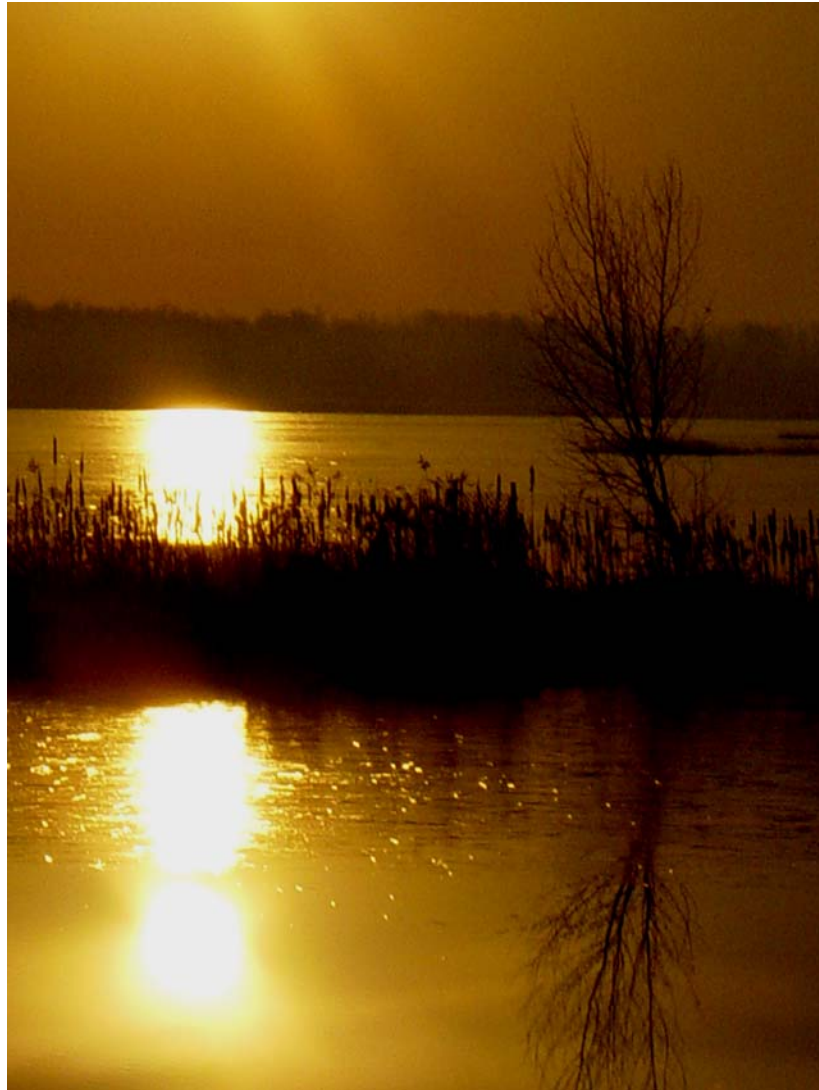


# MAC JOHNSON WILDLIFE AREA MASTER PLAN



**JANUARY 2007**

# **MAC JOHNSON WILDLIFE AREA MASTER PLAN**

Produced for the  
Cataraqui Region Conservation Authority

by  
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## **Resolution of Adoption by CRCA**

This Master Plan was adopted by the Full Authority Board of the Cataraqui Region Conservation Authority (CRCA) through Resolution 102-06 on November 22, 2006. It updates and replaces the *Master Plan for the Buells Creek Conservation Area* created in 1983. (The Area was renamed the Mac Johnson Wildlife Area in 1987). This Master Plan shall be subject to cursory review every five years and a comprehensive review every ten years.

## **Acknowledgements**

The efforts of the following in the preparation of this Master Plan are gratefully acknowledged:

- ❖ Eastern Ontario Development Fund for financial support of this project.
- ❖ Friends of Mac Johnson Wildlife Area for their sustained dedication to the property and for their financial support of this Master Plan.
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## **Executive Summary**

A Master Plan is developed to determine the best use and direction for a property over a twenty year horizon. Through the master planning process for the Mac Johnson Wildlife Area (MJWA), a vision for the long-term use of the property was developed, goals were set, and specific actions to be taken to meet these goals were identified. The process also identified the steps needed to respond to regional and local growth and the interests of stakeholders while creating an optimal future for the area.

### **❖ The Wildlife Area**

The MJWA, established in 1968, encompasses 532 hectares, of which 85 percent are wetland and open water. The remaining acreage consists of forests, fields, trails, and developed areas. At the heart of MJWA is the Buells Creek Reservoir, a Provincially Significant Wetland (PSW). A dam on the reservoir, the Broome-Runciman dam, was built in 1967 to provide flood control for the downstream City of Brockville by regulating flows in Buells Creek.

Visitors to MJWA come from two separate populations: those within walking distance of the property and those from further afield. Because the neighbouring residences are primarily south of Centennial Road, visitors who arrive on foot primarily use the trails south of the reservoir. Visitors from further away are more likely to drive into the Debruge Road entrance and use the northern trails.

The population using MJWA, like the population of Ontario, is growing and aging. Local development, currently occurring south of Centennial Road and along County Road 29, is expected to continue. Aging trends are also expected to continue over the next twenty years. MJWA, with its passive recreation favoured by older populations, will continue to be valued for its trails and nature experience as the population ages. This master plan accommodates these trends.

The property serves six primary functions:

- 1) It provides important woodland, meadow, wetland, and open water habitat for almost 600 plant species, over 160 bird species, and a multitude of other fauna.
- 2) The dam and reservoir provide flood control for the City of Brockville.
- 3) The property is home to the Eastern Service Centre for maintenance of all CRCA properties and water control structures in the eastern portion of the Cataraqui region.
- 4) Its trails and facilities provide passive outdoor recreation opportunities.
- 5) Environmental education programs are offered from the property.
- 6) Wildlife enhancement projects such as the Trumpeter Swan Restoration Program are supported at MJWA.

Through the master planning process, it was identified that these functions are most important to stakeholders and should be enhanced and supported over the next twenty years. The steps recommended to enhance these functions are outlined below.

### **❖ The Master Planning Process**

The master planning process, which began in 2005, was intended to update the existing 1983 Master Plan for the property. In preparation for updating the Master Plan, a facilitated

workshop was held May 16, 2005 with a group of stakeholders with varying interests in the property. The issues and recommendations raised in that meeting are summarized in the document *“Issues and Focus Paper: Background to Updating the Stewardship Plan for Mac Johnson Wildlife Area”*, of May 30, 2005.

At that meeting, stakeholders developed the following Draft Vision Statement for MJWA:

Mac Johnson Wildlife Area will continue to be appreciated as an important place, with significant intrinsic natural and cultural heritage values, which provides control of water flows at Buells Creek. The wildlife area will continue to afford valued opportunities for outdoor activity, focusing on appropriate recreational pursuits and environmental learning experiences, healthy living and care for the environment. The local community and visitors to the property will continue to collaborate with the Catawqui Region Conservation Authority in the stewardship and protection of the Mac Johnson Wildlife Area.

A public open house was held to discuss conceptual plans for MJWA on December 1, 2005. Three concepts were proposed at the open house:

- Northlands Growth (development northwest of the reservoir);
- Southlands Growth (development south of the reservoir); and
- Status Quo (no significant development).

Stakeholders were asked to rate these options and/or offer their own concept, including combinations of the above. They were also encouraged to offer specific comments on the property and its future management.

#### ❖ **Property Management Plan**

From comments suggested at the Open House and input gathered from other stakeholders, the direction for the property was developed for the next twenty years:

To retain the status quo with limited northlands development and specific alterations to enhance the property.

Priority was placed on the retention of all of the six primary functions of the property. As a result, maintenance of existing features (trails, buildings, wildlife habitats) directs much of the management plan. Habitat protection includes continuing to minimize access to both the northeastern portion of the property and to habitats for Species at Risk and Species of Special Interest.

In addition to maintenance, the specific alterations to be made to enhance the property within the next twenty years are as follows:

- Improvements to Trails
  - Rationalizing trails;
  - Improvement of MJWA trail access points through completion of the fencing along Centennial Road and connections to the Brock Trail;
  - Construction of benches and picnic areas along southland trails;

- Extension of Trail 5 east to the canoe access point; and
- Restriction of bicyclists to southland trails
- Improvements to Facilities
  - Construction of a new Nature Centre (Building #4 on Figure 3) nearer to the main parking lot
  - Use of the existing Nature Centre (Building #5 on Figure 2) as a storage facility
  - Construction of an addition onto the south side of the Workshop (Building #1 on Figure 2)
  - Sale of the Rental Property/Boardroom (Building #2 on Figure 2)
  - Removal of the existing washrooms (Building #4 on Figure 2) following construction of the new Nature Centre with insulated bathrooms that can be accessed from outside the centre
  - Construction of a new Skating Warming Hut (Building #6 on Figure 2)
  - Consolidation of parking lots along Centennial Road
- Retention and Enhancement of Wildlife Area Features
  - Hosting volunteer and/or staff BioBlitzes in all four seasons and on an on-going basis every few years
  - Minimizing the negative impacts of the likely upgrading of Centennial Road to an arterial standard. Steps to be taken will include:
    - (1) shrub and tree planting along Centennial Road;
    - (2) CRCA involvement in municipal planning of lighting, crosswalks, and stormwater management; and
    - (3) monitoring and addressing the impacts of the road upgrade
  - Investigating and addressing concerns regarding degradation of the wetlands surrounding the beaver pond
  - Monitoring water quality in the reservoir and beaver pond to accomplish the following:
    - determine both baseline levels and trends in the reservoir and beaver pond
    - identify water quality issues
    - evaluate whether eutrophication is occurring

In addition, the following will be undertaken within the duration of this master plan:

- Identification and promotion of partnerships and partnering projects
- Completion of a Marketing and Financial Feasibility Study
- Enhancing recognition of MJWA

An implementation schedule and relative costs for the above-listed projects are presented in the final two sections of this document.

## 1.0 Introduction

The Cataraqui Region Conservation Authority (CRCA) prepares master plans to guide the management, operation and development of its properties. These plans express how these properties will contribute to achieving the goals of the CRCA and define the property uses, development and policies that will maintain or enhance that contribution over a 20 year period. The goals of the CRCA are presented in the document [Strategic Plan: Cataraqui to 2020](#) (2001).

Mac Johnson Wildlife Area (MJWA) has an existing master plan, which was adopted in 1983. Since that time, the CRCA has adopted a new strategic plan and changes have occurred at MJWA, including changes in the uses of the property and development of the surrounding neighbourhoods. The preparation of a new plan for the MJWA is an opportunity to address management issues, consult with the public, and update the long-term management direction through the year 2026.

### 1.1 Goals of the Master Plan

The purpose of a master plan is to establish the policy guidelines for the planning, preservation, development, use and management of a conservation area. To achieve this purpose, the following goals for the MJWA Master Plan have been identified:

- To evaluate current conditions and existing biophysical, cultural and historical data;
- To assess current and potential user demands through consideration of the market area, site features, and site accessibility;
- To identify attributes for conservation, education and recreation activities;
- To identify ways in which those aspects that make MJWA a significant wildlife area can be maintained and enhanced;
- To evaluate concept alternatives as directed by site resource factors and public input;
- To present a vision and long-term plan for the area and the management direction and actions required to achieve these; and
- To serve as a working document to guide CRCA staff in management of the site planning and operations.

### 1.2 Report Layout

The MJWA property is described in Section 2. Section 3 sets MJWA in its regional setting as part of the UNESCO World Biosphere Reserve and as an element in the two municipalities in which it lies. The current uses of MJWA are presented in Section 4. The natural and cultural elements of MJWA are discussed in Section 5, as is the creation of the area and its designation as the MJWA.

A market analysis is presented in Section 6 that evaluates future user demand for MJWA. The steps followed in the process of developing the master plan, including a visioning exercise and public consultation, are described in Section 7. Section 8 presents the results of the master planning process, which include four major actions and some smaller actions that will support continued maintenance and enhancement of the desired aspects of MJWA. Section 9 discusses land acquisition and disposal and Section 10 identifies significant partners to MJWA. An implementation framework and relative costs are developed in Section 11. Section 12 presents a brief summary of this master plan.

## 2.0 Site Description

### 2.1 Location

The main entrance to MJWA is located at 4649 Debruge Road, Elizabethtown. MJWA is in the eastern portion of the Cataraqui Region, primarily in the Township of Elizabethtown-Kitley, with a portion in the City of Brockville. It is bounded by Centennial Road to the south, Debruge Road to the north, and the closed McLarry road right-of-way on the west. It lies two km east of County Road 29 (See Figure 1).

### 2.2 Bio-physical Description

The property includes 532 ha of wetlands, fields and forests and provides flood control, opportunities for outdoor recreation and education, and a nature refuge for a wide diversity of plant and animal species.

Buells Creek runs through the eastern portion of the property and a dam, the Broome-Runciman dam, on the reservoir serves as the first of three water control structures that work in conjunction with one another along Buells Creek to provide flood control to the City of Brockville. The dam also provides low flow augmentation in Buells Creek during summer months.

The reservoir has areas of open water and emergent vegetation and is a part of the larger Buells Creek Reservoir, which is a Provincially Significant Wetland (PSW). This wetland is maintained by the presence of the dam and covers approximately 663 ha, only a portion of which is on MJWA.

The upland portions of the property contain a wide variety of forests, including swamp deciduous woods, mature evergreen forest, and sugar maple woods. Meadows, shrub land and open fields are also present. The land has a high point of 114 metres above mean sea level near the main entrance and slopes gently down to the reservoir with elevation of about 102 metres.

The accessible lands of the property are divided into two physically distinct regions:

- the *northlands*, which are bounded by McLarry Rd. (closed road right-of-way) to the west, Debruge Rd. to the north and southeast facing frontage on the Buells Creek Reservoir. The northlands include two sand dunes, seven of the eight buildings on the property and the operational and visitor centre hub of the property.
- the *southlands*, which are bound by McLarry Rd. (closed road right-of-way) to the west, Centennial Rd. to the south and northeast facing frontage on the Buells Creek Reservoir. Limestone bedrock with little or no soil dominates the southlands which are bisected by the Transcanada Pipeline. The southlands contain the Broome-Runciman Dam, a canoe access launch for the reservoir, the McGhie House, and two parking lots.

The boundary between these two regions is the beaver pond as shown in Figure 2.

### 2.3 Facilities

The main entrance to MJWA is from Debruge Road (Figure 2). A picnic pavilion (labelled) and washrooms (Building 4; Figure 2) abut the main parking lot. A nature centre (Building 5) is a

Figure 1 MJWA Locator Map

short distance west of the washrooms and an inactive campground area with washrooms (Building 7) is yet another 200 metres to the west. A swan compound composed of a shelter with both indoor and outdoor roofed areas (Building 3) and a fenced field sits just north of a small lagoon created off the reservoir. A skating warming hut (Building 6) is further west, near a second small lagoon.

The service entrance, located further east along Debruge Road, accesses the workshop (Building 1), which serves as the Eastern Service Centre for all CRCA properties. A second building (Building 2) accessed from this entrance is divided into two; one half serves as a CRCA boardroom and related rooms, and the other half is rented out as a residence.

A second residence, called the McGhie house (Building 8), is near the southeast corner of the property on Centennial Road.

### **3.0 Setting**

#### **3.1 UNESCO<sup>1</sup> World Biosphere Reserve**

MJWA lies along the northeastern side of the Frontenac Arch Biosphere Reserve, which UNESCO officially designated a world biosphere reserve in 2002<sup>2</sup>. It is the third in Ontario and one of twelve in Canada. The Frontenac Arch Biosphere Reserve stretches along the St. Lawrence River between Brockville in the east and Gananoque in the west and extends north to Westport.

The UNESCO designation recognizes the need to conserve the ecosystem and encourages projects and activities that link conservation with regional social and economic development. These projects and activities are facilitated by a Board of Directors comprised of members of the community with a variety of perspectives. These include people who represent land owners, conservation organizations, lake associations, municipalities, provincial and federal government, and other organizations.<sup>3</sup>

Each biosphere reserve is intended to support three basic functions:

- 1) to contribute to conservation of landscapes, ecosystems, species and genetic variation;
- 2) to foster economic and human development which is socio-culturally and ecologically sustainable;
- 3) to provide support for research, monitoring, education and information exchange related to local, national and global issues of conservation and development<sup>4</sup> (Frontenac Arch Biosphere Reserve, 2006).

MJWA plays a significant role in supporting these functions:

- Unique landscapes are protected within MJWA including sand dunes, a Provincially Significant Wetland, and an area of Karst topography that exhibits characteristics similar to an alvar;

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<sup>1</sup> UNESCO: United Nations Educational, Scientific and Cultural Organization

<sup>2</sup> designated as Thousand Islands - Frontenac Arch Biosphere Reserve

<sup>3</sup> Ontario Parks, 2005. Frontenac Provincial Park Background Information.

<sup>4</sup> Frontenac Arch Biosphere Reserve website, [www.fabr.ca](http://www.fabr.ca) , 2006

- MJWA is home and migration stop for over 160 species of birds, a myriad of other animal species and home to 600 plant species. These include species at risk that have benefited from conservation of the property. With the loss of 70% of southern Ontario's wetlands since European settlement, MJWA's Provincially Significant Wetland is an important component in the regional landscape;
- Environmental education is provided at MJWA through programs offered by the Environmental Connections Outdoor Education Association both on-site and in collaboration with outdoor education opportunities elsewhere in the biosphere reserve. Environmental Connections operates under the motto, "Education for, in, and about the Frontenac Arch Biosphere."<sup>5</sup>

Benefits from the UNESCO designation to MJWA may be netted by undertaking projects in conjunction with the Biosphere Reserve mandate and working through the Biosphere Reserve Board of Directors.

### 3.2 Municipal Setting

MJWA lies within two municipalities: the Township of Elizabethtown-Kitley and the City of Brockville. The southernmost 10 percent of the property lies within the City of Brockville; the remainder of the property (approximately 90 percent) is within the Township of Elizabethtown-Kitley. Municipal boundaries are shown in relation to the property on Figure 2.

The designation and zoning of this property are defined by the Official Plans and Zoning By-Laws of the City of Brockville and the former Township of Elizabethtown.

#### 3.2.1 *City of Brockville*

MJWA is designated as "vacant/rural" in the City of Brockville's Official Plan and zoned "open space" in the implementing Zoning By-Law. There are no restrictions to land zoned "vacant/rural" in the Official Plan, but the "open space" zoning bylaw permits only restricted uses (see Appendix 1). Adjacent lands to the south are designated and zoned for a variety of uses including rural, open space, residential, commercial, industrial and vacant/rural.

#### 3.2.2 *Township of Elizabethtown-Kitley*

The Official Plan for the Township of Elizabethtown-Kitley designates the wetland portion of the property "Natural Heritage – Provincially Significant Wetland". The upland portion is designated as "Rural". The Zoning By-Law for the Township identifies zoning for MJWA as "restricted open space" and "general open space"

There will be opportunities for the Cataraqui Region Conservation Authority to request changes to the designations and zoning on the property to provide consistency over the entire property and better reflect its intended uses, as these documents are reviewed and updated by each municipality. Details of the existing designations and zones, as well as proposed changes are described in Appendix 1.

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<sup>5</sup> Environmental Connections website, [www.naturebuddy.com](http://www.naturebuddy.com), 2006

## 4.0 Current Uses

### 4.1 Operations

#### 4.1.1 Flood Control



The CRCA maintains the Broome-Runciman Dam at the southeast corner of MJWA, providing flood control for the Buells Creek system, which flows southwardly through the City of Brockville to the St. Lawrence River. This dam is the first of three water control structures whose correct operation are crucial to the control of flooding through the City. Creation of the Broome-Runciman Dam and the downstream Buells Creek Detention Basin has allowed development in Brockville in areas that otherwise would have flooded.

CRCA staff working from the workshop on MJWA are responsible for flood control operations at the Broome-Runciman Dam and other flood control structures in the eastern portion of the Cataraqui region. Easy access to the MJWA property, workshop, and water control structures must be maintained for appropriate dam operations and flood control.

#### 4.1.2 Property Maintenance (“Eastern Service Centre”)

The CRCA operates a maintenance workshop and gated storage facility for MJWA and other properties and water control structures in the eastern portion of the Cataraqui region. This Eastern Service Centre is located in the north-east portion of MJWA off Debruge Rd (Facility #1; Figure 2).

The property is maintained by the Area Supervisor. The Friends of Mac Johnson Wildlife Area, a dedicated group of hands-on volunteers, assists CRCA staff significantly with property maintenance at MJWA including maintenance of trails, installation of fencing, and many other projects. Activities of the “Friends” are described in Section 10.0.

### 4.2 Stewardship

#### 4.2.1 Trumpeter Swan Restoration Program

The CRCA participates in the Trumpeter Swan Restoration Program at MJWA. The program’s goal is to introduce Trumpeter Swans as a self-sustaining species in the area. The habitat and facilities at Mac Johnson Wildlife Area are ideal for these birds.

In 1999, a breeding pair of swans was released at Mac Johnson Wildlife Area. In 2000, 11 more swans were released. These swans were bred in captivity. By 2005 the number of Trumpeter Swans had increased to 25.



The Trumpeter Swan Restoration Program has been one of the most successful programs ever undertaken at MJWA. The public and media have followed the swans, their fledglings and their

flights since 1999 and are still interested. The program is consistent with the Wildlife Area focus.

The Trumpeter Swan compound includes a swan compound (Building #3; Fig 2), nesting raft, dock feeding system and an ice-away device to keep the water open in the winter in the eastern of the two lagoons neighbouring the reservoir.

Funding for this program has been received from the Community Wildlife Improvement Program, Friends of the Environment Foundation, Crinan Marine, and Jane Yaeger and Stephen Granger.

#### *4.2.2 Managed Forest*

MJWA forests are managed in accordance with the MJWA 20-year Forest Management Plan (1998-2017). The plan identifies 160 hectares of forest eligible for the Managed Forest Tax Incentive Program (MFTIP), in nine compartments. These occur both in the northlands and the southlands. The forest management plan identifies environmental protection, wildlife habitat, and demonstration as the highest priority objectives for the managed forests. Recreation is identified as a medium priority and income and wood products are identified as low priority objectives for the forests.

In 1999 an ice storm damaged trees throughout the region. As a result, the activity over the past years for each of the nine forest compartments at MJWA was limited to monitoring the stand for improvement/decline, wildlife activity and natural regeneration following the ice storm. No logging or other manipulation of the forests was conducted. The Forest Management Plan is currently being updated. No significant changes in the management of the forest compartments are foreseen for the next management plan period.

#### *4.2.3 Co-operative Tree Nursery*

Tree saplings and shrubs are raised in a fenced nursery in the Operations Area (ND1 in Figure 2). This is a co-operative project between the Leeds County and Grenville County Stewardship Councils, the Friends of Mac Johnson Wildlife Area, and the CRCA. The nursery stock is used for reforestation, streambank stabilization, riparian buffer, and beautification projects. The plants are made available to municipalities, school boards, and non-profit groups in addition to the stewardship councils and the CRCA.



#### *4.2.4 Osprey Nesting Platforms*

Two osprey nesting platforms were constructed on MJWA to encourage nesting pairs: one near the warming hut, another along the Ontario Hydro easement. The platform along the hydro easement has been dismantled to allow continued maintenance of the easement corridor. The platform near the warming hut has been in constant use since it was discovered by osprey in 2003.

## 4.3 Recreation

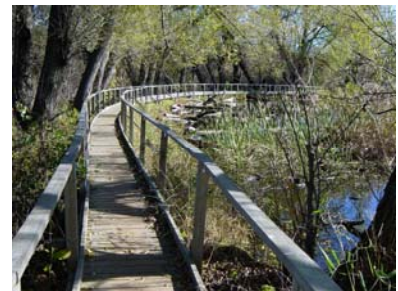
### 4.3.1 *Trail Use*

There are five main trails on MJWA with a total extent of 11 km (Figure 2). These trails at Mac Johnson Wildlife Area cross woodland, wetland and field areas and are used by hikers, joggers, dog walkers, cross-country skiers, and cyclists. Southland trails see significant daily use due to their proximity to residential neighbourhoods.

The Wildflower Loop (Trail 1) has been developed as an interpretive trail. This trail has been made fully wheelchair-accessible along three of the four sides of the loop with grading and compaction of stone dust along the trail in 1999 (Figure 2). The fourth side of the loop is the road past the existing Nature Centre. This road is passable by a wheelchair, but has a steeper grade than allowed by code for a fully-accessible trail. Annual maintenance is required for these wheelchair-accessible trails.

The trail system contains one boardwalk that connects the northern trails to the southern trails on the eastern side of the beaver pond.

Use of the trails is estimated at 40 to 50 hikers or skiers per day.



### 4.3.2 *Picnicking*

Picnic tables, a large picnic pavilion, a group fire pit, barbecues and handicapped accessible washrooms are available in the northlands. A small picnic area is also located on Centennial Road near the Broome-Runciman Dam and canoe access point (Figure 2).

### 4.3.3 *Canoeing*

There are two areas used by canoeists: a canoe launch point in the southlands accessed from the eastern parking area on Centennial Road near the Broome-Runciman Dam; and a dock in the northlands located near the skating shelter at the north end of the Buells Creek Reservoir (Figure 2).

### 4.3.4 *Skating*

A skating rink is maintained on the small pond north of the reservoir when conditions permit. A warming hut (Building 6; Fig 2) and a fire pit are beside the pond. The Friends of Mac Johnson Wildlife Area provide refreshments here on January and February weekends. Attendance is estimated at 30 skaters per day on weekends.

### 4.3.4 *Nature Centre*

This facility (Building 5; Fig 2) has picnic tables, a woodstove and washrooms and is available for rent by education and community groups. It is located along Trail 1, about 100 metres from the parking lot. In 2004 there were 10 group bookings for the nature centre, fire pit and picnic area combined, with about 280 in attendance.

#### 4.3.5 Major Events

The Friends of Mac Johnson Wildlife Area stage two major events on the property each year. An annual spring open house and plant sale brings about 350 people per event. A fall wildlife festival has a varying attendance estimated to average around 200. The “Friends” also significantly assist the CRCA staff with staging of the annual Winter Fun Days which include a winter sled-dog race along the trails. This event brings about 400 people to the property and is growing in interest and attendance each year.



#### 4.3.6 Fishing

Fishing is permitted on the reservoir in accordance with Provincial regulations. Northern pike, largemouth bass and bullheads are among the species caught.

#### 4.3.7 Snowmobiling

Snowmobiles are permitted to cross the Mac Johnson Wildlife Area in the area just north of Centennial Road in order to link with their trail network beyond the property (Figure 2). Generally this route follows the transmission easement of TransCanada Pipeline Limited and is maintained by the Elizabethtown Snowmobile Club. Snowmobiles are not permitted elsewhere at MJWA.

#### 4.3.8 Ice Boating

A number of enthusiasts sail their ice boats on the reservoir when the ice is sufficiently thick and free of deep snow.

#### 4.3.9 Regulated Activities

Some activities are prohibited by [regulation](#)<sup>6</sup> at Mac Johnson Wildlife Area, similar to other conservation areas owned and maintained by the CRCA. These include hunting and the use of all-terrain vehicles and motorized boats. Dog owners must keep dogs on a leash not more than 2 m in length. Visitors are restricted to trails and designated picnic and interpretive areas. Service vehicles used for maintenance and operations may use trails and walkways as necessary.

Exceptions to this regulation are made under permits issued by the CRCA for certain activities (e.g., scientific research).

These stipulations are necessary to maintain the ecosystems, habitat, and wildlife of MJWA.

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<sup>6</sup> Revised Regulations of Ontario. 1990. Regulation 99 under the Conservation Authorities Act.

#### 4.4 Environmental Education

Environmental education has been provided at MJWA since 1995. Environmental Connections, a non-profit organization, works with the Cataraqui Region Conservation Authority to deliver the environmental education programs. The local school boards, home schooling families, Girl Guides, Boy Scouts, Brownies, and other groups engage Environmental Connections to teach environmental curriculum.

More than 10,000 children and adults participated in programs between 1995 and 2005. Over this period there have been 450 participants in the summer camp program. About 100 preschoolers and caregivers participated in the Nature Buddy Program it when it was available from 1999 to 2003.

In 2003, Environmental Connections became an incorporated non-profit organization. Since receiving a grant in 2005 from the Ontario Trillium Foundation, the organization's focus has broadened to promote environmental education throughout the Frontenac Arch Biosphere Reserve.

### **5.0 Natural and Cultural Elements**

#### 5.1 Climate and Hydrology

##### *5.1.1 Current Conditions*

The climate for the area is typical of south-eastern Ontario; the St. Lawrence River has little moderating effect. Climate data gathered from the Brockville weather station at the Brockville Pollution Control Centre (PCC) (44 36 N 75 40 W) indicate that the daily average temperatures are -8.2°C in January and 20.8°C in July.

The area receives 983 mm of precipitation per year; 784 mm as rain and 199 mm as snow. April, with its combination of snowmelt and rainfall, and September with its large rainfall events, are the two most significant months for flooding and flood control operations, although such operations may be required throughout the year depending on precipitation and melt events.

The Buells Creek Reservoir is part of the greater Provincially Significant Wetland that extends to the northeast beyond the boundaries of MJWA. The reservoir is near the headwaters of Buells Creek, which flows southerly to the St. Lawrence River. The outlet of the reservoir is controlled by a 2-bay stop log dam near the eastern corner of MJWA on Centennial Road. This dam is maintained and operated by the CRCA to provide flood control and augment low flows for Buells Creek as it flows through the City of Brockville.

Surface water on MJWA drains primarily in sheet flow toward the reservoir and wetland. The ponds and reservoir are also partially spring-fed.

##### *5.1.2 Climate Change*

Climate change is altering temperature and precipitation patterns, affecting the frequency and severity of severe weather events, lake water levels, forest health, and the distribution and abundance of flora and fauna. Climate specialists predict that precipitation in Eastern Ontario will fall in fewer, yet more severe storms. This may result in lower water levels in the reservoir and wetland during extended periods of low precipitation. Dam operations may need to be adjusted in response to climate change in order to assure sufficient reservoir levels to maintain the wetland and provide low flow augmentation for Buells Creek. The warmer winters predicted

may shorten the length of the season for winter programming and decrease the quality of conditions for winter sports such as cross-country skiing and skating.

## 5.2 Geology, Geomorphology and Soils<sup>7</sup>

Limestone dominates the geology of MJWA. It is situated in the Smith Falls Limestone Plain and is a good example of this physiography with flat lying Palaeozoic Strata over Precambrian rock. There is some local faulting south of the reservoir which exposes fractured bedrock belonging to the Beekmantown formation (characterized by limestone dolomite and sandstone outcrops). A small limestone ridge occurs at the southwest side of the beaver pond.

Glacial action is evident here in the form of scattered erratics (single rocks often far from their source, deposited by glacial retreat in a previous ice age). The land is flat and shows characteristics of Karst<sup>8</sup> topography. Flat topography and shallow soils result in poor drainage throughout Mac Johnson Wildlife Area and contribute to the wetland.

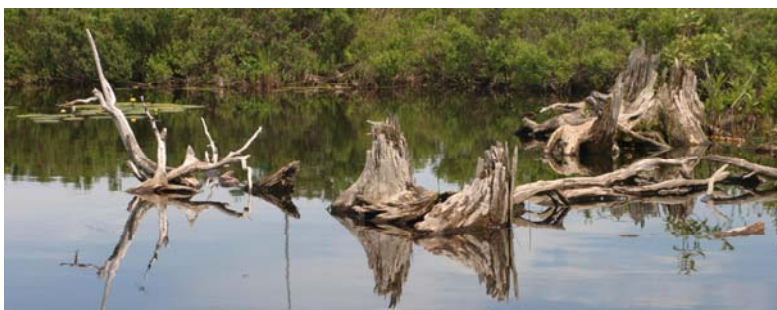
A thin, dark, sandy loam over the limestone dominates the soil north of the reservoir. It originates from the shoreline deposits of the Champlain Sea, as do two large sand dunes, composed of limestone shingle and sand. The Nature Centre sits on one of these dunes which curves north and west in an ellipse toward the entrance road. The second elliptical dune occurs in the western portion of the area near the ruins of the farmstead developed in the 1860s.

An area of Karst topography resembling an alvar in composition extends from the southern shore of the reservoir to just south of Trails 4 and 5. Unique hardy plants survive on shallow soils here.

A portion of the Mac Johnson Wildlife Area south and west of the reservoir is covered by a dark, thin layer of grey organic matter over a mineral soil. A muck soil characterized by black organic peat deposits occurs in the reservoir and the wetland forest communities.

## 5.3 Vegetation and Wildlife

### 5.3.1 *Vegetative Communities*



The Buells Creek Reservoir is approximately 50 percent open water containing submergent species. The Provincially Significant Wetland also contains swamp, marsh, and meadow. The swamp is dominated by white cedar, tamarack, white birch and swamp birch. A considerable number of dead trees and shrubs

still stand as remnants from the time before the dam construction. Marsh vegetation, including willow shrub, bur-reed and sedge, borders the central open water.<sup>9</sup> The *Resource Inventory*

<sup>7</sup> Cataraqui Region Conservation Authority. 1983. Buells Creek Conservation Area Master Plan.

<sup>8</sup> Karst topography is a landscape that develops from the action of ground water in areas of easily soluble rocks. It is characterized by caves, fractures, underground drainage and sinkholes.

<sup>9</sup> [Natural Heritage Information Centre](#). 1998. Natural area report for Buells Creek Reservoir Wetland (Area ID 8328 and 2036),

and *Analysis of Buells Creek Conservation Area Brockville* (CRCA, 1982) also discusses the presence of fens adjacent to the wetland and a bog in the reservoir. The wetland and its 120 m of adjacent lands are shown in Figure 2.

Upland vegetative communities include meadow, old field, planted, manicured grounds, tall shrub, and forests. Forest communities include the deciduous swamp woods in the northeast; mixed deciduous woods and mature mixed forest in the northwest; and sugar maple woods west of the reservoir, north of Centennial Road. Forest communities are presented in detail in *Forest Management Plan: Mac Johnson Wildlife Area 20 Year Plan (1998-2017)* created in support of the Managed Forest Tax Incentive Program (MFTIP) (CRCA, 1998).

A 1982 species inventory<sup>10</sup> for MJWA was updated in 2005<sup>11</sup>. This update resulted in the identification of several new vegetative species including Ebony Spleenwort, Marsh Bellflower, the invasive Garlic Mustard. Plants identified in the 1982 and 2005 species inventories are summarized in Appendix 2, Table 1.

### 5.3.2 Wildlife

Over 160 species of migratory and nesting bird have been sighted at MJWA. MJWA also protects valuable habitat for several Species at Risk<sup>12</sup> and Species of Special Concern.

The wetland is a feeding site for fish-eating birds such as the great blue heron and a nesting site for waterfowl including ducks, grebes, teal and the common loon. The reservoir is a spawning and rearing area for several warm water fish species including northern Pike, Largemouth Bass and White Sucker. Snapping Turtle, American Bullfrog, Muskrat, American Beaver and Red Fox also inhabit the area.



The 2005 update to the 1982 resource inventory identified additional bird species (Trumpeter Swan, Bufflehead and Red-necked Grebe) and three species of mollusc. Results from the 1982 and 2005 species inventories are summarized in Appendix 2. Table 2 of Appendix 2 identifies birds; mammals, reptiles, amphibians and gastropods are listed in Table 3; and fish in Table 4. Insects (including butterflies) and fungi were inventoried in 1982, but not in 2005. A summary of these species is presented in the 1982 *Resource Inventory and Analysis of Buells Creek Conservation Area Brockville* (CRCA, 1982).

On the whole, the wetland appears to be healthy. No significant changes have been noted by the many naturalists who frequent MJWA with the exception of one area: significant degradation has been noted in and surrounding the beaver pond in the southwest corner of MJWA. Shorebirds, once prevalent there, are no longer seen in the vicinity.

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<sup>10</sup> Cataraqui Region Conservation Authority. 1982. *Resource Inventory and Analysis of Buells Creek Conservation Area*.

<sup>11</sup> Cataraqui Region Conservation Authority, 2006. *Mac Johnson Wildlife Area Resource Inventory – Initial Findings*

<sup>12</sup> [Species at Risk in Ontario](#) are protected under the provisions of several legislative and policy tools.

## 5.4 History and Cultural Heritage

### 5.4.1 *Mills*

In the late 1700s and early 1800s, mills were an important feature in the settlement of south-eastern Ontario. Sawmills and gristmills provided lumber for carpentry and ground grain for food. Mills used moving water to operate their machinery and early settlements developed nearby. Brockville is typical of this pattern.

Buells Creek, with its potential to operate mills, attracted settlers to the area. William Buell, after whom the creek was named, was a merchant who settled at the mouth of the creek in 1784. Buell's activities opened the area for further settlement and the development of Brockville, with Buells Creek playing a key role. Buells Creek supported eight mills, which were some of the earliest industry in the area.

In the early 1800s the millponds along Buells Creek caused high water levels. These millponds included one at the marsh at the headwaters of the creek, bringing the water to a height near the current level.

### 5.4.2 *Attempted Business Ventures*

At the end of the milling era in the late 1800s the headwaters of the creek were used by a new industry. It was known as a 'peat works' and was operated by the Mallory family. The marsh was drained, and extraction began. However, the operation ran into financial difficulties and was abandoned.

After this initial drainage of the flooded marsh, further farming attempts were made including market gardening. However, much of the marsh proved unsuitable for grazing or market produce. According to local accounts the land remained very wet and mucky after draining, and heavy objects would sink as if it were quicksand. Horses and cattle were reported lost in this manner.

Sometime between 1878 and the turn of the century, construction of a railway by the Brockville & Ottawa Railway Company (B & O) was started through the middle area of what is now the MJWA property. The B & O railway was purchased by the Canada Central Railway Company and construction was not completed. The bed, now abandoned, runs northwest to southeast through the western portion of MJWA, creating the straight portions of Trails 2 and 3 (Figure 2).

### 5.4.3 *Early Settlement History*

In 1907 Maxwell Greer bought 50 hectares of land to farm, with access via what is now Debruge Road and McLarry Road (McLarry Road is a closed road right-of-way). A farmhouse was built with a stone basement and a square log construction covered with stucco. The property included a large barn, wells and a drive shed west of the railway bed. Remnants of the basement are fenced with cedar rails, and parts of the barn walls, drive shed and well are visible from the trails along the west side of the Mac Johnson Wildlife Area.

In 1914, Greer sold 12 hectares of his farm to Albert George Debruge. In 1919 Greer sold the remaining farm property to Laurence and Rose Joyce. Their son lived on the farm with his family until the late 1920's when he abandoned the farm. The house burned down before 1930. The farm reverted to Maxwell Greer in 1932. He gave the farm to Albert Debruge in 1942 with the

provision that Mr. Debruge pay the back taxes due. The taxes were not paid, so the municipality assumed title to the land. The house, known as the Joyce Farmstead, was abandoned. Only the foundation remains.

After purchasing the 12 hectares from Maxwell Greer and other lands from the Brockville Peat & Power Co. Ltd. in 1914, Albert Debruge built a farmhouse east of what is now the office and workshop buildings of the Mac Johnson Wildlife Area. In 1916, he built the dam on the current “beaver pond” to create a private fishing pond east of McLarry Road and south of the Joyce Farmstead. The Debruge farmhouse was demolished in 1981.<sup>13</sup>

The McGhie house was built pre-1900. It is currently occupied and has a newly upgraded septic system and well.

#### *5.4.4 Building the Dam and Conservation Area*

Mayor John Broome and Mr. Sandy Runciman of the *Recorder & Times* newspaper lobbied to have a control dam built to control the flows of Buells creek and reduce the flooding problems that frequently occurred in Brockville. The dam was built on what is now known as Centennial Road in 1966 and named the Broome-Runciman Dam to recognize the efforts of its proponents. This dam created a large shallow pond known locally as “The Back Pond”.

From 1966 to 1970, the CRCA assembled the land around Buells Creek that was then called the Buells Creek Conservation Area. The properties were acquired from various prior owners including: Mallory Estate, Wood Estate, H. Wordon, Wright Family, Brown Family, Fitzpatrick Family, Warren Family, McLarry Family, Debruge Family, Stewart Family, Elizabethtown Township, Smith Family, Reynolds Family, V. L. A. Campbell Family, and the City of Brockville.

#### *5.4.5 Designation as a Wildlife Area*

Mr. Mac Johnson served as one of the City of Brockville representatives on the CRCA Board from 1969 to 1980. Over these eleven years, he worked tirelessly to develop the property and encourage the use of the area for environmental education of Brockville and area youth. In 1987 the Buells Creek Conservation Area was renamed the Mac Johnson Wildlife Area to recognize the efforts and achievements of Mac Johnson and to highlight the wildlife habitat aspects of the property.

## **6.0 Market Analysis**

The potential future uses of and demands on MJWA are determined in part by market forces including the size, age, and interests of the resident and visiting populations that might use the wildlife area; and what public and ecological needs the wildlife area might reasonably fulfill.

### **6.1 Local Population**

The Mac Johnson Wildlife Area lies partly within the City of Brockville, which, at the time of the 2001 Census, had a population<sup>14</sup> of 21,375, and partly within the Township of Elizabethtown-Kitley, which had a population<sup>15</sup> of 10,039. North of the St. Lawrence River, and surrounding

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<sup>13</sup> [www.cybertap.com/macjohnson](http://www.cybertap.com/macjohnson), website of the Friends of Mac Johnson Wildlife Area. Don Wright, 2005. The Old Back Pond: The History of the Mac Johnson Wildlife Area.

<sup>14</sup> Statistics Canada, 2001 Census

<sup>15</sup> Statistics Canada, 2001 Census

Brockville, the United Counties of Leeds and Grenville includes the municipalities of Westport, Rideau Lakes, Leeds and the Thousand Islands, Gananoque, Athens, Front of Yonge, Merrickville - Wolford, Elizabethtown-Kitley, Augusta, North Grenville, and Edwardsburg - Cardinal. The United Counties had, on the basis of the 2001 Census, a population<sup>16</sup> of 96,606.

Through years of interviews with users, CRCA staff estimate that 60% of visitors to the property originate from within 25 kilometres of MJWA<sup>17</sup>. These visitors include school groups, birders, hikers, dog walkers, members of the Friends of Mac Johnson, and other users. This distance encompasses about half the area of the United Counties, so may represent a population of about 48,000.

To compare potential usage of the property with that of other CRCA Conservation Areas, the statistic of the number of people who live within a one-hour driving radius of MJWA must be used. This population is divided by the conservation area's acreage to develop a measure of the potential intensity of visitor use can be determined. MJWA has an area of 532 hectares and has 161,340 persons (2001 Census) within a 60 minute drive. The resulting density is 303 potential visitors per hectare.

This value is low compared to the other CRCA conservation areas as shown below.<sup>18</sup> However, a number of factors must be included to complete a true comparison. The reservoir and wetlands fills 85 percent of MJWA, so usage of MJWA property is concentrated in a much smaller area than indicated. With population growth in the surrounding area, it is anticipated that specific trails and access points to MJWA might see significant visitor use. However, as noted above, the majority of visitors come from within 25 kilometres, not 100 kilometres. This may also be true for other conservation areas.

As a result, these numbers are presented for general comparison purposes only. They do highlight the reality at MJWA: density of usage is lower than that for some of the other conservation areas in the region.

<b>Conservation Area</b>	<b>Area (hectares)</b>	<b>Population within 60 min drive (2001 Census)</b>	<b>Population per hectare</b>
Little Cataraqui Creek	392	286,480	732
Lemoine Point	137	249,895	1,829
Gould Lake	591	183,115	310
Lyn Valley	11	220,535	20,294
Mac Johnson Wildlife Area	532	161,340	303
Parrott's Bay	77	281,135	2,659
Total area	1,678	-	-

<sup>16</sup> Statistics Canada, 2001 Census

<sup>17</sup> S. Foerster, personal communication, 2006.

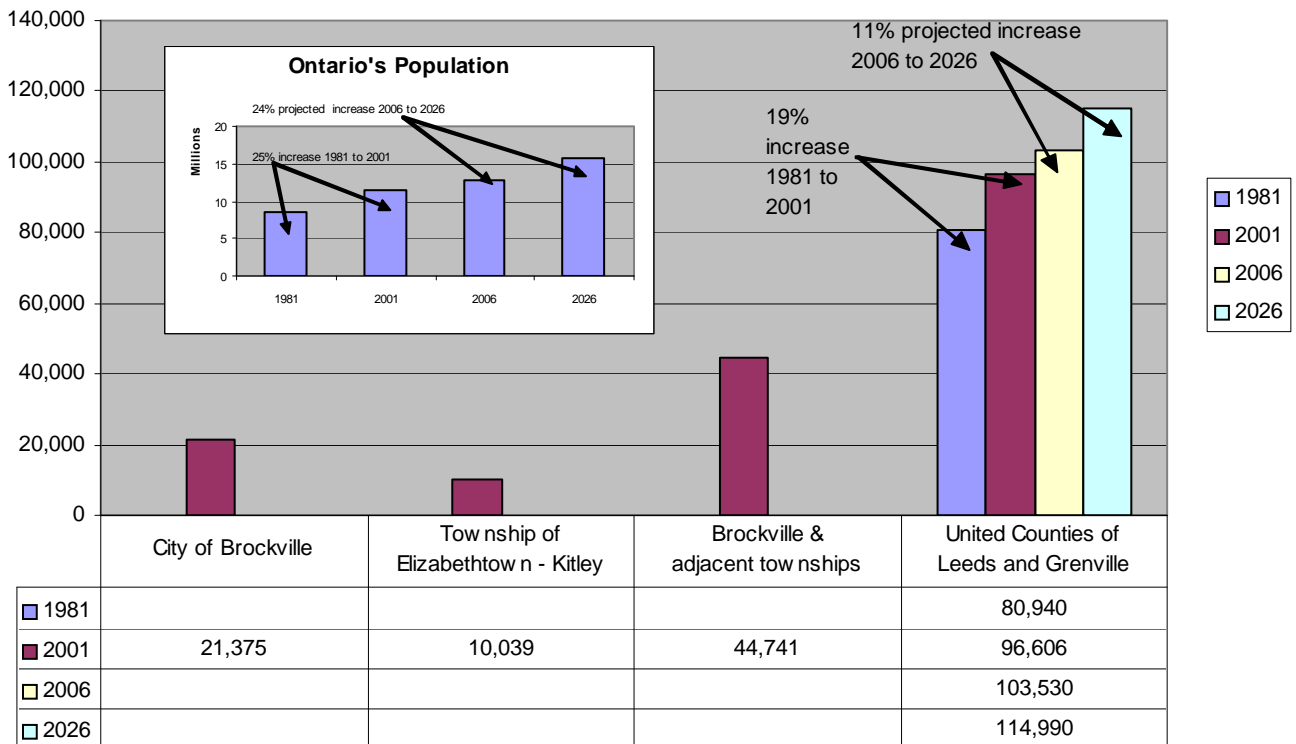
<sup>18</sup> *Providing Opportunities for Nature Appreciation & Outdoor Recreation*, (CRCA, 2003).

### 6.1.1 Growth of Local Population

Population data for the city, the townships, the counties and the province is shown in Figure 3. Between 1981 and 2001 Ontario's population increased by 25% while in the United Counties of Leeds and Grenville, there was an increase of 19%. Between 2006 and 2026 Ontario's estimated population is projected to increase by 24% while a lesser increase of 11% is projected for the counties.

Like the United Counties, the City of Brockville has grown since the previous Master Plan was created for this property in 1983. Suburban development has expanded to the southern boundary of MJWA on Centennial Road, creating more demand for access and more use of southern trails for dog walks, hiking and cross-country skiing. Projected population growth between 2006 and 2026 suggests that this demand will continue to grow, and the plan for the future character of MJWA should reflect this.

Ongoing development along Centennial Road is anticipated to result in upgrading of the road from a rural road to an arterial road. This would likely increase light, noise, aesthetics and runoff in MJWA. These aspects need to be considered in light of the natural heritage features of the property.



Regional Population, past and projected<sup>19</sup>

<sup>19</sup> Statistics Canada, 2001 Census and Ontario Ministry of Finance

The Draft Official Plan of the Township of Elizabethtown-Kitley anticipates that the population of the township will grow by only 31 persons per year (0.3% annual population growth) to a total of 10,708 by 2023. Based on the proximity of MJWA to the population growth near Centennial Road in Brockville, growth in the Township of Elizabethtown-Kitley may be concentrated near MJWA where estate residential subdivisions are most likely to be constructed. Other non-residential development (e.g., golf courses, garden centres, etc.) that occurs in exurban areas is also likely in this suburban fringe, particularly along the County Road 29 corridor.

This trend of development may result in MJWA becoming an “island of green” amidst built-out land uses within the next 20 years. The master planning process must consider the steps to be taken to retain the natural features of MJWA in the face of this potential scenario.

### 6.1.2 *Aging of Local Population*

The population of Leeds and Grenville<sup>20</sup>, with a median age of 40.7, is older than that of the province as a whole (median age 37.2). The median age of Ontario's population will rise to 42 years in 2026<sup>21</sup>. (Median age is the point at which exactly one-half of the population is older and the other half is younger.) It is anticipated that the population surrounding MJWA will similarly increase and use of MJWA will reflect the interests of the aging population.

A similarly aging population was noted in the Conceptual Plan for the CRCA's Lemoine Point Conservation Area in Kingston<sup>22</sup>. Trends in use of the area were identified that would also apply to MJWA. They are as follows:

- People are becoming more interested in the environment and outdoors, in their own wellbeing, and in informal rather than planned recreational activities.
- Demand for natural environment parks is rising, while demand for recreation based on facilities such as arenas and ball diamonds is decreasing.
- People spend more time close to home, which increases the pressures on facilities near urban areas.
- Walking, bicycling, and bird watching are the popular activities of an aging population.
- People consider experiences along waterfronts to be important to their quality of life.

In summary, the next twenty years will bring an increasing population, particularly south of Centennial Road; an aging population; and sustained and increasing interest in activities such as walking and bird watching close to home, yet along a waterfront. MJWA is perfectly situated to offer the experiences that will continue to serve the needs of its visitors.

## 6.2 Tourism

CRCA staff estimate, from interviews with visitors, that 30% of MJWA visitors are from parts of Ontario greater than 25 kilometres from MJWA. The remaining 10% of MJWA visitors are from other provinces and countries.

The most detailed tourism information for the area comes from the United Counties of Leeds and Grenville. In 2003, the United Counties had 1,828,565 visitors. 40% of these visitors stayed in the area for one or more nights and the remainder (60%) made same-day visits. 22% of

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<sup>20</sup> Statistics Canada, 2001 Census

<sup>21</sup> Ontario Ministry of Finance, 2005

<sup>22</sup> Cataraqui Region Conservation Authority. 1999. Conceptual Plan for Lemoine Point Conservation Area.

overnight visitors came from Ottawa and close to 10% were from each of the states of New York and Pennsylvania. The average age of visitors was 40.<sup>23</sup>

Of these visitors, 46% participated in outdoor or sports activities; 29% visited nature parks; and 25% of visitors included boating in their travel plans.

In concurrence with these statistics, tourists, particularly nature enthusiasts, have made MJWA a stop on their travels.

### 6.3 Physical Activities of Canadians

Section 6.1.2 presents trends in conservation area use given an aging population. The entire population of potential users is considered in this section.

The percentage of Canadians who participate in physical recreation is highest for outdoor activities.<sup>24</sup> For adults age 20 and older, the most popular activity is walking (65%), followed by gardening and home exercise. For people aged 12 to 19 the top three preferences are walking (58%), bicycling (45%), and jogging and running (43%).

The Importance of Nature to Canadians (Statistics Canada, 1996) survey measures the social and economic importance of nature by collecting information on nature related activities. Although the survey covers the entire country, the results can be locally applied to south-eastern Ontario. The survey reported the top three outdoor recreation activities as outdoor activities in natural areas (74%), watching, feeding or photographing wildlife (58%) and recreational fishing (42%). Outdoor activities in natural areas included sightseeing, camping, swimming, canoeing, hiking, sailing, cycling, skiing, relaxing and more.

The survey also assessed actual participation rates of people who indicated the main reason for their trip was to visit a natural area. It found that the top four activities of such people were picnicking (23%), hiking/backpacking (16%), relaxing in outdoor setting (15%) and photographing in natural area (14%).

The trails, reservoir, skating rink, and other amenities at Mac Johnson Wildlife Area afford visitors with opportunities for these popular outdoor activities in a natural environment.

### 6.4 The Economics of Natural Spaces

The enjoyment of nature has significant impacts on economies. In 1996, \$11.7 billion was spent in Canada on nature-related activities by Canadians and U.S. visitors.<sup>25</sup> These expenditures also led to contributions of \$5.9 billion in personal income generated by the 215,000 jobs sustained by this economic activity, and \$5.4 billion in government revenue from taxes.

The regional economic impact of MJWA has been estimated using the Tourism Regional Economic Impact Model of the Ontario Ministry of Tourism.<sup>26</sup> Based on estimates of property usage of approximately 4,000 people per year, the report evaluated the total economic value at

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<sup>23</sup> [Ontario Ministry of Tourism and Recreation, 2005](#)

<sup>24</sup> [Canadian Fitness and Lifestyle Research Institute, 2004](#)

<sup>25</sup> [Minister of the Environment, 2000](#)

<sup>26</sup> The Economic Impact of Mac Johnson Wildlife Area, 2005, (Ontario Ministry of Tourism)

approximately \$217,000 annually. The majority of this revenue is spent in the United Counties of Leeds & Grenville; the remainder in other parts of Ontario.

This analysis only estimates market values of money spent by visitors. Economic values of the preservation of wetlands, woodlands and species can also be predicted using environmental economic models, but for the purposes of this Master Plan, it suffices to restate that the protection of these are at the core of the CRCA mandate and of the vision for MJWA.

## **7.0 The Master Planning Process**

### **7.1 Evaluation of 1983 Master Plan**

The master planning process began with a review of the existing master plan. This plan, written in 1983, updated the original Development Plan for the property. The 1983 master plan recognized the importance of the wildlife habitat, passive recreation, environmental education and area interpretation, as does this 2006 master plan. Notable recommendations raised in the 1983 master plan include the following:

- Development of a beach and water contact facility – This was attempted, but was not successful due to aquatic species present and the presence of many other local opportunities for swimming. This is no longer proposed.
- Development of observation towers – This was proposed, but not enacted. The liability and maintenance costs of tall towers are prohibitive.
- Purchase of a foreman's residence – This was proposed, but not enacted. The current foreman lives sufficiently near the property to be able to respond to flood events or property needs.
- Development of a loop trail around the MJWA property – This was proposed in 1983 and is still on the table in 2006. A loop trail, however, would require an extensive boardwalk across the wetland. As discussed further below, construction and maintenance costs for this boardwalk are currently prohibitive.
- Construction of a storage facility for rental canoes, snowshoes and cross country skis was proposed, but not acted upon. The need for such a facility was not raised during the 2005-2006 master planning process.

### **7.2 Creation of a Vision, May 2005**

In preparation for updating the master plan for the Mac Johnson Wildlife Area, a facilitated workshop was held May 16, 2005 with a group of stakeholders who had varying interests in the property. The issues and recommendations raised in that meeting are summarized in the document "*Issues and Focus Paper: Background to Updating the Stewardship Plan for Mac Johnson Wildlife Area*", of May 30, 2005. The results of the workshop are also incorporated throughout this master plan, from the identification of issues and the role and value of the property to the plan for MJWA.

At the May 16, 2005 meeting, stakeholders developed a draft vision for MJWA. A vision statement is the formal expression of what is hoped for in the future. The vision statement is as follows:

Mac Johnson Wildlife Area will continue to be appreciated as an important place, with significant intrinsic natural and cultural heritage values, which provides control of water flows at Buells Creek. The wildlife area will continue to afford valued opportunities for outdoor activity, focusing on appropriate recreational

pursuits and environmental learning experiences, healthy living and care for the environment. The local community and visitors to the property will continue to collaborate with the Cataraqui Region Conservation Authority in the stewardship and protection of the Mac Johnson Wildlife Area.

### 7.3 Three Concepts for MJWA – Open House, December 2005

On December 1, 2005, staff of the Cataraqui Region Conservation Authority (CRCA) held a public open house at Vanier Public School in Brockville. Numerous stakeholders were invited to attend as listed in Appendix 3. A total of 38 people attended the Open House.

Three concepts were introduced and displayed at the open house with the intent of fostering discussion toward development of a new Master Plan for MJWA. The display material was also posted on the [CRCA website](#). People were invited to send their comments to CRCA staff, using the comment form supplied at the open house or by fax, mail or email. The responses assisted staff in the development of the plan for Mac Johnson Wildlife Area.

The three concepts presented for MJWA were:

- Northlands Growth,
- Southlands Growth, and
- Status Quo.

Stakeholders were also free to offer their own concept including combinations of the above.

As presented in Section 2.0, the northlands are those lands north and west of the reservoir, south to the beaver pond. The northlands contain all of MJWA's operational buildings, the Nature Centre, Swan compound, washrooms and skating area warming hut. The northlands are primarily used by day-destination drivers including school groups and visitors who are not necessarily residents of the municipality. The northlands trails away from the main centre of activity are usually quiet and enjoyed as a contemplative getaway.

The southlands, in contrast, contain no operational buildings, only the McGhie house, a canoe launch dock, and the Broome-Runciman dam. Most visitors to the southlands are local residents who cross Centennial Drive by foot to walk their dog, or enjoy a hike or run on the southern trails. The southlands parking lots also serve as a lunchtime parkette where many people enjoy weekday lunches.

The reservoir and surrounding wetlands provide the wildlife refuge and habitat that makes the wildlife area important to retain.

The northlands growth concept proposed that additions made to MJWA be focussed in these northlands, where the majority of the built up area already exists. This concept had the advantage of being most affordable, most easily implemented, but would not bring the built facilities to the majority of people who access the property from the south. The southlands growth concept proposed that additions to MJWA be focussed in the southlands to better serve the local users who access the area from Centennial Road. This concept would have required new facilities and might have encouraged more vandalism. The status quo concept was to not make any significant changes to the property.

To facilitate discussions, the property was divided into management zones as presented in Figure 2.

#### 7.4 Outcome of Public Open House Process

In total, 36 responses to the concepts presented for the Mac Johnson Wildlife Area were received from members of the public. Comments are summarized in Appendix 4 – *Synopsis of Public Responses to Concepts for Mac Johnson Wildlife Area*.

Of the three concept plans presented above, respondents supported northlands growth and a combination of northlands growth and status quo (50% of respondents). Southland development was not widely supported (14%). This response, with the specific comments provided, played an important role in determining the concept plan for MJWA, which proposes some development in the northlands with development in the southlands limited to trail improvements.

CRCA staff evaluated the comments from the public process on the basis of whether the suggested changes were necessary; would enhance MJWA; and/or whether their cost was justifiable on the basis of the benefit the change would bring to the property.

As a result of this process, it was determined that maintenance of the Status Quo with limited northland development should be the primary focus for the next twenty years. It was agreed that retaining activities in the northlands would be most cost-effective and have the least impact on the wildlife habitats. Specific changes necessary to the property were identified, but these were more limited than either of the growth options.

From the process, the primary goals for MJWA under this Master Plan are as follows:

- 1) Maintaining the natural and cultural heritage of MJWA;
- 2) Enhancing opportunities for use of the property for activities including passive recreation, nature appreciation and education;
- 3) Maintaining the Eastern Service Centre;
- 4) Maintaining the water control capabilities of the dam and reservoir;
- 5) Continued collaboration with partners in the maintenance, use and enhancement of MJWA; and
- 6) Identifying funding sources to meet Goals 1 through 5 and secure the future of MJWA.

### **8.0 Property Management Plan**

To support the goals presented in Section 8.4, the master planning process identified five significant projects:

- 1) Improvements to trails (to meet Goals 1 and 2);
- 2) Improvements to specific existing facilities (to meet Goals 1 – 3);
- 3) Retention and enhancement of the wildlife refuge features of the property (to meet Goals 1 and 2);
- 4) Identification and promotion of partnerships and partnering projects (to meet Goals 1,2 and 5); and
- 5) A Marketing and Financial Feasibility Study (to meet Goals 1-6).

No projects are necessary to meet Goal 4, maintaining the water control capabilities of the dam and reservoir. Continued awareness of this goal by CRCA staff and volunteers will assure that there is sufficient access for maintenance of the dam and the reservoir.

The manner in which each of these projects fits into the CRCA's existing corporate goals, as defined in *Strategic Plan: Cataraqui to 2020* (2001) is presented in Appendix 5.

### 8.1 Improvements to Trails

Trails cross the north-western, western and southern portions of MJWA. Given that 85 percent of MJWA is wetland and reservoir, there is little room for any realignment of existing trails. However, the trails should be rationalized under the implementation of this master plan.

Trail improvements were identified as a key element of this master plan to enhance opportunities for use of the property (Goal 2). Six improvements are discussed:

- Maintenance and improvement of MJWA trail access points;
- Repair and monitoring of southland trails;
- Construction of benches and picnic areas along southland trails;
- Extension of Trail 5 to the eastern canoe access point and consolidation of southern parking lots;
- Restriction of bicyclists to southland trails; and
- Construction of a boardwalk across the reservoir to create a loop trail (as discussed below, this improvement is considered in light of its costs and usage and dropped from the implementation plan).

#### *8.1.1 Trail Access from Off-property*

The major population that accesses MJWA on foot comes from the residential area south of Centennial Road. Dog walking, cross-country skiing and hiking are major uses for the trails that are accessible from the road. Maintaining access to the trails from the surrounding crosswalks and intersections is a priority, as is ensuring that access to the property is via a trail rather than overland, which degrades habitat.

Connections to the residential area south of Centennial Road already exist, with entrances to MJWA from five locations:

- 1) Kensington Drive;
- 2) Windsor Drive;
- 3) the Transcanada Pipeline entrance;
- 4) the parking lot between Windsor Drive and the McGhie House; and
- 5) the canoe access point.

Entrances and trails near Centennial Road will continue to be maintained.

Off-trail overland access to the southlands has been damaging to the property abutting Centennial Road. A significant project conducted over the past few years by the Friends of Mac Johnson Wildlife Area has been the installation of page wire fencing running the length of the property along Centennial Road. The only areas not fenced are the five entrances listed above and a final phase yet to be completed. The final phase, which is the installation of a remaining

1,000 feet of fencing between the southern parking lot and Windsor Drive, is to be completed when labour is available. This fencing project will encourage people to access MJWA via existing trails and decrease unwanted off-trail traffic. The Friends of Mac Johnson Wildlife Area plans to complete this project in the near future. The CRCA appreciates the Friends' sustained dedication to this project.

As the City of Brockville continues to build the Brock Trail north to the property, connections with the Trail will be made so that MJWA is part of the larger trail network.

### *8.1.2 Repair and Monitoring of Southland Trails*

Due to the proximity of the southland trails to residential development, the southland trails are well used. Trails 4 and 5 show signs of erosion from use, particularly where the trails run along the reservoir shoreline. These trails will need a specific maintenance effort. Because of the popularity of these trails with residents south of MJWA, these trails will continue to see significant use. These trails will be specifically monitored to ensure that maintenance can keep up with use.

### *8.1.3 Construction of Benches/Picnic Areas along Southland Trails*

A project identified to enhance the experience of hikers and walkers on the southlands trails is the creation of sitting or picnic areas along the trails. Benches will allow hikers to rest and appreciate their surroundings; picnic tables will allow greater use of the southlands for small gatherings. Approximate locations of these are shown in Figure 3.

### *8.1.4 Continuation of Trail 5 to Eastern Canoe Access Point*

Continuing Trail 5 east from its current eastern limit to the canoe access point and parking at the eastern corner of MJWA would serve two purposes:

- It would allow visitors who start at the canoe access point to access all other trails on the property; and
- It would allow for the consolidation of southern parking lots such that the more western parking lot on Centennial Road could be closed.

To develop this trail, Trail 5 will be extended to the east and a boardwalk will be required north of the Broome-Runciman dam. The McGhie house is currently inhabited, but owned by the CRCA. Development of this trail extension will not cross the property on which the McGhie house sits until tenancy of the house changes.

Building the boardwalk north of the dam can be done by CRCA staff and volunteers. The boardwalk will become a feature in the relatively high-use southlands trails.

### *8.1.5 Restriction of Cyclists to Southland Trails*

Off-road cycling is a popular activity at MJWA. To the extent that cyclists stay on-trail, the activity is permitted. Cycling may damage the surface of trails during wet conditions, may result in conflict with other users, and, to the extent to which cyclists go off-trail, may have an adverse affect on wildlife habitat.

There are many entrances to the southlands that cyclists use to access the trails. It is unlikely that access could be limited to these trails unless entrances are consolidated and monitored, a

change that would result in a significant reduction in pedestrian use as well as cycling. This is not a desired outcome.

To balance the desire of many residents to cycle the trails with the vision of the master plan which includes maintenance of the wildlife habitat and features, it was determined that cycling should be limited to a portion of the MJWA trails. Cycling should not be allowed on the trails where habitat is most sensitive.

This decision resulted in the determination to allow cycling on southern trails, but not on northern trails. Signs will be added to Trail 4 at the beaver pond boardwalk that will indicate that bicycles are not allowed on northern trails. Similar signs will also be added near the main parking lot and at the Debruge Road entrance.

#### *8.1.6 Consideration of a Boardwalk across the Reservoir*

A potential trail project identified in the 1983 Master Plan and again in this master planning process was the construction of a walkway across the eastern part of the reservoir and wetland to connect the southland and northland trails, thereby creating a loop trail around the property. This project, which would require construction of a floating boardwalk across the water and wetland, has impacts that must be weighed before it can be determined whether it is appropriate to build such a trail. Advantages to this loop trail include the following:

- the trail would enhance the experience hikers could have at MJWA by allowing them to see the wetlands more closely and offering them a circle loop which transects many different habitats;
- because the walkways are over water, hikers would be confined to the walkway and further encroachment into the wetlands would be limited; and
- promotion of the boardwalk might increase visitor use of MJWA.

Disadvantages include the following:

- the walkway would require significant initial construction costs;
- the walkway would require significant on-going maintenance costs;
- there are currently many entrances to MJWA, so collection of an entrance fee to recover costs is not feasible;
- it would bisect a pristine nesting and feeding area for many species;
- it might interfere with canoeing and other uses of the reservoir;
- there is not a large local market that would use the boardwalk; and
- the introduction of people into what is now a pristine habitat would increase trash in the wetland

Although this idea is popular with many who commented throughout the master planning process, its environmental impact to pristine habitat is contrary to the primary focus of the property, which is the retention of the wildlife reserve features of the property. Habitat research shows that many species need large undisturbed spaces for successful courting and nesting. MJWA is one area where this habitat can be maintained.

It is recommended instead that a spur boardwalk be considered that would allow visitors to surround themselves with the pristine wetland without crossing it. This would reduce the footprint of the human intervention in the wetland.

## 8.2 Improvements to Facilities

The master planning process identified a number of alterations to buildings necessary for on-going operations, enhanced public enjoyment, and a support of environmental education programs.

Nature Centre (Existing: Building #5 on Fig 2; New: Building #4 on Fig 3) – The existing Nature Centre is utilized by Environmental Connections. It is not, however, frequently used by the public as it does not serve as a meeting facility, nor is it visible from the parking lot.

A new nature centre would see more use and better serve the public if it were nearer to the main parking lot and had a flexible interior space. An approximate location of a new Nature Centre is shown in Figure 3; the exact location of the new centre will be determined in the design phase.

The new Nature Centre will be designed to meet property usage needs, with costs in line with those needs. One significant change will be the installation of washrooms that are accessible from the outside to provide year-round washrooms for visitors. The new Nature Centre will also include meeting space and perhaps include office space, if a need for this is identified.

Partnerships within the Frontenac Arch Biosphere Network might be made to fund the construction and maintenance for the new Nature Centre, since it appears to meet the criteria for Biosphere Network goals: to contribute to conservation of ecosystems and species; to foster economic and human development which is socio-culturally and ecologically sustainable; and to provide support for research, monitoring, education and information exchange related to conservation.

The existing nature centre will be converted to a storage facility for dry, secure storage of education and maintenance supplies. Given that storage space is in short supply at MJWA, this use would be cost-effective and beneficial to the property. Upon construction of the new nature centre, it should be determined whether the existing centre will be utilized for storage in its current location or whether it should be moved closer to the workshop area.

Workshop (Building #1)– The workshop is the Eastern Service Centre for all CRCA properties, not only MJWA. As such, it provides working and storage space for tractors, plows, mowers, stop logs for dams, power tools, and fencing, among other supplies. The existing space is full and more covered space is needed to shelter the equipment required to maintain properties and water control structures. An addition on the south side of the workshop will be designed and built to accommodate the equipment.

Rental Property/Boardroom (Building #2) – The new nature centre (Building #4; Fig 3) will include meeting space that will serve as a boardroom. Upon construction of the new nature centre, MJWA will have no need for this building. Demolition, conversion of the building to other uses, and sale of the building with a parcel of property were three options evaluated. Demolition is a net cost with no benefit. Conversion of the building to other uses is possible, but given the location of the building, its use is not likely to be required. Sale of the building and a parcel of land around it would provide an influx of capital for projects on the property. Given the location's proximity to the roadway and the Workshop, this sale would not negatively impact habitats, trails, or other uses of MJWA. Prior to the sale of the parcel a perimeter fence will be constructed and/or shrubbery will be planted to provide visual and acoustic separation from

MJWA. Sale of the building and a lot would include provisions to ensure that the homeowners respect the natural and cultural heritage of MJWA.

Picnic Pavilion, Parking, and Existing Washrooms – The pavilion and parking are currently utilized by the public. They will be maintained.

A proposal was discussed prior to the creation of this master plan to add a nature centre onto the existing washrooms (Building #4; Figure 2). However, the existing washrooms are not insulated and have poor floor drainage. Development of the new nature centre around these existing washrooms would require an overhaul of the bathrooms that is not cost-effective. Instead, the new nature centre will be constructed as discussed above and the existing washrooms will be removed following construction of the new nature centre with its year-round washrooms.

Campground and Campground Washrooms – These facilities are no longer used. The area (ND4) will be allowed to return to a natural state. The washrooms (Building #7; Fig 2), although closed, are still structurally sound. They will be left in place for future use should such a need arise or until the washrooms are constructed in the new nature centre. Following construction of the new nature centre, demolition of these washrooms will be evaluated.

Swan Compound – The Trumpeter Swan Reintroduction Program has been a success for the swans and for MJWA. Maintenance to the Swan Compound (Building #3; Fig 2) will be carried out as necessary to serve this program.

Skating Warming Hut – The current warming hut (Building #6; Fig 2) is not optimal for its use. A new structure will be constructed on the same footprint. The new hut will include signs to encourage skaters to use the warming hut.

McGhie House – This house is owned by the CRCA, but currently occupied by a tenant. Upon the change of tenancy, the condition of the house will be evaluated and the potential utilization of the house for MJWA purposes will be assessed in light of this master plan. As determined through this master planning process, the focus of the southlands is to remain support of passive use, not operations or MJWA facilities. Therefore, the McGhie house will have to be evaluated in this light. Trail 5 will be extended across the McGhie site after the change in tenancy.

Southern Parking Lots – The advantages to consolidating the parking lots along Centennial Road were expressed during the master planning process. These include restoring habitat, minimizing maintenance of parking lots, and consolidating where vehicles enter the property. The location of a consolidated parking lot may depend on the location of the entrance of the Brock Trail onto the property. The parking lot should coincide with that entrance and still allow for direct drive up to a canoe access point. Whether that lot is east or west of the Broome-Runciman dam will not be determined until the City of Brockville decides where the Brock Trail will be developed.

### 8.3 Retention and Enhancement of Wildlife Area Features

The wildlife and habitats of MJWA were identified as most important to stakeholders. These aspects must be maintained throughout the implementation of other aspects of the Master Plan. Enhancements to the wildlife refuge features will include the following.

### *8.3.1 Monitoring*

Resource inventories of MJWA were conducted in 1982 and 2005. The 1982 inventory was conducted between May and September of that year. The 2005 inventory was limited to October. Ideally, the species present throughout the year would be inventoried at a wildlife area such as MJWA. This year-round inventory would be followed up by on-going inventories to assess changes in flora and fauna and address any degradation of habitat or depletion of species.

Volunteer BioBlitzes, which are undertaken to inventory flora and fauna, will be coordinated in all four seasons and on an on-going basis every few years to maintain a record of what species are permanent residents of the Wildlife Area and which species are in MJWA for nesting, migration stopovers, wintering, and other seasonal uses. CRCA staff with experienced community volunteers will undertake these inventories. Summer students can also be hired to conduct this inventory under the supervision of the Conservation Authority biologist if funding for these positions is found.

Knowledge of the water quality in the wetland, reservoir and beaver pond is necessary to ensure the health of the waterbodies, particularly given the wide range of flora and fauna present on the property. Monitoring of the water quality in the reservoir and beaver pond will be undertaken to accomplish the following:

- determine both baseline levels and trends in the reservoir and beaver pond
- identify water quality issues
- evaluate whether eutrophication is occurring

Dissolved oxygen, turbidity, temperature and pH measurements will indicate the quality of the water for fisheries. Colorimetric and/or laboratory analysis of water samples for phosphates and nitrates will indicate whether the reservoir is undergoing eutrophication. Laboratory analysis of the beaver pond water samples may also be warranted for other constituents depending on the findings of the physical investigation of the surrounding land, drainage, and sources of contamination if any (see Section 8.3.4).

### *8.3.2 Maintenance*

One priority identified through the master planning process was maintenance of the undisturbed habitat in the north-eastern corner of the property. This master plan supports this goal, by not promoting the development of facilities or trails in the area.

Appropriate planning measures will be taken to retain and protect Species at Risk and Species of Special Concern for the long-term. Measures include ensuring that Species at Risk and Species of Special Interest are protected and that their habitats are not encroached upon by trails and use.

Both the osprey nesting platform and the ice-free lagoon for overwintering swans will continue to be maintained. The ice-free lagoon is critical to the continuation of the successful Trumpeter Swan Reintroduction Program. The swans are sufficiently hardy to overwinter in Ontario, but need open, ice-free water to do so. CRCA will continue to support this program for as long as it is feasible to do so.

### *8.3.3 Adapting to Development*

It is considered likely that Centennial Road will be upgraded from a rural to an arterial road within the 20-year timeline of this Master Plan. Steps will be taken to mitigate the impact of those road improvements on the Wildlife Area including: (1) shrub and tree planting along Centennial Road; (2) involvement of the CRCA in municipal planning of lighting, crosswalks, and stormwater management; and (3) monitoring the impacts of the upgrade of the road and addressing any impacts as they are identified.

### *8.3.4 Investigating Beaver Pond Degradation*

Concerns have been raised regarding degradation of the wetlands surrounding the beaver pond. This pond used to be a notable habitat for shorebirds, but does not serve that function currently. The cause of the degradation of the beaver pond will be investigated and remediated. This investigation will encompass the water, wetland, and the land surrounding the pond extending a minimum of 120 metres from the wetland boundary.

## 8.4 Identification and Promotion of Partnerships and Partnering Projects

One aspect of the vision for MJWA is to collaborate with the local community and visitors to the property in the stewardship and protection of the Mac Johnson Wildlife Area. Environmental learning opportunities and events are also valued.

To cultivate collaboration with the community and visitors, partnerships will be fostered and partnering projects will be identified. Existing partnerships, such as those with the Friends of Mac Johnson Wildlife Area will continue to be nurtured.

Inclusion in the Frontenac Arch Biosphere Reserve encourages these partnerships and assists in their creation. The CRCA will make a concerted effort to encourage partnering projects and develop partnerships to continue local and regional engagement with MJWA. Potential partners might include St. Lawrence College and the Leeds County Stewardship Council among many others.

Promotion of MJWA throughout the region is crucial to sparking community interest in forming MJWA-related partnerships. This Master Plan addresses promotion of the area through the following:

- Creation of a new Nature Centre
- Enhancing recognition
- Creation of sitting and picnic areas to increase use
- Continuing education programs
- Partnership promotion

Other promotion of MJWA will be done as time and budgets allow.

## 8.5 Marketing and Financial Feasibility Study

Funding is a challenge for maintenance of a wildlife area in a region with a relatively small local population. The CRCA will undertake a Marketing and Financial Feasibility Study to assess how to market and meet financial goals with the property. This study will consider, in greater detail, current and projected use patterns, demographics, potential user activities and events, advertising, communications and funding sources.

## 8.6 Other Improvements

In addition to the four significant items listed above, the master planning process identified other smaller projects of value to undertake within this master planning timeframe.

### 8.6.1 *Enhancing Recognition of MJWA*

In order to promote broader recognition, the Conservation Authority will pursue official adoption of the name Mac Johnson Wildlife Area by the [Ontario Geographic Names Board](#). In time this will ensure that the name appears on road maps and other publications.

### 8.6.2 *Inventory of Signs*

Appropriate trail, safety, and access signs enhance property enjoyment and use. An inventory of signs at MJWA was completed in 2003 and will be reviewed every three years to ensure that signs are legible, reflective of current conditions, and sufficient for current needs. Signs will also be rationalized again within the next three years.

## 8.7 Intended Activities by Management Zone

The management zones defined for MJWA are shown in Figures 2 and 3. The activities and structures that are intended for each zone are summarized in Appendix 6. Briefly, the activities intended for each zone are as follows:

- ND1 Operations Lands – The workshop and activities in support of the Eastern Service Centre are located in this area. An addition will be built onto the south of the workshop to increase storage space. The portion of this zone surrounding the boardroom/rental house will be sold following the completion of the new nature centre.
- ND2 Meadowlands -- This area will be maintained as a meadow. Native meadow species planted among those growing naturally could be planted to increase biodiversity should there be an interest to do so.
- ND3 Existing Built Lands -- This area is the centre of educational and visitor amenities. It will be maintained as such with maintenance of the parking lot, picnic pavilion, gardens, meadow, and manicured lawns. The existing nature centre will be replaced with a new facility adjacent to the parking lot with flexible interior space and washrooms that are accessible year-round from outside the building. The existing washrooms will be removed following construction of the new nature centre. The existing nature centre will be used for storage of educational and maintenance equipment.
- ND4 Revitalization Lands – The inactive campground is located in this area. This area will be allowed to revegetate naturally. Removal of the washrooms will be evaluated after construction of the new nature centre and its bathrooms is complete.
- ND5 Existing Non-Conforming Lands – This area has two structures near the shoreline of the reservoir: the swan compound and the skating warming hut. The hut will be replaced with a building that better suits the site; the swan compound will be maintained. The fully wheelchair-accessible portion of Trail 1 is to receive the maintenance required for wheelchair-bound visitors to enjoy the Wildlife Area.

- SR1 Passive Recreation – These southlands will continue to house trails and access points. Completion of the fenceline along Centennial Road will minimize the off-trail overland entrances to MJWA. Unofficial pathways will be left to re-establish vegetative cover naturally. Benches and picnic areas will be constructed along southland trails.
- SR2 Dam & Reservoir Maintenance Access – Maintenance of the Broome-Runciman Dam and of the reservoir are necessary to ensure flood control for the City of Brockville and to retain the reservoir and wetland. Management Zone SR2 has been designated as an area in which dam and reservoir access has priority. Any proposed future modifications to this area should be evaluated with regard to ensuring that access to the dam and reservoir is maintained. A boardwalk north of the dam will be built to connect the existing canoe access point to Trail 5 following a change in tenancy of the McGhie house.
- W1 and W2 – Wooded Areas – General and Adjacent Lands – Existing trails will be maintained. Forests will be monitored in accordance with the CRCA's 20-year Forest Management Plan. An extension to Trail 5 will be added to connect the existing canoe access point in SR2 to the eastern end of Trail 5 in W2. Benches and picnic tables are proposed for constructed along southland trails in W2.

## 9.0 Land Acquisition and Disposition

Lands abutting MJWA could be valuable additions for protection of natural or cultural values, resource management and/or operational reasons. Opportunities for land acquisition will be considered on an individual basis only if offered by sale, donation, or other method by willing owners. Any land acquisition or disposal will follow the *CRCA Conservation Lands Guidelines: Our Role, Principles, and Priorities (November 23, 2005)*.

Three properties have been identified as potential for acquisition/disposal.

- 1) It is in the interest of MJWA for the CRCA to secure permanent access along the currently closed McLarry Road to the west of MJWA. Access along this road allowance allows maintenance vehicles to travel from MJWA northlands to the southlands. This land is currently on an opened road allowance that is gated at both ends. The CRCA holds keys to this gate and is currently welcome to access this road allowance. Should use or ownership of this land change (i.e., if the road were closed), the CRCA would be offered the property that forms the east side of the road. The CRCA should also secure the west portion of the road at that time to increase the buffer area between the property and neighbours.
- 2) The Buells Creek Reservoir wetland extends north of MJWA. The current Provincial Policy Statement already protects this Provincially Significant Wetland from development, but, should the CRCA see a need for further protection of these lands, acquisition of these lands might be considered.
- 3) A parcel of property surrounding the current boardroom/rental house (Building 2) is a candidate for future disposal. Board meetings will be moved to the new Nature Centre following construction of the centre, making the existing boardroom/rental house extraneous. Options for the building would include demolition, continued rental, or sale of the building and a surrounding parcel of property to a residential purchaser. Disposal of this parcel would not impact the significant features of MJWA, but it would provide leverage for assembling funds for development projects on the property. This potential

disposal should be evaluated in three to five years to assess the value of this alternative to the CRCA at that time.

## **10.0 Partners**

The CRCA gratefully acknowledges the contributions of all of its partners.

### [Friends of Mac Johnson Wildlife Area](#)

The Friends of Mac Johnson Wildlife Area was formed in 1996, with assistance from the Lands Stewardship Council of the Ministry of Natural Resources, to assist in the development and promotion of the Mac Johnson Wildlife Area. The “Friends” have undertaken many projects including trail maintenance, fence installation, researching and writing the history of the area, promoting MJWA, raising local awareness, raising significant funds for property maintenance and improvements to the area. They have provided a large, consistent volunteer base to support the CRCA staff with any physical improvement projects at MJWA.

The Friends have worked with the Stewardship Councils on the Co-operative Tree Nursery in ND1. They also host refreshments at the skating rink on winter weekends. The Friends stage two large events each year: the Spring and Fall Open Houses, and provide significant assistance to CRCA staff with the popular Winter Fun Day.

The mandate of the Friends is to “preserve, promote and protect” MJWA. In 2006, the Friends had about 40 paid members with about 25 core members actively participating in the group. The CRCA gratefully recognizes the important contributions of the Friends of Mac Johnson Wildlife Area.

### [Environmental Connections](#)

Environmental Connections provides programs in outdoor education at Mac Johnson Wildlife Area in conjunction with the learning expectations of the Ontario Ministry of Education. See Section 4.4 above for information on this partnership.

### [TransCanada Pipelines Limited](#)

A portion of TransCanada’s Canadian mainline for natural gas transmission runs through the south part of Mac Johnson Wildlife Area. The company has a strong community investment program and has expressed interest in developing a meaningful partnership with the Cataraqui Region Conservation Authority relating to the Mac Johnson Wildlife Area. TransCanada Pipelines Ltd. donated funds to restore the canoe access point and associated parking area near the Broome-Runciman dam.

### [Ontario Society for the Prevention of Cruelty to Animals, \(OSPCA\) Leeds Grenville Branch](#)

The OSPCA’s animal shelter for the Leeds Grenville branch is located near the southwest corner of the Mac Johnson Wildlife Area, next to the Brockville metering station of TransCanada Pipelines Limited on Centennial Road. The OSPCA helps maintain MJWA trails close to their facility, which they use for dog walking. Their internal policy of always keeping their dogs on leashes meets the requirements of MJWA (see Section 4.3.8).

### [Leeds County Stewardship Council](#)

The Leeds County Stewardship Council was a lead partner in development of the tree nursery southeast of the workshop (Figure 2).

### Procter and Gamble Canada Inc.

Employees from Procter and Gamble Canada Inc. in Brockville participate in an annual Volunteer Day during which they volunteer throughout the community. MJWA saw large groups of enthusiastic volunteers undertake property projects in 2000 and 2006.

## **11.0 Implementation and Phasing**

### 11.1 Purpose of Implementation Framework

The purpose of an implementation strategy is threefold:

- 1) to prioritize projects into a phasing schedule
- 2) to identify capital development projects and their associated relative costs
- 3) to identify annual operating and maintenance costs

The phasing plan is prepared to ensure that the projects identified in the master plan are carried out in a systematic fashion. However, implementation is dependent on the availability of financial resources and staff and volunteer capacity. Approval of the master plan does not ensure that funding and labour capacity will be sufficient for implementation.

A cursory review of the master plan will be conducted every five years and a comprehensive review will be conducted every ten years. This schedule of review will ensure that the master plan continues to establish a direction for MJWA that is consistent with the priorities for the area, the needs of the community, and the concerns of neighbouring landowners.

### 11.2 Priority of Proposed Projects

Management of MJWA should follow the vision and goals that were developed for the property in the master planning process. Therefore projects will be prioritized by the following criteria:

- 1) Public Safety – Flood control, dam safety, safety in MJWA structures and on trails is first priority.
- 2) Character and Habitat – Projects that maintain the wildlife characteristics of MJWA are second priority. These projects include maintenance and protection of existing habitats and trails.
- 3) Public Use and Education – Projects that maintain trails and facilities for appropriate public use and education are the next priority. These projects also include required replacement of existing structures.
- 4) Amenity Improvements – Habitat and trail improvement projects are a later priority.

These priorities may occur simultaneously depending on funding and human resources. This list is simply intended to guide the focus of projects. Some projects will cover more than one of these priorities; they are not mutually exclusive.

The Marketing and Financial Feasibility Study must also be prioritized to ensure that funding and staffing are available for completion of projects identified in the master plan.

### 11.3 Phasing of Implementation

<b>PLANNED PROJECT</b>	<b>1-4 Years</b>	<b>5-10 Years</b>	<b>11-15 Years</b>	<b>16+ Years</b>
<b>TRAIL IMPROVEMENTS</b>				
Rationalizing Trails		X		
Completion of fencing along Centennial Road	X			
Picnic Areas/Benches on Southland Trails	X	X		
Extension of Trail 5 East				Unknown
Signs for Bicycles	X			
<b>FACILITY IMPROVEMENTS</b>				
Replacement of Nature Centre		X		
Addition onto Workshop	X			
Sale of Rental Property/Boardroom	X			
Removal of Existing Washrooms			X	
Replacement of Warming Hut		X		
Consolidation of southern parking lots			X	
<b>WILDLIFE FEATURES</b>				
4-Season BioBlitz	X	X	X	X
Minimizing impact of Centennial Rd upgrade			Unknown	
Beaver Pond Investigation and Restoration	X			
Water Quality Monitoring	X	X	X	X
<b>OTHER PROJECTS</b>				
Enhancing Recognition	X	X	X	X
Sign Inventory Evaluation		X	X	X
Forest Management Plan	X			X
Marketing and Financial Feasibility Study	X			

#### 11.4 Relative Cost Estimates

<b>Project</b>	<b>Relative Initial Cost</b>	<b>Relative Maintenance Cost</b>
Rationalizing Trails	Low	Low
Completion of fencing along Centennial Road	Low -- funding secured	Low
Picnic Areas/Benches along Southland Trails	Medium	Medium
Extension of Trail 5 East	Medium	Medium
Signs for Bicycles	Low	Low
Replacement of Nature Centre	High	High
Addition onto Workshop	Medium	Low
Sale of Rental Property/Boardroom	Medium	Low
Removal of Existing Washrooms	High	Low
Replacement of Warming Hut	Medium	Medium
Consolidation of southern Parking Lots	Medium	Low
4-season BioBlitz	Low	Low (if volunteer)
Minimizing impact of Centennial Road upgrade	Medium	Medium
Beaver Pond Investigation and restoration	Low - Medium	Low
Water Quality Monitoring	Low	Low
Enhancing Recognition	Low	None
Sign Inventory Evaluation	Low	Low
Forest Management Plan	Medium	Separate Funding Mechanism
Marketing and Financial Feasibility Study	Medium	None
On-going Facility Maintenance	n/a	High
On-going Trail Maintenance	n/a	Medium
On-going Dam Maintenance	n/a	High

Relative Initial Costs

Low: Below \$5,000

Medium: \$5,000 to \$20,000

High: Above \$20,000

Relative Maintenance Costs

Low: Below \$200/year

Medium: \$200 to \$500/year

High: Above \$500/year

## **12.0 Summary**

The Mac Johnson Wildlife Area is an important ecological and recreational asset to the region. The property is treasured for its role as a wildlife refuge near an urban centre. With its Provincially Significant Wetland, sand dunes, Karst topography, and habitat for a wide diversity of species, public support is strongly in favour of maintaining and enhancing the natural aspects of the property.

Identified development to the property is limited to enhancement of some facilities in the northlands and creation of benches and picnic areas along the southlands trails. Extension of Trail 5 will also be undertaken. A Marketing and Financial Feasibility Study will assess the funding opportunities for projects and maintenance of MJWA and potential marketing plans for the property. Other projects will be undertaken to evaluate and maintain wildlife aspects (e.g., BioBlitzes, water quality sampling), to ensure public safety (sign plans and trail maintenance), and to enhance educational and passive recreational use of the property (e.g., rebuilding of the Nature Centre, replacement of the skating warming hut). All projects will be undertaken within the context of the natural heritage of the area.

Implementation of this Master Plan is dependant on the availability of financial and labour resources.

## Key References

Ecological Services. 2005. **Issues & Focus Paper: Background to Updating the Stewardship Plan for Mac Johnson Wildlife Area.**

Cataraqui Region Conservation Authority, 2006. **Mac Johnson Wildlife Area Resource Inventory – Initial Findings**

Cataraqui Region Conservation Authority. 2006. **Synopsis of Public Responses to Concepts for Mac Johnson Wildlife Area.**

Cataraqui Region Conservation Authority, 2005. **CRCA Conservation Lands Guidelines: Our Role, Principles, and Priorities.**

Cataraqui Region Conservation Authority, 1998. **Mac Johnson Wildlife Area 20 Year Forest Management Plan (1998 – 2017).**

Cataraqui Region Conservation Authority. 1983. **Master Plan Buells Creek Conservation Area.**

Cataraqui Region Conservation Authority. 1982. **Resource Inventory and Analysis of Buells Creek Conservation Area.**

**Appendix 1**  
**Existing Official Plan Official Plans, Zoning By-Laws and Schedules –**  
**City of Brockville and Township of Elizabethtown**

*City of Brockville Official Plan (1987, amended in 2001)*

The City's "Rural" designation permits agriculture, conservation and public utility uses. The intent is to prevent urbanization of the area and to maintain its rural nature. When the Official Plan is updated, the CRCA should request that the designation on the wetland portion of the MJWA be changed to "Natural Heritage – Provincially Significant Wetland" to be consistent with the policies of the Township of Elizabethtown-Kitley. Depending on the intended use of the upland portion of the property, the CRCA may want to consider changing its designation from "Rural" to "Open Space".

*City of Brockville Zoning By-law (194-94)*

The property is currently zoned "Open Space". This zone permits limited land uses, none of which are of interest to the CRCA's objectives for the MJWA. When the Zoning By-law is updated, the CRCA should request that the permitted uses in the "Open Space" zone be amended to more accurately reflect the intended use of such areas (e.g. parks). Terminology used in the By-law would also need to be changed.

*Township of Elizabethtown-Kitley Official Plan (2005)*

The "Natural Heritage – Provincially Significant Wetland" designation applies to the wetlands on the property in the Township. The intended uses include wildlife management, conservation, resource management, and private and public passive recreation, generally not involving buildings. The Official Plan also sets out under what circumstances development may occur within 120 metres of a wetland.

The intent of the "Rural" designation that applies to the upland portion of MJWA is to preserve the open countryside, creeks, wetlands and wooded areas. Permitted uses include conservation, passive outdoor recreation, and accessory dwellings.

A small portion of the MJWA is designated "Mineral Resource" based on information supplied by the Ministry of Natural Resources and the Ministry of Northern Development and Mines. The main deposit of aggregates is located on land to the north of the property.

*Township of Elizabethtown Zoning By-law (1712)*

The Zoning By-law for the former Township of Elizabethtown precedes the Official Plan, and so the zones do not necessarily reflect the general land use policies of the Official Plan.

The "Restricted Open Space (OS1)" zone loosely corresponds to wetlands and floodplains. The zone permits a number of uses including a park and public uses. The "General Open Space (OS2)" zone includes similar limited uses. The term "public use" is defined in the Zoning By-law as "a building, structure or lot used for public services by ... any Conservation Authority established by the Government of Ontario..."

When a new Zoning By-law is written for the Township of Elizabethtown-Kitley it is anticipated that the zones will be changed to more accurately reflect the intended use of such areas as outlined in the Official Plan.

## Appendix 2 -- Resource Inventory

Table 1

Vascular Plants observed within Mac Johnson Wildlife Area, 1982-2005

FAMILY Scientific name	Common name	1982	2005
<b>LYCOPODIACEAE</b>			
<i>Diphasiastrum digitatum</i>	Ground Cedar	✓	
<i>Huperzia lucidula</i>	Shining Club-moss	✓	✓
<i>Lycopodium clavatum</i>	Running Club-moss	✓	
<i>L. obscurum</i>	Ground Pine	✓	✓
<b>EQUISETACEAE</b>			
<i>Equisetum arvense</i>	Common Horsetail	✓	JR
<i>E. fluviatile</i>	Water Horsetail	✓	
<i>E. hyemale</i>	Scouring-rush	✓	JR
<i>E. sylvaticum</i>	Wood Horsetail	✓	
<b>OPHIOGLOSSACEAE</b>			
<i>Botrychium multifidum</i>	Leathery Grape Fern	✓	
<i>B. virginianum</i>	Rattlesnake Fern	✓	
<b>OSMUNDACEAE</b>			
<i>Osmunda cinnamomea</i>	Cinnamon fern	✓	JR
<i>O. claytoniana</i>	Interrupted fern	✓	JR
<i>O. regalis</i>	Royal fern	✓	✓
<b>DENNSTAEDTIACEAE</b>			
<i>Pteridium aquilinum</i>	Bracken Fern Family	✓	✓
<b>THELYPTERIDACEAE</b>			
<i>Phegopteris connectilis</i>	Northern Beech Fern	✓	
<i>Thelypteris noveboracensis</i>	New York Fern	✓	
<i>T. palustris</i>	Marsh Fern	✓	?
<b>ASPLENIACEAE</b>			
<i>Asplenium platyneuron</i>	Spleenwort Family		✓
<b>DRYOPTERIDACEAE</b>			
<i>Athyrium filix-femina</i>	Lady Fern (green stem)	✓	
<i>A. filix-femina</i> var. <i>rubellum</i>	Lady Fern (wine stem)	✓	
<i>Cystopteris bulbifera</i>	Bulbet Bladder Fern	✓	
<i>Dryopteris carthusiana</i>	Spinulose Wood Fern	✓	
<i>D. clintoniana</i>	Clinton's Wood Fern	✓	
<i>D. intermedia</i>	Evergreen Wood Fern	✓	
<i>D. marginalis</i>	Marginal Wood Fern	✓	
<i>Gymnocarpium dryopteris</i>	Oak Fern	✓	
<i>Matteuccia struthiopteris</i>	Ostrich Fern	✓	JR
<i>Onoclea sensibilis</i>	Sensitive Fern	✓	✓ <sub>F, P</sub>
<i>Polystichum acrostichoides</i>	Christmas Fern	✓	JR

<b>POLYPODIACEAE</b>	<b>Fern Family</b>		
<i>Polypodium virginianum</i>	Rock Polyploidy Fern	✓	JR
<b>PINACEAE</b>	<b>Pine Family</b>		
<i>Abies balsamea</i>	Balsam Fir	✓	✓
<i>Larix decidua</i>	European Larch (planted)	✓	JR
<i>L. laricina</i>	Tamarack	✓	✓
<i>Picea abies</i>	Norway Spruce (planted)	✓	✓ <sub>P</sub>
<i>P. glauca</i>	White Spruce	✓	✓
<i>P. mariana</i>	Black Spruce	✓	JR
<i>P. rubens</i>	Red Spruce (planted)	✓	
<i>Pinus resinosa</i>	Red Pine (planted)	✓	✓
<i>P. strobus</i>	Eastern White Pine	✓	✓ <sub>F, P</sub>
<i>P. sylvestris</i>	Scotch Pine (planted)	✓	✓ <sub>F, P</sub>
<i>Tsuga canadensis</i>	Eastern Hemlock	✓	✓
<b>CUPRESSACEAE</b>	<b>Cedar Family</b>		
<i>Juniperus communis</i>	Common Juniper	✓	✓
<i>J. virginiana</i>	Red Cedar	✓	✓ <sub>F, P</sub>
<i>Thuja occidentalis</i>	Eastern White Cedar	✓	✓ <sub>F, P</sub>
<b>ARISTOLOCHACEAE</b>	<b>Dutchman's Pipe Family</b>		
<i>Asarum canadense</i>	Wild Ginger	✓	JR
<b>NYMPHAEACEAE</b>	<b>Water-lily Family</b>		
<i>Nuphar variegata</i>	Bulhead Pond-lily	✓	✓
<i>Nymphaea odorata</i>	Fragrant Water-lily	✓	✓
<b>CERATOPHYLLACEAE</b>	<b>Hornwort Family</b>		
<i>Ceratophyllum demersum</i>	Hornwort	✓	✓
<b>RANUNCULACEAE</b>	<b>Crowfoot or Buttercup Family</b>		
<i>Actaea pachypoda</i>	White Baneberry	✓	JR
<i>A. rubra</i>	Red Baneberry	✓	JR
<i>Anemone canadensis</i>	Canada Anemone	✓	JR
<i>A. virginiana</i>	Thimbleweed	✓	✓ <sub>F, P</sub>
<i>Aquilegia canadensis</i>	Wild Columbine	✓	JR, SF
<i>A. vulgaris</i>	European Columbine	✓	
<i>Caltha palustris</i>	Marsh-marigold	✓	JR
<i>Clematis virginiana</i>	Virgin's-bower	✓	✓
<i>Coptis trifolia</i>	Goldthread	✓	JR
<i>Ranaculus abortivus</i>	Kidney-leaf buttercup	✓	JR
<i>R. acris</i>	Tall buttercup	✓	✓ <sub>P</sub>
<i>R. flabellaris</i>	Yellow Water-crowfoot	✓	
<i>Thalictrum dioicum</i>	Early Meadow-rue	✓	JR
<i>T. pubescens</i>	Tall Meadow-rue	✓	✓
<b>BERBERIDACEAE</b>	<b>Barberry Family</b>		
<i>Berberis vulgaris</i>	Common Barberry	✓	
<i>Caulophyllum thalictroides</i>	Blue Cohosh	✓	JR
<i>Podophyllum peltatum</i>	May-apple	✓	JR
<b>PAPAVERACEAE</b>	<b>Poppy Family</b>		
<i>Sanguinaria canadensis</i>	Bloodroot	✓	JR

<b>ULMACEAE</b>	<b>Elm Family</b>		
<i>Ulmus americana</i>	White Elm	✓	✓ <sub>P</sub>
<i>U. rubra</i>	Red Elm	✓	
<i>U. thomasi</i>	Rock Elm	✓	
<b>CANNABACEAE</b>	<b>Hemp Family</b>		
<i>Humulus lupulus</i>	Common Hop	✓	
<b>URTICACEAE</b>	<b>Nettle Family</b>		
<i>Boehmeria cylindrica</i>	False Nettle	✓	
<i>Urtica dioica</i>	European Stinging Nettle	✓	JR
<b>JUGLANDACEAE</b>	<b>Walnut Family</b>		
<i>Carya cordiformis</i>	Bitternut Hickory	✓	✓
<i>C. ovata</i>	Shagbark Hickory	✓	JR,SF
<i>Juglans cinerea</i>	Butternut	✓	JR,SF
<i>Juglans nigra</i>	Black Walnut		GN
<b>MYRICACEAE</b>	Wax-myrtle Family		
<i>Myrica gale</i>	Sweet gale	✓	✓
<b>FAGACEAE</b>	<b>Beech Family</b>		
<i>Fagus grandifolia</i>	American Beech	✓	✓
<i>Quercus alba</i>	White Oak	✓	✓
<i>Q. macrocarpa</i>	Bur Oak	✓	✓ <sub>F, P</sub>
<i>Q. rubra</i>	Red Oak	✓	✓ <sub>F, P</sub>
<b>BETULACEAE</b>	Hazel Family		
<i>Alnus incana</i>	Speckled Alder	✓	✓
<i>Betula alleghaniensis</i>	Yellow Birch	✓	JR,SF
<i>B. papyrifera</i>	Paper Birch	✓	✓ <sub>F, P</sub>
<i>B. populifolia</i>	Gray Birch	✓	
<i>B. pumila</i> var. <i>glanulifera</i>	Swamp Birch	✓	✓
<i>Carpinus caroliniana</i>	Blue Beech	✓	
<i>Corylus cornuta</i>	Beaked Hazel	✓	
<i>Ostrya virginiana</i>	Ironwood	✓	JR
<b>CHENOPODIACEAE</b>	<b>Goosefoot Family</b>		
<i>Chenopodium album</i>	Lamb's Quarters	✓	JR
<i>C. glaucum</i>	Oak-leaved Goosefoot	✓	JR
<b>CARYOPHYLLACEAE</b>	<b>Pink Family</b>		
<i>Arenaria serpyllifolia</i>	Thyme-leaved Sandwort	✓	
<i>Cerastium arvense</i>	Field Chickweed	✓	
<i>C. fontanum</i>	Larger Mouse-ear Chickweed	✓	
<i>Dianthus armeria</i>	Deptford Pink	✓	JR
<i>Moehringia lateriflora</i>	Blunt-leaved Sandwort	✓	
<i>Saponaria officinalis</i>	Bouncing-bet	✓	✓
<i>Silene vulgaris</i>	Bladder Campion	✓	✓ <sub>F, P</sub>
<i>Stellaria graminea</i>	Grass-leaved Stitchwort	✓	
<b>POLYGONACEAE</b>	<b>Smartweed Family</b>		
<i>Polygonum amphibium</i>	Water smartweed	✓	
<i>P. hydropiper</i>	Water-pepper	✓	

<i>P. hydropiperoides</i>	Mild Water-pepper	✓	
<i>P. persicaria</i>	Lady's-thumb	✓	JR
Rumex acetosella	Sheep Sorrel	✓	JR
<i>R. crispus</i>	Curly-leaf Dock	✓	✓ <sub>P</sub>
<i>R. orbiculatus</i>	Great Water Dock	✓	✓
<b>GUTTIFERAE</b>	<b>St. John's-wort Family</b>		
<i>Hypericum perforatum</i>	Common St. John's-wort	✓	✓ <sub>P</sub>
<i>H. punctatum</i>	Spotted St. John's-wort	✓	
<i>Triadenum virginicum</i>	Marsh St. John's-wort	✓	
<b>TILIACEAE</b>	<b>Linden Family</b>		
<i>Tilia americana</i>	American Basswood	✓	✓ <sub>F, P</sub>
<b>MALVACEAE</b>	<b>Mallow Family</b>		
<i>Malva neglecta</i>	Cheeses	✓	JR
<b>SARRACENIACEAE</b>	<b>Pitcher-plant Family</b>		
<i>Sarracenia purpurea</i>	Pitcher-plant	✓	✓
<b>VIOLACEAE</b>	<b>Violet Family</b>		
<i>Viola blanda</i>	Sweet White Violet	✓	
<i>V. canadensis</i>	Canada Violet	✓	
<i>V. conspersa</i>	American Dog Violet	✓	
<i>V. cucullata</i>	Marsh Blue Violet	✓	
<i>V. macloskeyi</i>	Northern White Violet	✓	
<i>V. nephrophylla</i>	Northern Bog Violet	✓	
<i>V. pubescens</i>	Downy Violet	✓	
<i>V. rostrata</i>	Long-spurred Violet	✓	
<i>V. septentrionalis</i>	Northern Blue Violet	✓	
<b>CUCURBITACEAE</b>	<b>Gourd Family</b>		
<i>Echinocystis lobata</i>	Wild Cucumber	✓	JR
<b>SALICACEAE</b>	<b>Willow Family</b>		
<i>Populus balsamifera</i>	Balsam Poplar	✓	✓ <sub>P</sub>
<i>P. deltoides</i>	Eastern Cottonwood	✓	
<i>P. grandidentata</i>	Large-tooth Aspen	✓	✓
<i>P. tremuloides</i>	Trembling Aspen	✓	✓
<i>Salix amygdaloides</i>	Peach-leaved Willow	✓	✓ <sub>P</sub>
<i>S. bebbiana</i>	Bebb's Willow	✓	
<i>S. candida</i>	Hoary Willow	✓	
<i>S. discolor</i>	Pussy Willow	✓	✓ <sub>P</sub>
<i>S. fragilis</i>	Crack Willow	✓	
<i>S. lucida</i>	Shining Willow	✓	
<i>S. nigra</i>	Black Willow	✓	
<i>S. pedicellaris</i>	Bog Willow	✓	
<i>S. petiolaris</i>	Slender Willow	✓	
<i>S. serissima</i>	Autumn Willow	✓	
<b>BRASSICACEAE</b>	<b>Mustard Family</b>		
<i>Allaria petiolata</i>	Garlic Mustard		✓ <sub>F, P</sub>
<i>Armoracea rusticana</i>	Horseradish	✓	

<i>Barbarea vulgaris</i>	Winter-cress	✓	
<i>Cardamine diphylla</i>	Two-leaved Toothwort	✓	
<i>Hesperis matronalis</i>	Dame's Rocket	✓	
<i>Lepidium campestre</i>	Field Cress	✓	✓ <sub>P</sub>
<i>L. densiflorum</i>	Common Peppergrass	✓	
<i>Rorippa islandica</i>	Marsh Yellow-cress	✓	
<i>Sinapsis arvensis</i>	Wild Mustard	✓	
<i>Sisymbrium officinale</i>	Hedge mustard	✓	
<b>ERICACEAE</b>	<b>Heath Family</b>		
<i>Chamaedaphne calyculata</i>	Leatherleaf	✓	✓
<i>Gaultheria procumbens</i>	Wintergreen	✓	JR
<i>Vaccinium macrocarpon</i>	Large Cranberry	✓	✓
<b>PYROLACEAE</b>	Wintergreen Family		
<i>Pyrola elliptica</i>	Shinleaf	✓	
<b>MONOTROPACEAE</b>	Indian Pipe Family		
<i>Monotropa uniflora</i>	Indian-pipe	✓	JR, SF
<b>PRIMULACEAE</b>	<b>Primrose Family</b>		
<i>Lysimachia ciliata</i>	Fringed Loosestrife	✓	JR
<i>L. terrestris</i>	Swamp Loosestrife	✓	JR
<i>L. thyrsiflora</i>	Tufted Loosestrife	✓	
<i>Trientalis borealis</i>	Star-flower	✓	
<b>GROSSULARIACEAE</b>	Gooseberry or Currant Family		
<i>Ribes americanum</i>	Wild Black Currant	✓	
<i>R. cynosbati</i>	Prickly Gooseberry	✓	✓ <sub>F, P</sub>
<i>R. hirtellum</i>	Smooth Gooseberry	✓	
<i>R. odoratum</i>	Buffalo Currant	✓	
<i>R. rubrum</i>	Red Currant	✓	
<b>CRASSULACEAE</b>	<b>Stonecrop or Orpine Family</b>		
<i>Sedum acre</i>	Mossy Stonecrop	✓	JR, SF
<i>S. telephinum</i>	Live-forever Orpine	✓	
<b>SAXIFRAGACEAE</b>	<b>Saxifrage Family</b>		
<i>Mitella diphylla</i>	Coolwort Mitrewort	✓	
<i>M. nuda</i>	Naked Mitrewort	✓	
<i>Penthorum sedoides</i>	Ditch Stonecrop	✓	
<i>Tiarella cordifolia</i>	False Mitrewort	✓	
<b>ROSACEAE</b>	Rose Family		
<i>Agrimonia gryposepala</i>	Tall Hairy Agrimony	✓	JR
<i>Amelanchier arborea</i>	Downy Juneberry	✓	
<i>A. laevis</i>	Smooth Juneberry	✓	
<i>A. sanguinea</i>	Roundleaf Juneberry	✓	
<i>A. spicata</i>	Low Juneberry	✓	
<i>Aronia melanocarpa</i>	Black Chokeberry	✓	✓
<i>Aronia x prunifolia</i>	Purple chokeberry	✓	
<i>Crataegus crus-galli</i>	Cockspur Hawthorn	✓	
<i>C. flabellata</i>	Bosc's Thorn	✓	

<i>C. mollis</i>	Downy Thorn	✓	
<i>C. monogyna</i>	English Hawthorn	✓	
<i>C. punctata</i>	Large-fruited Thorn	✓	
<i>C. succulenta</i>	Long-spined Thorn	✓	
<i>Fragaria vesca</i>	Woodland Strawberry	✓	✓
<i>F. virginiana</i>	Common (Wild) Strawberry	✓	✓ <sub>F, P</sub>
<i>Geum aleppicum</i>	Yellow Avens	✓	JR
<i>G. canadense</i>	White Avens	✓	✓ <sub>P</sub>
<i>Malus pumila</i>	Common Crabapple	✓	✓ <sub>F, P</sub>
<i>Potentilla argentea</i>	Silvery Cinquefoil	✓	✓ <sub>P</sub>
<i>P. fruticosa</i>	Shrubby Cinquefoil	✓	
<i>P. norvegica</i>	Rough Cinquefoil	✓	✓
<i>P. palustris</i>	Marsh Cinquefoil	✓	
<i>P. recta</i>	Rough-fruited Cinquefoil	✓	✓ <sub>P</sub>
<i>Prunus pennsylvanica</i>	Pin Cherry	✓	JR
<i>P. serotina</i>	Black Cherry	✓	JR
<i>P. virginiana</i>	Choke Cherry	✓	✓ <sub>P</sub>
<i>Rosa acicularis</i>	Prickly Rose	✓	✓ <sub>P</sub>
<i>R. blanda</i>	Smooth Rose	✓	
<i>R. gallica</i>	Purple Rose	✓	
<i>Rubus allegheniensis</i>	Alleghany Blackberry	✓	
<i>R. canadensis</i>	Smooth Blackberry	✓	✓ <sub>F, P</sub>
<i>R. idaeus</i> spp. <i>melanolasius</i>	Wild Red Raspberry	✓	✓ <sub>F, P</sub>
<i>R. pubescens</i>	Dwarf Raspberry	✓	
<i>Sorbus americana</i>	American Mountain-ash	✓	? <sub>F, P</sub>
<i>S. decora</i>	Showy Mountain-ash	✓	
<i>Spiraea alba</i>	Meadow-sweet	✓	✓ <sub>P</sub>
<i>S. tomentosa</i>	Tomentuose Meadow-sweet	✓	
<i>Waldsteinia fragarioides</i>	Barren Strawberry	✓	
<b>FABACEAE</b>	<b>Pea or Pulse Family</b>		
<i>Amphicarpa bracteata</i>	Hog Peanut	✓	JR
<i>Lotus corniculatus</i>	Bird's-foot Trefoil	✓	✓ <sub>P</sub>
<i>Medicago lupulina</i>	Black Medick	✓	✓ <sub>P</sub>
<i>M. sativa</i>	Alfalfa	✓	
<i>Melilotus alba</i>	White Sweet-clover	✓	
<i>M. officinalis</i>	Yellow Sweet-clover	✓	✓ <sub>P</sub>
<i>Robinia pseudo-acacia</i>	Black Locust	✓	
<i>Trifolium dubium</i>	Small Hop Clover	✓	
<i>T. pratense</i>	Red Clover	✓	✓ <sub>F, P</sub>
<i>T. repens</i>	White Clover	✓	✓ <sub>F, P</sub>
<i>Vicia cracca</i>	Cow Vetch	✓	✓ <sub>F, P</sub>
<b>HALORAGACEAE</b>	<b>Water-milfoil Family</b>		
<i>Myriophyllum sibiricum</i>	Pale Water-milfoil	✓	
<i>M. spicatum</i>	Eurasian Water-milfoil	✓	JR
<b>LYTHRACEAE</b>	<b>Loosestrife Family</b>		

<i>Decodon verticillatus</i>	Swamp loosestrife	✓	JR
<i>Lythrum salicaria</i>	Purple loosestrife	✓	✓
<b>ONAGRACEAE</b>	<b>Evening-primrose Family</b>		
<i>Circaea alpina</i>	Smaller Enchanter's Nightshade	✓	
<i>C. lutetiana</i>	Canada Enchanter's Nightshade	✓	✓ <sub>P</sub>
<i>Epilobium ciliatum</i>	Northern Willow-herb	✓	JR
<i>E. hirsutum</i>	Hairy Willow-herb	✓	
<i>E. leptophyllum</i>	Narrow-leaved Willow-herb	✓	
<i>Ludwigia palustris</i>	Marsh Purslane	✓	
<i>Oenothera biennis</i>	Common Evening-primrose	✓	JR
<i>O. perennis</i>	Small Sundrops	✓	
<b>CORNACEAE</b>	<b>Dogwood Family</b>		
<i>Cornus alternifolia</i>	Alternate-leaved Dogwood	✓	JR
<i>C. amomum</i>	Silky Dogwood	✓	JR
<i>C. canadensis</i>	Bunchberry	✓	
<i>C. foemina</i>	Red Panicked Dogwood	✓	
<i>C. rugosa</i>	Round-leaved Dogwood	✓	
<i>C. stolonifera</i>	Red-osier Dogwood	✓	✓ <sub>F, P</sub>
<b>AQUIFOLIACEAE</b>	<b>Holly Family</b>		
<i>Ilex verticillata</i>	Winterberry	✓	
<b>EUPHORBIACEAE</b>	<b>Spurge Family</b>		
<i>Chamaesyce glyptosperma</i>	Ridge-seeded Spurge	✓	
<i>C. maculata</i>	Spotted Spurge	✓	
<b>RHAMNACEAE</b>	<b>Buckthorn Family</b>		
<i>Rhamnus alnifolia</i>	Alder-leaved Buckthorn	✓	
<i>R. cathartica</i>	Common Buckthorn	✓	✓
<i>R. frangula</i>	Glossy Buckthorn	✓	
<b>VITACEAE</b>	<b>Grape Family</b>		
<i>Parthenocissus inserta</i>	Inserted Virginia Creeper	✓	✓ <sub>P</sub>
<i>Vitis riparia</i>	Riverbank Grape	✓	✓ <sub>F, P</sub>
<b>ACERACEAE</b>	<b>Maple Family</b>		
<i>Acer negundo</i>	Manitoba Maple	✓	✓ <sub>P</sub>
<i>A. pensylvanicum</i>	Striped Maple	✓	JR
<i>A. rubrum</i>	Red Maple	✓	JR
<i>A. saccharinum</i>	Silver Maple	✓	✓
<i>A. saccharum</i> spp. <i>nigrum</i>	Sugar Maple (Black Maple)	✓	JR
<i>A. saccharum</i> spp. <i>saccharum</i>	Sugar Maple (Hard Maple)	✓	✓ <sub>F, P</sub>
<i>A. spicatum</i>	Mountain Maple	✓	
<b>ANACARDIACEAE</b>	<b>Sumac Family</b>		
<i>Rhus radicans</i>	Poison Ivy	✓	JR
<i>R. typhina</i>	Staghorn Sumac	✓	✓ <sub>F, P</sub>
<b>RUTACEAE</b>	<b>Rue Family</b>		
<i>Zanthoxylum americanum</i>	Prickly-ash	✓	✓ <sub>F, P</sub>
<b>OXALIDACEAE</b>	<b>Wood Sorrel Family</b>		
<i>Oxalis stricta</i>	Upright Yellow Wood-sorrel	✓	✓ <sub>P</sub>

<b>GERANIACEAE</b>	<b>Geranium Family</b>		
<i>Geranium robertianum</i>	Herb-robert	✓	✓ <sub>P</sub>
<b>BALSAMINACEAE</b>	<b>Jewel Weed Family</b>		
<i>Impatiens capensis</i>	Spotted Jewel-weed	✓	JR
<b>ARALIACEAE</b>	<b>Ginseng Family</b>		
<i>Aralia hispida</i>	Bristly Sarsaparilla	✓	JR
<i>A. nudicaulis</i>	Wild Sarsaparilla	✓	JR
<b>APIACEAE</b>	<b>Parsley or Carrot Family</b>		
<i>Carum carvi</i>	Common Caraway	✓	
<i>Cicuta bulbifera</i>	Bulb-bearing Water-hemlock	✓	
<i>C. maculata</i>	Spotted Water-hemlock	✓	
<i>Daucus carota</i>	Queen Anne's Lace	✓	✓ <sub>F, P</sub>
<i>Pastinaca sativa</i>	Wild Parsnip	✓	✓ <sub>P</sub>
<i>Sanicula marilandica</i>	Black Snakeroot	✓	JR
<i>Sium suave</i>	Hemlock Water-parsnip	✓	JR
<b>GENTIANACEAE</b>	<b>Gentian Family</b>		
<i>Gentiana andrewsii</i>	Closed gentian	✓	
<b>APOCYNACEAE</b>	<b>Dogbane Family</b>		
<i>Apocynum androsaemifolium</i>	Spreading Dogbane	✓	JR
<i>A. cannabinum</i>	Indian Hemp	✓	
<b>ASCLEPIADACEAE</b>	<b>Milkweed Family</b>		
<i>Asclepias incarnata</i>	Swamp Milkweed	✓	✓
<i>A. syriaca</i>	Common Milkweed	✓	✓ <sub>F, P</sub>
<b>SOLANACEAE</b>	<b>Potato or Nightshade Family</b>		
<i>Physalis alkekengi</i>	Chinese Lantern		✓
<i>P. heterophylla</i>	Clammy Ground-cherry	✓	JR
<i>Solanum dulcamara</i>	Bitter Nightshade	✓	JR
<b>CONVOLVULACEAE</b>	<b>Morning-glory Family</b>		
<i>Calystegia sepium</i>	Hedge Bindweed	✓	
<i>Convolvulus arvensis</i>	Field Bindweed	✓	
<i>Cuscuta gronovii</i>	Swamp Dodder	✓	JR
<b>MENYANTHACEAE</b>	<b>Buckbean Family</b>		
<i>Menyanthes trifoliata</i>	Three-leaved Buckbean	✓	
<b>POLEMONIACEAE</b>	<b>Phlox Family</b>		
<i>Phlox divaricata</i>	Wild Blue Phlox	✓	JR, SF
<b>HYDROPHYLLACEAE</b>	<b>Water-leaf Family</b>		
<i>Hydrophyllum virginianum</i>	Virginia Water-leaf	✓	✓ <sub>P</sub>
<b>BORAGINACEAE</b>	<b>Borage Family</b>		
<i>Cynoglossum officinale</i>	Hound's-tongue	✓	
<i>Echium vulgare</i>	Viper's Bugloss	✓	✓ <sub>F, P</sub>
<i>Lithospermum officinale</i>	Common Gromwell	✓	
<b>PHRYMACEAE</b>	<b>Lopseed Family</b>		
<i>Phryma leptostachya</i>	Lopseed	✓	
<b>VERBENACEAE</b>	<b>Vervain Family</b>		
<i>Verbena hastata</i>	Blue Vervain	✓	

<i>V. urticifolia</i>	White Vervain	✓	
<b>LAMIACEAE</b>	<b>Mint Family</b>		
<i>Clinopodium vulgare</i>	Wild Basil	✓	✓
<i>Glechoma hederacea</i>	Ground Ivy	✓	
<i>Lamium album</i>	White Dead-nettle	✓	✓
<i>Leonurus cardiaca</i>	Motherwort	✓	✓
<i>Lycopus americanus</i>	Cut-leaved Water-horehound	✓	
<i>L. uniflorus</i>	Northern Water-horehound	✓	
<i>Mentha arvensis</i>	American Wild Mint	✓	
<i>M. piperita</i>	Pepper Mint	✓	
<i>Nepeta catara</i>	Catnip	✓	JR
<i>Prunella vulgaris</i>	Selfheal	✓	✓ <sub>F, P</sub>
<i>Pycnanthemum virginianum</i>	Virginia Mountain-mint	✓	
<i>Scutellaria galericulata</i>	Hooded Skullcap	✓	
<i>S. lateriflora</i>	Mad-dog Skullcap	✓	
<i>Trichostema brachiatum</i>	False Pennyroyal	✓	
<b>PLANTAGINACEAE</b>	<b>Plantain Family</b>		
<i>Plantago lanceolata</i>	Narrow-leaved Plantain	✓	✓
<i>P. major</i>	Common Plantain	✓	✓ <sub>F, P</sub>
<b>OLEACEAE</b>	<b>Olive Family</b>		
<i>Fraxinus americana</i>	White Ash	✓	✓ <sub>P</sub>
<i>F. nigra</i>	Black Ash	✓	
<i>F. pennsylvanica</i>	Red Ash	✓	
<i>Syringa vulgaris</i>	Common Lilac	✓	✓ <sub>F, P</sub>
<b>SCROPHULARIACEAE</b>	<b>Figwort Family</b>		
<i>Agalinis paupercula</i>	Small-flowered Agalinis	✓	
<i>Chelone glabra</i>	Turtlehead	✓	
<i>Linaria vulgaris</i>	Butter-and-eggs	✓	✓ <sub>P</sub>
<i>Mimulus ringens</i>	Square-stemmed Monkey-flower	✓	
<i>Penstemon digitalis</i>	Foxglove beard-tongue	✓	
<i>Verbascum thapsus</i>	Common Mullein	✓	✓
<i>Veronica americana</i>	American Speedwell	✓	
<i>V. arvensis</i>	Corn Speedwell	✓	
<i>V. officinalis</i>	Common Speedwell	✓	
<i>V. scutellata</i>	Marsh Speedwell	✓	
<i>V. serpyllifolia</i>	Thyme-leaved Speedwell	✓	
<b>OROBANCHACEAE</b>	<b>Broomrape Family</b>		
<i>Epifagus virginiana</i>	Beech-drops	✓	JR, SF
<b>LENTIBULARIACEAE</b>	<b>Bladderwort Family</b>		
<i>Utricularia vulgaris</i>	Common Bladderwort	✓	JR
<b>CAMPANULACEAE</b>	<b>Bluebell or Bellflower Family</b>		
<i>Campanula aparinoides</i>	Marsh Bellflower	✓	
<i>C. rapunculoides</i>	Creeping Bellflower		✓ <sub>P</sub>
<i>Lobelia cardinalis</i>	Cardinal-flower	✓ <sub>V</sub>	JR, SF
<i>L. inflata</i>	Indian Tobacco	✓ <sub>V</sub>	

<b>RUBIACEAE</b>	<b>Madder Family</b>		
<i>Cephalanthus occidentalis</i>	Eastern Buttonbush	✓ <sub>V</sub>	
<i>Galium aparine</i>	Cleavers	✓ <sub>V</sub>	
<i>G. mollugo</i>	White Bedstraw	✓ <sub>V</sub>	✓
<i>G. palustre</i>	Marsh Bedstraw	✓ <sub>V</sub>	
<i>G. trifidum</i>	Small Bedstraw	✓ <sub>V</sub>	
<i>G. triflorum</i>	Fragrant Bedstraw	✓ <sub>V</sub>	
<i>Mitchella repens</i>	Creeping Partridge-berry	✓	✓
<b>CAPRIFOLIACEAE</b>	<b>Honeysuckle Family</b>		
<i>Lonicera canadensis</i>	American Fly Honeysuckle	✓ <sub>V</sub>	
<i>L. dioica</i>	Glaucous Honeysuckle	✓ <sub>V</sub>	
<i>L. oblongifolia</i>	Swamp Fly Honeysuckle	✓	
<i>L. tatarica</i>	Tartarian Honeysuckle	✓ <sub>V</sub>	✓
<i>Sambucus canadensis</i>	Common Elderberry	✓ <sub>V</sub>	✓ <sub>P</sub>
<i>S. racemosa</i>	Red-berried Elderberry	✓	
<i>Triosteum auranticum</i>	Scarlet-fruited Horse Gentian		✓
<i>Viburnum acerifolium</i>	Maple-leaved Viburnum	✓	✓
<i>V. lentago</i>	Nannyberry	✓	JR
<i>V. opulus</i>	Guelder Rose	✓	
<i>V. rafinesquianum</i>	Downy Arrow-wood	✓	
<i>V. recognitum</i>	Southern Arrow-wood	✓	
<i>V. trilobum</i>	High Bush Cranberry	✓	✓
<b>ASTERACEAE</b>	<b>Composite or Aster Family</b>		
<i>Achillea millefolium</i>	Common Yarrow	✓	✓ <sub>F, P</sub>
<i>Ambrosia artemisiifolia</i>	Common Ragweed	✓	✓ <sub>P</sub>
<i>Anaphalis margaritacea</i>	Pearly Everlasting	✓	
<i>Antennaria neglecta</i>	Field Pussytoes	✓	✓ <sub>P</sub>
<i>Arctium lappa</i>	Great Burdock	✓	
<i>A. minus</i>	Common Burdock	✓	✓
<i>A. borealis</i>	Rush Aster	✓	
<i>Aster cordifolius</i>	Heart-leaved Aster	✓	
<i>A. laevis</i>	Smooth Blue Aster	✓	
<i>A. lanceolatus</i>	Panicled Aster	✓	✓ <sub>P</sub>
<i>A. lateriflorus</i>	Calico Aster	✓	
<i>A. macrophyllus</i>	Large-leaved Aster	✓	✓
<i>A. novae</i>	New England Aster	✓	JR
<i>A. ontarionis</i>	Ontario Aster	✓	
<i>A. umbellatus</i>	Flat-top White Aster	✓	
<i>A. vimenius</i>	Small White Aster	✓	
<i>Bidens cernua</i>	Nodding Beggar-ticks	✓	
<i>B. frondosa</i>	Devil's Beggar-ticks	✓	✓
<i>Chrysanthemum leucanthemum</i>	Ox-eye Daisy	✓	✓ <sub>P</sub>
<i>Cichorium intybus</i>	Chicory	✓	✓ <sub>P</sub>
<i>Cirsium arvense</i>	Canada Thistle	✓	✓ <sub>F, P</sub>
<i>C. vulgare</i>	Bull Thistle	✓	✓ <sub>F, P</sub>

<i>Erigeron annuus</i>	Daisy Fleabane	✓	✓
<i>E. philadelphicus</i>	Philadelphia Fleabane	✓	✓
<i>Eupatorium maculatum</i>	Spotted Joe-pye-weed	✓	✓ <sub>P</sub>
<i>E. perfoliatum</i>	Boneset	✓	JR
<i>E. rugosum</i>	White Snakeroot	✓	JR
<i>Euthamia graminifolia</i>	Grass-leaved goldenrod	✓	✓
<i>Helianthus divaricatus</i>	Rough Woodland Sunflower	✓	✓ <sub>P</sub>
<i>Hieracium aurantiacum</i>	Orange Hawkweed	✓	
<i>H. caespitosum</i>	Yellow Hawkweed	✓	✓ <sub>P</sub>
<i>H. canadense</i>	Canada Hawkweed	✓	
<i>Hieracium x floribundum</i>	King Devil Hawkweed	✓	
<i>Inula helenium</i>	Elecampane	✓	JR
<i>Lactuca canadensis</i>	Canada Lettuce	✓	✓
<i>Lapsana communis</i>	Nipplewort	✓	
<i>Prenanthes alba</i>	White Lettuce	✓	JR
<i>Rudbeckia hirta</i>	Black-eyed Susan	✓	✓
<i>Senecio pauperculus</i>	Balsam Ragwort	✓	
<i>Solidago altissima</i>	Tall Goldenrod	✓	
<i>S. caesia</i>	Blue-stem Goldenrod	✓	JR
<i>S. canadensis</i>	Canada Goldenrod	✓	✓ <sub>F, P</sub>
<i>S. flexicaulis</i>	Zig-zag Goldenrod	✓	✓
<i>S. gigantea</i>	Late Goldenrod	✓	
<i>S. juncea</i>	Early Goldenrod	✓	
<i>S. rugosa</i>	Rough Goldenrod	✓	
<i>S. uliginosa</i>	Bog Goldenrod	✓	
<i>Sonchus arvensis</i> spp. <i>uliginosus</i>	Perennial Sow-thistle	✓	
<i>Taraxacum officinale</i>	Common Dandelion	✓	✓ <sub>F, P</sub>
<i>Tragopogon pratensis</i>	Meadow Goat's-beard	✓	✓ <sub>P</sub>
<b>ALISMATACEAE</b>	<b>Water-plantain Family</b>		
<i>Alisma plantago-aquatica</i>	American Water-plantain	✓	
<i>Sagittaria graminea</i>	Grass-leaved Arrowhead	✓	
<i>S. latifolia</i>	Broad-leaved Arrowhead	✓	
<i>S. rigida</i>	Sessile-fruited Arrowhead	✓	
<b>HYDROCHARITACEAE</b>	Frog's-bit Family		
<i>Elodea canadensis</i>	Common Elodea	✓	
<i>Vallisneria americana</i>	Water-celery	✓	
<b>JUNCAGINACEAE</b>	<b>Arrow-grass Family</b>		
<i>Triglochin maritimum</i>	Seaside Arrow-grass	✓	
<b>POTAMOGETONACEAE</b>	<b>Pondweed Family</b>		
<i>Potamogeton crispus</i>	Curly-leaved Pondweed	✓	
<i>P. natans</i>	Common Floating Pondweed	✓	
<i>P. robbinsii</i>	Robbins' Pondweed	✓	
<i>P. zosteriformis</i>	Flat-stemmed Pondweed	✓	
<b>ARACEAE</b>	<b>Arum Family</b>		
<i>Arisaema triphyllum</i>	Jack-in-the-pulpit	✓	JR

<i>Calla palustris</i>	Wild Calla	✓	JR
<b>LEMNACEAE</b>	<b>Duckweed Family</b>		
<i>Lemna minor</i>	Lesser Duckweed	✓	
<i>Spirodela polyrhiza</i>	Greater Duckweed	✓	
<b>JUNCACEAE</b>	<b>Rush Family</b>		
<i>Juncus alpinoarticulatus</i>	Richardson's Rush	✓	
<i>J. balticus</i>	Baltic Rush	✓	
<i>J. brevicaudatus</i>	Short-tailed Rush	✓	
<i>J. dudleyi</i>	Dudley's Rush	✓	
<i>J. effusus</i>	Soft Rush	✓	
<i>J. nodosus</i>	Knotted Rush	✓	
<b>CYPERACEAE</b>	<b>Sedge Family</b>		
<i>Carex aquatilis</i>	Aquatic Sedge	✓	
<i>C. aurea</i>	Golden-fruited Sedge	✓	
<i>C. bebbii</i>	Bebb's Sedge	✓	
<i>C. comosa</i>	Bristly Sedge	✓	
<i>C. crinita</i>	Fringed Sedge	✓	
<i>C. cristatella</i>	Crested Sedge	✓	
<i>C. diandra</i>	Lesser Panicked Sedge	✓	
<i>C. flava</i>	Yellow Sedge	✓	
<i>C. formosa</i>	Handsome Sedge	✓	
<i>C. granularis</i>	Meadow Sedge	✓	
<i>C. hirtifolia</i>	Pubescent Sedge	✓	
<i>C. interior</i>	Inland Sedge	✓	
<i>C. intumescens</i>	Bladder Sedge	✓	
<i>C. lacustris</i>	Common Lake Sedge	✓	
<i>C. lasiocarpa</i>	Slender Sedge	✓	
<i>C. lupulina</i>	Hop Sedge	✓	
<i>C. peckii</i>	Peck's Sedge	✓	
<i>C. scoparia</i>	Broom Sedge	✓	
<i>C. stipata</i>	Stipitate Sedge	✓	
<i>C. stricta</i>	Stiff Sedge	✓	
<i>C. vulpinoidea</i>	Fox Sedge	✓	
<i>Cladium mariscoides</i>	Twig-rush	✓	
<i>Dulichium arundinaceum</i>	Reed-like Three-way Sedge	✓	
<i>Eleocharis erythropoda</i>	Red-footed Spike-rush	✓	
<i>Rhynchospora alba</i>	White Beaked-rush	✓	
<i>Scirpus acutus</i>	Hard-stemmed Bulrush	✓	
<i>S. atrovirens</i>	Black Bulrush	✓	
<i>S. cyperinus</i>	Wool-grass	✓	
<i>S. pendulus</i>	Lined Bulrush	✓	
<i>S. validus</i>	American Great Bulrush	✓	
<b>POACEAE</b>	<b>Grass Family</b>		
<i>Agrostis gigantea</i>	Giant Bent Grass	✓	
<i>A. stolonifera</i>	Creeping Bent Grass	✓	

<i>Brachyelytrum erectum</i>	Bearded Short-husk	✓	
<i>Bromus inermis</i>	Awnless Brome	✓	
<i>Calamagrostis canadensis</i>	Blue-joint Grass	✓	
<i>Dactylis glomerata</i>	Orchard Grass	✓	
<i>Digitaria sanguinalis</i>	Large Crabgrass	✓	
<i>Echinochloa crusgalli</i>	Common Barnyard Grass	✓	
<i>Elymus repens</i>	Quack grass	✓	
<i>Glyceria grandis</i>	Tall Manna Grass	✓	
<i>G. striata</i>	Fowl Meadow Grass	✓	
<i>Hierochloa odorata</i>	Sweet Grass	✓	
<i>Leersia oryzoides</i>	Rice Cut Grass	✓	
<i>Panicum acuminatum</i> var. <i>fasciuculatum</i>	Panic Grass	✓	
<i>P. acuminatum</i> var. <i>acuminatum</i>	Panic Grass	✓	
<i>Panicum capillare</i>	Witch Grass	✓	
<i>Phalaris arundinacea</i>	Reed Canary Grass	✓	
<i>Phleum pratense</i>	Timothy	✓	✓ <sub>F, P</sub>
<i>Phragmites australis</i>	Common Reed	✓	
<i>Poa compressa</i>	Canada Blue Grass	✓	
<i>Setaria viridis</i>	Green Foxtail	✓	
<i>Torreyochloa pallida</i>	Torrey's Manna Grass	✓	
<i>Zizania aquatica</i>	Southern Wild-rice	✓	
<b>SPARGANIACEAE</b>	<b>Bur-reed Family</b>		
<i>Sparganium emersum</i>	Green-fruited Bur-reed	✓	
<i>S. eurycarpum</i>	Broad-fruited Bur-reed	✓	
<b>TYPHACEAE</b>	<b>Cattail Family</b>		
<i>Typha angustifolia</i>	Narrow-leaved Cattail	✓	✓ <sub>F, P</sub>
<i>T. latifolia</i>	Broad-leaved Cattail	✓	✓
<b>LILIACEAE</b>	<b>Lily Family</b>		
<i>Allium tricoccum</i>	Wild Leek	✓	JR
<i>Asparagus officinalis</i>	Garden Asparagus	✓	JR
<i>Clintonia borealis</i>	Yellow Clintonia	✓	JR
<i>Erythronium americanum</i>	Yellow Dog's-tooth Violet	✓	
<i>Hemerocallis fulva</i>	Orange Day-lily	✓	JR
<i>Maianthemum canadense</i>	Wild Lily-of-the-valley	✓	
<i>M. racemosum</i>	False Solomon's Seal	✓	JR
<i>M. stellatum</i>	Starry False Solomon's Seal	✓	
<i>Medeola virginiana</i>	Indian Cucumber-root	✓	
<i>Polygonatum pubescens</i>	Hairy Solomon's Seal	✓	
<i>Streptopus roseus</i>	Rose Twisted-stalk	✓	
<i>Trillium cernuum</i>	Nodding Trillium	✓	
<i>T. erectum</i>	Purple Trillium	✓	JR
<i>T. grandiflorum</i>	White Trillium	✓	JR
<i>T. undulatum</i>	Painted Trillium	✓	
<b>IRIDACEAE</b>	<b>Iris Family</b>		
<i>Iris versicolor</i>	Multi-coloured Blue-flag	✓	JR

Sisyrinchium montanum	Montane Blue-eyed-grass	✓	
<b>ORCHIDACEAE</b>	Orchid Family		
<i>Epipactis helleborine</i>	Common Helleborine	✓	JR
<i>Liparis loeselii</i>	Fen Twayblade	✓	
<i>Platanthera psycodes</i>	Smaller Purple-fringed Orchis	✓	
<i>Spiranthes cernua</i>	Nodding Ladies' Tresses	✓	

Taxonomy and nomenclature follow:

Newmaster, S.G., A. Lehela, P.W.C. Uhlig, S. McMurray and M. J. Oldham. 1998. **Ontario Plant List**. Ontario Ministry of Natural Resources, Ontario Forest Research Institute, Sault Ste.-Marie, Ontario, Forest Research Information Paper No. 123, 550 pp. + appendices.

Species at Risk as designated by COSSARO, April 2004 and/or by COSEWIC, May 2005.

Species identified in 1982 from: Robinson, J., J. Delange and S. Kenney. 1982. **Resource Inventory and Analysis of Buell's Creek Conservation Area, Brockville**. Cataraqui Region Conservation Authority. 62 pp. + appendices.

2005 Species list based on observations by C. Bonta and T. Lamarche (✓), and J.Robinson (JR)

"F" refers to observations in the field by C. Bonta in November 2005; "P" refers to photograph taken by T. Lamarche May through September 2005. Where not otherwise indicated, the observation was made by C. Bonta.

"?" indicates a species that was likely observed, but could not be confirmed.

Table 2  
Birds observed at Mac Johnson Wildlife Area, 1982 and 2005

<b>Common Name</b>	<b>Scientific Name</b>	<b>1982 Inventory</b>	<b>2005 Update</b>	<b>Notes</b>
Snow Goose	<i>Chen caerulescens</i>	1975		
Canada Goose	<i>Branta canadensis</i>	1982	CB	
Trumpeter Swan	<i>Cygnus buccinator</i>		CB	
Wood Duck	<i>Aix sponsa</i>	1982		
Gadwall	<i>Anas strepera</i>	1982		
American Wigeon	<i>Anas americana</i>	1982		
Black Duck	<i>Anas rubripes</i>	1982	CB	
Mallard	<i>Anas platyrhynchos</i>	1982	CB	
Blue-winged Teal	<i>Anas discors</i>	1982	JR	
Northern Pintail	<i>Anas acuta</i>	No date		
Green-winged Teal	<i>Anas crecca</i>	1982		
Canvasback	<i>Aythya valisineria</i>	1982		
Ring-necked Duck	<i>Aythya collaris</i>	1982		
Bufflehead	<i>Bucephala albeola</i>		CB	
Common Goldeneye	<i>Bucephala clangula</i>	No date		
Hooded Merganser	<i>Lophodytes cucullatus</i>	1982	JR	
Common Merganser	<i>Mergus merganser</i>	1981	JR	
Ruffed Grouse	<i>Bonasa umbellus</i>	1982	CB	
Common Loon	<i>Gavia immer</i>	1982	JR	breeding in 2005
Pied-billed Grebe	<i>Podilymbus podiceps</i>	1982	JR	
Red-necked Grebe	<i>Podiceps grisegena</i>		CB	
American Bittern	<i>Botaurus lentiginosus</i>	1982	JR,SF	Photo in 2005
Least Bittern	<i>Ixobrychos exilis</i>	1982		THR /THR
Great Blue Heron	<i>Ardea herodias</i>	1982	CB	
Great Egret	<i>Ardea alba</i>	1982		
Turkey Vulture	<i>Cathartes aura</i>	1982	JR	
Osprey	<i>Pandion haliaetus</i>	1982	CB	Nesting in 2005
Northern Harrier	<i>Circus cyaneus</i>	1982	JR	
Sharp-shinned Hawk	<i>Accipiter striatus</i>	1982	JR	
Cooper's Hawk	<i>Accipiter cooperii</i>	1982		
Northern Goshawk	<i>Accipiter gentilis</i>	1982		
Red-shouldered Hawk	<i>Buteo lineatus</i>	1982	JR	SC / SC
Broad-winged Hawk	<i>Buteo platypterus</i>	1982		
Red-tailed Hawk	<i>Buteo jamaicensis</i>	1982	JR	
Rough-legged Hawk	<i>Buteo lagopus</i>	1981		

American Kestrel	<i>Falco sparverius</i>	1982	JR	
Virginia Rail	<i>Rallus limicola</i>	1982	JR	
Sora	<i>Porzana carolina</i>	1982	JR	
Common Gallinule (Moorhen)	<i>Gallinula chloropus</i>	1982	JR	<u>"Common"</u> sp.
American Coot	<i>Fulica americana</i>	1982	JR	
Killdeer	<i>Charadrius vociferus</i>	1982	JR	
Greater Yellowlegs	<i>Tringa melanoleuca</i>	1981		
Lesser Yellowlegs	<i>Tringa flavipes</i>	1982	JR	
Spotted Sandpiper	<i>Actitis hypoleucos</i>	1982	JR	
Short-billed Dowitcher	<i>Limnodromus griseus</i>	1982		
Common Snipe	<i>Gallinago gallinago</i>	1982	JR	
American Woodcock	<i>Scolopax minor</i>	1982	JR	
Ring-billed Gull	<i>Larus delawarensis</i>	1982	JR	
Herring Gull	<i>Larus argentatus</i>	1982	JR	
Caspian Tern	<i>Sterna caspia</i>	1981	JR	
Common Term	<i>Sterna hirundo</i>	1982		
Black Tern	<i>Chidonias niger</i>	1982		SC / -
Rock Pigeon	<i>Columba livia</i>	1982	JR	
Mourning Dove	<i>Zenaida macroura</i>	1982	JR	
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>	1982	JR	
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	1981		
Great Horned Owl	<i>Bubo virginianus</i>	1982	JR	
Common Nighthawk	<i>Chordeiles minor</i>	No date		
Whip-poor-will	<i>Caprimlgus vocifera</i>	No date		
Ruby-throated Hummingbird	<i>Archilochus colubris</i>	1982	JR	
Belted Kingfisher	<i>Ceryle alcyon</i>	1982	JR	
Yellow-bellied Sapsucker	<i>Saphyrpicus varius</i>	1982	JR,SF	Photo
Downy Woodpecker	<i>Picoides pubescens</i>	1982	JR	
Hairy Woodpecker	<i>Picoides villosus</i>	1982	JR	
Northern Flicker	<i>Colaptes auratus</i>	1982	JR	
Pileated Woodpecker	<i>Dryocopus pileatus</i>	1982	JR	
Olive-sided Flycatcher	<i>Contopus cooperi</i>	1982		
Eastern Wood-Pee-wee	<i>Contopus virens</i>	1982	JR	
Yellow-bellied Flycatcher	<i>Epidomax flaviventris</i>	1982		
Alder Flycatcher	<i>Epidomax alnorum</i>	1982		
Least Flycatcher	<i>Epidomax minimus</i>	1982		
Eastern Phoebe	<i>Sayornis phoebe</i>	1982	JR	
Great Crested Flycatcher	<i>Myiarchus crinitus</i>	1982	JR	
Eastern Kingbird	<i>Tyrannus tyrannus</i>	1982	JR	
Northern Shrike	<i>Lanius exubitor</i>	(1982)	CB	

White-eyed Vireo	<i>Vireo griseus</i>	1982		
Yellow-throated Vireo	<i>Vireo flavifrons</i>	1981		
Blue-headed Vireo	<i>Vireo solitarius</i>	1981		
Warbling Vireo	<i>Vireo gilvus</i>	1982	JR	
Philadelphia Vireo	<i>Vireo philadelphicus</i>	1982		
Red-eyed Vireo	<i>Vireo olivaceus</i>	1982	JR	
Blue Jay	<i>Cyanocitta cristata</i>	1982	CB	
American Crow	<i>Corvus brachyrhynchos</i>	1982	CB	
Purple Martin	<i>Progne subis</i>	1982	JR, SF	
Tree Swallow	<i>Trachycineta bicolor</i>	1982	CB	
Northern Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>	1982		
Bank Swallow	<i>Riparia riparia</i>	1982		
Barn Swallow	<i>Hirundo rustica</i>	1982		
Black-capped Chickadee	<i>Poecile atricapillus</i>	1982	CB	
Chimney Swift	<i>Chaetura pelagica</i>		JR, SF	
Red-breasted Nuthatch	<i>Sitta canadensis</i>	1982		
White-breasted Nuthatch	<i>Sitta carolinensis</i>	1982	CB	
Brown Creeper	<i>Certhia americana</i>	1982		
House Wren	<i>Troglodytes aedon</i>	1982	JR	
Winter Wren	<i>Troglodytes troglodytes</i>	1981		
Sedge Wren	<i>Cistothorus platensis</i>	1982		
Marsh Wren	<i>Cistothorus palustris</i>	1982	JR	Calls
Golden-crowned Kinglet	<i>Regulus satrapa</i>	1981		
Ruby-crowned Kinglet	<i>Regulus calendula</i>	1982		
Blue-gray Gnatcatcher	<i>Poliophtila caerulea</i>	1982		
Eastern Bluebird	<i>Sialia sialis</i>	No date	SF	
Veery	<i>Catharus fuscescens</i>	1982	JR	
Gray-cheeked Thrush	<i>Catharus bicknelli</i>	1982		
Swainson's Thrush	<i>Catharus ustulatus</i>	1981		
Hermit Thrush	<i>Catharus guttatus</i>	1982		
Wood Thrush	<i>Hylocichla mustelina</i>	1982	JR	
American Robin	<i>Turdus migratorius</i>	1982	JR	
Gray Catbird	<i>Dumetella carolinensis</i>	1982	JR	
Brown Thrasher	<i>Toxostoma rufum</i>	1982	JR	
Starling	<i>Sturnus vulgaris</i>	1982	CB	
Cedar Waxwing	<i>Bombycilla cedrorum</i>	1982	JR	
Golden-winged Warbler	<i>Vermivora chrysoptera</i>	1982		
Tennessee Warbler	<i>Vermivora peregrina</i>	1982		
Orange-crowned Warbler	<i>Vermivora celata</i>	1981		

Nashville Warbler	<i>Vermivora ruficapilla</i>	1982	
Northern Parula	<i>Parula americana</i>	1982	
Yellow Warbler	<i>Dendroica petechia</i>	1982	JR
Magnolia Warbler	<i>Dendroica magnolia</i>	1982	
Cape May Warbler	<i>Dendroica tigrina</i>	1982	
Black-throated Blue Warbler	<i>Dendroica caerulescens</i>	1982	
Yellow-rumped Warbler	<i>Dendroica coronata</i>	1982	JR
Black-throated Green Warbler	<i>Dendroica virens</i>	1982	
Blackburnian Warbler	<i>Dendroica fusca</i>	1982	
Yellow-throated Warbler	<i>Dendroica dominica</i>	1982	
Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>	1982	JR
Pine Warbler	<i>Dendroica pinus</i>	1982	
Bay-breasted Warbler	<i>Dendroica castanea</i>	1982	
Blackpoll Warbler	<i>Dendroica striata</i>	1981	
Cerulean Warbler	<i>Dendroica cerulea</i>	1982	SC / SC
Black and White Warbler	<i>Mniotilta varia</i>	1982	
American Redstart	<i>Setophaga ruticilla</i>	1982	JR,SF
Ovenbird	<i>Seiurus aurocapilla</i>	1982	JR
Northern Waterthrush	<i>Seiurus noveboracensis</i>	1982	
Mourning Warbler	<i>Oporornis philadelphia</i>	1982	
Common Yellowthroat	<i>Geothlypis trichas</i>	1982	JR
Hooded Warbler	<i>Wilsonia citrina</i>	1982	THR / THR
Wilson's Warbler	<i>Wilsonia pusilla</i>	1982	
Canada Warbler	<i>Wilsonia canadensis</i>	1982	
Scarlet Tanager	<i>Piranga olivacea</i>	1981	JR
Eastern Towhee	<i>Pipilo erythrophthalmus</i>	1982	JR
American Tree Sparrow	<i>Spizella arborea</i>	(1982)	JR
Chipping Sparrow	<i>Spizella passerina</i>	1982	JR
Field Sparrow	<i>Spizella pusilla</i>	1982	JR
Song Sparrow	<i>Melospiza melodia</i>	1982	JR
Lincoln's Sparrow	<i>Melospiza lincolni</i>	1981	
Swamp Sparrow	<i>Melospiza georgiana</i>	1982	JR
White-throated Sparrow	<i>Zonotrichia albicollis</i>	1982	JR
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	1982	JR
Dark-eyed Junco	<i>Junco hyemalis</i>	(1982)	JR
Snow Bunting	<i>Plectrophenax nivalis</i>	(1982)	JR
Northern Cardinal	<i>Cardinalis cardinalis</i>	1982	JR
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>	1982	JR
Indigo Bunting	<i>Passerina cyanea</i>	1981	
Bobolink	<i>Dolichonyx oryzivorus</i>	1982	

Red-winged Blackbird	<i>Agelaius phoeniceus</i>	1982	JR
Eastern Meadowlark	<i>Sturnella magna</i>	1982	
Rusty Blackbird	<i>Euphagus carolinus</i>	1982	JR
Common Grackle	<i>Quiscalus quiscula</i>	1982	JR
Brown-headed Cowbird	<i>Molothrus ater</i>	1982	JR
Baltimore Oriole	<i>Icterus galbula</i>	1982	JR
Pine Grosbeak	<i>Pinicola enucleator</i>	1982	JR
Purple Finch	<i>Carpodacus purpurea</i>	1981	JR
Common Redpoll	<i>Carduelis flammea</i>	(1982)	
American Goldfinch	<i>Carduelis tristis</i>	1982	CB
Evening Grosbeak	<i>Coccothraustes vespertinus</i>	No date	
House Sparrow	<i>Passer domesticus</i>	1982	JR

Taxonomy and nomenclature follow:

*The American Ornithologists' Union (AOU) Check-list of North American Birds*, Seventh Edition. This list incorporates changes made in the 42<sup>nd</sup>, 43<sup>rd</sup>, 44<sup>th</sup> and 46<sup>th</sup> Supplements to the Check-list.

Species at Risk as designated by COSSARO, April 2004 and/or by COSEWIC, May 2005. SC – species of concern; THR – threatened species

Robinson, J., J. Delange and S. Kenney. 1982. **Resource Inventory and Analysis of Buell's Creek Conservation Area, Brockville**. Cataraqui Region Conservation Authority. 62 pp. + appendices.

2005 Species list based on observations by C. Bonta (CB), J. Robinson (JR), Stefan Foerster and (SF).

Table 3

Mammals, reptiles, amphibians and gastropods observed within Mac Johnson Wildlife Area, 1982 and 2005

Common Name	Scientific Name	1982	2005	2005 Evidence
	MAMMALIA			
Short-tailed Shrew	<i>Blarina brevicauda</i>	✓	JR	Dead on trail
Hairy tailed Mole	<i>Parascalops breweri</i>	✓		
Star-nosed Mole	<i>Condylura cristata</i>	✓	JR	Dead on road
Eastern Cottontail	<i>Sylvilagus floridanus</i>	✓	✓	
Snowshoe Hare	<i>Lepus americanus</i>	✓		
European Hare	<i>Lepus europaeus</i>	✓		
Eastern Chipmunk	<i>Tamias striatus</i>	✓	JR	
Woodchuck	<i>Marmota monax</i>	✓	JR	
Grey Squirrel	<i>Sciurus carolinensis</i>	✓	JR	
American Red Squirrel	<i>Tamiasciurus hudsonicus</i>	✓	✓	
American Beaver	<i>Castor Canadensis</i>	✓	✓	Felled trees, chews
Gapper's Redback Vole	<i>Clethrionomys gapperi</i>	✓		
Southern Bog Lemming	<i>Synaptomys cooperi</i>	?		
Meadow Vole	<i>Microtus pennsylvanicus</i>	✓		
Woodland Jumping Mouse	<i>Napaeozapus insignis</i>	✓		
Muskrat	<i>Ondatra zibethicus</i>	"Common"	✓	Lodges
American Porcupine	<i>Erethizon dorsatum</i>	✓	JR, SF	
Coyote	<i>Canis latrans</i>	✓	JR	
Red Fox	<i>Vulpes vulpes</i>	✓	JR	
Eastern Grey Wolf	<i>Canis lupes</i>		SF	
American Black Bear	<i>Ursus americanus</i>	✓	SF	Bear scats
Raccoon	<i>Procyon lotor</i>	✓	✓	Pers. Comm..
Long-tailed Weasel	<i>Mustela frenata</i>	✓	JR, SF	
American Mink	<i>Mustela vison</i>	✓	JR	
Striped Skunk	<i>Mephitis mephitis</i>	✓	JR	
River Otter	<i>Lontra Canadensis</i>	✓	JR, SF	
Fisher	<i>Martes pennanti</i>		SF	
White-tailed deer	<i>Odocoileus virginianus</i>	✓	✓	Photo, tracks

Common Name	Scientific Name	1982	2005	2005 Evidence
<i>AMPHIBIA</i>				
American Toad	<i>Bufo americanus</i>	✓	JR	
Gray Treefrog	<i>Hyla versicolor</i>	✓	JR	
Spring Peeper	<i>Pseudacris crucifer</i>	✓	✓	Calling
Western Chorus Frog	<i>Pseudacris triseriata</i>	✓	JR	
Wood Frog	<i>Rana sylvatica</i>	✓		
Northern Leopard Frog	<i>Rana pipiens</i>	✓	✓	
Green Frog	<i>Rana clamitans</i>	✓	JR	
American Bullfrog	<i>Rana catesbeiana</i>	✓	JR	
<i>REPTILIA</i>				
Snapping Turtle	<i>Chelydra serpentina</i>	✓	JR,SF	
Midland Painted Turtle	<i>Chrysemys picta marginata</i>	✓	JR,SF	
Blanding's Turtle*	<i>Emydoidea blandingii</i>	✓	JR,SF	Threatened Status
Common Gartersnake	<i>Thamnophis sirtalis</i>	✓	✓	
Northern Watersnake	<i>Nerodia sipedon</i>	✓	JR,SF	
Red-bellied Snake	<i>Storeria occipitomaculata</i>	✓		
<i>GASTROPODA</i>				
Great Pond Snail	<i>Lymnaea stagnalis jugularis</i>		✓	Shell
Tadpole Snail	<i>Physa gyrina gyrina</i>		✓	Shell
Greater Carinate Ramshorn	<i>Helisoma (Pierosoma) pilsbryi infracarinatum</i>		✓	Shell

Taxonomic order and nomenclature for gastropoda follow Clarke, A.H. 1981. **The Freshwater Molluscs of Canada**. National Museum of Natural Sciences, National Museums of Canada, Ottawa. 446 pp.

Taxonomy and nomenclature for amphibians and reptiles follow MacCulloch, R.D. 2002. **The ROM Field Guide to Amphibians and Reptiles of Ontario**. Royal Ontario Museum and McClelland & Stewart Ltd., Toronto. 168 pp.

\* Listed as Threatened by COSEWIC and Special Concern by COSSARO.

1982 Species identification from Robinson, J., J. Delange and S. Kenney. 1982. **Resource Inventory and Analysis of Buell's Creek Conservation Area, Brockville**. Cataraqui Region Conservation Authority. 62 pp. + appendices.

2005 Species list based on observations by C. Bonta and T. Lamarche (✓), J. Robinson (JR), and Stefan Foerster (SF)

**Table 4**  
**Other Species observed in Mac Johnson Wildlife Area, 1982 and 2005**

Common Name	Scientific Name	1982	2005	2005 Evidence
	<i>OSTEICHTHYES</i> <sup>27</sup>			
Northern Pike	<i>Esox lucius</i>	✓	✓	Photo
Central Mudminnow	<i>Umbra limi</i>	✓		
Golden Shiner	<i>Notemigonus crysoleucas</i>	✓		
Common Shiner	<i>Notropis cornutus</i>	✓		
Black-chin Shiner	<i>Notropis heterodon</i>	✓		
White Sucker	<i>Castostomus commersoni</i>	✓		
Brown Bullhead	<i>Ictalurus nebulosus</i>	✓		
Brook Stickleback	<i>Culaea inconstans</i>	✓		
Pumpkinseed	<i>Lepomis gibbosus</i>	✓		
Bluegill	<i>Lepomis macrochirus</i>	✓		
Largemouth Bass	<i>Micropterus salmoides</i>	✓		
Johnny Darter	<i>Etheostoma nigrum</i>	✓		

1982 Species identification from Robinson, J., J. Delange and S. Kenney. 1982. **Resource Inventory and Analysis of Buell's Creek Conservation Area, Brockville.** Cataraqui Region Conservation Authority. 62 pp. + appendices.

2005 photo by T. Lamarche.

<sup>27</sup> Fish not included in 2005 inventory.

### **Appendix 3 -- Stakeholders invited to the MJWA Master Plan Open House, Dec. 1, 2005**

- Brockville Chamber of Commerce
- Brockville Field Naturalists
- City of Brockville Fire Department
- City of Brockville Parks & Recreation
- City of Brockville Planning Department
- City of Brockville Police Department
- Cataraqui Region Conservation Authority staff & board members
- Da Hon Neh Girl Guides
- Ecological Services Ltd. (consultant)
- Township of Elizabethtown-Kitley Fire Department
- Township of Elizabethtown-Kitley Planning Department
- Township of Elizabethtown-Kitley Building Department
- Environmental Connections
- Friends of Mac Johnson Wildlife Area
- County of Leeds and Grenville Planning Department
- Leeds Grenville Branch of the Ontario Society for the Prevention of Cruelty to Animals
- Leeds Grenville & Lanark Health Unit
- Leeds County Stewardship Council
- TransCanada Pipelines Limited
- St. Lawrence Islands National Park
- St. Lawrence Parks Commission
- Ontario Parks (Ministry of Natural Resources)
- Ontario Provincial Police (Elizabethtown-Kitley detachment)
- Ministry of the Environment

## Appendix 4 -- Synopsis of Public Responses to Concepts for Mac Johnson Wildlife Area

### Part 1 - Concepts Presented

*Do you agree with the proposed overall direction presented for the Mac Johnson Wildlife Area?*

Yes                    13 (36%)  
No                      4 (11%)  
No response        19 (53%)

*Three concepts were presented. Which do you favour?*

<b>Response</b>	<b>Tally</b>	<b>Percentage</b>
Concept 1 – Status Quo	5	13.8 %
Concept 2 – Northlands Growth	13	36 %
Concept 3 – Southlands Growth	3	8.3 %
A combination of Concepts 1 & 2	5	13.8 %
A combination of Concepts 2 & 3	0	0
A combination of Concepts 1 & 3	1	2.7
A combination of all three Concepts	2	5.4 %
None of the Concepts	1	2.7 %
No response	7	19.4 %

Responses did recognize interests in each of the concepts presented, with the most significantly interest favouring Northlands focused development at the property. Developing a concept that combined aspects of two or more of those presented was also valued.

### Part 2 - Summarized Comments

Comments can be divided into four main categories as follows:

- Existing Features;
- Development;
- Buildings and Infrastructure; and
- On-Site Activity

#### Existing Features

##### **Pipeline Easement**

The pipeline easement was viewed as limiting the availability of developable area in the southlands. TransCanada Pipeline has provided a detailed list of guidelines relating to their position on future development adjacent to the existing easement.

##### **Reservoir**

Comments support continued passive recreational use of the reservoir (canoeing, kayaking, birdwatching and skating). A high value was placed on being able to have good views of the reservoir and related wildlife. Updating canoe facilities (rentals and launchings) were encouraged.

## **Wildlife**

There was a significant interest in maintaining and enhancing the wildlife habitat aspects of the property. Concerns were raised that a “people-centred” focus should not dominate the use of the property. Responses tended to focus on value of the property as bird and animal habitat rather than vegetation species. Wildlife observation (bird watching) was recognized as an activity of significant interest among visitors. There was a perception expressed among the comments that the name “wildlife area” refers to a distinct land use designation among lands managed by the Conservation Authority. The Trumpeter Swans were seen as an attraction and source of education on the property

## Development

### **Development in the Southlands**

Pressure for use from the residential areas to the south of the property was recognized. It was acknowledged that the southlands were already impacted by this development with more pedestrian access. It was suggested that the majority of the southlands were less environmentally valuable than the Northlands. Maintaining the primary entrance and any main building in the Northlands was preferred with concerns over utilizing existing infrastructure (parking, buildings, reservoir access), limitations on buildable space in the south (furthered by easements), and the environmental impacts and financial costs of refocusing activity in the southlands. Popular suggestions for southlands development included: trail improvement, washrooms & potable water, leash-free dog use, picnic space (with and without shelter), possibly establishing a new main building/entrance, establishing some parking on the south end of currently closed McLarry Rd. at or near Centennial Rd. and improved signs. CRCA staff review of the costs associated with moving the main entrance to the south found that this suggestion was cost-prohibitive

### **Development in the Northlands**

The facilities and infrastructure in the northlands were recognized as being outdated and requiring evaluation, upgrading and/or reconfiguration in order to be viable for public activity. An interest was expressed in maintaining and “improving” the focus of developed activity in the northlands where the majority of infrastructure and access already exist. The northlands were also recognized as containing areas more suitable for protection and rehabilitation as natural habitat, and being less accessible by pedestrian visitors. Trail/road configuration, establishment of a new multi-use building, washroom improvement, potable water and use of the “campground” area were concerns voiced in regard to the northlands area. The establishment of an arboretum in this area was of interest.

### **New Concept: Mixed Northlands & Southlands Development**

The combination of utilizing existing facilities in the northlands and addressing increased pedestrian pressures on the southlands was recognized with comments proposing an alternative mixed development concept that addresses use in both regions of the property.

## Buildings and Infrastructure

### **Accessibility**

Increasing wheelchair accessibility on the property was supported, particularly along the trails with washrooms or buildings.



### **Campground**

The campground area was recognized as a portion of the property that is underutilized and was not well planned for in its intended form due to the absence of a potable water source and viable swimming facilities. Security was also an issue with this land use. The reuse of this area as part of a new native species arboretum was proposed.

### **Existing Nature Centre**

Comments were received that the existing Nature Centre was not adequately equipped or utilized and required significant repair/upgrading. The location was viewed as environmentally damaging (sand dune, Provincially Significant Wetland), but concern was expressed regarding the costs and environmental impact (footprint) of relocation.

### **Leash-Free Dog Area**

Significant interest was expressed in establishing a defined leash-free dog area at the Mac Johnson Wildlife Area property. It was recognized that dogs were often let off leash in violation of conservation authority regulation and that by providing a secure area (fenced) for dog owners to take their pets, the impacts of this activity might be better isolated. Establishing some form of cooperative involvement with the neighbouring OSPCA branch and locating a “dog park” in the southlands near their building was suggested.

Review of the suggestion found that creation of such an area was not in the mandate of conservation authorities, was not supported by the the Leeds & Grenville OSPCA, who are the most frequent dog walkers on MJWA, would likely increase dog visits to the wildlife refuge, and was unlikely to solve the off-leash dog problems on the property. Therefore, this suggestion was not advanced.

### **McGhie House**

Comments regarding the McGhie House suggested that it held no significant historic value locally. It is currently occupied by a member of the McGhie family, but owned by the CRCA.

### **New Multi-use Building**

A new multi-use, conservation-focused building to consolidate organized public activity on the property was a popular idea. Issues to address include: existing infrastructure, environmental impacts, local residential access, construction partnerships and available space.

### **Office/Rental Property**

The existing office/rental property is deteriorating and was seen as an expense to maintain. Comments suggested that renting both side of the property would increase revenue and security for the property (by having more eyes watching the property after hours). Options proposed included renting out the office side, converting the office side into an additional rental apartment, or removal of the building.

### **Parking**

Comments reflected an interest in focusing development close to the existing parking lot in the northlands, and establishing wheelchair accessible trails that connect to the southlands parking lot. “Park and eat” was recognized as a common and acceptable practice at the property parking lots.

### **Picnic Shelter**

The existing shelter was valued and interest was expressed for establishing one in the southlands.

### **Signs**

Comments were received that the signs on the property were insufficient. Increasing public awareness of permitted and regulated activity, directions and the promotion of the property appeared to be of primary interests expressed. Creating opportunities for passive education displays was also suggested.

### **Trails**

The existing trail system was viewed as important feature of the property that is in need of updating. Preparation of a trail development plan was recommended to address issues such as trail rationalization and maintenance, accessibility, circuit development in the southlands and use specific trails (walking, biking, cross country skiing).

### **Washrooms**

Responses indicated that public washrooms onsite are a utilized amenity, but that current facilities are not adequately equipped and do not service the needs in the southlands area.

### **Workshop**

Few comments were received regarding the workshop; those most notable suggest considering to either sell the current facility along with the office/rental property as a means raise funds for property development elsewhere, or building a new workshop next to any new multi-use building.

### On Site Activity

#### **Educational Use**

The property was highly valued as a location for facilitating environment focused education and learning. Both organized use (school & personal interest groups) and passive displays were encouraged. Educating the public was viewed as an effective means for protecting the natural features of the property.

#### **Recreation Use**

The property was highly valued as a location for passive recreational activity. Respondents identified the following types of activity as occurring or desired at the Mac Johnson Wildlife Area:

- Mountain Biking (both liked and disliked)
- Bird/Nature Watching (including trumpeter swans)
- Canoeing/Kayaking
- Cross-Country Skiing
- Dog walking (both liked and disliked)
- Local History Appreciation
- Pedestrian Use (Hiking/Running/Walking)
- Picnicking
- "Solitude"
- Skating
- SnowShoeing
- Snowmobiling
- Stargazing
- Wildlife Education/Interpretation

Undesired Recreational Uses :

- Playgrounds
- Sports Fields & Pits
- Motorized Boat Usage

## Appendix 5 -- MJWA Master Plan in Context of CRCA Goals

The [Strategic Plan: Cataraqui to 2020](#) sets out goals for the Cataraqui Region Conservation Authority as follows:

- Goal A: To conserve CRCA's water resources, including the safeguarding, management and restoration of rivers, lakes and streams, and to work cooperatively with our partners to protect the water cycle.
- Goal B: To implement policies that will protect life and property from natural hazards such as flooding and erosion.
- Goal C: To conserve woodlands, wetlands and natural habitat.
- Goal D: To facilitate protection of resources within the jurisdiction in order to conserve, restore, develop or manage them
- Goal E: To provide opportunities for the public to learn from the public open spaces within the jurisdiction, and to respect the local natural environment.

Operations and management strategies identified in the MJWA Master Plan support these goals as follows:

*Goal A: To conserve CRCA's water resources, including the safeguarding, management and restoration of rivers, lakes and streams, and to work cooperatively with our partners to protect the water cycle.*

Proposed in MJWA Master Plan

- continue to manage the Broome-Runciman Dam and the Buells Creek Reservoir in such a way as to safeguard the reservoir and the creek

*Goal B: To implement policies that will protect life and property from natural hazards such as flooding and erosion.*

Proposed in MJWA Master Plan

- continue to manage the Broome-Runciman Dam and the Buells Creek Reservoir to control water flow on Buells Creek to prevent flooding; and
- ensure access to the dam and reservoir for equipment to maintain these features.

*Goal C: To conserve woodlands, wetlands and natural habitat*

Proposed in MJWA Master Plan

- apply the policies set out in the forthcoming Official Plan for the Township of Elizabethtown-Kitley (2005) with respect to the protection of natural heritage features. This includes the protection of the provincially significant Buells Creek Reservoir

Wetland, woodlands, wildlife habitat, fish habitat, and any species that is observed at MJWA and that appears on the *Species at Risk in Ontario List* of the Ministry of Natural Resources. It also includes ensuring that any proposed development or site alteration adjacent to these features will not have a negative impact on the feature or its ecological function.

- update inventories of natural heritage features and map the resulting information;
- seek to develop and conserve corridors linking to surrounding natural areas, in cooperation with other agencies and groups;
- continue to maintain the northeastern portion of MJWA as undeveloped wetland

*Goal D: To facilitate protection of resources within the jurisdiction in order to conserve, restore, develop or manage them*

Proposed in MJWA Master Plan

- continue to provide outdoor recreational opportunities with a conservation focus
- work with the Friends of Mac Johnson on property maintenance, projects, and fundraising to maintain the area
- establish a program to collect statistics on the use of the property and pursue suitable partnerships to do so
- support trails linking open spaces
- continue inventories of species, ecosystems and natural heritage features
- initiate monitoring of reservoir and beaver pond
- investigate degradation of the Beaver Pond

*Goal E: To provide opportunities for the public to learn from the public open spaces within the jurisdiction, and to respect the local natural environment.*

Proposed in MJWA Master Plan

- continue to collaborate with local school boards, with the [Friends of Mac Johnson Wildlife Area](#), and with [Environmental Connections](#) and others in providing facilities and programs to support outdoor and environmental education;
- pursue other partnerships and partnering projects, possibly through the Frontenac Arch Biosphere Network; and
- make information about MJWA and the natural environment widely available

## Appendix 6 -- Land Uses by Management Zone

	ND1	ND2	ND3	ND4	ND5	SR1	SR2	W1	W2
All built structures existing on January 1, 2006	*	*	*	*	*		*	*	*
All heritage features existing on January 1, 2006							*	*	*
Arboretum				*					
Canoe/kayak launch docks					*				*
Dam access							*		
Fencing	*					*	*	*	*
Gated property entrance	*								
Maintained trails		*	*	*	*	*	*	*	*
Managed forestry	*	*						*	
Meadowland		*							
Multi-use/interpretive buildings			*	*					
Operational office	*								
Operational roadways	*	*	*	*	*	*	*	*	*
Operational storage	*								
Operational workshop	*								
Parking	*		*	*		*	*		
Pedestrian property entrance						*	?	*	*
Picnic shelters			*	*		*			
Potable water	*		*	*		*			
Public driveway			*	*		*	?		
Rental unit (office space)	*								
Rental unit (residential)	*								
Signs	*	*	*	*	*	*	*	*	*
Washrooms			*	*					
Wildlife habitat structures	*	*	*	*	*	*		*	*
Wildlife observation stations		*						*	
Wildlife observation stations not requiring building permits					*				*

### Management Zones

ND1 – Operations Lands

ND2 – Meadowlands

ND3 – Existing Built Lands

ND4 – Revitalization Lands

ND5 – Existing Non-Conforming Lands

SR1 – Primary Recreation

SR2 – Dam & Reservoir Management Access

W1 – Wooded Areas – General

W2 – Wooded Areas – Adjacent Lands