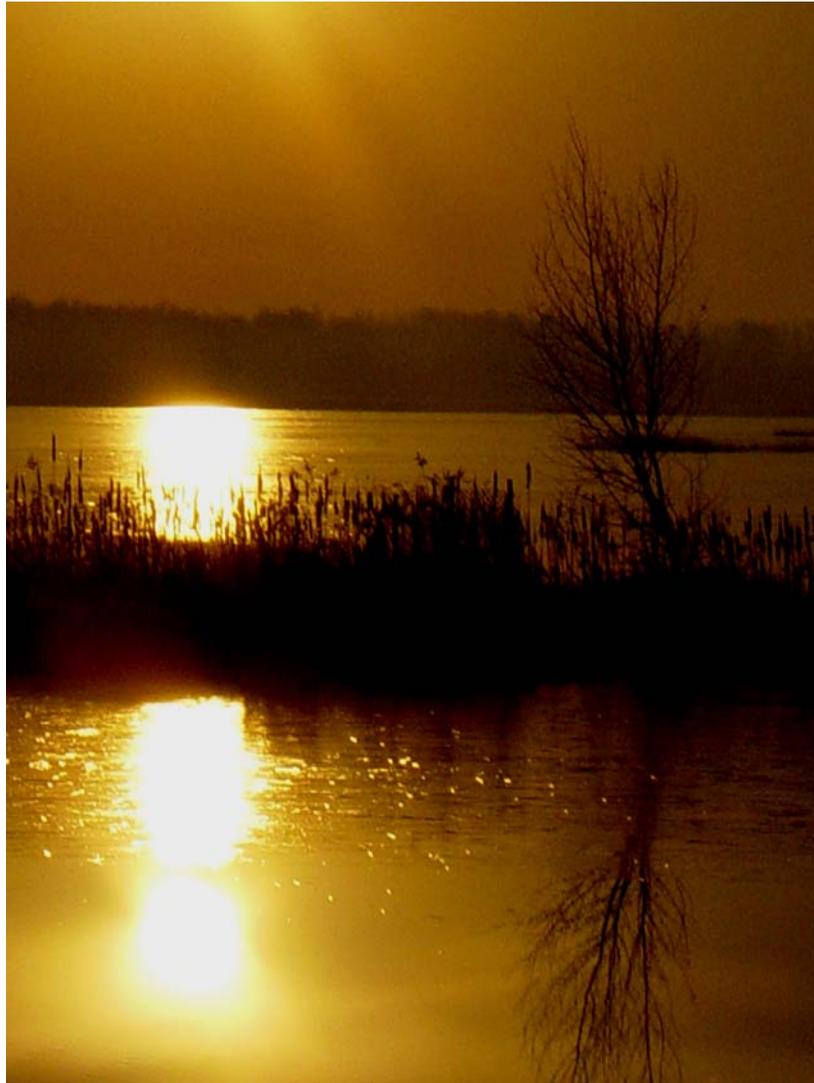


MAC JOHNSON WILDLIFE AREA MASTER PLAN



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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- ❖ Janice Robinson for the 1982 species inventory and for consultation in 2005.

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 Catawaqui 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.

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 inventory¹⁰ for MJWA was updated in 2005¹¹. 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 Risk¹² 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.

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

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

¹² [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 1981.¹³

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 population¹⁴ of 21,375, and partly within the Township of Elizabethtown-Kitley, which had a population¹⁵ of 10,039. North of the St. Lawrence River, and surrounding

¹³ 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.

¹⁴ Statistics Canada, 2001 Census

¹⁵ 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 population¹⁶ 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 MJWA¹⁷. 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.¹⁸ 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.

Conservation Area	Area (hectares)	Population within 60 min drive (2001 Census)	Population per hectare
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	-	-

¹⁶ Statistics Canada, 2001 Census

¹⁷ S. Foerster, personal communication, 2006.

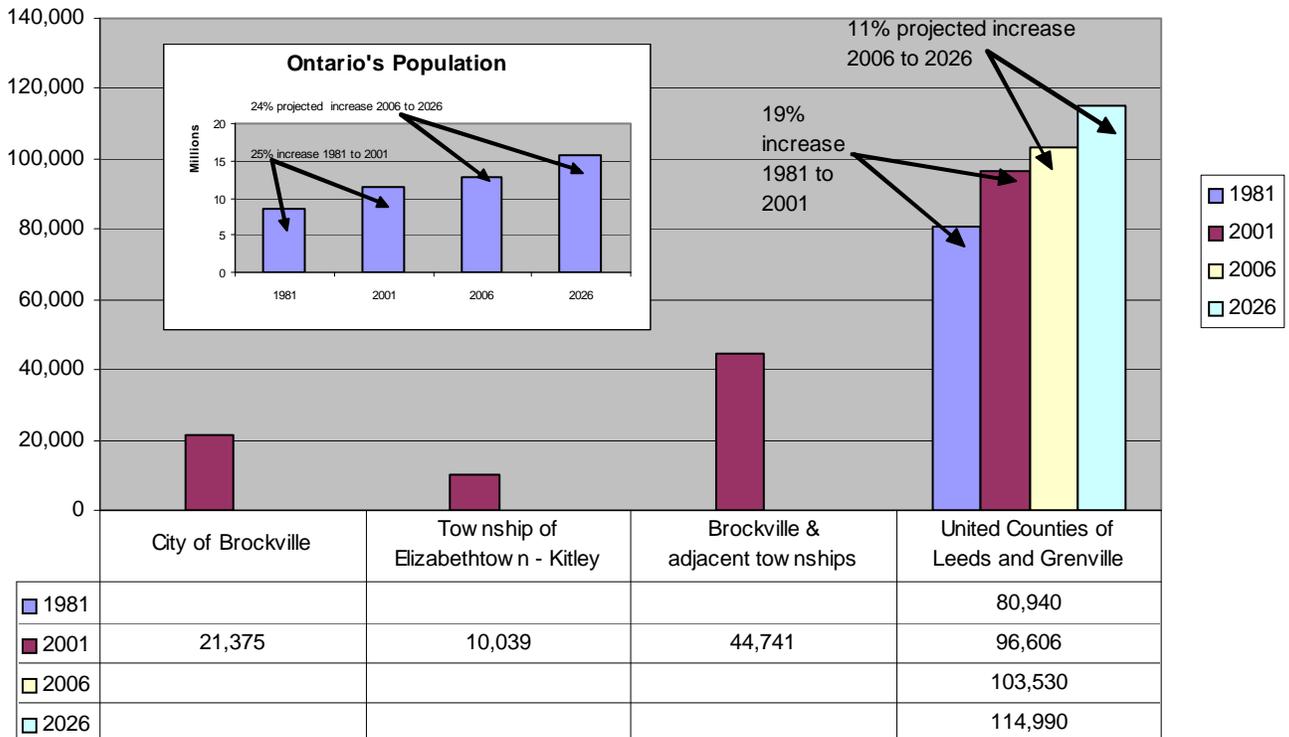
¹⁸ *Providing Opportunities for Nature Appreciation & Outdoor Recreation*, (CRCA, 2003).

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 projected¹⁹

¹⁹ 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 Grenville²⁰, 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 2026²¹. (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 Kingston²². 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

²⁰ Statistics Canada, 2001 Census

²¹ Ontario Ministry of Finance, 2005

²² 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 40.²³

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.²⁴ 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.²⁵ 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.²⁶ Based on estimates of property usage of approximately 4,000 people per year, the report evaluated the total economic value at

²³ [Ontario Ministry of Tourism and Recreation, 2005](#)

²⁴ [Canadian Fitness and Lifestyle Research Institute, 2004](#)

²⁵ [Minister of the Environment, 2000](#)

²⁶ 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).

ULMACEAE	Elm Family		
<i>Ulmus americana</i>	White Elm	✓	✓ _P
<i>U. rubra</i>	Red Elm	✓	
<i>U. thomasi</i>	Rock Elm	✓	
CANNABACEAE	Hemp Family		
<i>Humulus lupulus</i>	Common Hop	✓	
URTICACEAE	Nettle Family		
<i>Boehmeria cylindrica</i>	False Nettle	✓	
<i>Urtica dioica</i>	European Stinging Nettle	✓	JR
JUGLANDACEAE	Walnut Family		
<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
MYRICACEAE	Wax-myrtle Family		
<i>Myrica gale</i>	Sweet gale	✓	✓
FAGACEAE	Beech Family		
<i>Fagus grandifolia</i>	American Beech	✓	✓
<i>Quercus alba</i>	White Oak	✓	✓
<i>Q. macrocarpa</i>	Bur Oak	✓	✓ _{F, P}
<i>Q. rubra</i>	Red Oak	✓	✓ _{F, P}
BETULACEAE	Hazel Family		
<i>Alnus incana</i>	Speckled Alder	✓	✓
<i>Betula alleghaniensis</i>	Yellow Birch	✓	JR,SF
<i>B. papyrifera</i>	Paper Birch	✓	✓ _{F, P}
<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
CHENOPODIACEAE	Goosefoot Family		
<i>Chenopodium album</i>	Lamb's Quarters	✓	JR
<i>C. glaucum</i>	Oak-leaved Goosefoot	✓	JR
CARYOPHYLLACEAE	Pink Family		
<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	✓	✓ _{F, P}
<i>Stellaria graminea</i>	Grass-leaved Stitchwort	✓	
POLYGONACEAE	Smartweed Family		
<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
<i>Rumex acetosella</i>	Sheep Sorrel	✓	JR
<i>R. crispus</i>	Curly-leaf Dock	✓	✓ _P
<i>R. orbiculatus</i>	Great Water Dock	✓	✓
GUTTIFERAE	St. John's-wort Family		
<i>Hypericum perforatum</i>	Common St. John's-wort	✓	✓ _P
<i>H. punctatum</i>	Spotted St. John's-wort	✓	
<i>Triadenum virginicum</i>	Marsh St. John's-wort	✓	
TILIACEAE	Linden Family		
<i>Tilia americana</i>	American Basswood	✓	✓ _{F, P}
MALVACEAE	Mallow Family		
<i>Malva neglecta</i>	Cheeses	✓	JR
SARRACENIACEAE	Pitcher-plant Family		
<i>Sarracenia purpurea</i>	Pitcher-plant	✓	✓
VIOLACEAE	Violet Family		
<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	✓	
CUCURBITACEAE	Gourd Family		
<i>Echinocystis lobata</i>	Wild Cucumber	✓	JR
SALICACEAE	Willow Family		
<i>Populus balsamifera</i>	Balsam Poplar	✓	✓ _P
<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	✓	✓ _P
<i>S. bebbiana</i>	Bebb's Willow	✓	
<i>S. candida</i>	Hoary Willow	✓	
<i>S. discolor</i>	Pussy Willow	✓	✓ _P
<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	✓	
BRASSICACEAE	Mustard Family		
<i>Allaria petiolata</i>	Garlic Mustard		✓ _{F, P}
<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	✓	✓ _P
<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	✓	
ERICACEAE	Heath Family		
<i>Chamaedaphne calyculata</i>	Leatherleaf	✓	✓
<i>Gaultheria procumbens</i>	Wintergreen	✓	JR
<i>Vaccinium macrocarpon</i>	Large Cranberry	✓	✓
PYROLACEAE	Wintergreen Family		
<i>Pyrola elliptica</i>	Shinleaf	✓	
MONOTROPACEAE	Indian Pipe Family		
<i>Monotropa uniflora</i>	Indian-pipe	✓	JR,SF
PRIMULACEAE	Primrose Family		
<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	✓	
GROSSULARIACEAE	Gooseberry or Currant Family		
<i>Ribes americanum</i>	Wild Black Currant	✓	
<i>R. cynosbati</i>	Prickly Gooseberry	✓	✓ _{F, P}
<i>R. hirtellum</i>	Smooth Gooseberry	✓	
<i>R. odoratum</i>	Buffalo Currant	✓	
<i>R. rubrum</i>	Red Currant	✓	
CRASSULACEAE	Stonecrop or Orpine Family		
<i>Sedum acre</i>	Mossy Stonecrop	✓	JR.SF
<i>S. telephinum</i>	Live-forever Orpine	✓	
SAXIFRAGACEAE	Saxifrage Family		
<i>Mitella diphylla</i>	Coolwort Mitrewort	✓	
<i>M. nuda</i>	Naked Mitrewort	✓	
<i>Penthorum sedoides</i>	Ditch Stonecrop	✓	
<i>Tiarella cordifolia</i>	False Mitrewort	✓	
ROSACEAE	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	✓	✓ _{F, P}
<i>Geum aleppicum</i>	Yellow Avens	✓	JR
<i>G. canadense</i>	White Avens	✓	✓ _P
<i>Malus pumila</i>	Common Crabapple	✓	✓ _{F, P}
<i>Potentilla argentea</i>	Silvery Cinquefoil	✓	✓ _P
<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	✓	✓ _P
<i>Prunus pennsylvanica</i>	Pin Cherry	✓	JR
<i>P. serotina</i>	Black Cherry	✓	JR
<i>P. virginiana</i>	Choke Cherry	✓	✓ _P
<i>Rosa acicularis</i>	Prickly Rose	✓	✓ _P
<i>R. blanda</i>	Smooth Rose	✓	
<i>R. gallica</i>	Purple Rose	✓	
<i>Rubus allegheniensis</i>	Alleghany Blackberry	✓	
<i>R. canadensis</i>	Smooth Blackberry	✓	✓ _{F, P}
<i>R. idaeus</i> spp. <i>melanolasius</i>	Wild Red Raspberry	✓	✓ _{F, P}
<i>R. pubescens</i>	Dwarf Raspberry	✓	
<i>Sorbus americana</i>	American Mountain-ash	✓	? _{F, P}
<i>S. decora</i>	Showy Mountain-ash	✓	
<i>Spiraea alba</i>	Meadow-sweet	✓	✓ _P
<i>S. tomentosa</i>	Tomentuose Meadow-sweet	✓	
<i>Waldsteinia fragarioides</i>	Barren Strawberry	✓	
FABACEAE	Pea or Pulse Family		
<i>Amphicarpa bracteata</i>	Hog Peanut	✓	JR
<i>Lotus corniculatus</i>	Bird's-foot Trefoil	✓	✓ _P
<i>Medicago lupulina</i>	Black Medick	✓	✓ _P
<i>M. sativa</i>	Alfalfa	✓	
<i>Melilotus alba</i>	White Sweet-clover	✓	
<i>M. officinalis</i>	Yellow Sweet-clover	✓	✓ _P
<i>Robinia pseudo-acacia</i>	Black Locust	✓	
<i>Trifolium dubium</i>	Small Hop Clover	✓	
<i>T. pratense</i>	Red Clover	✓	✓ _{F, P}
<i>T. repens</i>	White Clover	✓	✓ _{F, P}
<i>Vicia cracca</i>	Cow Vetch	✓	✓ _{F, P}
HALORAGACEAE	Water-milfoil Family		
<i>Myriophyllum sibiricum</i>	Pale Water-milfoil	✓	
<i>M. spicatum</i>	Eurasian Water-milfoil	✓	JR
LYTHRACEAE	Loosestrife Family		

<i>Decodon verticillatus</i>	Swamp loosestrife	✓	JR
<i>Lythrum salicaria</i>	Purple loosestrife	✓	✓
ONAGRACEAE	Evening-primrose Family		
<i>Circaea alpina</i>	Smaller Enchanter's Nightshade	✓	
<i>C. lutetiana</i>	Canada Enchanter's Nightshade	✓	✓ _P
<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	✓	
CORNACEAE	Dogwood Family		
<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	✓	✓ _{F, P}
AQUIFOLIACEAE	Holly Family		
<i>Ilex verticillata</i>	Winterberry	✓	
EUPHORBIACEAE	Spurge Family		
<i>Chamaesyce glyptosperma</i>	Ridge-seeded Spurge	✓	
<i>C. maculata</i>	Spotted Spurge	✓	
RHAMNACEAE	Buckthorn Family		
<i>Rhamnus alnifolia</i>	Alder-leaved Buckthorn	✓	
<i>R. cathartica</i>	Common Buckthorn	✓	✓
<i>R. frangula</i>	Glossy Buckthorn	✓	
VITACEAE	Grape Family		
<i>Parthenocissus inserta</i>	Inserted Virginia Creeper	✓	✓ _P
<i>Vitis riparia</i>	Riverbank Grape	✓	✓ _{F, P}
ACERACEAE	Maple Family		
<i>Acer negundo</i>	Manitoba Maple	✓	✓ _P
<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)	✓	✓ _{F, P}
<i>A. spicatum</i>	Mountain Maple	✓	
ANACARDIACEAE	Sumac Family		
<i>Rhus radicans</i>	Poison Ivy	✓	JR
<i>R. typhina</i>	Staghorn Sumac	✓	✓ _{F, P}
RUTACEAE	Rue Family		
<i>Zanthoxylum americanum</i>	Prickly-ash	✓	✓ _{F, P}
OXALIDACEAE	Wood Sorrel Family		
<i>Oxalis stricta</i>	Upright Yellow Wood-sorrel	✓	✓ _P

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

<i>V. urticifolia</i>	White Vervain	✓	
LAMIACEAE	Mint Family		
<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	✓	✓ _{F, P}
<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	✓	
PLANTAGINACEAE	Plantain Family		
<i>Plantago lanceolata</i>	Narrow-leaved Plantain	✓	✓
<i>P. major</i>	Common Plantain	✓	✓ _{F, P}
OLEACEAE	Olive Family		
<i>Fraxinus americana</i>	White Ash	✓	✓ _P
<i>F. nigra</i>	Black Ash	✓	
<i>F. pennsylvanica</i>	Red Ash	✓	
<i>Syringa vulgaris</i>	Common Lilac	✓	✓ _{F, P}
SCROPHULARIACEAE	Figwort Family		
<i>Agalinis paupercula</i>	Small-flowered Agalinis	✓	
<i>Chelone glabra</i>	Turtlehead	✓	
<i>Linaria vulgaris</i>	Butter-and-eggs	✓	✓ _P
<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	✓	
OROBANCHACEAE	Broomrape Family		
<i>Epifagus virginiana</i>	Beech-drops	✓	JR, SF
LENTIBULARIACEAE	Bladderwort Family		
<i>Utricularia vulgaris</i>	Common Bladderwort	✓	JR
CAMPANULACEAE	Bluebell or Bellflower Family		
<i>Campanula aparinoides</i>	Marsh Bellflower	✓	
<i>C. rapunculoides</i>	Creeping Bellflower		✓ _P
<i>Lobelia cardinalis</i>	Cardinal-flower	✓ _V	JR, SF
<i>L. inflata</i>	Indian Tobacco	✓ _V	

RUBIACEAE	Madder Family		
<i>Cephalanthus occidentalis</i>	Eastern Buttonbush	✓ _V	
<i>Galium aparine</i>	Cleavers	✓ _V	
<i>G. mollugo</i>	White Bedstraw	✓ _V	✓
<i>G. palustre</i>	Marsh Bedstraw	✓ _V	
<i>G. trifidum</i>	Small Bedstraw	✓ _V	
<i>G. triflorum</i>	Fragrant Bedstraw	✓ _V	
<i>Mitchella repens</i>	Creeping Partridge-berry	✓	✓
CAPRIFOLIACEAE	Honeysuckle Family		
<i>Lonicera canadensis</i>	American Fly Honeysuckle	✓ _V	
<i>L. dioica</i>	Glaucous Honeysuckle	✓ _V	
<i>L. oblongifolia</i>	Swamp Fly Honeysuckle	✓	
<i>L. tatarica</i>	Tartarian Honeysuckle	✓ _V	✓
<i>Sambucus canadensis</i>	Common Elderberry	✓ _V	✓ _P
<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	✓	✓
ASTERACEAE	Composite or Aster Family		
<i>Achillea millefolium</i>	Common Yarrow	✓	✓ _{F, P}
<i>Ambrosia artemisiifolia</i>	Common Ragweed	✓	✓ _P
<i>Anaphalis margaritacea</i>	Pearly Everlasting	✓	
<i>Antennaria neglecta</i>	Field Pussytoes	✓	✓ _P
<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	✓	✓ _P
<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	✓	✓ _P
<i>Cichorium intybus</i>	Chicory	✓	✓ _P
<i>Cirsium arvense</i>	Canada Thistle	✓	✓ _{F, P}
<i>C. vulgare</i>	Bull Thistle	✓	✓ _{F, P}

<i>Erigeron annuus</i>	Daisy Fleabane	✓	✓
<i>E. philadelphicus</i>	Philadelphia Fleabane	✓	✓
<i>Eupatorium maculatum</i>	Spotted Joe-pye-weed	✓	✓ _P
<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	✓	✓ _P
<i>Hieracium aurantiacum</i>	Orange Hawkweed	✓	
<i>H. caespitosum</i>	Yellow Hawkweed	✓	✓ _P
<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	✓	✓ _{F, P}
<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	✓	✓ _{F, P}
<i>Tragopogon pratensis</i>	Meadow Goat's-beard	✓	✓ _P
ALISMATACEAE	Water-plantain Family		
<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	✓	
HYDROCHARITACEAE	Frog's-bit Family		
<i>Elodea canadensis</i>	Common Elodea	✓	
<i>Vallisneria americana</i>	Water-celery	✓	
JUNCAGINACEAE	Arrow-grass Family		
<i>Triglochin maritimum</i>	Seaside Arrow-grass	✓	
POTAMOGETONACEAE	Pondweed Family		
<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	✓	
ARACEAE	Arum Family		
<i>Arisaema triphyllum</i>	Jack-in-the-pulpit	✓	JR

<i>Calla palustris</i>	Wild Calla	✓	JR
LEMNACEAE	Duckweed Family		
<i>Lemna minor</i>	Lesser Duckweed	✓	
<i>Spirodela polyrhiza</i>	Greater Duckweed	✓	
JUNCACEAE	Rush Family		
<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	✓	
CYPERACEAE	Sedge Family		
<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	✓	
POACEAE	Grass Family		
<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	✓	✓ _{F, P}
<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	✓	
SPARGANIACEAE	Bur-reed Family		
<i>Sparganium emersum</i>	Green-fruited Bur-reed	✓	
<i>S. eurycarpum</i>	Broad-fruited Bur-reed	✓	
TYPHACEAE	Cattail Family		
<i>Typha angustifolia</i>	Narrow-leaved Cattail	✓	✓ _{F, P}
<i>T. latifolia</i>	Broad-leaved Cattail	✓	✓
LILIACEAE	Lily Family		
<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	✓	
IRIDACEAE	Iris Family		
<i>Iris versicolor</i>	Multi-coloured Blue-flag	✓	JR

Sisyrinchium montanum	Montane Blue-eyed-grass	✓	
ORCHIDACEAE	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

Common Name	Scientific Name	1982 Inventory	2005 Update	Notes
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>Polioptila 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 42nd, 43rd, 44th and 46th 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> ²⁷			
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.

²⁷ 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?

Response	Tally	Percentage
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