed Cuckoo	*Coccyzus americanus*	Accidental
Black-billed Cuckoo	*Coccyzus erythropthalmus*	Secure
Cooper's Hawk	*Accipiter cooperii*	Undetermined
Northern Goshawk	*Accipiter gentilis*	Secure
Sharp-shinned Hawk	*Accipiter striatus*	Secure
Golden Eagle	*Aquila chrysaetos*	Accidental
Red-tailed Hawk	*Buteo jamaicensis*	Secure
Rough-legged Hawk	*Buteo lagopus*	Secure

Red-shouldered Hawk	*Buteo lineatus*	Accidental
Broad-winged Hawk	*Buteo platypterus*	Accidental
Swainson's Hawk	*Buteo swainsoni*	Accidental
Northern Harrier	*Circus cyaneus*	Secure
Bald Eagle	*Haliaeetus leucocephalus*	Secure
Osprey	*Pandion haliaetus*	Secure
Merlin	*Falco columbarius*	Secure
Peregrine Falcon	*Falco peregrinus*	Accidental
Gyrfalcon	*Falco rusticolus*	Accidental
American Kestrel	*Falco sparverius*	Secure
Ruffed Grouse	*Bonasa umbellus*	Secure
Spruce Grouse	*Falcipennis canadensis*	Undetermined
Gray Partridge	*Perdix perdix*	Exotic
Ring-necked Pheasant	*Phasianus colchicus*	Exotic
Sharp-tailed Grouse	*Tympanuchus phasianellus*	Exotic
Common Loon	*Gavia immer*	Secure
Pacific Loon	*Gavia pacifica*	Accidental
Red-throated Loon	*Gavia stellata*	Accidental
Sandhill Crane	*Grus canadensis*	Accidental
American Coot	*Fulica americana*	Accidental
Common Moorhen	*Gallinula chloropus*	Accidental
Purple Gallinule	*Porphyrio martinica*	Accidental
Sora	*Porzana carolina*	Secure
King Rail	*Rallus elegans*	Accidental
Virginia Rail	*Rallus limicola*	May be at Risk
Horned Lark	*Eremophila alpestris*	Sensitive
Cedar Waxwing	*Bombycilla cedrorum*	Secure
Bohemian Waxwing	*Bombycilla garrulus*	Secure
Northern Cardinal	*Cardinalis cardinalis*	Accidental
Blue Grosbeak	*Passerina caerula*	Accidental
Indigo Bunting	*Passerina cyanea*	Accidental
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	Secure
Dickcissel	*Spiza americana*	Accidental
Brown Creeper	*Certhia americana*	Secure
American Crow	*Corvus brachyrhynchos*	Secure
Common Raven	*Corvus corax*	Secure
Blue Jay	*Cyanocitta cristata*	Secure
Gray Jay	*Perisoreus canadensis*	Secure
Nelson's Sharp-tailed Sparrow	*Ammodramus nelsoni*	Secure
Grasshopper Sparrow	*Ammodramus savannarum*	Accidental
Lapland Longspur	*Calcarius lapponicus*	Secure
Lark Sparrow	*Chondestes grammacus*	Accidental
Dark-eyed Junco	*Junco hyemalis*	Secure
Swamp Sparrow	*Melospiza georgiana*	Secure
Lincoln's Sparrow	*Melospiza lincolnii*	Secure

Song Sparrow	*Melospiza melodia*	Secure
Savannah Sparrow	*Passerculus sandwichensis*	Secure
Fox Sparrow	*Passerella iliaca*	Accidental
Eastern Towhee	*Pipilo erythrophthalmus*	Accidental
Spotted Towhee	*Pipilo maculatus*	Accidental
Snow Bunting	*Plectrophenax nivalis*	Secure
Vesper Sparrow	*Pooecetes gramineus*	May be at Risk
American Tree Sparrow	*Spizella arborea*	Secure
Chipping Sparrow	*Spizella passerina*	Secure
Field Sparrow	*Spizella pusilla*	Accidental
White-throated Sparrow	*Zonotrichia albicollis*	Secure
White-crowned Sparrow	*Zonotrichia leucophrys*	Secure
Common Redpoll	*Carduelis flammea*	Secure
Hoary Redpoll	*Carduelis hornemanni*	Accidental
Pine Siskin	*Carduelis pinus*	Secure
American Goldfinch	*Carduelis tristis*	Secure
House Finch	*Carpodacus mexicanus*	Exotic
Purple Finch	*Carpodacus purpureus*	Secure
Evening Grosbeak	*Coccothraustes vespertinus*	Secure
Red Crossbill	*Loxia curvirostra*	Undetermined
White-winged Crossbill	*Loxia leucoptera*	Secure
Pine Grosbeak	*Pinicola enucleator*	Secure
Barn Swallow	*Hirundo rustica*	Sensitive
Cliff Swallow	*Petrochelidon pyrrhonota*	May be at Risk
Purple Martin	*Progne subis*	Accidental
Bank Swallow	*Riparia riparia*	Secure
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	Accidental
Tree Swallow	*Tachycineta bicolor*	Secure
Red-winged Blackbird	*Agelaius phoeniceus*	Secure
Bobolink	*Dolichonyx oryzivorus*	Sensitive
Rusty Blackbird	*Euphagus carolinus*	Sensitive
Bullock's Oriole	*Icterus bullockii*	Accidental
Baltimore Oriole	*Icterus galbula*	Accidental
Orchard Oriole	*Icterus spurius*	Accidental
Brown-headed Cowbird	*Molothrus ater*	Sensitive
Common Grackle	*Quiscalus quiscula*	Secure
Eastern Meadowlark	*Sturnella magna*	Accidental
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*	Accidental
Northern Shrike	*Lanius excubitor*	Secure
Loggerhead Shrike	*Lanius ludovicianus*	Accidental
Gray Catbird	*Dumetella carolinensis*	Secure
Northern Mockingbird	*Mimus polyglottos*	Secure
Brown Thrasher	*Toxostoma rufum*	Accidental
American Pipit	*Anthus rubescens*	Accidental

Black-capped Chickadee	*Poecile atricapillus*	Secure
Boreal Chickadee	*Poecile hudsonica*	Secure
Black-throated Blue Warbler	*Dendroica caerulescens*	Secure
Bay-breasted Warbler	*Dendroica castanea*	Secure
Yellow-rumped Warbler	*Dendroica coronata*	Secure
Prairie Warbler	*Dendroica discolor*	Accidental
Yellow-throated Warbler	*Dendroica dominica*	Accidental
Blackburnian Warbler	*Dendroica fusca*	Secure
Magnolia Warbler	*Dendroica magnolia*	Secure
Black-throated Gray Warbler	*Dendroica nigrescens*	Accidental
Palm Warbler	*Dendroica palmarum*	Secure
Chestnut-sided Warbler	*Dendroica pensylvanica*	Secure
Yellow Warbler	*Dendroica petechia*	Secure
Pine Warbler	*Dendroica pinus*	Accidental
Blackpoll Warbler	*Dendroica striata*	Accidental
Cape May Warbler	*Dendroica tigrina*	Secure
Black-throated Green Warbler	*Dendroica virens*	Secure
Common Yellowthroat	*Geothlypis trichas*	Secure
Worm-eating Warbler	*Helmitheros vermivorum*	Accidental
Yellow-breasted Chat	*Icteria virens*	Accidental
Black-and-white Warbler	*Mniotilta varia*	Secure
Mourning Warbler	*Oporornis philadelphia*	Secure
Northern Parula	*Parula americana*	Secure
Ovenbird	*Seiurus aurocapilla*	Secure
Northern Waterthrush	*Seiurus noveboracensis*	Secure
American Redstart	*Setophaga ruticilla*	Secure
Orange-crowned Warbler	*Vermivora celata*	Accidental
Tennessee Warbler	*Vermivora peregrina*	Secure
Blue-winged Warbler	*Vermivora pinus*	Accidental
Nashville Warbler	*Vermivora ruficapilla*	Secure
Canada Warbler	*Wilsonia canadensis*	Sensitive
Wilson's Warbler	*Wilsonia pusilla*	Secure
House Sparrow	*Passer domesticus*	Exotic
Ruby-crowned Kinglet	*Regulus calendula*	Secure
Golden-crowned Kinglet	*Regulus satrapa*	Secure
Red-breasted Nuthatch	*Sitta canadensis*	Secure
White-breasted Nuthatch	*Sitta carolinensis*	Sensitive
European Starling	*Sturnus vulgaris*	Exotic
Blue-gray Gnatcatcher	*Polioptila caerulea*	Accidental
Western Tanager	*Piranga ludoviciana*	Accidental
Scarlet Tanager	*Piranga olivacea*	Accidental
Summer Tanager	*Piranga rubra*	Accidental
Marsh Wren	*Cistothorus palustris*	Accidental
Sedge Wren	*Cistothorus platensis*	Accidental
House Wren	*Troglodytes aedon*	Accidental

Winter Wren	*Troglodytes troglodytes*	Secure
Bicknell's Thrush	*Catharus bicknelli*	Accidental
Veery	*Catharus fuscescens*	Secure
Hermit Thrush	*Catharus guttatus*	Secure
Gray-cheeked Thrush	*Catharus minimus*	Accidental
Swainson's Thrush	*Catharus ustulatus*	Secure
Wood Thrush	*Hylocichla mustelina*	Accidental
Varied Thrush	*Ixoreus naevius*	Accidental
Townsend's Solitaire	*Myadestes townsendi*	Accidental
Eastern Bluebird	*Sialia sialis*	Accidental
American Robin	*Turdus migratorius*	Secure
Olive-sided Flycatcher	*Contopus cooperi*	Sensitive
Eastern Wood-Pewee	*Contopus virens*	Secure
Alder Flycatcher	*Empidonax alnorum*	Secure
Yellow-bellied Flycatcher	*Empidonax flaviventris*	Sensitive
Least Flycatcher	*Empidonax minimus*	Secure
Willow Flycatcher	*Empidonax traillii*	Accidental
Great Crested Flycatcher	*Myiarchus crinitus*	Accidental
Eastern Phoebe	*Sayornis phoebe*	Accidental
Scissor-tailed Flycatcher	*Tyrannus forficatus*	Accidental
Eastern Kingbird	*Tyrannus tyrannus*	Secure
Western Kingbird	*Tyrannus verticalis*	Accidental
Yellow-throated Vireo	*Vireo flavifrons*	Accidental
Warbling Vireo	*Vireo gilvus*	Accidental
Red-eyed Vireo	*Vireo olivaceus*	Secure
Philadelphia Vireo	*Vireo philadelphicus*	Sensitive
Blue-headed Vireo	*Vireo solitarius*	Secure
American White Pelican	*Pelecanus erythrorhynchos*	Accidental
Double-crested Cormorant	*Phalacrocorax auritus*	Secure
Great Cormorant	*Phalacrocorax carbo*	Secure
Northern Gannet	*Morus bassanus*	Secure
Northern Flicker	*Colaptes auratus*	Secure
Pileated Woodpecker	*Dryocopus pileatus*	May be at Risk
Red-bellied Woodpecker	*Melanerpes carolinus*	Accidental
Red-headed Woodpecker	*Melanerpes erythrocephalus*	Accidental
Black-backed Woodpecker	*Picoides arcticus*	Secure
American Three-toed Woodpecker	*Picoides dorsalis*	Accidental
Downy Woodpecker	*Picoides pubescens*	Secure
Hairy Woodpecker	*Picoides villosus*	Secure
Yellow-bellied Sapsucker	*Sphyrapicus varius*	Secure
Horned Grebe	*Podiceps auritus*	Accidental
Red-necked Grebe	*Podiceps grisegena*	Secure
Eared Grebe	*Podiceps nigricollis*	Accidental
Pied-billed Grebe	*Podilymbus podiceps*	Secure
Wilson's Storm-Petrel	*Oceanites oceanicus*	Secure

Leach's Storm-Petrel	*Oceanodroma leucorhoa*	Secure
Northern Fulmar	*Fulmarus glacialis*	Accidental
Little Shearwater	*Puffinus assimilis*	Accidental
Greater Shearwater	*Puffinus gravis*	Accidental
Sooty Shearwater	*Puffinus griseus*	Accidental
Audubon's Shearwater	*Puffinus lherminieri*	Accidental
Manx Shearwater	*Puffinus puffinus*	Accidental
Northern Saw-whet Owl	*Aegolius acadicus*	Secure
Boreal Owl	*Aegolius funereus*	Undetermined
Short-eared Owl	*Asio flammeus*	May be at Risk
Long-eared Owl	*Asio otus*	May be at Risk
Snowy Owl	*Bubo scandiacus*	Accidental
Great Horned Owl	*Bubo virginianus*	Secure
Eastern Screech-Owl	*Megascops asio*	Accidental
Great Gray Owl	*Strix nebulosa*	Accidental
Barred Owl	*Strix varia*	Secure
Northern Hawk Owl	*Surnia ulula*	Accidental
Barn Owl	*Tyto alba*	Accidental
MAMMALS (excluding marine mammals)		
Caribou	*Rangifer tarandus*	Extirpated
Coyote	*Canis latrans*	Secure
Grey Wolf	*Canis lupus*	Undetermined
Red Fox	*Vulpes vulpes*	Secure
Feral Cat	*Felis catus*	Exotic
Canada Lynx	*Lynx canadensis*	Extirpated
Bobcat	*Lynx rufus*	Undetermined
Striped Skunk	*Mephitis mephitis*	Secure
Northern River Otter	*Lontra canadensis*	Extirpated
American Marten	*Martes americana*	Extirpated
Ermine	*Mustela erminea*	Secure
American Mink	*Mustela vison*	Secure
Northern Raccoon	*Procyon lotor*	Exotic
American Black Bear	*Ursus americanus*	Extirpated
Hoary Bat	*Lasiurus cinereus*	Accidental
Little Brown Myotis	*Myotis lucifugus*	Secure
Northern Long-eared Myotis	*Myotis septentrionalis*	Sensitive
Northern Short-tailed Shrew	*Blarina brevicauda*	Secure
Masked Shrew	*Sorex cinereus*	Secure
Smoky Shrew	*Sorex fumeus*	Undetermined
Pygmy Shrew	*Sorex hoyi*	Secure
American Water Shrew	*Sorex palustris*	Secure
Snowshoe Hare	*Lepus americanus*	Secure
American Beaver	*Castor canadensis*	Secure
Southern Red-backed Vole	*Clethrionomys gapperi*	Secure

Meadow Vole	*Microtus pennsylvanicus*	Secure
House Mouse	*Mus musculus*	Exotic
Common Muskrat	*Ondatra zibethicus*	Secure
Deer Mouse	*Peromyscus maniculatus*	Secure
Norway Rat	*Rattus norvegicus*	Exotic
Northern Flying Squirrel	*Glaucomys sabrinus*	Secure
Eastern Chipmunk	*Tamias striatus*	Secure
Red Squirrel	*Tamiasciurus hudsonicus*	Secure
Woodland Jumping Mouse	*Napaeozapus insignis*	Secure
Meadow Jumping Mouse	*Zapus hudsonius*	Secure

Appendix II

GENERAL STATUS OF FERNS, ORCHIDS, AND VASCULAR PLANTS IN PRINCE EDWARD ISLAND, 2005

Name	Scientific Name	General Status
EnName	SciName	PE
Northern Water Plantain	Alisma triviale	Secure
Grass-leaved Arrowhead	Sagittaria graminea	May be at Risk
Broad-leaved Arrowhead	Sagittaria latifolia	Secure
Sessile-fruited Arrowhead	Sagittaria rigida	Undetermined
Flowering Rush	Butomus umbellatus	Exotic
Goutweed	Aegopodium podagraria	Exotic
Purple-stemmed Angelica	Angelica atropurpurea	Sensitive
Seaside Angelica	Angelica lucida	May be at Risk
Wild Caraway	Carum carvi	Exotic
Bulbous Water-hemlock	Cicuta bulbifera	Secure
Spotted Water-hemlock	Cicuta maculata	Secure
Chinese Hemlock-parsley	Conioselinum chinense	May be at Risk
Queen Anne's-lace	Daucus carota	Exotic
Cow Parsnip	Heracleum maximum	Secure
Marsh-pennywort	Hydrocotyle americana	Secure
Scotch Lovage	Ligusticum scoticum	Secure
Hairy Sweet Cicely	Osmorhiza claytonii	May be at Risk
Smooth Sweet Cicely	Osmorhiza longistylis	May be at Risk
Wild Parsnip	Pastinaca sativa	Exotic
Black Sanicle	Sanicula marilandica	Secure
Water Parsnip	Sium suave	Secure
Bristly Sarsaparilla	Aralia hispida	Secure
Wild Sarsaparilla	Aralia nudicaulis	Secure
Spikenard	Aralia racemosa	Sensitive
Dwarf Ginseng	Panax trifolius	May be at Risk
American Sweetflag	Acorus americanus	Secure
European Sweetflag	Acorus calamus	Exotic
Jack-in-the-pulpit	Arisaema triphyllum	Secure
Wild Calla	Calla palustris	Secure
Star Duckweed	Lemna trisulca	Sensitive
Turion Duckweed	Lemna turionifera	Secure
Great Duckweed	Spirodela polyrrhiza	Secure
Common Yarrow	Achillea millefolium	Secure
Sneezeweed	Achillea ptarmica	Exotic
Common Ragweed	Ambrosia artemisiifolia	Secure
Perennial Ragweed	Ambrosia psilostachya	Exotic
Great Ragweed	Ambrosia trifida	Exotic
Pearly Everlasting	Anaphalis margaritacea	Secure

Howell's Pussytoes	Antennaria howellii	Secure
Field Chamomile	Anthemis arvensis	Exotic
Mayweed Chamomile	Anthemis cotula	Exotic
Common Burdock	Arctium minus	Exotic
Woolly Burdock	Arctium tomentosum	Exotic
Lamb-succory	Arnoseris minima	Exotic
Common Wormwood	Artemisia absinthium	Exotic
Annual Wormwood	Artemisia annua	Exotic
Biennal Wormwood	Artemisia biennis	Exotic
White Wormwood	Artemisia ludoviciana	Exotic
Dusty Miller	Artemisia stelleriana	Exotic
Common Mugwort	Artemisia vulgaris	Exotic
Nodding Beggarticks	Bidens cernua	Secure
Purple-stemmed Beggarticks	Bidens connata	Sensitive
Devil's Beggarticks	Bidens frondosa	Secure
Connecticut Beggarticks	Bidens heterodoxa	May be at Risk
Estuary Beggarticks	Bidens hyperborea	May be at Risk
Garden Cornflower	Centaurea cyanus	Exotic
Black Knapweed	Centaurea nigra	Exotic
Wild Chicory	Cichorium intybus	Exotic
Canada Thistle	Cirsium arvense	Exotic
Swamp Thistle	Cirsium muticum	May be at Risk
Bull Thistle	Cirsium vulgare	Exotic
Canada Horseweed	Conyza canadensis	Secure
Common Brassbuttons	Cotula coronopifolia	Exotic
Narrow-leaved Hawksbeard	Crepis tectorum	Exotic
Flat-topped White Aster	Doellingeria umbellata	Secure
Eastern Burnweed	Erechtites hieraciifolia	May be at Risk
Annual Fleabane	Erigeron annuus	Undetermined
Philadelphia Fleabane	Erigeron philadelphicus	May be at Risk
Whitetop Fleabane	Erigeron strigosus	Secure
Spotted Joe-pye-weed	Eupatorium maculatum	Secure
Common Boneset	Eupatorium perfoliatum	May be at Risk
Large-leaved Aster	Eurybia macrophylla	May be at Risk
Rough Aster	Eurybia radula	May be at Risk
Grass-leaved Goldenrod	Euthamia graminifolia	Secure
Fringed Quickweed	Galinsoga quadriradiata	Exotic
Marsh Cudweed	Gnaphalium uliginosum	Exotic
Common Sunflower	Helianthus annuus	Exotic
Maximillian Sunflower	Helianthus maximiliani	Exotic
Few-flowered Sunflower	Helianthus pauciflorus	Exotic
Jerusalem Artichoke	Helianthus tuberosus	Exotic
False Sunflower	Heliopsis helianthoides	Exotic
Orange Hawkweed	Hieracium aurantiacum	Exotic
Field Hawkweed	Hieracium caespitosum	Exotic

Canada Hawkweed	Hieracium canadense	Undetermined
Common Hawkweed	Hieracium lachenalii	Exotic
Wall Hawkweed	Hieracium murorum	Exotic
Mouse-eared Hawkweed	Hieracium pilosella	Exotic
King Devil	Hieracium praealtum	Exotic
New England Hawkweed	Hieracium sabaudum	Exotic
Rough Hawkweed	Hieracium scabrum	Secure
Umbellate Hawkweed	Hieracium umbellatum	May be at Risk
Elecampane	Inula helenium	Exotic
Coarse Sumpweed	Iva xanthifolia	Exotic
Tall Blue Lettuce	Lactuca biennis	Secure
Canada Lettuce	Lactuca canadensis	Sensitive
Hairy Lettuce	Lactuca hirsuta	Extinct
Prickly Lettuce	Lactuca serriola	Exotic
Common Nipplewort	Lapsana communis	Exotic
Fall Dandelion	Leontodon autumnalis	Exotic
Ox-eye Daisy	Leucanthemum vulgare	Exotic
Pineapple Weed	Matricaria discoidea	Exotic
Sharp-leaved Aster	Oclemena acuminata	Secure
Bog Aster	Oclemena nemoralis	May be at Risk
Woodland Cudweed	Omalotheca sylvatica	Secure
Golden Groundsel	Packera aurea	May be at Risk
Balsam Groundsel	Packera paupercula	Extinct
Schweinitz's Groundsel	Packera schweinitziana	May be at Risk
Arctic Sweet Coltsfoot	Petasites frigidus	Sensitive
Tall Rattlesnake-root	Prenanthes altissima	Secure
Three-leaved Rattlesnake-root	Prenanthes trifoliolata	Secure
Macoun's Rabbit Tobacco	Pseudognaphalium macounii	May be at Risk
Fragrant Cudweed	Pseudognaphalium obtusifolium	May be at Risk
Black-eyed Susan	Rudbeckia hirta	Exotic
Cut-leaved Coneflower	Rudbeckia laciniata	Exotic
Tansy Ragwort	Senecio jacobaea	Exotic
Woodland Ragwort	Senecio sylvaticus	Exotic
Sticky Ragwort	Senecio viscosus	Exotic
Common Ragwort	Senecio vulgaris	Exotic
Tall Goldenrod	Solidago altissima	May be at Risk
White Goldenrod	Solidago bicolor	Secure
Canada Goldenrod	Solidago canadensis	Secure
Zigzag Goldenrod	Solidago flexicaulis	Sensitive
Late Goldenrod	Solidago gigantea	Secure
Early Goldenrod	Solidago juncea	May be at Risk
Large-leaved Goldenrod	Solidago macrophylla	May be at Risk
Field Goldenrod	Solidago nemoralis	Secure
Downy Goldenrod	Solidago puberula	Secure

Rough-stemmed Goldenrod	Solidago rugosa	Secure
Seaside Goldenrod	Solidago sempervirens	Secure
Bog Goldenrod	Solidago uliginosa	Secure
Field Sow Thistle	Sonchus arvensis	Exotic
Spiny-leaved Sow Thistle	Sonchus asper	Exotic
Common Sow Thistle	Sonchus oleraceus	Exotic
Boreal Aster	Symphyotrichum boreale	May be at Risk
Heart-leaved Aster	Symphyotrichum cordifolium	Secure
Lance-leaved Aster	Symphyotrichum lanceolatum	May be at Risk
Starved Aster	Symphyotrichum lateriflorum	Secure
Gulf of St Lawrence Aster	Symphyotrichum laurentianum	At Rsik
New York Aster	Symphyotrichum novi-belgii	Secure
Purple-stemmed Aster	Symphyotrichum puniceum	Secure
Annual Saltmarsh Aster	Symphyotrichum subulatum	May be at Risk
Common Feverfew	Tanacetum parthenium	Exotic
Common Tansy	Tanacetum vulgare	Exotic
Red-seeded Dandelion	Taraxacum laevigatum	Exotic
Common Dandelion	Taraxacum officinale	Exotic
Meadow Goatsbeard	Tragopogon pratensis	Exotic
Scentless Chamomile	Tripleurospermum perforata	Exotic
Coltsfoot	Tussilago farfara	Exotic
Rough Cockleburr	Xanthium strumarium	Secure
Northern Water-starwort	Callitriche hermaphroditica	Undetermined
Marsh Water-starwort	Callitriche palustris	Secure
Common Marestail	Hippuris vulgaris	Secure
Creeping Bellflower	Campanula rapunculoides	Exotic
Harebell	Campanula rotundifolia	Undetermined
Water Lobelia	Lobelia dortmanna	May be at Risk
Indian Tobacco	Lobelia inflata	Secure
Pale-spiked Lobelia	Lobelia spicata	Undetermined
Garlic Mustard	Alliaria petiolata	Exotic
Horse Radish	Armoracia rusticana	Exotic
Yellow Rocket	Barbarea vulgaris	Exotic
Chinese Mustard	Brassica juncea	Exotic
Turnip	Brassica napus	Exotic
Black Mustard	Brassica nigra	Exotic
Cabbage	Brassica oleracea	Exotic
Bird's Rape	Brassica rapa	Exotic
American Searocket	Cakile edentula	Secure
Little-seeded False-flax	Camelina microcarpa	Exotic
Shepherd's Purse	Capsella bursa-pastoris	Exotic
Two-leaved Toothwort	Cardamine diphylla	May be at Risk
Pennsylvania Bittercress	Cardamine pensylvanica	Secure
Cuckoo Flower	Cardamine pratensis	Exotic
Hare's-ear Mustard	Conringia orientalis	Exotic

Herb Sophia	Descurainia sophia	Exotic
Annual Wallrocket	Diplotaxis muralis	Exotic
Twisted Whitlow-grass	Draba incana	May be at Risk
Spring Whitlow-grass	Draba verna	Exotic
Common Dog Mustard	Erucastrum gallicum	Exotic
Worm-seeded Wallflower	Erysimum cheiranthoides	Exotic
Dame's Rocket	Hesperis matronalis	Exotic
Globe Candytuft	Iberis umbellata	Exotic
Field Pepperwort	Lepidium campestre	Exotic
Dense-flowered Pepperwort	Lepidium densiflorum	Exotic
Garden Pepperwort	Lepidium sativum	Exotic
Poor-man's Pepperwort	Lepidium virginicum	Exotic
Yellow Ball-mustard	Neslia paniculata	Exotic
Wild Radish	Raphanus raphanistrum	Exotic
Garden Radish	Raphanus sativus	Exotic
One-rowed Yellowcress	Rorippa microphylla	Exotic
Bog Yellowcress	Rorippa palustris	Undetermined
Creeping Yellowcress	Rorippa sylvestris	Exotic
White Mustard	Sinapis alba	Exotic
Corn Mustard	Sinapis arvensis	Exotic
Tall Hedge Mustard	Sisymbrium altissimum	Exotic
Hedge Mustard	Sisymbrium officinale	Exotic
Field Pennycress	Thlaspi arvense	Exotic
White Tumbleweed	Amaranthus albus	Exotic
Green Amaranth	Amaranthus retroflexus	Exotic
Common Corncockle	Agrostemma githago	Exotic
Thyme-leaved Sandwort	Arenaria serpyllifolia	Exotic
Mouse-ear Chickweed	Cerastium arvense	Secure
Common Chickweed	Cerastium fontanum	Exotic
Snow-in-summer	Cerastium tomentosum	Exotic
Deptford Pink	Dianthus armeria	Exotic
Maiden Pink	Dianthus deltoides	Exotic
Low Baby's-breath	Gypsophila muralis	Exotic
Sea-beach Sandwort	Honckenya peploides	Sensitive
Blunt-leaved Sandwort	Moehringia lateriflora	Secure
Knotted Pearlwort	Sagina nodosa	May be at Risk
Procumbent Pearlwort	Sagina procumbens	Exotic
Bouncing-bet	Saponaria officinalis	Exotic
Annual Knawel	Scleranthus annuus	Exotic
Maltese-cross Campion	Silene chalcedonica	Exotic
White Campion	Silene latifolia	Exotic
Night-Flowering Catchfly	Silene noctiflora	Exotic
Maiden's-tears	Silene vulgaris	Exotic
Corn Spurry	Spergula arvensis	Exotic
Canada Sandspurry	Spergularia canadensis	Secure

Ruby Sandspurry	Spergularia rubra	Exotic
Saltmarsh Sandspurry	Spergularia salina	Secure
Trailing Stitchwort	Stellaria alsine	Undetermined
Boreal Stitchwort	Stellaria borealis	Undetermined
Fleshy Stitchwort	Stellaria crassifolia	Undetermined
Little Starwort	Stellaria graminea	Exotic
Saltmarsh Starwort	Stellaria humifusa	Undetermined
Common Starwort	Stellaria media	Exotic
Thick-leaved Orache	Atriplex dioica	Undetermined
Glabrous Orache	Atriplex glabriuscula	Undetermined
Belgian Orache	Atriplex laciniata	Exotic
Narrow-leaved Orache	Atriplex littoralis	Exotic
Spreading Orache	Atriplex patula	Exotic
Thin-leaved Orache	Atriplex prostrata	Secure
Lamb's Quarters	Chenopodium album	Exotic
Berlandier's Goosefoot	Chenopodium berlandieri	Undetermined
Good King Henry	Chenopodium bonus-henricus	Exotic
Oak-leaved Goosefoot	Chenopodium glaucum	Exotic
Red Pigweed	Chenopodium rubrum	May be at Risk
Strict Goosefoot	Chenopodium strictum	Exotic
Perennial Glasswort	Salicornia depressa	Undetermined
Maritime Glasswort	Salicornia maritima	Secure
Common Saltwort	Salsola kali	Exotic
Russian Thistle	Salsola tragus	Exotic
Horned Sea-blite	Suaeda calceoliformis	Undetermined
White Sea-blite	Suaeda maritima	Secure
Carolina Spring Beauty	Claytonia caroliniana	May be at Risk
Water Blinks	Montia fontana	Extinct
Common Purslane	Portulaca oleracea	Exotic
Common Winterberry	Ilex verticillata	Secure
Mountain Holly	Nemopanthus mucronatus	Secure
Alternate-leaved Dogwood	Cornus alternifolia	Secure
Bunchberry	Cornus canadensis	Secure
Round-leaved Dogwood	Cornus rugosa	May be at Risk
Red Osier Dogwood	Cornus sericea	Secure
Red Bulrush	Blysmopsis rufa	May be at Risk
Saltmarsh Bulrush	Bolboschoenus maritimus	Secure
White-tinged Sedge	Carex albicans	Secure
Yellow-fruited Sedge	Carex annectens	May be at Risk
Water Sedge	Carex aquatilis	May be at Risk
Drooping Woodland Sedge	Carex arctata	Secure
Silvery-flowered Sedge	Carex argyrantha	May be at Risk
Golden Sedge	Carex aurea	Sensitive
Bebb's Sedge	Carex bebbii	Sensitive
Bromelike Sedge	Carex bromoides	May be at Risk

Brownish Sedge	Carex brunnescens	Secure
Silvery Sedge	Carex canescens	Secure
Creeping Sedge	Carex chordorrhiza	May be at Risk
Fibrous-root Sedge	Carex communis	Secure
Crawford's Sedge	Carex crawfordii	Secure
Fringed Sedge	Carex crinita	Secure
Dense Sedge	Carex cumulata	May be at Risk
White-edged Sedge	Carex debilis	Secure
Northern Sedge	Carex deflexa	Sensitive
Dewey's Sedge	Carex deweyana	Secure
Lesser Panicled Sedge	Carex diandra	Secure
Two-seeded Sedge	Carex disperma	Secure
Star Sedge	Carex echinata	Secure
Yellow Sedge	Carex flava	May be at Risk
Hay Sedge	Carex foenea	May be at Risk
Northern Long Sedge	Carex folliculata	May be at Risk
Graceful Sedge	Carex gracillima	Secure
Nodding Sedge	Carex gynandra	Secure
Northern Bog Sedge	Carex gynocrates	May be at Risk
Hammer Sedge	Carex hirta	Exotic
Marsh Straw Sedge	Carex hormathodes	Secure
Porcupine Sedge	Carex hystericina	May be at Risk
Inland Sedge	Carex interior	Secure
Bladder Sedge	Carex intumescens	Secure
Lake Sedge	Carex lacustris	Sensitive
Slender Sedge	Carex lasiocarpa	May be at Risk
Bristly-stalked Sedge	Carex leptalea	Secure
Finely-nerved Sedge	Carex leptonervia	Secure
Mud Sedge	Carex limosa	May be at Risk
Livid Sedge	Carex livida	May be at Risk
Sallow Sedge	Carex lurida	May be at Risk
Mackenzie's Sedge	Carex mackenziei	May be at Risk
Boreal Bog Sedge	Carex magellanica	Secure
Smooth Black Sedge	Carex nigra	Secure
New England Sedge	Carex novae-angliae	Secure
Oval Sedge	Carex ovalis	Exotic
Chaffy Sedge	Carex paleacea	Secure
Pale Sedge	Carex pallescens	Secure
Few-flowered Sedge	Carex pauciflora	May be at Risk
Long-stalked Sedge	Carex pedunculata	May be at Risk
Necklace Sedge	Carex projecta	Secure
Cyperuslike Sedge	Carex pseudocyperus	Secure
Eastern Star Sedge	Carex radiata	May be at Risk
Loose-flowered Alpine Sedge	Carex rariflora	May be at Risk
Estuary Sedge	Carex recta	Sensitive

Retrorse Sedge	Carex retrorsa	Secure
Beaked Sedge	Carex rostrata	May be at Risk
Rough Sedge	Carex scabrata	Secure
Broom Sedge	Carex scoparia	Secure
Seabeach Sedge	Carex silicea	Secure
Awl-fruited Sedge	Carex stipata	Secure
Tussock Sedge	Carex stricta	May be at Risk
Tender Sedge	Carex tenera	May be at Risk
Sparse-flowered Sedge	Carex tenuiflora	May be at Risk
Tinged Sedge	Carex tincta	May be at Risk
Deep Green Sedge	Carex tonsa	Sensitive
Three-seeded Sedge	Carex trisperma	Secure
Northwest Territory Sedge	Carex utriculata	Sensitive
Estuarine Sedge	Carex vacillans	Undetermined
Inflated Sedge	Carex vesicaria	May be at Risk
Greenish Sedge	Carex viridula	Secure
Fox Sedge	Carex vulpinoidea	Sensitive
Wiegand's Sedge	Carex wiegandii	May be at Risk
Three-way Sedge	Dulichium arundinaceum	Sensitive
Needle Spike-rush	Eleocharis acicularis	Sensitive
Quill Spike-rush	Eleocharis nitida	May be at Risk
Blunt Spike-rush	Eleocharis obtusa	Secure
Ovate Spike-rush	Eleocharis ovata	May be at Risk
Common Spike-rush	Eleocharis palustris	Secure
Dwarf Spike-rush	Eleocharis parvula	Sensitive
Few-flowered Spike-rush	Eleocharis quinqueflora	May be at Risk
Slender Spike-rush	Eleocharis tenuis	Sensitive
Single-glumed Spike-rush	Eleocharis uniglumis	Secure
Narrow-leaved Cottongrass	Eriophorum angustifolium	Secure
Russet Cottongrass	Eriophorum chamissonis	Sensitive
Slender Cottongrass	Eriophorum gracile	May be at Risk
Rough Cottongrass	Eriophorum tenellum	Secure
Tussock Cottongrass	Eriophorum vaginatum	Secure
Tawny Cottongrass	Eriophorum virginicum	Secure
Green-keeled Cottongrass	Eriophorum viridicarinatum	May be at Risk
White Beakrush	Rhynchospora alba	Secure
Hard-stemmed Bulrush	Schoenoplectus acutus	Secure
Three-square Bulrush	Schoenoplectus pungens	Secure
Water Bulrush	Schoenoplectus subterminalis	May be at Risk
Soft-stemmed Bulrush	Schoenoplectus tabernaemontani	Secure
Black-girdled Bulrush	Scirpus atrocinctus	Secure
Common Woolly Bulrush	Scirpus cyperinus	Secure
Georgia Bulrush	Scirpus georgianus	Undetermined
Mosquito Bulrush	Scirpus hattorianus	Undetermined

Small-fruited Bulrush	Scirpus microcarpus	Secure
Alpine Cottongrass	Trichophorum alpinum	May be at Risk
Tufted Clubrush	Trichophorum cespitosum	Sensitive
Velvet Bent Grass	Agrostis canina	Exotic
Colonial Bent Grass	Agrostis capillaris	Exotic
Redtop	Agrostis gigantea	Exotic
Upland Bent Grass	Agrostis perennans	Sensitive
Rough Bent Grass	Agrostis scabra	Secure
Creeping Bent Grass	Agrostis stolonifera	Secure
Short-awned Foxtail	Alopecurus aequalis	May be at Risk
Water Foxtail	Alopecurus geniculatus	Exotic
Meadow Foxtail	Alopecurus pratensis	Exotic
American Beach Grass	Ammophila breviligulata	Secure
Sweet Vernal Grass	Anthoxanthum odoratum	Exotic
Wild Oats	Avena fatua	Exotic
Cultivated Oats	Avena sativa	Exotic
American Slough Grass	Beckmannia syzigachne	Exotic
Northern Shorthusk	Brachyelytrum aristosum	May be at Risk
Fringed Brome	Bromus ciliatus	Secure
Smooth Brome	Bromus inermis	Exotic
Bald Brome	Bromus racemosus	Exotic
Bluejoint Reed Grass	Calamagrostis canadensis	Secure
Slim-stemmed Reed Grass	Calamagrostis stricta	Sensitive
Water Whorl Grass	Catabrosa aquatica	May be at Risk
Drooping Wood Reed Grass	Cinna latifolia	Secure
Orchard Grass	Dactylis glomerata	Exotic
Flattened Oat Grass	Danthonia compressa	May be at Risk
Poverty Oat Grass	Danthonia spicata	Secure
Tufted Hairgrass	Deschampsia cespitosa	May be at Risk
Wavy Hairgrass	Deschampsia flexuosa	Secure
Woolly Panic Grass	Dichanthelium acuminatum	Secure
Northern Panic Grass	Dichanthelium boreale	Secure
Starved Panic Grass	Dichanthelium depauperatum	May be at Risk
Stiff-leaved Panic Grass	Dichanthelium ovale	Undetermined
Smooth Crab Grass	Digitaria ischaemum	Exotic
Hairy Crab Grass	Digitaria sanguinalis	Exotic
Salt Grass	Distichlis spicata	Secure
Large Barnyard Grass	Echinochloa crus-galli	Exotic
Quack Grass	Elymus repens	Exotic
Slender Wild Rye	Elymus trachycaulus	Sensitive
Virginia Wild Rye	Elymus virginicus	May be at Risk
Little Love Grass	Eragrostis minor	Exotic
Hair Fescue	Festuca filiformis	Exotic
Red Fescue	Festuca rubra	Secure
Hard Fescue	Festuca trachyphylla	Exotic

Northern Manna Grass	Glyceria borealis	Sensitive
Rattlesnake Manna Grass	Glyceria canadensis	May be at Risk
Water Manna Grass	Glyceria fluitans	Exotic
Common Tall Manna Grass	Glyceria grandis	Secure
Fowl Manna Grass	Glyceria striata	Secure
Sweet Grass	Hierochloë odorata	Secure
Foxtail Barley	Hordeum jubatum	Secure
Common Barley	Hordeum vulgare	Exotic
Rice Cut Grass	Leersia oryzoides	Secure
Sea Lyme Grass	Leymus mollis	Secure
Perennial Rye Grass	Lolium perenne	Exotic
Spiked Muhly	Muhlenbergia glomerata	May be at Risk
White-grained Mountain Rice	Oryzopsis asperifolia	May be at Risk
Common Witch Grass	Panicum capillare	Exotic
Fall Panic Grass	Panicum dichotomiflorum	Exotic
Proso Millet	Panicum miliaceum	Exotic
Reed Canary Grass	Phalaris arundinacea	Exotic
Common Canary Grass	Phalaris canariensis	Exotic
Common Timothy	Phleum pratense	Exotic
Common Reed	Phragmites australis	Secure
Canada Rice Grass	Piptatherum canadense	May be at Risk
Grove Blue Grass	Poa alsodes	May be at Risk
Annual Blue Grass	Poa annua	Exotic
Canada Blue Grass	Poa compressa	Exotic
Fowl Blue Grass	Poa palustris	Secure
Kentucky Blue Grass	Poa pratensis	Secure
Weak Blue Grass	Poa saltuensis	Secure
Rough Blue Grass	Poa trivialis	Exotic
Spreading Alkali Grass	Puccinellia distans	Exotic
Saltmarsh Alkali Grass	Puccinellia fasciculata	Exotic
Seaside Alkali Grass	Puccinellia maritima	Undetermined
Nuttall's Alkali Grass	Puccinellia nuttalliana	Exotic
Dwarf Alkali Grass	Puccinellia pumila	May be at Risk
Tundra Alkali Grass	Puccinellia tenella	Secure
Tall Fescue	Schedonorus arundinaceus	Exotic
Meadow Fescue	Schedonorus pratensis	Exotic
Purple Oat Grass	Schizachne purpurascens	May be at Risk
Common Rye	Secale cereale	Exotic
Yellow Foxtail	Setaria pumila	Exotic
Green Foxtail	Setaria viridis	Exotic
Smooth Cord Grass	Spartina alterniflora	Secure
Saltmeadow Cord Grass	Spartina patens	Secure
Prairie Cord Grass	Spartina pectinata	Secure
Slender Wedge Grass	Sphenopholis intermedia	May be at Risk
Sheathed Dropseed	Sporobolus vaginiflorus	Exotic

Pale False Manna Grass	Torreyochloa pallida	Secure
Common Wheat	Triticum aestivum	Exotic
Bush Honeysuckle	Diervilla lonicera	Secure
Twinflower	Linnaea borealis	Secure
American Fly Honeysuckle	Lonicera canadensis	Secure
Mountain Fly Honeysuckle	Lonicera villosa	Secure
Black Elderberry	Sambucus nigra	Secure
Red Elderberry	Sambucus racemosa	Secure
Snowberry	Symphoricarpos albus	Exotic
Hobblebush	Viburnum lantanoides	May be at Risk
Northern Wild Raisin	Viburnum nudum	Secure
Highbush Cranberry	Viburnum opulus	Secure
Common Valerian	Valeriana officinalis	Exotic
Field Horsetail	Equisetum arvense	Secure
Water Horsetail	Equisetum fluviatile	Secure
Dwarf Scouring-rush	Equisetum scirpoides	May be at Risk
Wood Horsetail	Equisetum sylvaticum	Secure
Variegated Scouring-rush	Equisetum variegatum	May be at Risk
Broom Crowberry	Corema conradii	Sensitive
Pink Crowberry	Empetrum eamesii	Undetermined
Black Crowberry	Empetrum nigrum	Secure
Bog Rosemary	Andromeda polifolia	May be at Risk
Common Bearberry	Arctostaphylos uva-ursi	Sensitive
Leatherleaf	Chamaedaphne calyculata	Secure
Trailing Arbutus	Epigaea repens	Secure
Creeping Snowberry	Gaultheria hispidula	Secure
Teaberry	Gaultheria procumbens	Secure
Black Huckleberry	Gaylussacia baccata	Secure
Dwarf Huckleberry	Gaylussacia dumosa	Secure
Sheep Laurel	Kalmia angustifolia	Secure
Bog Laurel	Kalmia polifolia	Secure
Labrador Tea	Ledum groenlandicum	Secure
Rhodora	Rhododendron canadense	Secure
Lowbush Blueberry	Vaccinium angustifolium	Secure
Large Cranberry	Vaccinium macrocarpon	Secure
Velvet-leaved Blueberry	Vaccinium myrtilloides	Secure
Small Cranberry	Vaccinium oxycoccos	Secure
Alpine Bilberry	Vaccinium uliginosum	May be at Risk
Mountain Cranberry	Vaccinium vitis-idaea	Secure
Pinesap	Monotropa hypopithys	Secure
Indian Pipe	Monotropa uniflora	Secure
Woodland Pinedrops	Pterospora andromedea	Extinct
Pipsissewa	Chimaphila umbellata	Secure
One-flowered Wintergreen	Moneses uniflora	Secure
One-sided Wintergreen	Orthilia secunda	Secure

Round-leaved Pyrola	Pyrola americana	Secure
Pink Pyrola	Pyrola asarifolia	May be at Risk
Green-flowered Pyrola	Pyrola chlorantha	May be at Risk
Shinleaf	Pyrola elliptica	Secure
Lesser Pyrola	Pyrola minor	Undetermined
White Buttons	Eriocaulon aquaticum	May be at Risk
Ridged-seeded Spurge	Chamaesyce glyptosperma	Exotic
Spotted Spurge	Chamaesyce maculata	Exotic
Seaside Spurge	Chamaesyce polygonifolia	Sensitive
Cypress Spurge	Euphorbia cyparissias	Exotic
Leafy Spurge	Euphorbia esula	Exotic
Sun Spurge	Euphorbia helioscopia	Exotic
Petty Spurge	Euphorbia peplus	Exotic
American Groundnut	Apios americana	May be at Risk
Purple Crown-vetch	Coronilla varia	Exotic
Scotch Broom	Cytisus scoparius	Exotic
Honey-locust	Gleditsia triacanthos	Exotic
Beach Pea	Lathyrus japonicus	Secure
Everlasting-Pea	Lathyrus latifolius	Exotic
Marsh Vetchling	Lathyrus palustris	Secure
Meadow Vetchling	Lathyrus pratensis	Exotic
Narrow-leaved Vetchling	Lathyrus sylvestris	Exotic
Garden Bird's-foot Trefoil	Lotus corniculatus	Exotic
Large-leaved Lupine	Lupinus polyphyllus	Exotic
Black Medick	Medicago lupulina	Exotic
Alfalfa	Medicago sativa	Exotic
Yellow Sweet-clover	Melilotus officinalis	Exotic
Black Locust	Robinia pseudoacacia	Exotic
Soft-haired Thermopsis	Thermopsis mollis	Exotic
Rabbit-foot Clover	Trifolium arvense	Exotic
Yellow Clover	Trifolium aureum	Exotic
Lesser Hop Clover	Trifolium campestre	Exotic
Alsike Clover	Trifolium hybridum	Exotic
Zigzag Clover	Trifolium medium	Exotic
Red Clover	Trifolium pratense	Exotic
White Clover	Trifolium repens	Exotic
Tufted Vetch	Vicia cracca	Exotic
Hairy Vetch	Vicia hirsuta	Exotic
Spring Vetch	Vicia sativa	Exotic
Bush Vetch	Vicia sepium	Exotic
Lentil Vetch	Vicia tetrasperma	Exotic
American Beech	Fagus grandifolia	Secure
English Oak	Quercus robur	Exotic
Red Oak	Quercus rubra	Secure
Speckled Alder	Alnus incana	Secure

Green Alder	Alnus viridis	Secure
Yellow Birch	Betula alleghaniensis	Secure
Heart-leaved Birch	Betula cordifolia	Undetermined
Paper Birch	Betula papyrifera	Secure
Weeping Birch	Betula pendula	Exotic
Gray Birch	Betula populifolia	Secure
Silver Birch	Betula pubescens	Exotic
Bog Birch	Betula pumila	Sensitive
Beaked Hazel	Corylus cornuta	Secure
Ironwood	Ostrya virginiana	May be at Risk
Spreading Dogbane	Apocynum androsaemifolium	Secure
Swamp Milkweed	Asclepias incarnata	May be at Risk
Common Milkweed	Asclepias syriaca	Exotic
Branched Centaury	Centaurium pulchellum	Exotic
Stork's-bill	Erodium cicutarium	Exotic
Meadow Geranium	Geranium pratense	Exotic
Herb Robert	Geranium robertianum	Secure
Common Woodsorrel	Oxalis acetosella	Secure
Creeping Woodsorrel	Oxalis corniculata	Exotic
Dillen's Woodsorrel	Oxalis dillenii	Exotic
European Woodsorrel	Oxalis stricta	Secure
Andean Water Milfoil	Myriophyllum quitense	Undetermined
Spilked Water Milfoil	Myriophyllum sibiricum	Secure
Eurasian Water Milfoil	Myriophyllum spicatum	Exotic
Slender Water Milfoil	Myriophyllum tenellum	May be at Risk
Whorled Water Milfoil	Myriophyllum verticillatum	Undetermined
Witch-hazel	Hamamelis virginiana	May be at Risk
Nuttall's Waterweed	Elodea nuttallii	May be at Risk
Wild Celery	Vallisneria americana	May be at Risk
Lake Quillwort	Isoëtes lacustris	May be at Risk
Butternut	Juglans cinerea	Exotic
Alpine Rush	Juncus alpinoarticulatus	Secure
Arctic Rush	Juncus arcticus	Secure
Jointed Rush	Juncus articulatus	Secure
Short-tailed Rush	Juncus brevicaudatus	Secure
Toad Rush	Juncus bufonius	Secure
Canada Rush	Juncus canadensis	Sensitive
Dudley's Rush	Juncus dudleyi	Undetermined
Soft Rush	Juncus effusus	Secure
Thread Rush	Juncus filiformis	Sensitive
Black-grass Rush	Juncus gerardii	Secure
Greene's Rush	Juncus greenei	May be at Risk
Bayonet Rush	Juncus militaris	Sensitive
Knotted Rush	Juncus nodosus	Secure
Brown-fruited Rush	Juncus pelocarpus	Secure

Path Rush	Juncus tenuis	Secure
Hairy Woodrush	Luzula acuminata	Secure
Common Woodrush	Luzula multiflora	Secure
Small Bugloss	Anchusa arvensis	Exotic
Common Borage	Borago officinalis	Exotic
Common Viper's Bugloss	Echium vulgare	Exotic
European Stickseed	Lappula squarrosa	Exotic
Field Forget-me-not	Myosotis arvensis	Exotic
Small Forget-me-not	Myosotis laxa	Secure
Large Forget-me-not	Myosotis scorpioides	Exotic
Small-flowered Forget-me-not	Myosotis stricta	Exotic
Prickly Comfrey	Symphytum asperum	Exotic
Spring Savory	Acinos arvensis	Exotic
Bifid-lip Hemp-nettle	Galeopsis bifida	Exotic
Common Hemp-nettle	Galeopsis tetrahit	Exotic
Ground Ivy	Glechoma hederacea	Exotic
Purple Dead-nettle	Lamium purpureum	Exotic
Common Motherwort	Leonurus cardiaca	Exotic
Cut-leaved Bugelweed	Lycopus americanus	Secure
Northern Bugleweed	Lycopus uniflorus	Secure
Wild Mint	Mentha arvensis	Secure
Spearmint	Mentha spicata	Exotic
Catnip	Nepeta cataria	Exotic
Wild Marjoram	Origanum vulgare	Exotic
Common Heal-all	Prunella vulgaris	Secure
Hooded Skullcap	Scutellaria galericulata	Secure
Mad-dog Skullcap	Scutellaria lateriflora	Secure
Common Hedge-nettle	Stachys officinalis	Exotic
Marsh Hedge-nettle	Stachys palustris	Undetermined
American Germander	Teucrium canadense	May be at Risk
Lemon Thyme	Thymus pulegioides	Exotic
Stinking Iris	Iris foetidissima	Exotic
Hooker's Iris	Iris hookeri	Undetermined
Yellow Iris	Iris pseudacorus	Exotic
Larger Blue Flag	Iris versicolor	Secure
Mountain Blue-eyed-grass	Sisyrinchium montanum	Secure
Garden Asparagus	Asparagus officinalis	Exotic
Yellow Bluebead Lily	Clintonia borealis	Secure
European Lily-of-the-valley	Convallaria majalis	Exotic
Orange Day Lily	Hemerocallis fulva	Exotic
Yellow Day Lily	Hemerocallis lilioasphodelus	Exotic
Tiger Lily	Lilium lancifolium	Exotic
Wild Lily-of-the-valley	Maianthemum canadense	Secure
Large False Solomon's Seal	Maianthemum racemosum	Secure
Starry False Solomon's Seal	Maianthemum stellatum	Secure

Three-leaved False Soloman's Seal	Maianthemum trifolium	Secure
Indian Cucumber Root	Medeola virginiana	Secure
Poet's Narcissus	Narcissus poeticus	Exotic
Clasping-leaved Twisted-stalk	Streptopus amplexifolius	Secure
Rose Twisted-stalk	Streptopus lanceolatus	Secure
Nodding Trillium	Trillium cernuum	Secure
Painted Trillium	Trillium undulatum	Secure
Pickerelweed	Pontederia cordata	May be at Risk
Fairy Flax	Linum catharticum	Exotic
Common Yellow Flax	Linum usitatissimum	Exotic
Northern Clubmoss	Diphasiastrum complanatum	Sensitive
Southern Clubmoss	Diphasiastrum digitatum	Secure
Sitka Clubmoss	Diphasiastrum sitchense	May be at Risk
Blue Ground-cedar	Diphasiastrum tristachyum	Sensitive
Shining Firmoss	Huperzia lucidula	Secure
Northern Bog Clubmoss	Lycopodiella inundata	Secure
Stiff Clubmoss	Lycopodium annotinum	Secure
Running Clubmoss	Lycopodium clavatum	Secure
Prickly Tree Clubmoss	Lycopodium dendroideum	Secure
One-cone Clubmoss	Lycopodium lagopus	Undetermined
Flat-branched Tree Clubmoss	Lycopodium obscurum	Undetermined
Velvet-leaf	Abutilon theophrasti	Exotic
Flower-of-an-hour	Hibiscus trionum	Exotic
Musk Mallow	Malva moschata	Exotic
Common Mallow	Malva neglecta	Exotic
Whorled Mallow	Malva verticillata	Exotic
Sweet-fern	Comptonia peregrina	Secure
Sweet Gale	Myrica gale	Secure
Northern Bayberry	Myrica pensylvanica	Secure
Swamp Loosestrife	Decodon verticillatus	May be at Risk
Purple Loosestrife	Lythrum salicaria	Exotic
Fireweed	Chamerion angustifolium	Secure
Small Enchanter's Nightshade	Circaea alpina	Secure
Broad-leaved Enchanter's Nightshade	Circaea lutetiana	Sensitive
Hairy Willowherb	Epilobium ciliatum	Secure
Great Hairy Willowherb	Epilobium hirsutum	Exotic
Bog Willowherb	Epilobium leptophyllum	Secure
Marsh Willowherb	Epilobium palustre	Secure
Downy Willowherb	Epilobium strictum	Sensitive
Common Evening Primrose	Oenothera biennis	Secure
Northern Evening Primrose	Oenothera parviflora	Secure
Small Evening Primrose	Oenothera perennis	Secure
Hairy Evening Primrose	Oenothera villosa	Undetermined
Daphne	Daphne mezereum	Exotic

Gaspé Arrowgrass	Triglochin gaspensis	Sensitive
Seaside Arrowgrass	Triglochin maritima	Secure
Marsh Arrowgrass	Triglochin palustris	May be at Risk
Slender Naiad	Najas flexilis	May be at Risk
Alpine Pondweed	Potamogeton alpinus	May be at Risk
Ribbon-leaved Pondweed	Potamogeton epihydrus	May be at Risk
Leafy Pondweed	Potamogeton foliosus	Undetermined
Fries' Pondweed	Potamogeton friesii	Secure
Variable-leaved Pondweed	Potamogeton gramineus	Undetermined
Floating-leaved Pondweed	Potamogeton natans	Secure
Oakes' Pondweed	Potamogeton oakesianus	May be at Risk
Blunt-leaved Pondweed	Potamogeton obtusifolius	Sensitive
Clasping-leaved Pondweed	Potamogeton perfoliatus	Secure
White-stemmed Pondweed	Potamogeton praelongus	Secure
Small Pondweed	Potamogeton pusillus	Undetermined
Richardson's Pondweed	Potamogeton richardsonii	May be at Risk
Thread-leaved Pondweed	Stuckenia filiformis	Undetermined
Sago Pondweed	Stuckenia pectinata	Secure
Big-sheathed Pondweed	Stuckenia vaginata	May be at Risk
Sea Ditchgrass	Ruppia maritima	Secure
Horned Pondweed	Zannichellia palustris	Undetermined
Common Eelgrass	Zostera marina	Secure
Spoon-leaved Sundew	Drosera intermedia	May be at Risk
Round-leaved Sundew	Drosera rotundifolia	Secure
Northern Pitcher Plant	Sarracenia purpurea	Secure
Water-shield	Brasenia schreberi	May be at Risk
Common Coontail	Ceratophyllum demersum	Secure
Variegated Pond-lily	Nuphar variegata	Secure
Fragrant Water-lily	Nymphaea odorata	May be at Risk
Dissected Moonwort	Botrychium dissectum	May be at Risk
Triangle Moonwort	Botrychium lanceolatum	May be at Risk
Daisy-leaved Moonwort	Botrychium matricariifolium	May be at Risk
Leathery Moonwort	Botrychium multifidum	May be at Risk
Least Moonwort	Botrychium simplex	May be at Risk
Rattlesnake Fern	Botrychium virginianum	Secure
Northern Adder's-tongue	Ophioglossum pusillum	May be at Risk
Arethusa	Arethusa bulbosa	May be at Risk
Tuberous Grass-pink	Calopogon tuberosus	Secure
Spotted Coral-root	Corallorhiza maculata	May be at Risk
Early Coral-root	Corallorhiza trifida	Sensitive
Pink Lady's-slipper	Cypripedium acaule	Secure
Yellow Lady's-slipper	Cypripedium parviflorum	Sensitive
Showy Lady's-slipper	Cypripedium reginae	Sensitive
Helleborine	Epipactis helleborine	Exotic
Menzies' Rattlesnake-plantain	Goodyera oblongifolia	May be at Risk

Lesser Rattlesnake-plantain	Goodyera repens	May be at Risk
Checkered Rattlesnake-plantain	Goodyera tesselata	May be at Risk
Loesel's Twayblade	Liparis loeselii	May be at Risk
Southern Twayblade	Listera australis	May be at Risk
Broad-leaved Twayblade	Listera convallarioides	May be at Risk
Heart-leaved Twayblade	Listera cordata	Sensitive
Green Adder's-mouth	Malaxis unifolia	Sensitive
Tall Northern Green Orchid	Platanthera aquilonis	Sensitive
White Fringed-orchid	Platanthera blephariglottis	Sensitive
Club Spur Orchid	Platanthera clavellata	Sensitive
White Bog Orchid	Platanthera dilatata	Sensitive
Ragged Fringed-orchid	Platanthera lacera	Secure
Blunt-leaved Orchid	Platanthera obtusata	May be at Risk
Small Round-leaved Orchid	Platanthera orbiculata	Sensitive
Small Purple Fringed-orchid	Platanthera psycodes	Secure
Rose Pogonia	Pogonia ophioglossoides	Sensitive
Nodding Ladies'-tresses	Spiranthes cernua	May be at Risk
Slender Ladies'-tresses	Spiranthes lacera	Secure
Yellow Ladies'-tresses	Spiranthes ochroleuca	May be at Risk
Hooded Ladies'-tresses	Spiranthes romanzoffiana	Sensitive
Pale Corydalis	Corydalis sempervirens	Sensitive
Dutchman's-breeches	Dicentra cucullaria	May be at Risk
Common Fumitory	Fumaria officinalis	Exotic
Greater Celandine	Chelidonium majus	Exotic
California Poppy	Eschscholzia californica	Exotic
Common Juniper	Juniperus communis	Secure
Creeping Juniper	Juniperus horizontalis	Secure
Eastern White Cedar	Thuja occidentalis	Secure
Balsam Fir	Abies balsamea	Secure
Tamarack	Larix laricina	Secure
White Spruce	Picea glauca	Secure
Black Spruce	Picea mariana	Secure
Red Spruce	Picea rubens	Secure
Jack Pine	Pinus banksiana	Sensitive
Red Pine	Pinus resinosa	Secure
Eastern White Pine	Pinus strobus	Secure
Scotch Pine	Pinus sylvestris	Exotic
Eastern Hemlock	Tsuga canadensis	Secure
English Plantain	Plantago lanceolata	Exotic
Common Plantain	Plantago major	Exotic
Seaside Plantain	Plantago maritima	Secure
Sea Lavender	Limonium carolinianum	Secure
Blood-red Milkwort	Polygala sanguinea	May be at Risk
Common Buckwheat	Fagopyrum esculentum	Exotic
Fringed Bindweed	Fallopia cilinodis	Secure

Black Bindweed	Fallopia convolvulus	Exotic
Japanese Knotweed	Fallopia japonica	Exotic
Giant Knotweed	Fallopia sachalinensis	Exotic
Climbing False Buckwheat	Fallopia scandens	Undetermined
Water Smartweed	Persicaria amphibia	Secure
Halberd-leaved Tearthumb	Persicaria arifolia	Sensitive
Water-pepper	Persicaria hydropiper	Exotic
Pale Smartweed	Persicaria lapathifolia	Secure
Lady's-thumb	Persicaria maculosa	Exotic
Dotted Smartweed	Persicaria punctata	May be at Risk
Arrow-leaved Tearthumb	Persicaria sagittata	Secure
Prostrate Knotweed	Polygonum aviculare	Secure
Fowler's Knotweed	Polygonum fowleri	Undetermined
Sharp-fruited Knotweed	Polygonum oxyspermum	Undetermined
Bushy Knotweed	Polygonum ramosissimum	Sensitive
Common Sorrel	Rumex acetosa	Exotic
Sheep Sorrel	Rumex acetosella	Exotic
Greater Water Dock	Rumex brittanica	Secure
Curly Dock	Rumex crispus	Exotic
Tierra del Fuego Dock	Rumex fueginus	Sensitive
Dooryard Dock	Rumex longifolius	Exotic
Broad-leaved Dock	Rumex obtusifolius	Exotic
White Dock	Rumex pallidus	Undetermined
Triangular-valved Dock	Rumex triangulivalvis	Exotic
Virginia Chain Fern	Woodwardia virginica	May be at Risk
Eastern Hay-scented Fern	Dennstaedtia punctilobula	Secure
Bracken	Pteridium aquilinum	Secure
Lady Fern	Athyrium filix-femina	Secure
Mackay's Brittle Fern	Cystopteris tenuis	May be at Risk
Silvery Spleenwort	Deparia acrostichoides	Sensitive
Mountain Wood Fern	Dryopteris campyloptera	Secure
Spinulose Wood Fern	Dryopteris carthusiana	Secure
Crested Wood Fern	Dryopteris cristata	Secure
Evergreen Wood Fern	Dryopteris intermedia	Secure
Common Oak Fern	Gymnocarpium dryopteris	Secure
Ostrich Fern	Matteuccia struthiopteris	Secure
Sensitive Fern	Onoclea sensibilis	Secure
Christmas Fern	Polystichum acrostichoides	Secure
Braun's Holly Fern	Polystichum braunii	May be at Risk
Cinnamon Fern	Osmunda cinnamomea	Secure
Interrupted Fern	Osmunda claytoniana	Secure
Royal Fern	Osmunda regalis	Secure
Appalachian Polypody	Polypodium appalachianum	May be at Risk
Rock Polypody	Polypodium virginianum	May be at Risk
Northern Beech Fern	Phegopteris connectilis	Secure

New York Fern	Thelypteris noveboracensis	Secure
Marsh Fern	Thelypteris palustris	Secure
Scarlet Pimperel	Anagallis arvensis	Exotic
Sea Milkwort	Glaux maritima	Secure
Fringed Yellow Loosestrife	Lysimachia ciliata	Exotic
Creeping Jenny	Lysimachia nummularia	Exotic
Spotted Yellow Loosestrife	Lysimachia punctata	Exotic
Swamp Yellow Loosestrife	Lysimachia terrestris	Secure
Tufted Yellow Loosestrife	Lysimachia thyrsiflora	Secure
Garden Yellow Loosestrife	Lysimachia vulgaris	Exotic
Valerand's Brookweed	Samolus valerandi	Undetermined
Northern Starflower	Trientalis borealis	Secure
Japanese Barberry	Berberis thunbergii	Exotic
Common Barberry	Berberis vulgaris	Exotic
White Baneberry	Actaea pachypoda	May be at Risk
Red Baneberry	Actaea rubra	Secure
Canada Anemone	Anemone canadensis	May be at Risk
Garden Columbine	Aquilegia vulgaris	Exotic
Marsh Marigold	Caltha palustris	Secure
Virginia Virgin's-bower	Clematis virginiana	Sensitive
Goldthread	Coptis trifolia	Secure
Kidney-leaved Buttercup	Ranunculus abortivus	Secure
Common Buttercup	Ranunculus acris	Exotic
White Water-buttercup	Ranunculus aquatilis	Secure
Seaside Buttercup	Ranunculus cymbalaria	Secure
Small Yellow Water-buttercup	Ranunculus gmelinii	Sensitive
Hispid Buttercup	Ranunculus hispidus	Undetermined
Bristly Buttercup	Ranunculus pensylvanicus	Undetermined
Hooked Buttercup	Ranunculus recurvatus	May be at Risk
Creeping Buttercup	Ranunculus repens	Exotic
Cursed Buttercup	Ranunculus sceleratus	May be at Risk
Northern Meadow-rue	Thalictrum confine	Undetermined
Tall Meadow-rue	Thalictrum pubescens	Secure
Glossy Buckthorn	Frangula alnus	Exotic
Alder-leaved Buckthorn	Rhamnus alnifolia	Secure
European Buckthorn	Rhamnus cathartica	Exotic
Dahurian Buckthorn	Rhamnus davurica	Exotic
Virginia Creeper	Parthenocissus quinquefolia	Exotic
Riverbank Grape	Vitis riparia	Exotic
Water Pygmyweed	Crassula aquatica	Extinct
Live-forever	Hylotelephium telephium	Exotic
Mossy Stonecrop	Sedum acre	Exotic
Crooked Yellow Stonecrop	Sedum reflexum	Exotic
Skunk Currant	Ribes glandulosum	Secure
Smooth Gooseberry	Ribes hirtellum	Secure

Bristly Black Currant	Ribes lacustre	Secure
Garden Black Currant	Ribes nigrum	Exotic
Northern Red Currant	Ribes rubrum	Exotic
Swamp Red Currant	Ribes triste	Secure
Tall Hairy Grooveburr	Agrimonia gryposepala	Sensitive
Creeping Grooveburr	Agrimonia repens	Exotic
Woodland Agrimony	Agrimonia striata	Secure
Mountain Serviceberry	Amelanchier bartramiana	Secure
Canada Serviceberry	Amelanchier canadensis	Undetermined
Fernald's Serviceberry	Amelanchier fernaldii	Undetermined
Shadbush	Amelanchier interior	Secure
Smooth Serviceberry	Amelanchier laevis	Undetermined
Running Serviceberry	Amelanchier stolonifera	Undetermined
Silverweed	Argentina anserina	Secure
Egede Cinquefoil	Argentina egedii	Secure
Marsh Cinquefoil	Comarum palustre	Secure
Fireberry Hawthorn	Crataegus chrysocarpa	Undetermined
Holmes' Hawthorn	Crataegus holmesiana	Undetermined
One-seeded Hawthorn	Crataegus monogyna	Exotic
Fleshy Hawthorn	Crataegus succulenta	Undetermined
Robin-Runaway	Dalibarda repens	May be at Risk
Shrubby Cinquefoil	Dasiphora fruticosa	May be at Risk
Queen-of-the-meadow	Filipendula ulmaria	Exotic
Virginia Strawberry	Fragaria virginiana	Secure
Yellow Avens	Geum aleppicum	Secure
White Avens	Geum canadense	Sensitive
Rough Avens	Geum laciniatum	Secure
Large-leaved Avens	Geum macrophyllum	Secure
Purple Avens	Geum rivale	Secure
Common Apple	Malus pumila	Exotic
Purple Chokeberry	Photinia floribunda	Secure
Black Chokeberry	Photinia melanocarpa	Secure
Red Chokeberry	Photinia pyrifolia	Secure
Silvery Cinquefoil	Potentilla argentea	Exotic
Graceful Cinquefoil	Potentilla gracilis	Exotic
Ashy Cinquefoil	Potentilla inclinata	Exotic
Downy Cinquefoil	Potentilla intermedia	Exotic
Norwegian Cinquefoil	Potentilla norvegica	Secure
Sulphur Cinquefoil	Potentilla recta	Exotic
Oldfield Cinquefoil	Potentilla simplex	Secure
Sour Cherry	Prunus cerasus	Exotic
Canada Plum	Prunus nigra	Exotic
Pin Cherry	Prunus pensylvanica	Secure
Choke Cherry	Prunus virginiana	Secure
Carolina Rose	Rosa carolina	Sensitive

Cabbage Rose	Rosa centifolia	Exotic
a Rose	Rosa majalis	Exotic
Small-flowered Sweetbrier	Rosa micrantha	Exotic
Shining Rose	Rosa nitida	Secure
Rugosa Rose	Rosa rugosa	Exotic
Scotch Rose	Rosa spinosissima	Exotic
Woolly Rose	Rosa tomentosa	Exotic
Virginia Rose	Rosa virginiana	Secure
Alleghaney Blackberry	Rubus allegheniensis	Secure
Wand Dewberry	Rubus arcuans	Undetermined
Smooth Blackberry	Rubus canadensis	Secure
Cloudberry	Rubus chamaemorus	Secure
Showy Blackberry	Rubus elegantulus	Undetermined
Bristly Dewberry	Rubus hispidus	Secure
Red Raspberry	Rubus idaeus	Exotic
Pennsylvania Blackberry	Rubus pensilvanicus	Undetermined
Dwarf Red Raspberry	Rubus pubescens	Secure
Prince Edward Island Blackberry	Rubus quaesitus	Undetermined
Nova Scotia Dewberry	Rubus segnis	Undetermined
Wet-thicket Dewberry	Rubus tardatus	Undetermined
Vermont Blackberry	Rubus vermontanus	Undetermined
Three-toothed Cinquefoil	Sibbaldiopsis tridentata	Secure
False Spiraea	Sorbaria sorbifolia	Exotic
American Mountain Ash	Sorbus americana	Secure
European Mountain Ash	Sorbus aucuparia	Exotic
Showy Mountain Ash	Sorbus decora	Undetermined
Narrow-leaved Meadow-sweet	Spiraea alba	Secure
Steeplebush	Spiraea tomentosa	Secure
American Golden Saxifrage	Chrysosplenium americanum	Secure
Bare-Stem Bishop's-cap	Mitella nuda	Secure
Marsh Grass-of-parnassus	Parnassia palustris	May be at Risk
Spotted Jewelweed	Impatiens capensis	Secure
Purple Jewelweed	Impatiens glandulifera	Exotic
Small-flowered Jewelweed	Impatiens parviflora	Exotic
Rough Bedstraw	Galium asprellum	Secure
Northern Bedstraw	Galium boreale	May be at Risk
Bog Bedstraw	Galium labradoricum	May be at Risk
Great Hedge Bedstraw	Galium mollugo	Exotic
Common Marsh Bedstraw	Galium palustre	Secure
Stiff Marsh Bedstraw	Galium tinctorium	Secure
Small Bedstraw	Galium trifidum	Secure
Fragrant Bedstraw	Galium triflorum	Secure
Yellow Spring Bedstraw	Galium verum	Exotic
Partridge Berry	Mitchella repens	May be at Risk
White Poplar	Populus alba	Exotic

Balsam Poplar	Populus balsamifera	Sensitive
Largetooth Aspen	Populus grandidentata	Secure
Lombardy Poplar	Populus nigra	Exotic
Trembling Aspen	Populus tremuloides	Secure
White Willow	Salix alba	Exotic
Bebb's Willow	Salix bebbiana	Secure
Hoary Willow	Salix candida	May be at Risk
Pussy Willow	Salix discolor	Secure
Heart-leaved Willow	Salix eriocephala	Secure
Crack Willow	Salix fragilis	Exotic
Prairie Willow	Salix humilis	Secure
Shining Willow	Salix lucida	Secure
Meadow Willow	Salix petiolaris	May be at Risk
Purple Willow	Salix purpurea	Exotic
Balsam Willow	Salix pyrifolia	Secure
Basket Willow	Salix viminalis	Exotic
Bastard's Toadflax	Comandra umbellata	Sensitive
Eastern Dwarf Mistletoe	Arceuthobium pusillum	Secure
Hedge Maple	Acer campestre	Exotic
Manitoba Maple	Acer negundo	Exotic
Striped Maple	Acer pensylvanicum	Secure
Norway Maple	Acer platanoides	Exotic
Red Maple	Acer rubrum	Secure
Sugar Maple	Acer saccharum	Secure
Mountain Maple	Acer spicatum	Secure
Staghorn Sumac	Rhus typhina	Sensitive
Northern Poison Oak	Toxicodendron rydbergii	Secure
Horned Bladderwort	Utricularia cornuta	May be at Risk
Twin-stemmed Bladderwort	Utricularia geminiscapa	May be at Risk
Greater Bladderwort	Utricularia macrorhiza	May be at Risk
Lesser Bladderwort	Utricularia minor	May be at Risk
White Ash	Fraxinus americana	Secure
Black Ash	Fraxinus nigra	May be at Risk
Red Ash	Fraxinus pennsylvanica	Exotic
Common Lilac	Syringa vulgaris	Exotic
Beechdrops	Epifagus virginiana	Sensitive
One-flowered Broomrape	Orobanche uniflora	May be at Risk
Dwarf Snapdragon	Chaenorhinum minus	Exotic
White Turtlehead	Chelone glabra	Secure
Common Eyebright	Euphrasia nemorosa	Secure
Small Eyebright	Euphrasia randii	Undetermined
Stiff Eyebright	Euphrasia stricta	Exotic
Welsh Mudwort	Limosella australis	Secure
Moroccan Toadflax	Linaria maroccana	Exotic
Butter-and-eggs	Linaria vulgaris	Exotic

Yellow-seeded False Pimperel	Lindernia dubia	May be at Risk
American Cow Wheat	Melampyrum lineare	Secure
Muskflower	Mimulus moschatus	Exotic
Square-stemmed Monkey Flower	Mimulus ringens	Sensitive
Old-field Toadflax	Nuttallanthus canadensis	Exotic
Red Bartsia	Odontites vernus	Exotic
Little Yellow Rattle	Rhinanthus minor	Secure
Woodland Figwort	Scophularia nodosa	Exotic
Orange Mullein	Verbascum phlomoides	Exotic
Great Mullein	Verbascum thapsus	Exotic
American Speedwell	Veronica americana	Secure
Corn Speedwell	Veronica arvensis	Exotic
Germander Speedwell	Veronica chamaedrys	Exotic
Long-leaved Speedwell	Veronica longifolia	Exotic
Gypsyweed	Veronica officinalis	Exotic
Purslane Speedwell	Veronica peregrina	Exotic
Bird-eye Speedwell	Veronica persica	Exotic
Marsh Speedwell	Veronica scutellata	Secure
Thyme-leaved Speedwell	Veronica serpyllifolia	Exotic
Spring Speedwell	Veronica verna	Exotic
Hedge Bindweed	Calystegia sepium	Secure
Field Bindweed	Convolvulus arvensis	Exotic
Gronovius Dodder	Cuscuta gronovii	May be at Risk
Bog Buckbean	Menyanthes trifoliata	Secure
Narrow-leaved Collomia	Collomia linearis	Exotic
Jimsonweed	Datura stramonium	Exotic
Black Henbane	Hyoscyamus niger	Exotic
Apple-of-Peru	Nicandra physalodes	Exotic
Climbing Nightshade	Solanum dulcamara	Exotic
Eastern Black Nightshade	Solanum ptychanthum	Exotic
Horned Nightshade	Solanum rostratum	Exotic
Potato	Solanum tuberosum	Exotic
Canada Yew	Taxus canadensis	Secure
Canada St. John's-wort	Hypericum canadense	Secure
Pale St. John's-wort	Hypericum ellipticum	Undetermined
False St. John's-wort	Hypericum gentianoides	Exotic
Larger St. John's-wort	Hypericum majus	May be at Risk
Dwarf St. John's-wort	Hypericum mutilum	Secure
Common St. John's-wort	Hypericum perforatum	Exotic
Fraser's Marsh St. John's-wort	Triadenum fraseri	Secure
Small Waterwort	Elatine minima	May be at Risk
American Burreed	Sparganium americanum	Undetermined
Narrow-leaved Burreed	Sparganium angustifolium	Secure
Green-fruited Burreed	Sparganium emersum	Secure
Broad-fruited Burreed	Sparganium eurycarpum	Secure

Floating Burreed	Sparganium fluctuans	Undetermined
Small Burreed	Sparganium natans	May be at Risk
Narrow-leaved Cattail	Typha angustifolia	Secure
Broad-leaved Cattail	Typha latifolia	Secure
Common Hop	Humulus lupulus	Undetermined
White Elm	Ulmus americana	Sensitive
Canada Wood-nettle	Laportea canadensis	May be at Risk
Canada Clearweed	Pilea pumila	May be at Risk
Stinging Nettle	Urtica dioica	Secure
Burning Nettle	Urtica urens	Exotic
Golden Heather	Hudsonia ericoides	May be at Risk
Woolly Beach-heath	Hudsonia tomentosa	Secure
Large-podded Pinweed	Lechea intermedia	Secure
Beach Pinweed	Lechea maritima	May be at Risk
Wild Cucumber	Echinocystis lobata	Exotic
Small Wild Pansy	Viola arvensis	Exotic
Smooth White Violet	Viola blanda	Secure
Marsh Blue Violet	Viola cucullata	Secure
Labrador Violet	Viola labradorica	Sensitive
Lance-leaved Violet	Viola lanceolata	May be at Risk
Smooth White Violet	Viola macloskeyi	Secure
Northern Bog Violet	Viola nephrophylla	May be at Risk
Downy Yellow Violet	Viola pubescens	Sensitive
Kidney-leaved White Violet	Viola renifolia	Secure
Arrow-leaved Violet	Viola sagittata	Extinct
Northern Woodland Violet	Viola septentrionalis	Secure
Johnny-jump-up	Viola tricolor	Exotic