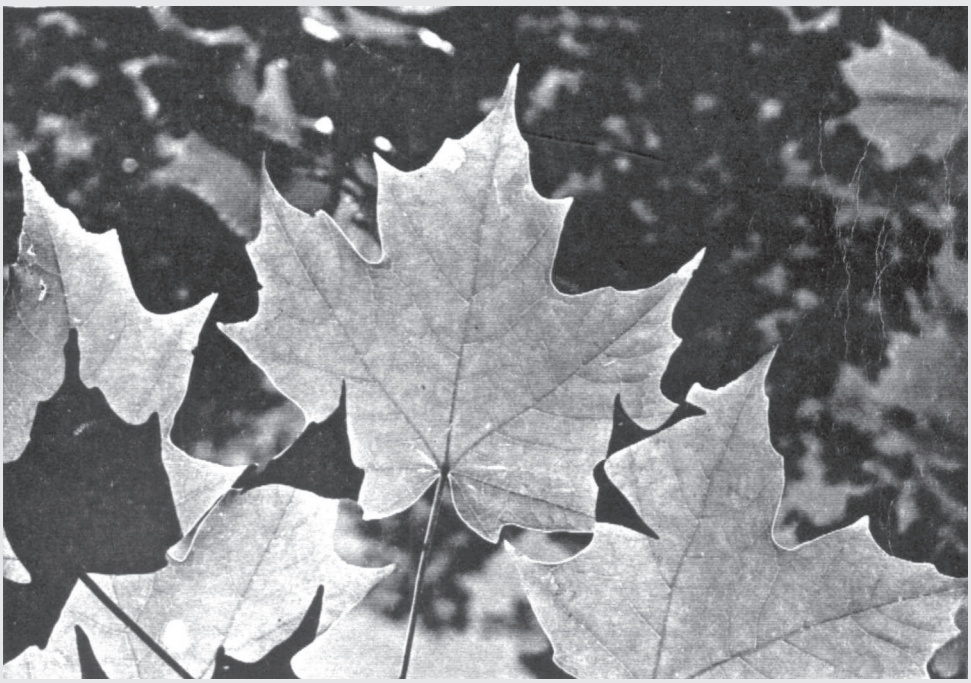
DANIEL BRUNTON CONSULTING SERVICES
216 Lincoln Heights Road, Ottawa, Ontario K2B 8A8
(613) 829 -7307 FAX (613) 829-4688

KANATA LAKES STUDY AREA
NATURAL ENVIRONMENT ASSESSMENT



Daniel F. Brunton

February 1992

Natural Environment research and planning

Natural Environment Inventory of the Kanata Lakes Study Area, Kanata, Regional Municipality of Ottawa-Carleton, Ontario

Daniel F. Brunton,

DANIEL BRUNTON CONSULTING SERVICES

February 1992

Prepared for:

GENSTAR DEVELOPMENT COMPANY,

Nepean, Ontario

and

CITY OF KANATA,

Kanata, Ontario

PREFACE

The natural environment assessment of the Kanata Lakes study area has been a challenge which I was pleased to undertake from a professional perspective. It was also a labour of love, for I have enjoyed the special character of the study area for some 20 years. In this regard, my thanks to the many local naturalists who shared this enthusiasm for this special place as they shared their knowledge and their time. This includes (but is not restricted to) naturalists R. Layberry, K. L. McIntosh, M. Weber, R. Taylor and R. Killeen.

Clarence and Enid Frankton of Ottawa have been particularly outstanding in this regard. They gathered and shared botanical data throughout the 1991 field season as well as in previous years. It was they who introduced me (and most other naturalists) to the natural treasures of the Trillium Woods decades ago. Clarence also provided a most helpful technical and structural review of the draft report. It is a great pleasure to acknowledge their help and my debt to their generosity.

The present study is a unique example of a co-operative venture by a municipal government, a private development company and a community association. The Kanata Lakes Association encouraged the development of the study and helped Genstar Development Company and the City of Kanata design it. Alan Austin represented the Association on the joint Steering Committee established with the city and Genstar to oversee the program and also provided a very helpful critique of the draft report.

The project was funded equally by Genstar and the city. Kanata Recreation and Parks Department personnel Rick Baker and Alan Cameron administered the contract; to them fell the unenviable task of handling the paper flow, in addition to providing resource materials and information. Jack Stirling of Genstar Development Company facilitated contract financing, provided base maps and oblique aerial photographs and responded promptly and completely to any other requests for assistance. He also maintained a hands-off position which made my task much easier and encouraged the production of the most technically objective report possible.

Bruce Di Labio expertly conducted a field and archival assessment of breeding bird populations with his usual straightforward effectiveness, thus greatly simplifying the faunal analysis and permitting more of my time to be applied to other areas of investigation.

Additional valuable information was provided by a variety of resource specialists, including scientists with the National Museum of Nature (F. Cook, G. Argus), the Biosystematics Research Centre, Agriculture Canada (W. G. Dore, J. D. Lafontaine and P. M. Catling), biologists/ecologists with the Ministry of Natural Resources (D. Cuddy, K. Taylor, H. McLeod) and Dr. D. M. Britton of University of Guelph.

A special acknowledgement is due to the Kanata Lakes Community Association. They provided the incentive and energy to initiate the project and proved that while you may not wish to fight city hall, you can certainly work effectively with it in a project of mutual benefit. Without the optimism, wisdom, good humour and remarkably tenacity of the Association, and particularly past-President Merle Nicholds, none of this would have been possible.

PREFACE TO THE WEB EDITION

This Report has become particularly topical since KNL Development Co. (who acquired the described lands from Genstar) has submitted Applications for Subdivision Plan Approval, together with proposals to amend the Official Plan of the City of Ottawa into which the City of Kanata was amalgamated.

While every effort was made to present the content of this Report as accurately as possible on the World Wide Web in the widely accessible PDF format, formatting discrepancies due to technical reasons may be evident. Also, the originals of the photographs were not available, so the photocopied replicas are used primarily as place holders. For the Report original, readers are directed to the Ottawa Public Library, Beaverbrook Branch. The cooperation of the City of Ottawa and kind assistance of the report author is gratefully acknowledged.

Mikelis Svilans, Kanata Lakes Community Association, 16th August 2003

EXECUTIVE SUMMARY

A natural environment inventory and assessment of the ca. 345 ha Kanata Lakes Study Area was undertaken to determine the nature of this southern end of the Regionally unique Carp Ridge and the appropriateness of existing Natural Environment Area (EPA) zones as delineated in the Kanata Official Plan.

Although having experienced significant degrees of disturbance by human activity such as agriculture, residential development, logging, fire and even mining for over a century and a half, the study area was found to support a rich and varied natural life. Several substantial areas of Provincially Significant mature hardwood forest vegetation were documented, the so-called “Trillium Woods” along Goulbourn Forced Road being clearly the most significant.

Almost 500 vascular plant species were recorded, including many species found virtually nowhere else in the Regional Municipality of Ottawa-Carleton. Flora believed to be relict from a post-glacial climatically warmer period some 4000 to 7000 years ago were also found. Approximately 70 species of breeding birds were recorded as well as a number of mammals, amphibians and reptiles considered representative of the Carp Ridge.

The EPA (NEA) zones of the Kanata Official Plan were found to be inadequate in terms of representation and conservation management. A realignment of the NEA zones is proposed which emphasizes the mature and submature hardwood forest areas which are the heart of a Provincially Significant landform/vegetation complex.

An evaluation of the existing Official Plan suggests that more direction is required to ensure that effective and meaningful conservation management objectives will be achieved in NEA zones. An amendment to the Official Plan is proposed, as are elements of a supporting municipal by-law to facilitate the objectives of the Official Plan.

A series of recommendations are provided which are intended to assist the developer and the city in maximizing protection for significant natural areas while providing an optimum of recreational and environmental education opportunities for the citizens of Kanata without encumbering the residential and commercial development of less significant lands in the Kanata Lakes Study Area.

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CHAPTER 1: INTRODUCTION

(1) Location and Situation

The study area is a rural part of the city of Kanata, Regional Municipality of Ottawa-Carleton, Ontario (Figure 1). It is approximately of ca. 345 ha. (850 acres) in size. The core of the study area is situated in Lots 6, 7, 8 and 9 of Concessions 2 and 3 and is centred at 45° 20'N, 75° 56'W.

The study area contains limited development, concentrated along the two main transportation corridors, the Richardson Side Road and the Goulbourn Forced Road (Figure 2). A handful of private residences occupy scattered sites along these roads. A spur line of the Canadian National Railway transects the centre of the area in an east-west direction.

A limited cattle grazing operation is maintained in the fields north of the railway and west of the Goulbourn Forced Road, across the tracks from the only area of active agricultural crop lands.

Two hydrolines define border areas; a high power transmission corridor runs along the eastern border, crossing a small portion of the study area near Kanata Pond, and a minor transmission line extends northward along the First Line allowance on the western border of the site.

An extensive system of winter-skiing/summer hiking recreational trails connects the site with the larger, equally undeveloped area of the Carp Ridge to the west and north of the Kanata Lakes study area (cf. Brunton 1992b).

The land is owned by Genstar Development Company and zoned for a variety of residential and commercial developments, as well as a substantial portion as Natural Environment Area (NEA) or Environmental Protection Area (EPA) (Haigis, MacNabb & Deleuw 1991).

Three isolated portions of the study area are located along the Goulbourn Forced Road south of the main study area (Figure 2).

(2) Study Objectives and Assumptions

The development of the Marchwood-Lakeside Community, within which the study is situated, is expected to support a population of 15,000 to 20,000 people at the end of a 10 to 15 year development period. Despite this significant development commitment and the delineation of Natural Environment Areas (*Environmental Protection Areas* in the Kanata Official Plan), detailed assessment of natural environment values had not been undertaken.

Accordingly, this study has been initiated to achieve the following objectives:

- to provide a complete and detailed inventory of the vertebrate fauna (mammals, reptiles, amphibians, birds), vascular flora and vegetation in order to identify the full range of biological diversity;
- to provide an ecological interpretation of these inventory data in order to delineate significant species, features and areas;
- to clarify the boundaries and extent of existing NEA (Natural Environment Areas);
- *to offer recommendations for the development of a zoning bylaw to ensure continued natural environment integrity for NEAs;*
- *to offer recommendations to minimize development impact on significant natural environment features and values in the study area.*

The study also is based on several understandings which colour the methodology to be employed and the interpretation of data:

1. that the Goulbourn Forced Road will remain an active vehicular road until an alternative alignment is approved in ca. 10 years;

2. that a pedestrian pathway linking Morgan's Grant Community to communities to the south is to be built during the summer of 1991, with advice from the consultant;

3. that the railway line will remain active for at least 2 to 3 years;

4. that the study will maintain close contact throughout with the investigation of the adjacent South March Highlands study area and will encourage natural environment data analyses which are mutually complementary.

(3) Methodology

The natural environment assessment of the Kanata Lakes study area was undertaken between April 1991 and January 1992. The data gathering and analyses were conducted by D. F. Brunton, with the assistance of B. M. Di Labio who had the primary responsibility for data gathering and analysis of breeding and migratory bird populations. He also photographically documented habitat observations and provided a variety of other natural resources information.

A Steering Committee composed of representatives of Genstar Development Company, the City of Kanata and the Kanata Lakes Community Association, was established to meet periodically and oversee the program.

The inventory and assessment program consisted of Pre-field, Field and Post-field phases, as follows:

Pre-field (April - May 1991)

This was undertaken to provide logistical preparation and to conduct off-site preparatory research (i.e. assessment of existing data base) and included:

- the assessment of local, regional and provincial natural environment literature; discussion with appropriate natural environment experts (academic, provincial, federal agencies) and local authorities on the area (natural environment, development, planning), as well as a review of personal natural history data collections;
- review of municipal zoning and background site condition data;
- logistical and administrative detail such as contract finalization, base map determination, development of field program for inventory team, etc.
- preparation of working floral and faunal lists, including vascular plants, birds, mammals, amphibians and reptiles.

Field Inventory (April - October 1991)

This was undertaken at various periods during the growing season to provide detailed on-site identification, mapping and assessment of natural environment features. A detailed inventory of the primary core was conducted between April and September 1991, with single-visit surveys of southern reconnaissance sites in June and July 1991. It was conducted in three major blocks, with additional visits at various times up to and including October 1991 for various follow-up purposes.

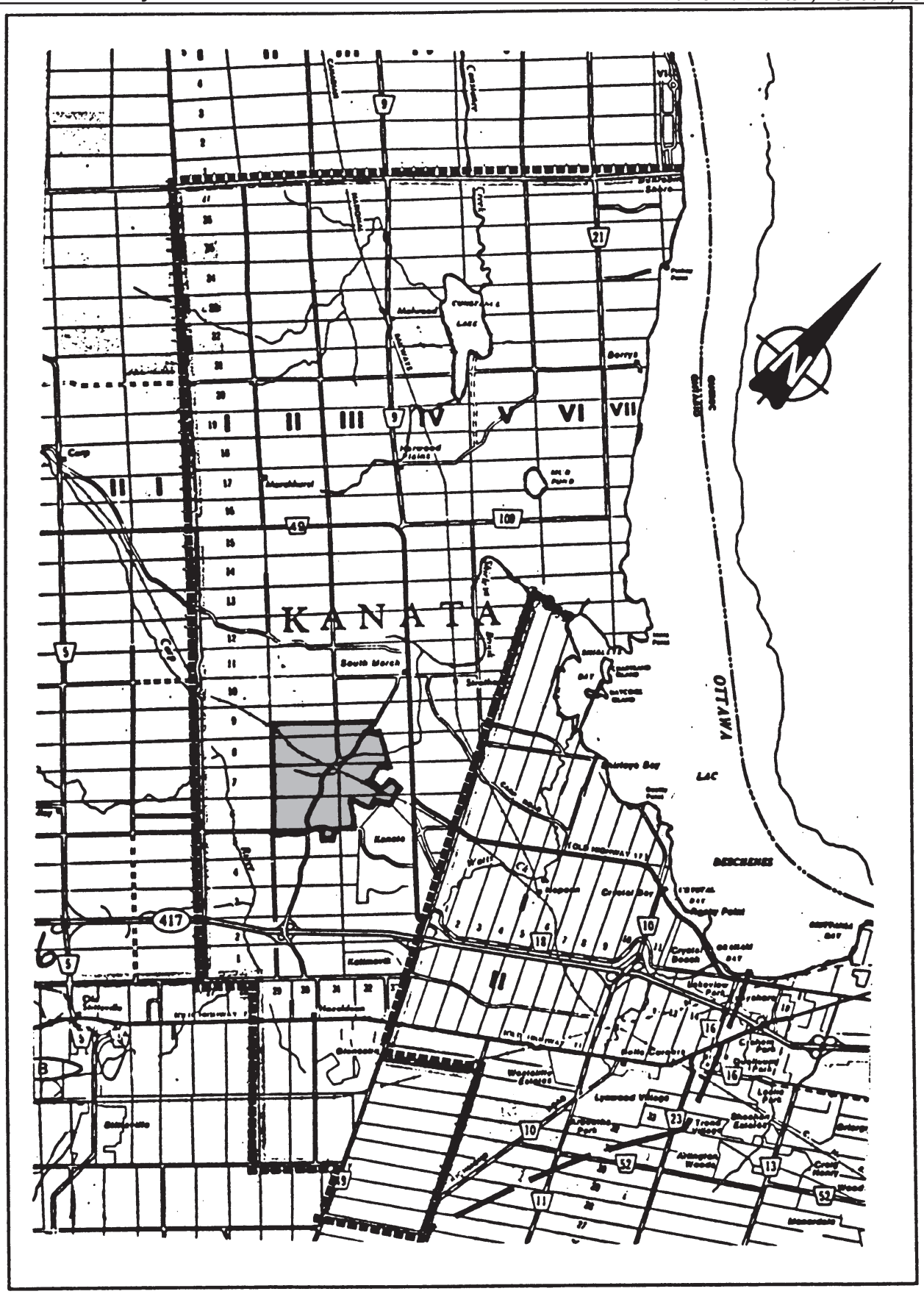

Figure 1: Location of the Kanata Lakes Study Area within City of Kanata

(study area shaded)

(adapted from OMNR 1988)

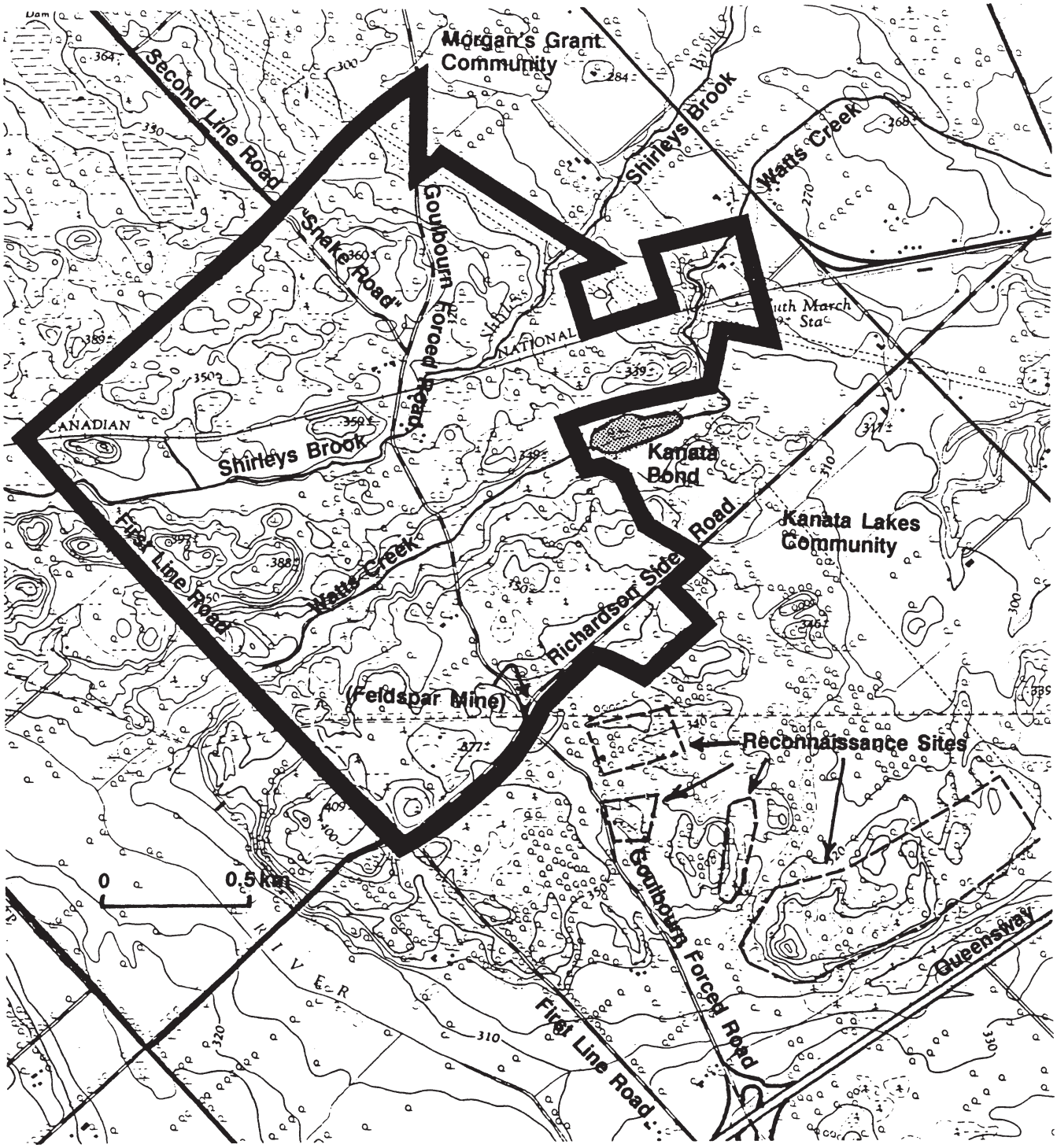

Figure 2: Kanata Lakes Study Area Situation
(Scale 1: 25,000)

The schedule of field work was as follows:

Early Season (late April - early May; early June) - survey of all major habitats and areas in study area was conducted, focusing of assessment of diversity and populations of amphibians, breeding birds, spring vascular flora, migrant wildlife and vegetation quality.

Mid Season (late June - early August) - detailed survey and ecological mapping of site was undertaken; brief surveys of the sites south of Richardson Side Road to receive reconnaissance assessment only;

Late Season (late August - mid Sept) - late season floral /faunal diversity and vegetation conditions were observed and documented in all major habitats; remaining vegetation/habitat mapping was conducted.

The field work included:

- transects of all habitat types during which written observations were documented, voucher specimens of unfamiliar/significant plant species obtained and marking of features on large scale aerial photographs for later transferral to composite site maps completed;
- detailed mapping of vegetation onto stereo aerial photographs;
- documentation of vegetation variation and constitution;
- identification of floral/faunal diversity;
- black and white photographs of significant features and representative habitats for inclusion in the final report;

Post-field (mid-September to late October 1991)
This involved the assimilation and analysis of field data and off-site data gathered from other sources such as literature, resources specialists and field authorities in order to determine the local, regional or provincial level of significance (and hence, conservation priorities) of natural environment values. The elements involved included:

- the processing, identification and distribution of voucher specimens for significant/ unidentified vascular plant specimens, processing and selection of black and white photographic images, organization of field data, etc..
- documentation of findings in annotated lists, on maps and in written form;
- comparison of data with regional data sources and authorities, particularly Ontario Ministry of Natural Resources identification and priorization of significant features, complexes and areas;
- the delineation and mapping of significant areas (particularly the Natural Environment Areas and possible connecting natural corridors);
- consideration of spatial and ecological relationships between significant natural features/areas in the study area, the South March Highlands study area and other significant natural areas in the Kanata area.
- preparation of a comprehensive draft report in early November 1991 and, following review of the draft report by the Steering Committee, preparation of final report.

(4) Previous Studies

Although the study area and the entire Carp Ridge have long been known to represent a complex of habitats rarely encountered in the Regional Municipality of Ottawa-Carleton and throughout eastern Ontario, life science investigations have been remarkably few. A few sketchy reports from the Carp Ridge a few kilometres north of the study area dating from 1840 (Lett 1890) constitute the only mammal records until at least the 1940s (Rand 1945). Bird sightings were similarly fragmentary. Only a handful of records were known from the area until recent years, those being observations by the famous conservation biologist Harrison F. Lewis in 1943 from "South March" (Lloyd 1944). Botanical data were no more comprehensive; Dore (1959), for example, indicates that less than 1% of the exceptionally large number of grass specimens preserved in the huge Agriculture Canada and National Museum of Nature collections were taken from the Carp Ridge; he notes none from the South March Highlands portion. And the same lack of attention can be inferred from the distribution maps of Ottawa District amphibians and reptiles published over twenty years later (Cook 1981).

The first precise documentation of natural history elements in the South March Highlands portion of the Carp Ridge was likely the notification by W. G. Dore that the area contained unusual botanical values, specifically the northernmost known population of an uncommon phlox (Dore 1968).

More comprehensive investigations of the flora of the South March Highlands in general (though focused on the Kanata Lakes study area) were initiated in the early 1960s by Dr. Clarence Frankton and Enid Frankton of Ottawa, formerly of the Plant Research Institute (now, Biosystematics Research Centre) of Agriculture Canada. Beginning in August 1966 and continuing to the present day, the Franktons have repeatedly surveyed the area, documenting observations in note form and through the collection of voucher specimens (preserved in the Biosystematics Research Centre herbarium).

Beginning in the late 1960s through the information being disseminated by the Franktons, W. G. Dore and others (e.g. Solman 1968), naturalists with the Ottawa Field-Naturalists' Club increasingly explored the special natural history features of the Carp Ridge and South March Highlands. Formal and informal outings to various sites were initiated and continue to the present day (pers. obs.). Based on the information gathered by these naturalists, a proposal for conservation of the study area within a larger South March Highlands conservation area was made to the Regional Municipality of Ottawa-Carleton (Anonymous 1970).

A formal ecological investigation was first undertaken in the study area by students at the University of Ottawa in response to its designation as part of a larger Regional Municipality of Ottawa-Carleton conservation area in the 1974 Regional Official Plan. This reconnaissance inventory highlighted the major vegetation and landform features as well as relating unusual discoveries by the Ottawa Field Naturalists (Reed 1975). Another reconnaissance level study was undertaken shortly thereafter on behalf of the land-owner's rezoning application, covering much the same ground but based on more detailed on-site examination of lands in the Kanata Lakes study area.

Informal studies since then by a number of naturalists including members of the Ottawa Field-Naturalists, Kanata residents Martha Weber and Klaus Gottlob and individuals involved in the Breeding Atlas of Ontario Birds Project (Cadman 1987) have contributed a variety of life science data on the study area and its surrounding lands.

CHAPTER 2: RESOURCE ASSESSMENT

(1) Landscape

Topography and Drainage

The study area occupies the southeastern portion of a large bedrock outcrop area known as the Carp Ridge, extending from Morris Island near Fitzroy Harbour to central Kanata, a distance of about 15 km (Figure 3). The Kanata Lakes study constitutes the lowest portion of the ridge, with maximum elevations of ca. 120 m above sea level (asl) found along its southwestern border. Shirleys Brook at the northern border of the site has the lowest locality in the study area at ca. 90 m asl.

Bare rock ridges are common on the Carp Ridge and infrequent in the Kanata Lakes study area, grading into upland scrub then forest vegetation, frequently concluding with swamp vegetation in bedrock (and beaver) controlled wetlands occupying the frequent landscape depressions. Drainage channels flow mostly eastward from these collection areas. The headwater area for two major streams, Shirleys Brook and Watts Creek, are situated in bedrock troughs in the central portion of the study area. Both are semi-permanent at this elevation. Neither flow, however, towards the end of particularly dry summers, such as that experienced in 1991.

The upland drops quickly into the deep soil flats along the Carp River by the southwestern margin of the site and more gently onto the thinly-buried sedimentary bedrock areas along its northeastern margins. A broad, relatively level valley transects the middle of the study area in an east-west direction. The CNR line runs through the valley.

Bedrock Geology

The study area consists largely of a rugged landscape of Precambrian-age gneissic bedrock thinly buried in overburden, with only the northern edge of the site being underlain by younger, sedimentary Nepean sandstone. The bedrock geology of the Kanata Lakes study area is superficially like that of much of the Gatineau Hills of Quebec, 15 km to the north east (Renauld 1977). It contains a rich and chemically complex mosaic of diorite, gabbro, quartz and marble in a predominately non-basic gneissic substrate (Wilson 1956; Figure 4) that is unique in southern Ontario (Freeman 1979). This complex geology has physical, chemical and nutrient loading implications for the soil and vegetation, contributing to the diversity and floristic uniqueness of the site. Minor ledge and cliff systems criss-cross the area in many places, reflecting its long, complex history of landscape formation. These frequently alter and disrupt surface drainage, contributing to the formation of ephemeral pools and innumerable small drainage channels throughout the site.

Geomorphology

The variation of surface material on this bedrock landscape is limited. The area is categorized as almost entirely bare to thinly-buried bedrock outcrop, with small areas of marine clay (upon which agricultural development has long been active) between the Goulbourn Forced Road and the western study area boundary and along the northeastern edge of the area by the hydro transmission line.

Only one small area of glacial till is present, along the west side of the Goulbourn Forced Road at the northern edge of the study area (Yeager & Daley 1974). A shallow organic deposit underlies the wetland complex in the bedrock trough occupied by Watts Creek and Kanata Pond (Pratt 1982).

Many of these surficial deposits result from deposition from or erosion by the post-glacial Champlain Sea. This Atlantic Ocean embayment flooded the lower Ottawa Valley following deglaciation ca. 10,000

years B. P.. Isostatic rebound raised the land sufficiently by 8,400 years B. P. to expose the Ottawa area (Dyke and Prest 1987a) but not before the vast quantity of glacial meltwater significantly altered the local landscape by depositional and erosional activities (Chapman and Putnam 1984). The thinly covered, scoured outcrops of this upland area and the rarity of till materials are examples of this alteration.

During the latter stages of the reduction of water levels in the Ottawa Valley (9,000 - 8,000 years B. P. - McAndrews et al. 1984) the glacial meltwater formed a proto-Ottawa River which was much larger than today's river and may have formed a large lake (Dadswell 1974). A boreal-subarctic vegetation would have dominated during the colder period following deglaciation. Western Quebec and eastern Ontario underwent

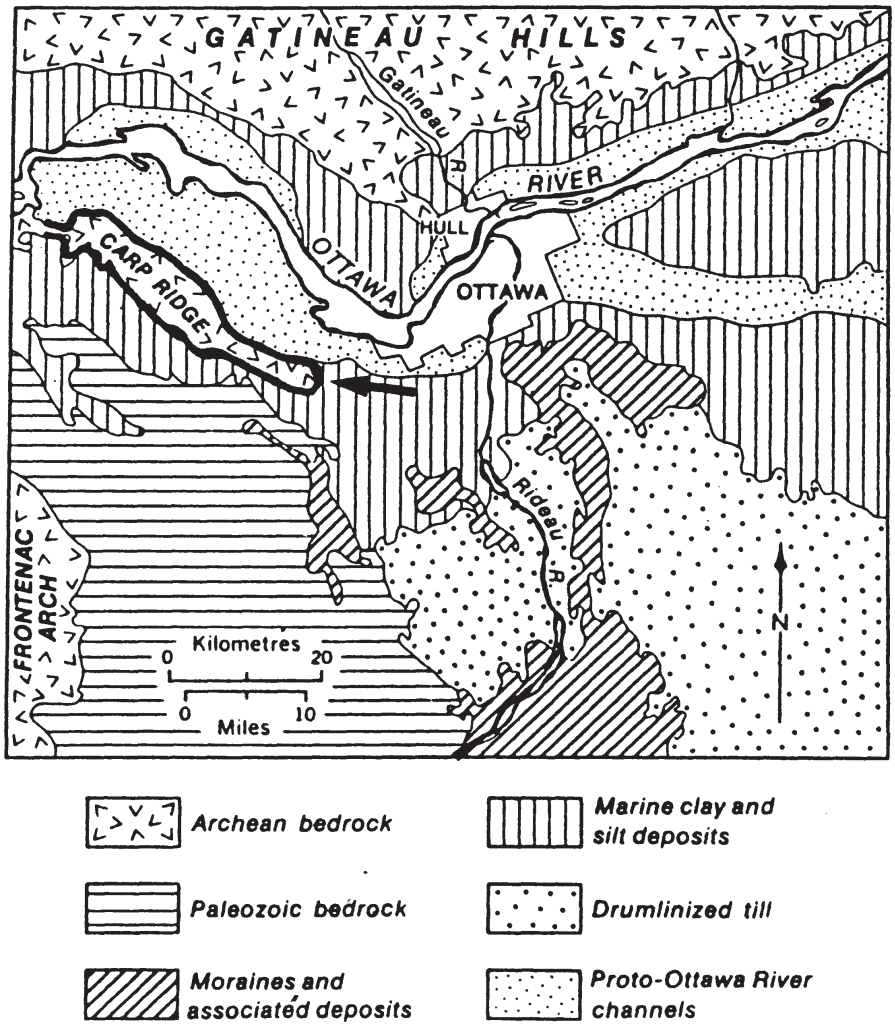

Figure 3: The Carp Ridge and a Simplified Geology of the Ottawa District
(arrow points to study area; from Belanger & Harrison 1980)

a warmer climatic period between 7,000 and 4,000 years B. P. (the hypsithermal period) (McAndrews et al. 1987) during which the Great Lake drained through the Ottawa Valley and provided a direct link with areas to the west (until about 5,000 years B. P.)(Dyke and Prest 1987b). Southern floristic elements may have rapidly invaded along these river and lake shores during this warmer period and become established in the study area and the lower Ottawa Valley (Brunton 1980).

By ca. 4,000 years B.P. the landscape and vegetation characteristic of contemporary natural sites was established (Dadswell 1974; McAndrews et al. 1987). In the study area this would have been a somewhat more mature version of the vegetation which we see in the study area today, with more fire and drought-tolerant forest vegetation dominating the more exposed outcrop areas. Mature late successional hardwood and mixed forests likely dominated the lower, more mesic, more deeply buried sites. Eastern Hemlock was likely a considerably more significant component of such mature forests before its selective removal by early settlers.

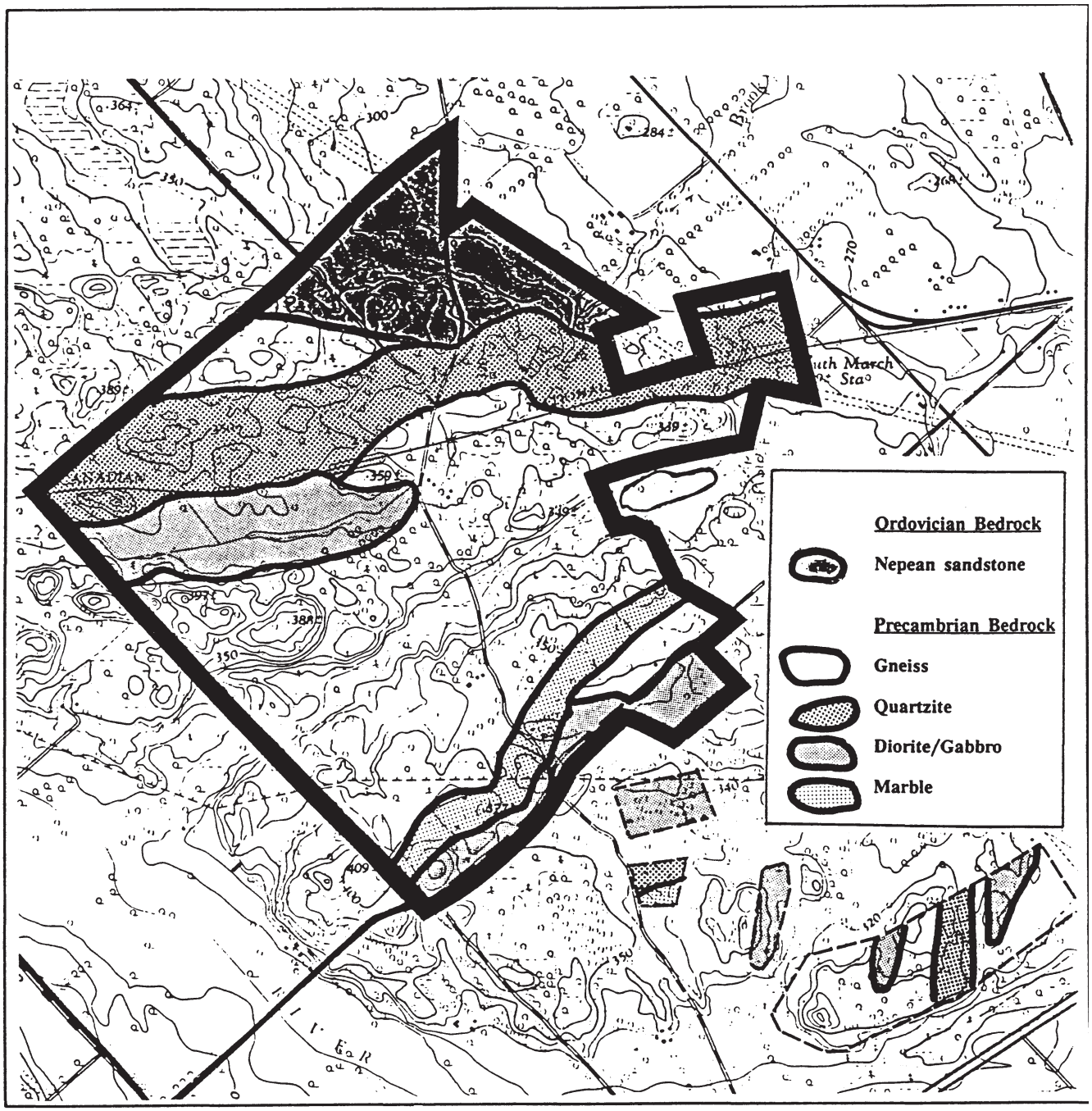

Figure 4: Bedrock Geology of the Kanata Lakes Study Area
(from Renaud 1979)

(2) Historical Impact and Development

Early Development

Significant activity in the Kanata Lakes study area began in the early 19th century with the arrival of British and Canadian colonial settlers who initiated the agricultural activity which is still evident. Prior to that time, local aboriginal people focused their activity along the biologically more productive and logistically less demanding shore areas of major river systems. It is unlikely that aboriginal activity would have amounted to more than seasonal hunting activity (Brault 1946).

All of the study area has been logged since the early 19th century. Timber extraction commenced in the Ottawa-Hull area in the last years of the 18th century and remained the primary industrial activity here for many decades (Walker & Walker 1969). Burns et al. (1972) suggest that Philemon Wright's company may have logged Red Pine and some White Pine from the region of the study area in the 1820s. This seems unlikely, given the complete absence of any natural Red Pine in Nepean or Kanata today (pers. obs.). In any event, the first wave of export logging activity passed beyond the Kanata area by 1830. Subsequent timber activity would have been to supply local lumber needs.

Agricultural settlement here was initiated by Captain J. B. Monk, a Napoleonic War veteran who received a 300 ha (1000 acre) military land grant involving lands along Concession 3 within the study area. How quickly land clearing took place is unclear, but by the 1860s the South March Highlands had been surveyed and largely settled, with most lots having one or more structures built upon them (Figure 5). The thin, relatively sterile soils of most of the Kanata Lakes study area provided limited agricultural production and very little active agriculture remains.

The presence of a tannery just beyond the study areas suggests a connection between agricultural activity and timber extraction in the area. It seems likely that the late successional forests of the Kanata Lakes area once supported a substantial Eastern Hemlock population, as the bark of this tree was the mainstay of the 19th century Ontario tanning industry.

The landscape impact of greatest significance next to agriculture in the Kanata Lakes Study Area was the Great Fire of 1870. A series of fires swept the entire western half of what is now the Regional Municipality of Ottawa-Carleton during a prolonged drought in August 1870 (Walker and Walker 1969). Much of the mixed forest and coniferous forest areas on the dry outcrop areas were severely impacted and still show signs of the 120 year old fire (pers. obs.).

Substantial areas of forest were spared, however - some by chance and others by ecological advantage. Mature deciduous forest contains less combustible material than younger, disturbed forest and would have been less vulnerable to the advancing fire. The settlement at South March, for instance was saved by the presence of " ... an extended hardwood bush ... (R. Lyon (1905), in Burns et al. 1972). What is known today as the Trillium Woods along the Goulbourn Forced Road (Lot 8, Concession 3) is undoubtedly the southern remnant of that 'hardwood bush' which would have extended northward across what is now Morgan's Grant towards Harwood Plains. Particularly vulnerable were those areas of mixed or coniferous forest and those bounded by cedar rail fences along which the fire spread rapidly.

Other industrial activity has had a much more limited impact on the natural landscape. A small, now-abandoned feldspar mine is situated in the southwestern corner of the study area at the northeastern intersection of Richardson Side Road and the Goulbourn Forced Road (Concession 2, Lot 6). It presumably is the only such mine, past or present, in the Regional Municipality of Ottawa-Carleton.

The Kanata Lakes Study Area and the entire South March Highlands was designated part of a Conservation Areas system in the 1974 Regional Official Plan. This designation was reversed several years later, although two areas along the Goulbourn Forced Road (the Trillium Woods and "Kizell's Pond" on Watts Creek) were dedicated as Natural Environment Protection lands (Brunton 1981; Haigis, McNabb & Deleuw 1991).

In 1990 a substantial rock-crush surfaced bicycle trail was constructed through the Trillium Woods and adjacent lands (Figures 6 and 7) connecting the Morgan's Grant and Kanata Lakes communities (see Environmental Impacts, page 82).

(3) Vegetation

The vegetation of the study area is the framework upon which the natural environment assessment is structured, as most floral and faunal features are dependent on it. The habitat categories utilized are compatible with those utilized in detailed inventories elsewhere in the Regional Municipality of Ottawa-Carleton (cf. Mosquin & Gillett 1984; Brunton 1984).

Twelve vegetation types are identified in the study area, in addition to developed land, agricultural land and open water. The majority of habitats represent upland vegetation complexes, all of which show impact from human activity to some degree.

Due to the level of disturbance in some areas and their transitional nature, it is difficult to put precise 'labels' on large blocks of forest vegetation. In such situations the broad habitat category is identified as closely as possible and the locally important variations in combinations of dominants is noted. Less attention is placed on labelling particular stands than on classifying the overall habitat type and identifying natural environment significance.

Figure 8 illustrates the distribution of each of these vegetation types. This map is prepared directly from transparent overlay on 1:15,000 scale stereo aerial photographs of the study area [1]. The habitat number/letter codes listed below are those used in Figure 8.

The habitats identified in the study area are as follows:

WETLAND HABITATS

Open Water (ow)
Marsh (1)
Thicket Swamp (2)
Early Successional Mixed Swamp Forest (3)
Early Successional Deciduous Swamp Forest (4)
Late Successional Deciduous Swamp Forest (5)

UPLAND HABITATS

Late Successional Mixed Forest (6)
Late Successional Deciduous Forest (7)
Early Successional Deciduous Forest (8)
Early Successional Mixed Forest (9)
Early Successional Coniferous Forest (10)
Scrub and Thicket (S)
Bedrock Outcrop (R)
Meadow/Abandoned Cropland (M)
Developed/Severely Disturbed Land (D)

[1]A more detailed vegetation map, extrapolated from the aerial photographs onto much more detailed 1: 2,500 scale bases maps, has also been prepared. This requires several large sheets of paper to accommodate and is considered unnecessarily cumbersome for this document. Copies of the 1: 2,500 scale map have been deposited with Genstar Development Company and the City of Kanata.

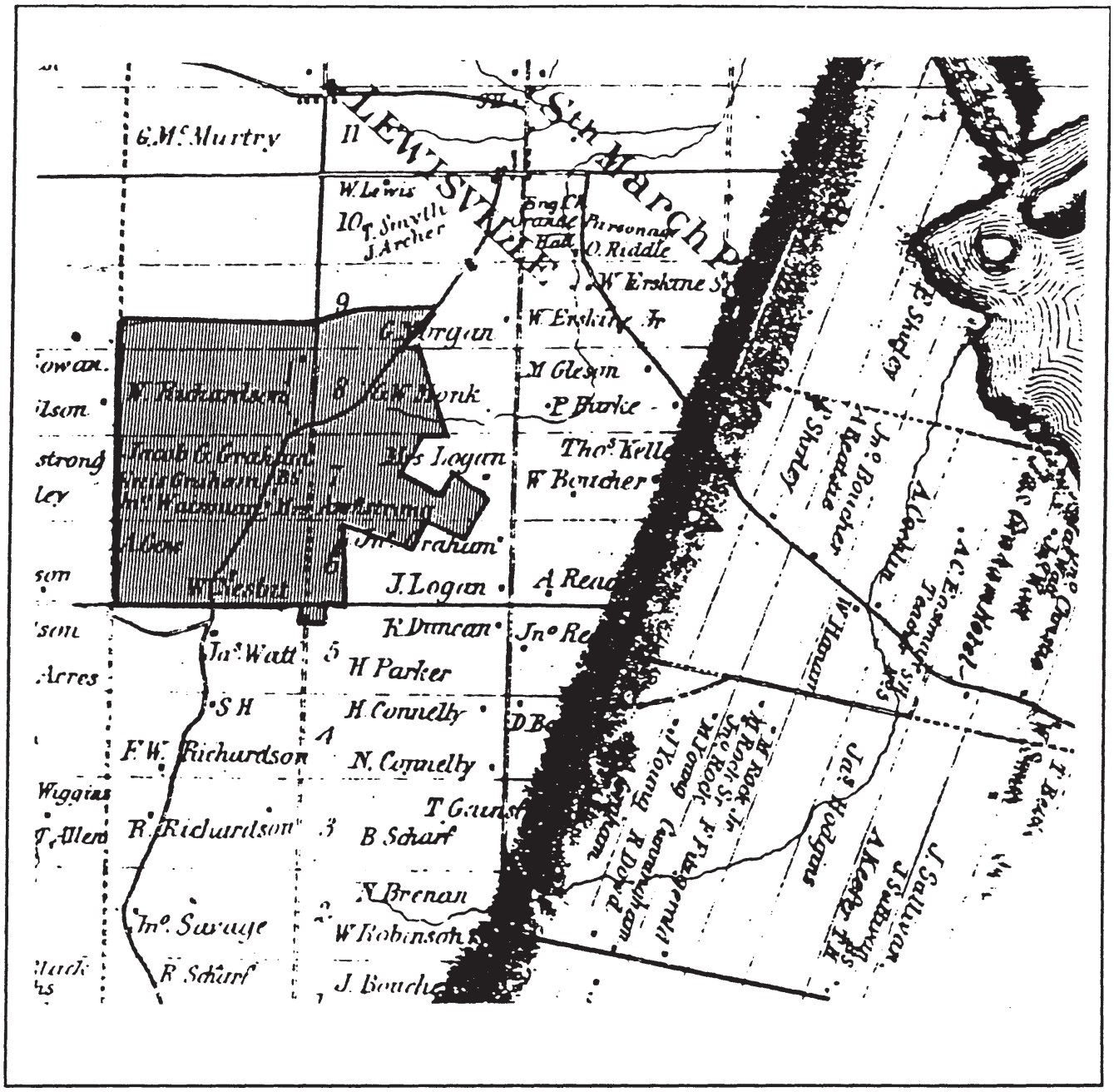

Figure 5: Settlement in the South March Highlands, 1863

The following discussions are provided in order to identify the biophysiological site variations and vegetation characteristics of each habitat type and to indicate the dominant vegetation associations, landscape appearance and ecological evolution of each. This will not only facilitate the identification of significant vegetation but will also assist in assessing the potential support for significant floral and faunal elements in the study area.

Each discussion begins with a brief description of the site, followed by vegetation characteristics, ecological trends and significant floral and faunal elements. The code letter(s) or number by which each habitat is identified on Figure 8 is noted following each discussion.

Figure 6: Rock-crush Bicycle Path through Trillium Woods

Figure 7: Bicycle Path Bridge over Trickling Falls, Shirleys Brook

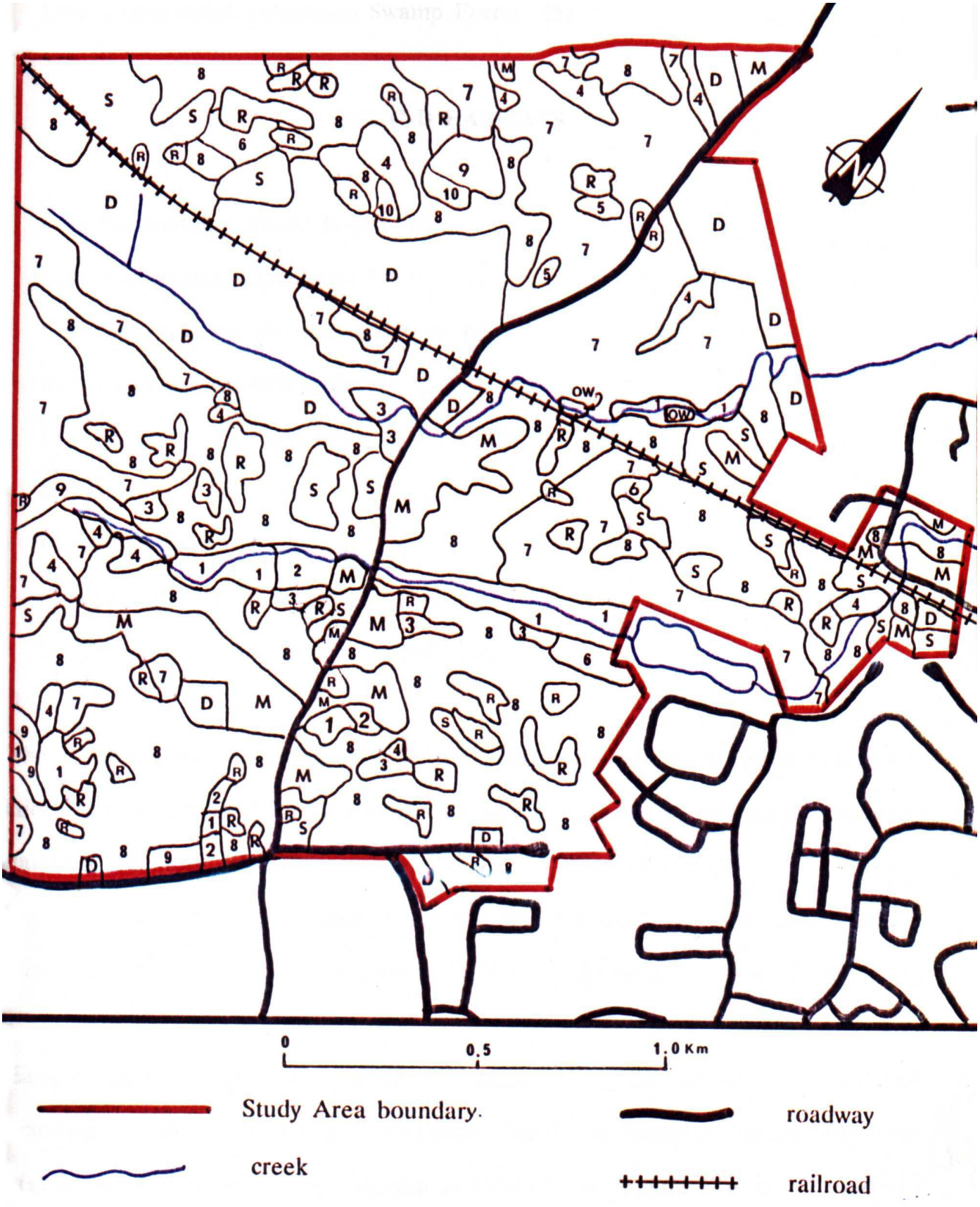

Figure 8: Habitats of the Kanata Lakes study area
(Scale 1: 15,000)

WETLAND HABITATS

Open Water Habitat (OW)

(Figure 9)

This is rare in the study area, occurring as small, shallow ponds along Shirleys Brook and Watts Creek, as well as small, transitory beaver ponds in the southwest towards the First Line. Most ponds originate from damming activity by beaver along these creeks and/or (as in the case with some ponds on Watts Creek), with road building.

The vegetation is characterized by a combination of true aquatic species (pondweeds, duckweed) and marsh plants (loosestrife, cattail, canary-grass, etc.) and is typically sparsely distributed on the surface.

Characteristic species include:

Lemna minor
Alisma triviale
Wolffia columbiana
Ceratophyllum demersum
Potamogeton pusillus
Cicuta bulbifera
Rumex orbiculatus
Wolffia borealis

Such sites succeed to marsh or thicket swamp, unless maintained by high water levels and/or recurring flooding episodes.

Although a reasonably common habitat in small sites throughout the study area, Open Water is rarely large enough to support large populations of significant flora or benefit significant wildlife species. The Regionally Significant (Sparse or Rare) Spiny Coontail (*Ceratophyllum echinatum*) and Green Bur-reed (*Sparganium chlorocarpum*) are found in this habitat. It is not considered to be an intrinsically significant habitat of the study area.

Marsh Vegetation (1)

(Figures 9 and 10)

Marsh areas are commonly scattered across the study area in low bedrock depressions and along flowing waterways. They are particularly extensively distributed along Watts Creek and Shirleys Brook (Figures 8, 10) and are a common element of overgrown beaver ponds. Substrates contain a high organic component and often constitute a substantial layer of silty ooze over shallow till or even bedrock.

A wide variety of wetland dominants characterize marsh sites in the study area, varying from virtually pure stands of Canary-grass (*Phalaris arundinacea*) to Canary-grass-Cat-tail (*Typha latifolia*) - Purple Loosestrife (*Lythrum salicaria*) vegetation. The infestation of wetlands in the study area by Purple Loosestrife is severe. Typical vegetation is characterized by graminoid and other monocot plant species. A wide variety of herbaceous plant species are found here, including:

Phalaris arundinacea
Leersia oryzoides
Aster lanceolatus
Lythrum salicaria
Eleocharis smallii
Cicuta bulbifera
Urtica dioica
Lycopus uniflorus
Eupatorium perforatum
Verbena hastata
Carex crinita
Triadenum virginicum
Galium palustris
Scutellaria galericulata
Cornus stolonifera
Thelypteris palustris

Advanced vegetation growth encourages the developments of thicket swamp and upland forest vegetation, unless disturbance (usually by flooding) retards that succession. This vegetation is common in the Regional Municipality of Ottawa-Carleton (Brunton 1984; 1992) and the small examples found in the study area are of low natural environment significance. It supports few significant natural environment components, although the Regionally Sparse plant species Green Bur-reed (*Sparganium chlorocarpum*) and Water-pepper (*Polygonum hydropiperoides*) are recorded from the habitat. The Regionally Significant Blanding's Turtle is also reported from this habitat along Watts Creek.

Thicket Swamp (2)
(Figures 11 and 12)
This vegetation is common, bordering marsh and swamp forest vegetation throughout the study area (Figure 8). It is dominated by native shrubs, particularly Slender Willow (*Salix petiolaris*) and Speckled Alder. Undergrowth is typically sparse, though a significant density of marsh flora develops within the shrub cover in some particularly wet sites.

Typical floristic elements include:

Alnus incana	*Cornus stolonifera*
Glyceria borealis	*Carex pseudo-cyperus*
Asclepias incarnata	*Eupatorium maculatum*
Eleocharis acicularis	*Cicuta bulbifera*
Scirpus cyperinus	Spiraea alba

As this vegetation ages and organic material accumulates, lowland tree species succeed the shrub component and transform the vegetation into a variety of expressions of swamp forest. Revegetation of beaver pond areas, however, is constantly providing new thicket swamp habitat.

This vegetation is common in the Regional Municipality of Ottawa-Carleton (Brunton 1984; 1992) and is of low natural environment significance in its own right in the study area. It supports no natural environment components of particular significance here.

Early Successional Mixed Swamp Forest (3) [cedar-hardwood swamp]
(Figure 13)
Young swamp forest dominated by a mixture of hardwood and coniferous forest cover is typical of this uncommon transitional habitat type in the Kanata Lakes Study Area. It typically occurs in shallow, organic-rich, acidic substrate deposits in small areas in bedrock depressions (Kanata Pond area), on lower seepage slopes (Watts Creek headwaters) and at the forested edges of thicket swamps (along Shirleys Brook).

Red Maple, White Birch, White Spruce, Green Ash and other early-successional tree species are secondary components of associations dominated by White Cedar and/or Black Ash. The undergrowth is typically a tangled, shrub-dominated vegetation with floristic components from upland and wetland sites.

Figure 9: Open Water (ow) and Marsh (1) Habitat along Shirleys Brook

Figure 10: Cat-tail - Loosestrife Marsh, Kanata Pond

The ground vegetation includes the following characteristic plant species:

Caltha palustris
Aster puniceus
Parthenocissus vitacea
Impatiens capensis
Glyceria striata
Bidens frondosa
Onoclea sensibilis
Lycopus americanus
Boehmeria cylindrica
Dryopteris carthusiana
Chelone glabra
Pilea pumila

Such sites frequently have evolved from thicket swamp vegetation and, in the absence of disturbance (cutting, windthrow, flooding) will be themselves succeeded by late successional forest cover.

This vegetation, being early successional and transitional between deciduous and coniferous forest vegetation, has a low level of intrinsic natural significance in the Regional Municipality of Ottawa-Carleton (Brunton 1984; 1992). No significant faunal species and only one Regionally Sparse plant, the sedge *Carex brunnescens*, were observed in this habitat.

Early Successional Deciduous Swamp Forest (4) [Black Ash swamp]
(Figure 14)
Young hardwood swamp forests formed by White Elm, Red Maple, Sugar Maple, Bur Oak and/or Green Ash in combination with a predominant cover of Black Ash are maintained in permanently wet areas in thin organic, primarily acidic deposits across the study area, particularly along Watts Creek and towards the north end of the site. Many tiny stands, too small to appear in Figure 8, occur throughout. Beaver cutting and flooding has affected these sites significantly. Some small areas of trees have been killed by flooding, creating a variably open canopy.

The undergrowth, reflecting its evolution, is a combination of marsh, swamp thicket and early successional forest taxa. Although non-native elements are few, they have had a significant impact in some areas along Watts Creek (especially the Purple Loosestrife and Canary-grass).

Typical floristic elements include:

Arisaema triphyllum
Carex utriculata
Glyceria striata
Carex crinita
Circaea lutetiana
Boehmeria cylindrica
Athyrium filix-femina
Onoclea sensibilis
Carex bromoides
Impatiens capensis
Carex intumescens
Viola cucullata

Given a considerable period of time without disturbance, this vegetation succeeds to late successional deciduous swamp forest. Disturbance can alter that to encourage a return to thicket swamp vegetation or mixed swamp vegetation.

This habitat is common in the Regional Municipality of Ottawa-Carleton (Brunton 1984). It is of low intrinsic natural environment significance in the study area, but it supports a number of significant floristic elements, including the Regionally (and Provincially ?) Rare hybrid fern *Dryopteris clintoniana x goldiana* and the Regionally Sparse Goldie's Fern (*Dryopteris goldiana*), Glade Fern (*Athyrium pycnocarpon*), Clinton's Fern (*D. clintoniana*), the sedges *Carex cephaloidea* and *C. brunnescens* and the Northern Sandwort (*Moehringia lateriflora*). No significant fauna were noted here.

Figure 11: Alder Thicket Swamp (2) along Richardson Side Road

Figure 12: Abandoned Lodge in Beaver Pond Overgrown by Thicket Swamp (2)

Figure 13: Red Maple-White Cedar Swamp Forest (3) by Marsh, Watts Creek

Figure 14: Black Ash Swamp Forest (4) by Campeau Drive

Late Successional Deciduous Swamp Forest (5) [maple swamp]
(Figures 15 and 16)
This Red and Silver Maple dominated vegetation is rare in the Kanata Lakes Study Area, occurring only in two substantial sites in the Trillium Woods (Figure 8). Small pockets, usually dominated by a few large maples each, occur elsewhere in small bedrock depressions and on lower seepage slopes. It dominates sandy-loam substrate in bedrock depressions within rich, mature hardwood forest and is typically flooded through all or most of the growing season. (Both sites were dry through most of the unusually dry summer of 1991). Undergrowth is sparse beneath the dense shade of older forest, becoming more diverse at the margins of the sites.

Typical ground flora includes:

Impatiens capensis
Lycopus uniflorus
Betula allegheniensis (seedlings)
Carex cristatella
Carex tuckermanii
Dryopteris carthusiana
Onoclea sensibilis
Fraxinus nigra (seedlings)
Carex lupulina
Laportea canadensis

The vegetation in this habitat is self-maintaining, excepting major physical disturbance (windthrow, human impact). Reduction of the ground vegetation diversity will continue with increased maturity.

This is a significant vegetation in the context of the Regional Municipality of Ottawa-Carleton (Brunton 1984) and contributes towards representation of a Provincially Significant landform/vegetation in the South March Highlands complex (Brunton 1992). Nowhere else in southeastern Ontario (*viz*, Site District 6-12) are there substantial examples of this vegetation. The small size of these stands, however, would reduce their significance were they not part of a large significance unit (see Habitats 6 and 7, below).

The Regionally Sparse Goldie's Fern (*Dryopteris goldiana*) and Clinton's Fern (*D. clintoniana*) are found here as well as in Habitat 4 (above). This vegetation (with mature Sugar Maple forest - see Habitat 7, below) has long provided breeding sites for the Regionally Uncommon Pileated Woodpecker.

UPLAND HABITATS

Late Successional Mixed Forest (6) [Sugar Maple-Eastern Hemlock forest]
Submature to mature Sugar Maple forest with a substantial Eastern Hemlock component in wet-mesic loam, with scattered early successional species like American Basswood and Black Ash, occurs rarely. It is found in a small stand northwest of Kanata Pond and uncommonly elsewhere within mature Sugar Maple forest in scattered sites too small to map on Figure 8 (e.g. along Shirleys Brook by Trickling Falls).

Undergrowth is sparse, as a result of the heavy shade, consisting primarily of Sugar Maple seedlings and a scattering of mature hardwood forest herbaceous species.

This is a significant vegetation in the context of the Regional Municipality of Ottawa-Carleton (Brunton 1984) and contributes towards representation of a Provincially Significant landform/vegetation in the South March Highlands complex (Brunton 1992). The small size of the stands, however, dictates that such significance is only creditable when considered within the surrounding mature hardwood forest (Habitat 7, below). The Regionally Significant Gray's Sedge (*Carex grayii*) was recorded in this habitat. No significant fauna were noted here.

Late Successional Deciduous Forest (7) [Sugar maple forest]
(Figure 17 and 18)
Mature and submature forests dominated by Sugar Maple, with American Beech and or Yellow Birch in deeper loam soil and Ironwood and Black Cherry on drier, rocky ground, are common here, particularly north of the CNR tracks. Other species such as White Ash, Black Maple, Red Oak, Eastern Hemlock and Basswood form locally important associations, depending on particular site conditions. Ground vegetation diversity varies from sparse (consisting mostly of Sugar Maple seedlings) to a relatively dense mixture of herbaceous and shrubby plant growth. Typical ground species include:

Allium tricoccum
Carex communis
Erythronium americanum
Dirca palustris
Hepatica acutiloba
Dryopteris intermedia
Lycopodium dendroideum
Oryzopsis racemosa
Trillium grandiflorum
Dicentra canadensis
Caulophyllum giganteum
Acer saccharum (seedlings)
Carex arctata
Geranium robertianum

None of the mature Sugar Maple stands (or any vegetation in the Kanata Lakes Study Area) are ecologically pristine, but this vegetation is the least disturbed of the entire South March Highlands (cf. Brunton 1992). Older portions like the Trillium Woods and areas north of Kanata Pond were either missed by the fires of 1870 or lightly impacted (see Historical Impact and Development, page 15).

This vegetation has been identified as regionally significant in previous studies in the Regional Municipality of Ottawa-Carleton (Brunton 1980 and 1984) and Provincially Significant in the context of this landform/vegetation complex (Brunton 1992). It contains a large number of significant natural environment values as well, including the following Regionally Significant (Sparse or Rare) plant species:

Lycopodium obscurum (s. st.)
Asplenium trichomanes
Dryopteris goldiana
Carex hitchcockiana
Luzula acuminata
Goodyera pubescens
Dentaria laciniata
Parthenocissus quinquefolia
Verbena urticifolia
Solidago flexicaulis
Galium aparine
Carex sparganioides
Galearis spectabilis
Claytonia virginica
Amelanchier arborea (s. st.)
Viola rostrata

This vegetation (with mature maple swamp forest - see 5, above) has long provided breeding sites for the Regionally Uncommon Pileated Woodpecker and probably also for the similarly uncommon Barred Owl.

Figure 15: Silver Maple Swamp Forest (5) in Trillium Woods

Figure 16: Dried-up Swale in Silver Maple Swamp Forest (5) in Trillium Woods

Early Successional Deciduous Forest (8) [young hardwoods]
(Figure 19)
This is the most common vegetation type in the Kanata Lakes Study Area, reflecting the long history of disturbance of much of the area as a result of fires (especially those of 1870), logging, agricultural development and other human activity. It occupies a wide variety of dry to mesic upland sites in rocky outcrops to loam-filled depressions. Red Maple, White Ash, Green Ash, Basswood, Ironwood, Sugar Maple, Bitternut Hickory, White Elm, Bur Oak, Trembling Aspen and White Birch combine in various associations to form the dominants. Lower vegetation is diverse and reflects the diverse but always light-rich ground conditions and includes the following amongst characteristic species:

Toxicodendron rydbergii	*Aster macrophyllus*
Maianthemum canadense	*Viola conspersa*
Lonicera canadensis	*Rubus strigosus*
Pteridium aquilinum	*Lycopodium digitatum*
Poa pratensis	*Ribes cynosbati*
Waldsteinia fragarioides	*Carex gracillima*
Aster ciliolatus	Solidago juncea

Late successional deciduous and mixed forest naturally succeed this vegetation, although that succession is retarded in the thin, dry, rocky landscape of the Kanata Lakes Study Area where the intensity of the fires of 1870 is still felt.

This is a common, insignificant vegetation in the Regional Municipality of Ottawa-Carleton in its own right (Brunton 1984) but in the study area it contributes to a Provincially Significant landform/vegetation complex (*viz*, within Site District 6-12) (Brunton 1992). It supports a variety of Regionally Significant (Sparse or Rare) flora, including Wood-rush (*Luzula acuminata*), Climbing Poison-ivy (*Toxicodendron radicans*), Narrow Vervain (*Verbena stricta*), White Vervain (*Verbena urticifolia*), Horse-gentian (*Triosteum perfoliatum*) and Ox-eye (*Heliopsis helianthoides*). In addition, the Provincially Significant (as breeding species) Cooper's Hawk and Saw-whet Owl have been recorded as breeding here (near Watts Creek [2]).

Early Successional Mixed Forest (9) [young mixed forest]
(Figure 20)
This vegetation is transitional between two early successional forest habitats, the common deciduous forest (Habitat 8, above) and the uncommon coniferous forest (Habitat 10, below). It occupies a variety of dry situations, from rocky ridges to south-facing slopes, where White Pine, Trembling Aspen, White Spruce, White Ash, Basswood, White Cedar, Ironwood, Red Oak and Red Maple associate. It is common west of Snake Road and south of Kanata Pond, though frequently in sites too small to form significant habitat units (Figure 8).

Typical ground vegetation includes:

Maianthemum canadense	*Aralia nudicaulis*
Amelanchier arborea var. laevis	*Cornus canadensis*
Dryopteris marginalis	*Oryzopsis asperifolia*
Pteridium aquilinum	*Juniperus communis*
Lycopodium digitatum	*Carex gracillima*
Poa compressa	*Viburnum acerifolium*

[2]Watts Creek near the Goulbourn Forced Road is locally referred to as 'Kizell's (or Kizel's) Creek (or Pond). As this name is not an officially accepted one and is geographically confusing it is avoided in favour of Watt's Creek for the purposes of this study.

Figure 17: Mature Sugar Maple Forest (7), South Side of Trillium Woods

Figure 18: Younger Sugar Maple Forest (7), North of Watts Creek

This habitat will ultimately succeed into late successional deciduous or mixed forest, though like other early successional upland vegetation, that succession is retarded in the thin, dry, rocky landscape of the Kanata Lakes Study Area where the intensity of the fires of 1870 is still felt.

This vegetation is not considered to have a high degree of intrinsic natural significance in the Regional Municipality of Ottawa-Carleton (cf. Brunton 1984) but it contributes representation to a Provincially Significant landform/vegetation complex (*viz*, within Site District 6-12) as a significant element in the South March Highlands (Brunton 1992). The Regionally Sparse Twinflower (*Linnaea borealis*) is recorded from this habitat.

Early Successional Coniferous Forest (10) [White Pine forest]
(Figure 21)
Dry, warmer-than-normal, rocky sites along ridge tops and south-facing slopes frequently support substantial populations of White Pine in the Kanata Lakes Study Area, occasionally in proportions large enough to constitute the dominant vegetation.

These are frequently in small, narrow sites but in the area west of Snake Road (Figure 40) constitute distinctive units. The pine domination is shared with a variety of canopy species from early successional mixed and deciduous forest (Habitats 8 and 9, above), including Trembling Aspen, White Ash, Basswood, Ironwood and Red Oak. Undergrowth is sparse to moderately dense and typically includes species such as the following:

Pteridium aquilinum
Gaultheria procumbens
Danthonia spicata
Maianthemum canadense
Amelanchier arborea var. laevis
Cypripedium acaule
Aralia nudicaulis
Aster macrophyllus
Diervilla lonicera
Juniperus communis

This habitat will ultimately succeed into late successional deciduous or mixed forest. Like other early successional upland vegetation, however, that succession is retarded in the thin, dry, rocky landscape here (due to the lingering effect of the fires of 1870) and by the long-lived nature of pine forest.

Extensive examples of this vegetation are no longer common in the Regional Municipality of Ottawa-Carleton and are thus of representational significance. The examples in the Kanata Lakes Study Area are small and isolated, however, and offer significance only as part of the Provincially Significant landform/vegetation complex (*viz*, within Site District 6-12) in the South March Highlands (Brunton 1992). No species of significant flora or fauna have been recorded from this habitat.

Scrub and Thicket (S)
(Figure 22 and 23)
This upland habitat results almost totally from human disturbance. It occurs on a variety of sites on the drier portions of the study area. It represents pasture land and cleared forest areas which are reverting to a forested condition. Accordingly, such areas contain saplings and scattered younger individuals of a wide variety of deciduous tree species as well as remnants of the field vegetation which formerly dominated. Trees such as Corky Elm, White Ash, White Cedar, White Birch, Bur Oak and White Spruce occur, usually as scattered individuals or in small clumps. Several species of hawthorn shrubs are common, mixed with the tree saplings, raspberry and a wide variety of herbaceous flora, including:

Inula helenium
Aster lanceolatus
Phleum pratense
Hypericum perforatum

Figure 19: Early Successional Hardwood Habitat (8) North of Trillium Woods

Figure 20: Rocky Early Successional Mixed Maple-Pine Forest (9) near First Line

Asclepias syriaca	*Geum aleppicum*
Vitis riparia	*Rubus strigosus*
Solidago canadensis	*Juniperus communis*
Amelanchier arborea var. laevis	Agrostis gigantea

Early successional forest succeeds this habitat in due course, the variety determined by site and seed source conditions.

This vegetation is well distributed in the Regional Municipality of Ottawa-Carleton and, being significantly affected by human interference, is of low natural environment significance here. No significant flora were recorded here. The Provincially Rare (as a natural breeding species) Eastern Bluebird has been recorded nesting in this habitat.

Rock Outcrop (R)

(Figures 23 and 24)

The bare tops of bedrock ridges and outcrops are common throughout the Precambrian-based portions of the study area, particularly in areas exposed to disturbance by the fires of 1870, logging, agricultural practices and/or other human activity. These sites are very dry and warm and consist of a mixture of bare rock, thin moss mats and very shallow soil. Such sites are usually enclosed with Scrub and Thicket (Habitat S, above) and associated with a variety of early successional forest vegetation. A herbaceous cover of native and introduced grasses and herbs of sunny, dry sites characterize the site, with isolated clumps of dry shrubbery and/or tree saplings. Typical flora includes:

Poa pratensis	*Agrostis gigantea*
Danthonia spicata	*Hieracium spp.*
Pteridium aquilinum	*Verbascum thapsus*
Hypericum perforatum	*Solidago nemoralis*
Phleum pratense	*Sedum acre*
Portulaca oleracea	*Rumex acetosella*
Fragaria virginiana	*Juniperus communis*
Corydalis sempervirens	*Panicum philadelphicum*

Regeneration of such site is very slow, due to the virtual absence of soil in much of the habitat and the extreme susceptibility of the vegetation to drought. Many trees and shrubs were killed by the hot, dry summer of 1991 (Figure 25).

This vegetation is rare in the Regional Municipality of Ottawa-Carleton (cf. Brunton 1984) and southeastern Ontario (*viz*, Site District 6-12). It supports a number of Regionally Significant (Sparse or Rare) flora, including Rusty Woodsia (*Woodsia ilvensis*)[3], Maidenhair Spleenwort (*Asplenium trichomanes*) and Philadelphia Witch-grass (*Panicum philadelphicum*).

This habitat forms a significant element in the Provincially Significant landform/vegetation complex of the South March Highlands, Ontario (Brunton 1992).

[3] The only Regional Municipality of Ottawa-Carleton record of the provincially restricted and uncommon Oregon Woodsia (*Woodsia oregana*) is based on a small population which occupied an outcrop area just east of the Kanata Lakes Study Area (south of Kanata Pond) at the present intersection of Slade Road and Walden Drive. The site was destroyed by road construction although the plants were removed beforehand and are presently being maintained by the author.

Figure 21: Early Successional Conifer (White Pine) Forest (10) West of Snake Road

Figure 22: Upland Scrub (S) and Meadow (M) Habitat South of Trillium Woods

Meadow/Abandoned Cropland (M)

(Figures 22 and 26)

Human activity, primarily agriculture, accounts for virtually all of this habitat. Old pasture and long-abandoned croplands on thin to moderately deep soil sites are typical.

It is a widespread habitat in association with former human activity south of the railway line in the Kanata Lakes Study Area (Figure 8).

Non-native vegetation predominates, with only scattered native shrub tree growth. Typical species include:

Agrostis gigantea	*Phleum pratense*
Bromus inermis	*Rubus strigosus*
Sisyrinchium montanum	*Vicia cracca*
Chrysanthemum leucanthemum	*Cirsium arvense*
Carex pallescens	*Potentilla recta*
Oenothera parviflora	*Oxalis stricta*
Crataegus spp.	*Linaria vulgaris*
Hypericum perforatum	Galium mollugo

Scrub and Thicket and various early successional forest habitats will succeed this vegetation in reasonably quick order unless physical disturbance (land clearing, fire) interrupts the succession. The human-derived, artificial forms of this habitat are widespread in the Regional Municipality of Ottawa-Carleton (cf. Brunton 1984) and are of limited natural environment significance in their own right. The Regionally Significant (Sparse) Northern Bedstraw (*Galium boreale*) occurs in this vegetation in the Kanata Lakes Study Area. No significant faunal species are recorded from it, although many common animals, including Coyote, Eastern Garter Snake, White-tailed Deer, Tree Swallow, Song Sparrow and (non-breeding) Eastern Bluebird utilize the habitat for feeding and/or resting.

Developed/Severely Disturbed Land (D)

(Figures 27 and 28)

Site conditions have little to do with the development of this form of vegetation cover. It reflects the human history of the site. Accordingly, it is found in various site conditions, although areas with the highest potential for development (deeper soils, level topography, close to existing facilities and road, etc.) tend to experience a greater degree of human impact.

This vegetation is dominated by non-native vascular plants, reflecting the artificial nature of the situation. It includes scattered remnants of the forest cover and former agricultural vegetation.

There are no components of particular natural significance in this vegetation type.

4) Flora

The flora of the Kanata Lakes Study Area is diverse, with almost 500 species recorded (Appendix 1). It is dominated by species typical of and common in the Regional Municipality of Ottawa-Carleton and southeastern Ontario (cf. Gillett & White 1978). Some exceptional habitat representation, however, has encouraged the presence of unusual species with particular affinities to areas geographically distant from study area. Other affinities reflect prehistoric events and conditions. Many reflect the activities of man.

Northern Influence

Figure 23: Open Rock Outcrop (R) with Scrub (S) Habitat at Margins, by Kanata Pond

Figure 24: Sloping Rock Barren (R) South of Watts Creek

The rugged, Canadian Shield-like landscape of the entire Carp Ridge exhibits northern vegetational, floristic and faunal affinities (Brunton 1992). This is less clearly illustrated in the Kanata Lakes Study Area at the southern end of the Ridge, but a number of elements are expressed.

The presence of flora more typical of northern areas is also encouraged by the extent of acidic substrate in the Kanata Lakes Study Area, particularly in wetland sites; acidic substrates are uncommon to rare in the Regional Municipality of Ottawa-Carleton. Over half of the northern elements are wetland species.

These northern taxa are:

Dryopteris cristata
Woodsia ilvensis
Agrostis scabra
Spirodella polyrhiza
Chenopodium capitatum
Geranium bicknellii
Viburnum opulus
Potamogeton pusillus
Linnaea borealis
Carex brunnescens
Rumex orbiculatus
Moehringia lateriflora
Galium boreale

Many of these species are more common in the Gatineau Hills of western Quebec (Gillett & White 1978) and on the Canadian Shield of the upper Ottawa Valley (Moore 1978; Brunton 1988).

Southern Affinity

Many of the southern floristic elements here are uncommon or rare, as is the case in similar vegetation in the nearby Shirleys Bay (Brunton 1980). Most are upland species and reflect a preference for calcareous or circumneutral substrates, often associated with rich hardwood forests.

The southern affinity is the strongest element in the flora, perhaps indicating the degree to which the area has been recolonized since deglaciation. The active nature of revegetation is indicated by the presence of such species as Blue Phlox (*Phlox divaricata*) and Southern Spring Beauty (*Claytonia virginica*) which are at the northern limits of their range and are perhaps recent arrivals here.

The Kanata Lakes Study Area was at or very near the shore of the proto-Ottawa River during the warmer hypsithermal period (ca. 7,000 to 4,000 years B.P.), encouraging the development of southern taxa which were advancing northward along rivershores at that time. The continued presence in the Kanata Lakes Study Area of several southern species which are now virtually unknown away from major river corridors may provide important biogeographic evidence of the evolution of the flora here. Those relict species are Virginia Cut-grass (*Leersia virginica*), Woodbine (*Parthenocissus quinquefolia*), Gray's Sedge (*Carex grayii*), Climbing Poison-ivy (*Toxicodendron radicans*) and Canadian Tick-trefoil (*Desmodium canadense*).

Curiously, a northern species with a similar river-focused local distribution, Northern Stitchwort (*Moehringia lateriflora*), also occurs in the study area and may be associated with the same phenomena.

A representation of the almost 50 species with strong southern affinities includes:

Parthenocissus quinquefolia
Geum canadense
Athyrium pycnocarpon
Goodyera pubescens
Wolffia columbiana
Elymus hystrix
Carpinus caroliniana
Carex hitchcockiana
Dentaria laciniata
Carex cephaloidea

Figure 25: Wilted and Bare Sumac in Droughted Bedrock Outcrop, Kanata Pond

Figure 26: Open, dry Meadow Habitat (M) near First Road Allowance

Panicum philadelphicum	*Carex sparganoides*
Ulmus rubra	*Acer nigrum*
Hydrophyllum virginianum	*Viola rostrata*
Solidago flexicaulis	*Amelanchier arborea (s. st.)*

Widespread Significant Taxa

In addition to this geographic affinity there are a group of plants which are relatively widespread in distribution but which appear to show a strong preference/requirement for older, rich hardwood forests. In the Kanata Lakes Study Area these include Silvery Spleenwort (*Athyrium thelypteroides*), Christmas Fern (*Polysticum acrosticoides*), Wild Leek (*Allium tricoccum*), Canada Yew (*Taxus canadensis*) and Forest-grass (*Poa saltuensis*). These all occur in the Trillium Woods and likely also reflect the rich and diverse geological situation in that portion of the study area.

Introduced Flora

The impact of agricultural activity has been particularly important is reducing the extent of natural landscape in the Kanata Lakes Study Area since the mid 1800s. Only in the least disturbed portion of the site are predominantly natural complexes of significant flora remaining.

Upland areas of southern Ontario typically have non-native taxa representing 20 to 27% of their total flora (Brunton and Di Labio 1989). The 108 non-native taxa in the study area (all noted in Appendix 1) constitute 22% of the total flora. This somewhat low figure, with the consideration that the vast majority of such species are found along the Goulbourn Forced Road and the CNR track, indicates that the flora of the Kanata Lakes Study Area is in uncommonly natural condition for such a large site in a southern Ontario urban area.

Significant floristic species are discussed in Chapter 3: Significant Features (below).

5) Fauna

The fauna of the site reflects a similar pattern to that of the flora, *viz*, a set of common, widely distributed species with a minor northern influence and with a significant southern affinity. Relatively few rare species are known from the area, again reflecting its representative nature.

The fauna of the Kanata Lakes Study Area shares much in common with that of South March Highlands Study Area (Brunton 1992b) and with the entire Carp Ridge (Brunton 1992). Most bird species represent seasonal residents and migrants; approximately 70 species have been known to breed in the study area.

Mammals and amphibian and reptile populations are similarly made up of common species, without elements of a significance level greater than of local importance.

Significant fauna are discussed in Chapter 3: Significant Features (below) and are listed in Appendix 2.

Figure 27: Cattle Pasture on West Side of Goulbourn Forced Road

Figure 28: Active Road Construction East of Goulbourn Forced Road

CHAPTER 3: SIGNIFICANT FEATURES ASSESSMENT

The character of the natural environment of the study area and the life science features observed in it have been described in the previous chapter, Resource Assessment (page 9). The significance of these features and particular life science characteristics of the study area will be discussed and evaluated here in order to put the natural environment values of the study area into a larger context.

1) Significant Vegetation

Although significant floral and faunal values are found throughout the Kanata Lakes Study Area, relatively few habitats supporting intrinsically significant vegetation are present. Relatively insignificant vegetation can (and does) provide habitat for significant flora and fauna, however, and is considered in the designation of candidate NEAs.

Four habitats in the Kanata Lakes Study Area contain significant vegetation, as follows:

Late Successional Deciduous Swamp Forest (Habitat 5)

This vegetation in the study area is Regionally Significant [4]. It is found in several areas in the western portion of the Regional Municipality of Ottawa-Carleton, most notably Shirleys Bay, Nepean/Kanata (Brunton 1980) and the Stony Swamp Conservation Area, Nepean (Brunton 1982). The examples in the study area are too small to warrant a high level of attention on their own merits, but as part of a larger complex of significant vegetation, they are of value for representational purposes and as habitat for significant flora and fauna.

Late Successional Mixed Forest (Habitat 6)

and

Late Successional Deciduous Forest (Habitat 7)

These two constitute the least disturbed forest vegetation in the Kanata Lakes Study Area and are closely connected ecologically and geographically. The vast majority of the significant flora and several of the significant fauna of the study area occur here.

Substantial examples of this vegetation are considered significant in the Regional Municipality of Ottawa-Carleton (Brunton 1984) due to the rarity of natural representation of mature hardwood forest. The Kanata Lakes Study Area representative also constitute the largest areas of mature, relatively natural maple-dominated forest on the Carp Ridge. By virtue of the absence of other comparable areas in southeastern Ontario, such vegetation is considered to constitute a vital part of a Provincially Significant landform/vegetation complex (Brunton 1992).

Bedrock Outcrop (R)

In the Regional Municipality of Ottawa-Carleton this habitat is confined to the Carp Ridge and thus is rare. In the Kanata Lakes Study Area much of the habitat has been affected by past agricultural activity, especially near former crop lands. As this is well represented in the adjacent South March Highlands Study Area (Brunton 1992b) and elsewhere on the Carp Ridge (Brunton 1992), it would be considered no more than Regionally Significant here. The Rock Outcrop habitat in the study area, however, does contribute representation to the Provincially Significant landform/vegetation complex which encloses a large portion of southern end of the Carp Ridge (Brunton 1992).

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[4] 'Regionally Significant' indicates an important example (by virtue of its rarity and/or undisturbed natural state) of a landform-vegetation complex, and/or complex of rare and unusual floral and faunal species, within the context of the Regional Municipality of Ottawa-Carleton. It achieves that by constituting a superior example of a particular landform-vegetation complex, even if that complex is not, of itself, dramatic or the habitat for rare species. If this significance status is maintained beyond the limits of the Regional Municipality of Ottawa-Carleton, it would likely qualify for Provincially Significant status.

2) Significant Flora

This section provides a more detailed discussion of the particularly significant plant species that are known from the study area. A listing of all species observed is contained in Appendix 1.

The levels of floristic significance are as follows:

PROVINCIAL - a native vascular species listed in Argus *et al*. (1982 - 1987) and/or Argus and Pryer (1990) as rare in Ontario and/or Canada.

REGIONAL - a native vascular plant species considered to be rare, or previously unknown, or ecologically critical within the Regional Municipality of Ottawa-Carleton and/or Site District 6-12.

LOCAL - a native or non-native vascular plant considered rare in this area of the Regional Municipality of Ottawa-Carleton.

The status of individual species in the Regional Municipality of Ottawa-Carleton is determined by reference to regional literature and by examination of specimen collections at the National Museum of Nature (CAN), the Biosystematics Research Centre of Agriculture Canada (DFB), the Royal Ontario Museum (TRT), the personal collection of the author (DFB) and by personal observation.

Provincially/Nationally Significant

No species found in the study area are Provincially or Nationally Significant. Several taxa were found to be significant at a lesser level, as determined by reference to the Ottawa District checklist (Gillett & White 1978), as up-dated by subsequent literature (Darbyshire 1982; Brunton 1985).

Regionally Significant

Initiating the discussion of each Regionally Significant taxon is an indication of its local status (in brackets). A brief statement of its affinity and typical habitat are then followed by a summary of its distribution and status in the Ottawa District/Regional Municipality of Ottawa-Carleton. An explanation of other range or significance characteristics completes the treatment.

These taxa (in checklist order) are:

Lycopodium obscurum L. var. obscurum (Ground-cedar)

(Sparse) - southern and eastern fern uncommon in Ontario; at the northern limit of its range.

- known from scattered wet-mesic, usually sandy mature maple-hemlock or Red Maple swamp forest across the Region.

Ophioglossum vulgatum L. (Adder's-tongue Fern)

(Sparse) - widespread but never common in eastern Canada.

- locally abundant but scattered in wet, calcareous sandy sites across the Region (Cody 1978).

Asplenium trichomanes L. ssp. trichomanes (Maidenhair-spleenwort Fern)

(Rare) - transcontinental species of wet calcareous rock.

- the diploid subspecies known in the Region only from the Trillium Woods where it is abundant on a particular rock ledge (tetraploid subspecies *quadrivalens Mey.* is found scattered across the Region on limestone and marble ledges). This may be a distinct, unrecognized species (Cody & Britton 1989).

Athyrium pycnocarpum (Spreng.)Tidestr. (Glade Fern)

(Sparse) - southern species of rich, mature Sugar Maple forest; formerly considered rare in Canada.

- found in scattered wet swales in rich hardwood sites across RMOC, usually in small populations and likely declining due to habitat destruction; a colony of 5 or 6 plants was found in the Trillium Woods in the early 1970s (discovered by C. & E. Frankton) but has declined to a single, depauperate frond.
- at the northern limit of its North American range.

Dryopteris clintoniana (Eat.)Dow. (Clinton's Wood Fern)

(Sparse) - southern fern of low, calcareous woods.

- found regularly across the Region in low calcareous woods, especially over clay substrate and probably Uncommon at most.

Dryopteris clintoniana (Eat.)Dow. x goldiana (Hook.)Gray (hybrid Wood Fern)

(Unreported) - uncommon hybrid wood fern of wet, calcareous sites in rich hardwoods in southern Ontario (Britton 1965).

- a single plant near Trickling Falls in the Trillium Woods; known elsewhere in the Region only from Beechwood Cemetery, Ottawa (pers. obs.).

Dryopteris goldiana (Hook.)Gray (Goldie's Fern) (Figure 29)

(Rare) - southern species of rich, wet-mesic, somewhat calcareous Sugar Maple forest; formerly considered rare in Canada (Argus & Pryer 1990; Cody & Britton 1989).

- known here since the early 1970s (discovered by C. & E. Frankton); four stands known, one large (" 20 clumps) and one small (" 5 clumps) near Trickling Falls, another (" 12 clumps) near Snake Road and a small stand (1 clump) at north end, all in Trillium Woods; latter stand destroyed by trail construction; known elsewhere in the Region only from Beechwood Cemetery, Ottawa and the Antrim-Pakenham area; more common in the Gatineau Hills (Cody 1978).
- at northern limit of North American range here (Cody & Britton 1989).

Woodsia ilvensis (L.)R. Br. (Rusty Woodsia) (Figure 30)

(Rare) - a common transcontinental, Boreal fern (Cody & Britton 1989).

- known in the Region from elsewhere in the Carp Ridge, *viz*, outcrops (now destroyed) in the Kanata Lakes subdivision and in the South March Highlands Study Area.

Sparganium chlorocarpum Rydb. (Green Bur-reed)

(Sparse) - uncommon eastern Canadian Boreal species.

- known elsewhere in the Region from Shirleys Bay, Stony Swamp, Carleton Place and Mer Bleue (Brunton 1986).

Leersia virginica Willd. (Virginia Cut-grass)

(Rare away from rivers) - southern riparian grass locally distributed along major river corridors in southern Ontario (Dore and McNeill 1980).

- unknown in other inland sites in the Region except Stony Swamp, Nepean (C. Frankton, pers. comm.); likely a relict population from proto-Ottawa River shore thickets established during hypsithermal conditions (see Geomorphology, page 12).

Panicum philadelphicum Bernh. (Philadelphia Witch-grass) (Figure 31)

(Sparse) - a locally abundant southern species of rocky calcareous sites; formerly considered rare in Ontario (Dore & McNeill 1980; Argus & Pryer 1990).

- abundant on open outcrop areas over marble and diorite (calcareous) bedrock; otherwise found across the Region (perhaps commonly) on limestone plains.

- approaching the northern limit of its North American range.

Carex brunnescens (Pers.)Poir. (Brown Sedge)

(Sparse) - common transcontinental Boreal species of boggy woods.

- known in the Region from the margins of bogs; particularly abundant at Mer Bleue bog, Gloucester (Brunton 1986).

Carex cephaloidea (Dew.)Dew. (Oval Sedge)

(Sparse) - southern species of wet, usually clay-based, calcareous woodland swales.

- sparingly distributed across the Region in clay-based, hardwood ravines; at the northern limit of its Ontario range.

Carex grayii Carey (Gray's Sedge)

(Sparse) - uncommon southern species largely confined in southern Ontario to shores of major rivers (Reznicek & Ball 1974).

- one small (5+ plants) clump by Trickling Falls, Shirleys Brook (destroyed by trail construction); believed to be a hypsithermal relict, as with *Leersia virginica*, above; otherwise known in the Region only from the shores of the Ottawa, Rideau and Mississippi Rivers.

- at the northern limit of its North American range.

Carex hirtifolia Mack. (Hairy Sedge)

(Sparse) - southern species of wet or dry, usually clay-based, calcareous woodlands.

- sparingly distributed across the Region in clay-based, hardwood ravines; at the northern limit of its Ontario range.

Carex hitchcockiana Dew. (Hitchcock's Sedge)

(Rare) - southern sedge of dry, calcareous ground in rich hardwoods.

- in the Region found sparingly in rich hardwoods throughout (perhaps Sparse to Uncommon).

- at the northern limit of its range.

Carex sparganioides Willd. (Bur-reed Sedge)

(Rare) - southern species of rich, dry-mesic hardwood forests on circumneutral to calcareous substrate.

- otherwise known in the Region only from elsewhere on the Carp Ridge.

- at the northern limit of its range.

Luzula acuminata Raf. (Wood-rush)

(Sparse) - common southern rush of rich calcareous to circumneutral soil in hardwood forests.

- otherwise known in the Region (and Ottawa District) from elsewhere in the Carp Ridge.

Galearis spectabilis (L.)Raf. (Showy Orchis)

(Sparse) - common southern orchid of rich, mesic, calcareous substrates in mature hardwoods (Luer 1975).

- known from rich hardwoods sites across the Region.

Goodyera pubescens (Willd.)R. Br. (Downy Rattlesnake-plantain) (Figure 32)

(Rare) - a rare and local southern orchid in dry, rocky hardwoods in southern Ontario on circumneutral substrate (Whiting and Catling 1986).

- otherwise known in the Region only from the north end of the Carp Ridge.

Polygonum hydropiperoides Michx. (Water-pepper)

(Sparse) - southern wetland species of rich, often clayey substrates.

- known in the Region form a number of sites in western RMOC, including Stony Swamp, Nepean (Brunton 1982).

Rumex triangulivalvis (Dans.)Rech.f. (Western Dock)

(Sparse) - common prairie species of wet sites which is uncommon on sandy rivershores in Ontario (as a native) and uncommon along saline-rich roadways (introduced).

- likely introduced; uncommon but increasingly common introduction along roadsides and disturbed sites throughout the Region.

Claytonia virginica L. (Virginia Spring Creeper)

(Rare) - abundant southern spring wildflower of low, wet open hardwoods in clay soil.

- extirpated in the Trillium Woods (?); otherwise from a site near North Gower and an old (extirpated) population at Ottawa (Partridge 1987).

- at the northern limit of its range here.

Moehringia lateriflora (L.)Fenzl (Northern Stitchwort)

(Sparse) - northern species of wet, sandy shore swamps.

- otherwise known only from a scattering of sites along the Ottawa River and one other inland site in Stony Swamp, Nepean (Brunton 1982); likely a post-glacial relict of proto-Ottawa River shores (see Geomorphology, page 12).
- approaching the southern limit of its range.

Ceratophyllum echinatum Gray (Spiny Coontail) (Figure 33)

(Previously Unreported) - a widespread southern aquatic of shallow, still, circumneutral pond water over granitic bedrock which is uncommon in Ontario.

- otherwise known in the Region only from old ditches through peat at the Leitrim Wetland, Gloucester (A. Dugal, pers. comm.).

Dentaria laciniata Muhl. (Cut-leaved Toothwort)

(Sparse) - a common species of rich, calcareous southern hardwood forests.

- known elsewhere in the Region from Beechwood Cemetery, Ottawa; Stony Swamp, Nepean and Antrim, West Carleton (Brunton 1982).

Amelanchier arborea (Michx. f.)Fern. var. arborea (Canada Serviceberry)

(Sparse ?) - southern shrub of rich hardwood forest edges in Ontario (McKay 1973).

- status in RMOC unclear but probable scattered in southern hardwood sites (cf. McKay 1973).
- at the northern limit of its range.

Euphorbia glyptosperma Engelm. (Spurge)

(Sparse) - widespread species of open prairie and sandy, disturbed ground across Canada (Mulligan and Lindsay 1978).

- increasingly weedy (probably only Uncommon) across RMOC (Brunton 1986).

Euphorbia maculata L. (Spurge)

(Sparse) - uncommon species of open weedy sites across southern Ontario (Mulligan and Lindsay 1978).

- increasingly weedy in recent years (now probably Common) across RMOC (pers. obs.).

Toxicodendron radicans (L.)Kuntze (Climbing Poison-ivy)

(Sparse) - a southern vine of low, calcareous woodlands (Mulligan & Junkins 1977).

- found sparingly in rich southern sites along river shores and rarely inland; perhaps a hypsithermal relict of the proto-Ottawa River shoreline (see Geomorphology, page 14) ?

Parthenocissus quinquefolius (Woodbine)

(Sparse) - southern vine of scattered warmer-than-normal sites in Ontario (often combined with the widespread *P. vitacea*).

- usually found along major river systems in the Ottawa area and fewer than ten sites known (Brunton 1985); a hypsithermal relict of the proto-Ottawa River shoreline (see Geomorphology, page 14) ?

Figure 29: Goldie's Fern (*Dryopteris goldiana*) in the Trillium Woods

Figure 30: Rusty Woodsia (*Woodsia ilvensis*) on Outcrop near First Line Allowance

Viola rostrata Pursh (Long-spurred Violet)

(Rare) - common species of mature southern hardwoods.

- known elsewhere in the Region only at Stony Swamp, Nepean (Brunton 1982).

- at the northern limit of its range.

Verbena stricta Vent. (Hoary Vervain)

(Rare) - uncommon southern species of open, calcareous woodlands.

- known elsewhere in the Region only from the northern Carp Ridge.

- at the northern limit of its range.

Verbena urticifolia L. (White Vervain)

(Sparse) - southern species of open calcareous woodland edges.

- otherwise known in the RMOC from a scattering of sites in the western portion of the Region.

Galium aparine L. (Cleavers)

(Sparse) - common species of rich southern calcareous hardwood forest.

- known from scattered hardwood sites across the entire RMOC.

Galium boreale L. (Northern Bedstraw)

(Sparse) - common transcontinental Boreal species; weedy in southern Ontario.

- perhaps introduced (along the railway?) near the Trillium Woods; known from a number of (mostly old) records across the agricultural areas of the Region (Brunton 1982).

Linnaea borealis L. (Twinflower)

(Sparse) - common Boreal species of cool mixed and coniferous forest across Canada.

- found scattered throughout the RMOC, usually associated with major wetland complexes.

Triosteum perfoliatum L. (Horse-gentian)

(Sparse) - southern species of rich, rocky southern hardwood forest in calcareous ground.

- widely scattered across the Region in southern associations (Brunton 1982); at the northern limit of its range.

Heliopsis helianthoides (L.)Sw. (Ox-eye)

(Sparse) - southern sunflower of open, calcareous meadows; partially introduced ?

- found sparingly along dry shores of the Ottawa River and rarely inland (Queensway Terrace, Ottawa and Stony Swamp, Nepean) (Brunton 1982).

Locally Significant

A significant number of plant species in the study area are considered to be Uncommon native species or Rare or Sparse non-native species and are thus considered to be locally significant. All are indicated in Appendix 1. The Locally Significant **native** species are listed below:

Adiantum pedatum
Dryopteris cristata
Taxus canadensis
Agrostis scabra
Muhlenbergia glomerata
Poa saltuensis
Carex plantaginea
Spirodela polyrhiza
Wolffia columbiana
Cypripedium calceolus
Carpinus caroliniana
Boehmeria cylindrica
Polygonum sagittatum
Chenopodium capitatum
Crataegus punctata
Geum canadense
Oxalis stricta
Epilobium leptophyllum
Cryptotaenia canadensis
Phlox divaricata
Solanum ptycanthum
Veronica scutellata
Symphoricarpos albus
Erechtites hieracifolia
Solidago flexicaulis
Athyrium thelypteroides
Polystichum acrostichoides
Potamogeton pusillus
Elymus hystrix
Oryzopsis racemosa
Carex albursina
Scirpus pendulus
Wolffia borealis
Lilium philadephicum
Malaxis monophyllos
Ulmus rubra
Polygonum convolvulus
Rumex orbiculatus
Penthorum sedoides
Fragaria vesca
Geranium bicknellii
Acer nigrum
Panax trifolius
Gentiana andrewsii
Hackelia virginiana
Penstemon hirsutus
Lonicera dioica
Viburnum opulus var. americanus
Solidago hispida

3) Significant Fauna

The mammals, birds, amphibians and reptiles observed in the study area are listed in Appendix 2. The degree of significance of each of these faunal groups varies considerably and each will be assessed independently.

a) BIRDS

A number of the birds observed here are considered to be significant by various measures. For the purpose of this study, individuals which were observed moving through the site but having little or no interaction with it will not be considered evidence for significance. They will be listed but not discussed.

Provincially Significant

Figure 31: Dense Philadelphia Panic-grass (*Panicum philadelphicum*) Stand by Kanata Pond

Figure 32: Downy Rattlesnake-plantain Orchid (*Goodyera pubescens*) in Trillium Woods

Figure 33: Mass of Spiny Coontail (*Ceratophyllum echinatum*) Near First Line Allowance

[Arrow indicates mature seed; oval leaves of Duckweed (*Lemna minor*) in upper left are ca. 4 mm long]

This includes species listed by the Ontario Ministry of Natural Resources Eastern Region Office (T. Norris, in lit.) as being of provincial significance in this area due to their rarity and/or declining population in Ontario.

Cooper's Hawk

This raptor breeds across southern Ontario, primarily south of the Canadian Shield. Though rare in the province in the 19th century, its population increased significantly in the first half of the 20th century. Habitat destruction in recent decades appears to have initiated a slight population decline in the province (Wier 1987).

Adults feeding young were observed west of Goulbourn Forced Road just north of Watts Creek in June 1982; none were observed in 1991.

Northern Goshawk

Seen in migration only; not observed to use habitats in the study area.

Red-shouldered Hawk

Seen in migration only; not observed to use the resources of the study area, although the Trillium Woods appears to be suitable breeding habitat.

Northern Saw-whet Owl

This inconspicuous raptor is a year-round resident in the Ottawa District and has been found breeding in early successional deciduous and mixed forest across the Regional Municipality of Ottawa-Carleton; it is considered an uncommon breeding species across southern and

central Ontario (Mills 1987).

A nest with at least two young was found in June 1981 east of Goulbourn Forced Road south of Watts Creek, in an old flicker nest hole.

Eastern Bluebird

This small thrush has undergone drastic alterations in its population over the last century. Likely benefitting from pioneer farm clearing of forests, it was a common, even abundant species in the late 19th century. Severe winter and late fall weather and the competition from Starlings led to a serious decline in the middle of this century (Risley 1987). Severe population declines in the mid to late 1970s caused it to be declared Rare by the Ontario Ministry of Natural Resources. Bluebird nesting box projects have greatly increased its population in many areas in recent years - including the western Regional Municipality of Ottawa-Carleton - and it is now locally common.

One or two pairs have bred most years in the upland scrub vegetation (primarily in bluebird boxes along Goulbourn Forced Road) south of Watts Creek.

Regionally Significant

This category includes species identified as rare or restricted in the Regional Municipality of Ottawa-Carleton (as described with each). The Ontario Ministry of Natural Resources maintains a partial list of Regionally Significant bird species based on their Wetlands Classification needs, but as it is incomplete and somewhat specialized, it will not be followed here.

Only one Regionally Significant species has been recorded here:

Red-headed Woodpecker

This species was the common woodpecker species of farm land in the Ottawa area in the mid 19th century (Billings 1856) but declined dramatically with the massive land clearing, invasion of Starlings and pesticide spraying of the 20th century (Woodliffe 1987). It is now uncommon to rare in the Regional Municipality of Ottawa-Carleton (Anonymous 1979).

Red-headed Woodpeckers nested at the edge of young upland deciduous forest near the Goulbourn Forced Road railway crossing in 1984; they have not been seen here subsequently.

Locally Significant

This category includes those listed as uncommon breeding species or resident in the Regional Municipality of Ottawa-Carleton portion of the Ottawa District (i.e. " ... found with difficulty/great difficulty ..." (OFNC 1985)). They include:

Barred Owl - uncommon to rare breeding species in the Region; nested near Shirleys Brook in June 1983 and likely breeds regularly in the Trillium Woods.

Pileated Woodpecker - uncommon across the Region; formerly very rare and feared to be on the verge of extinction (Billings 1856); it has slowly recovered much of its numbers; the Trillium Woods have long been considered a particularly reliable breeding site for one to two pairs each year.

Common Raven - uncommon but increasingly more abundant scavenger which breeds inscattered locations across the Gatineau Hills of western Quebec and (very rarely) in the eastern portion of the Regional Municipality of Ottawa-Carleton; suspected of breeding in the Constance Lake area of Kanata - West Carleton (Di Labio and Martin 1989). Individuals or small groups are regularly observed cruising over the hardwoods of Kanata Lakes study area or flying from there northward to the Gatineaus (pers. obs.). This species may breed in the adjacent South March Highlands study area (Brunton 1992b).

b) MAMMALS

No provincially or regionally rare mammal species have been recorded in the Kanata Lakes Study Area (see Appendix 2).

The White-tailed Deer is often considered a significant species because of its attraction as a game species. Wintering areas (deer yards) are particularly highly regarded by Ontario Ministry of Natural Resources wildlife managers.

White-tailed Deer have benefited, since 1982, from a series of relatively easy winters in the Regional Municipality of Ottawa-Carleton (*viz*, thin snow pack and relatively infrequent bouts of severe weather). This has resulted in a steady increase of the resident deer population in the entire South March Highlands (H. McLeod, MNR, pers. comm.).White-tailed Deer and their tracks were commonly observed throughout the study area during 1991. The western portion of the site, west of Goulbourn Forced Road, supports suitable deer wintering habitat and is associated with the more extensive deer yard habitat of the adjacent South March Highlands Study Area (Brunton 1992b).

Tracks believed to be those of a Black Bear were observed in August 1991 in the Trillium Woods (A. Cameron, pers. comm.). This is a fairly common resident species of parts of Gatineau Park in west Quebec which infrequently strays southward and crosses the Ottawa River. Although bears are occasionally reported along the Ottawa River in late fall, inland sightings, especially in mid-summer, are exceptionally rare.

Beaver are common throughout the Kanata Lakes study area and have had significant impacts on the area by clearing of creekside forest over (Figures 34 and 35) and damming creeks. Many of these dammed water bodies have been depleted of food resources for the beaver and have been abandoned, resulting in their eventual drainage (Figure 12). This clearly has locally significant impacts on the landscape but is not significant in terms of rarity of important representational ability.

c) AMPHIBIANS and REPTILES

The list of Provincially and Regionally Significant species is derived from the eastern Ontario list prepared by the Eastern Regional office of the Ontario Ministry of Natural Resources (T. Norris, in lit.).

No Provincially Significant species have been recorded.

One Regionally Significant species (*viz*, Uncommon or Rare in the Cornwall - Ottawa-Carleton portion of the Eastern Region) occurs:

Blanding's Turtle

This reptile is a southern species of flooded deciduous swamps and log-choked pools across southern Ontario and is uncommon in the province (McCracken 1988). All Regional Municipality of Ottawa-Carleton records are from Ottawa, Nepean and Kanata (Cook 1981).

It was reported from Watts Creek west of Goulbourn Forced Road in the early 1970s but has not been observed in the study area since. A 1991 observation in the adjacent South March Highlands study area, however, offers some hope that a small population may still persist in the Kanata Lakes Study Area (Brunton 1992b).

4) Significant Areas

An analysis of the vegetation, flora and fauna determined to be of significance indicates that certain portions of the study area best represent these values. These are illustrated on Figure 37. Four major areas of significance are delineated, as well as several smaller sites. The four areas of particular significance (in declining order of natural environment importance) are:

1) **Trillium Woods**: (Figures 6, 9, 15, 17, 18, 22, 29, 30, 31, 32, 34 and 36) The most extensive area of mature hardwood forest on the Carp Ridge, containing a large proportion of the significant flora of the study area, including rare southern taxa, post-glacial relict species and unusual hybrids. The superior vegetation representation here is supported upon a Regionally unique substrate. The site is Provincially Significant in its own right.

2) **West Block**: (Figure 18 and 38) The rugged, outcrop-dominated highland includes a diversity of upland and wetland vegetation over a Regionally unique bedrock complex. The area includes the tallest hardwood forest in the study area, a variety of Regionally Significant flora and breeding habitat for Provincially Rare birds.

3) **Kanata Pond Ridge**: (Figures 23, 25, 30, 31 and 39) The bedrock outcrop - hardwood forest complex here includes a rich and varied flora, unusually numerous Black Cherry trees and southern elements such as Black Maple and Bitternut Hickory groves. The landform/ vegetation complex represented here is rare in the Regional Municipality of Ottawa-Carleton.

4) **Snake Road Outcrop**: (Figure 40) The extent of bedrock outcrop habitat in the Kanata Lakes Study Area is highest here, with associated young pine, hardwood and mixed forest commonly associated. Some confined areas of late successional forest occur as well, as does habitat for some Regionally Significant bird species.

The other less significant sites (not in order of significance) are:

5 - an isolated hardwood bush along the south side of the railway west of Goulbourn Forced Road; it supports a small mature Sugar Maple and early successional hardwood forest.

6 - young forest and outcrop east of Goulbourn Forced Road south of Watts Creek; it supports a landscape of rugged outcrop clearings with early successional deciduous and mixed forest and some large White Spruce and Black Cherry trees, including an individual Black Cherry tree with a diameter of ca. 90 cm (Figure 41).

7 - late successional hardwood and outcrop area with rich spring and outcrop flora west of Goulbourn Forced Road and south of Watts Creek.

8 - abandoned beaver pond and thicket swamp complex with rare aquatic flora and adjacent rich outcrop vegetation north of Richardson Side Road east of the First Line.

9 - late successional hardwood forest with scattered large White Pine and Regionally Rare southern flora at west end of Campeau Drive reconnaissance site.

CHAPTER 4: DEVELOPMENT AND MANAGEMENT

The previous chapters have addressed the description and analysis of natural features in the Kanata Lakes Study Area. The following will consider the management and development implications of those analyses.

1) Environmental Impacts

The Kanata Lakes Study Area has been significantly affected by past human activity - logging, agricultural, residential development, road construction - but presently is subjected to a relatively low level of impact. Away from Goulbourn Forced Road and the CNR track this is largely restricted to dispersed recreation (hiking, cross-country skiing, natural history investigation and photography).

Most of the area has been zoned for various forms of urban development (Haigis, McNabb & Deleuw 1991). Residential development has begun in the southeast and south. As can be seen from Figure 36, some significant natural values are being affected, as well as potentially significant historical features (e.g. the Feldspar mine).

The other significant natural areas within the study area are relatively unaffected by on-going activity, although most would be almost totally eliminated under existing development schemes.

A recreational pathway/bicycle trail constructed through the eastern portion of the Trillium Woods area in 1991 has had immediate negative impacts (vegetation and significant plant species destruction, alteration of forest floor drainage patterns, introduction of non-native flora, etc.) and threatens long-term degradation of the site (Figures 6, 7 and 29). It is a non-conforming short and long-term use in terms of appropriate Natural Environment Area activities and facilities (see Municipal Bylaw, page 91).

Ski trails (also utilized as summer hiking trails) in the three major significant area also have some immediate negative impact, but to a significantly lesser degree due to their low development standard and less intensive use. Such impact becomes academic, however, in those areas which are utilized for residential or commercial developments.

2) Mitigation

The impact of urban development on the important natural environment values in the Kanata Lakes Study Area would be very severe if conducted without mitigation. It is anticipated, however, that with appropriate mitigation measures, the scheduled level of development can be undertaken while maintaining and protecting the most important natural environment values of the study area. This mitigation involves rezoning of some lands and realignment of proposed roads.

a) Zoning

The existing EPA (Environmental Protection Area) zoning excludes many of the important natural values of the Kanata Lakes Study Area and most of the boundaries of these zones are impractical from an ecological management or protection perspective (Figure 42). The OS (Open Space) zones, providing sites for recreational facilities and the like, offer little environmental protection but could assist in this regard at some sites.

The analysis of the natural environment values of the Kanata Lakes Study Area indicates that representation of the majority of significant features and complexes can be contained within two large Natural Environment Areas (NEAs) while occupying the same (or slightly less) total area as the existing EPA zones. Conversely, since adequate protection of the complexes identified in areas of particular significance (see Significant Areas sites 1 to 4, above) *can only be effectively protected by extensive and continuous reserve areas,* two large, self-sustaining Natural Environment Areas are proposed (below).

Smaller, isolated and disconnected reserves such as those which would result during subdivision planning, would be ecologically compromised and unlikely to survive over the long term.

The proposed NEAs also accommodate buffer areas around critical core natural complexes to the greatest degree possible. They offer more ecologically practical boundaries which reflect vegetation and topographic variation rather than lot line boundaries. The proposed NEA (EPA zone) lands are identified in Figure 43 (below). They are as follows:

Trillium Woods - incorporating most of the existing northern EPA plus the Kanata Pond Ridge significant area identified in this study;

West Block - includes the West Block Significant Area identified in this study.

The other significant areas identified in this study (Figure 42) are largely represented by habitats found within the two proposed areas (e.g. values of area 4 represented in West Block and Trillium Woods, area 7 in West Block, areas 6 and 8 in Trillium Woods and area 9 in West Block). Specific features in some of these isolated sites, however, could be further protected by realignment of OS zoning (e.g. expansion of the OS zone by significant area 5 to accommodate the hardwoods) and site plan design. The small wetland in significant area 8, for example, could be rezoned OS. This would maintain the natural drainage pattern and with it the rare flora (as is likely required, in any event, under Official Plan conditions applying to Sensitive Lands (Haigis, McNabb & Deleuw 1991)). Similarly, the huge cherry and spruce trees of significant area 6 (Figure 42) can be protected by adapting site plans to ensure that the low density residential development there avoids the small area occupied by these trees.

The wetlands constituting the upper portion of Watts Creek (Kanata Pond and "Kizell's Pond" - Figures 38 and 44) formerly have been proposed for conservation status. Such proposals, however, may reflect a widespread but ecologically questionable view that areas with standing water have enhanced conservation significance over that of terrestrial sites. The reality of these Watts Creek sites is that their wetland habitats are well represented elsewhere in the Kanata Lakes study area and the site district (Brunton 1992) and by examples much less disturbed than those found here. The relatively low (regional) wetland classification rating for these sites will also be further reduced by these disturbances. Accordingly, the Watts Creek examples cannot be highly rated for consideration for candidate Natural Environment Area consideration.

It is important to appreciate that this study is not designed to satisfy all conflicting zoning or development option questions in and about the candidate NEAs and may even raise new ones in some cases.

b) Transportation Corridors

The Kanata Official Plan illustrates several proposed roadways which, in addition to existing transportation corridors, would have significant environmental impact on the proposed NEA areas (Haigis, McNabb & Deleuw 1991).

Proposed Routes

Two roads east of Goulbourn Forced Road and crossing the proposed Trillium Woods NEA, *viz*, the western extension of Walden Drive and the road from it northeastward passing the western edge of the hydro transmission station, would have serious impacts on these proposed conservation lands. These roadways (and the proposed Kizell Lake Collector west of Goulbourn Forced Road between Watts Creek and the railway) should be realigned to avoid the NEA areas.

Other proposed roadways do not directly affect the proposed NEAs. A possible proposed extension of Terry Fox Drive would form the western and northern boundary of the proposed Trillium Woods NEA.

Figure 34: Hardwood Forest Along Shirleys Brook Cleared by Beaver

Figure 35: Depleted and Abandoned Beaver Pond, First Line Allowance

While the presence of a major arterial road would potentially generate environmental impacts (road salt pollution, litter, physical impacts, etc.), the roadway could also serve as a useful buffer between surrounding residential/commercial developments and the conservation area.

Existing Routes

Goulbourn Forced Road

The road bisects the existing and proposed EPA/NEA. It is to be closed upon completion of the road network servicing the residential and commercial development in the area. That closure will be of considerable ecological benefit to the proposed Trillium Woods NEA as increasing traffic is already contributing to increasing litter, pollution and vegetation destruction in the conservation area. Until the road is closed, road maintenance programs should be designed to minimize impact on the vegetation by such measures as prohibiting pesticide and other toxic spraying, ditch-digging, vegetation clearing or thinning or other harmful activities.

The rehabilitation of the roadway through the proposed Trillium Woods NEA should be designed within an overall vegetation conservation management plan. This possibly could accommodate a major bicycle path connecting the Morgan's Grant and Kanata Lakes Communities.

Canadian National Railway line

The CNR line crossing the northern portion of the study area also bisects the proposed Trillium Woods NEA. It is scheduled for removal within two years or so, to be replaced by some other form of transportation. The installation of a recreational pathway, such as a pedestrian/bicycle pathway to connect to a future Morgan's Grant-Kanata Lakes bicycle path along the present alignment of Goulbourn Forced Road, would be an environmentally desirable option. It would also provide access to possible Trillium Woods interpretive trail entrances.

Failing a recreational utilization of the CNR corridor lands, mitigation of pollution into Shirleys Brook (road salt, sprays, etc.)and physical impacts on the water course and adjacent uplands (including noise, barriers to wildlife movements, etc.) will need to be factored into development plans.

3) Site Development

Development in NEA zones should be directed and controlled by approved conservation management plans (see NEA Official Plan and By-law Considerations, below). This would ensure continued protection for the ecological integrity of the sites while accommodating conforming recreational uses such as low impact hiking and ski trails.

Site development beyond the NEAs (subdivision design and development) is guided by the various zoning designations available within the Kanata Official Plan (cf. Schedule 2). Additional consideration of the sensitivity of NEA zoning can be effectively achieved at no development cost by the placement of the least ecologically impacting land use of the development unit adjacent to the NEA boundary whenever possible.

Creative subdivision design and development can also provide small sites where locally significant values (see significant sites 5 to 9, Significant Areas page 78) can be protected. This could include sites for the introduction of remnant populations of the Oregon Woodsia (*Woodsia oregana*). This rare fern, the only Ottawa Valley population in Ontario (Cody 1978), was removed from an outcrop area just east of the Kanata Lakes study area and placed into cultivation just prior to destruction of that site by residential development in 1989.

Figure 36: Large Black Maple Along Shirleys Brook, Trillium Woods

Figure 37: Areas of Natural Significance in the Kanata Lakes Study Area

Figure 38: Aerial View of West Block (Southwest from over Goulbourn Forced Road and North of Watts Creek) [Dotted line indicates approximate extent]

Figure 39: Hardwood Forest on Kanata Pond Ridge (across Kanata Pond)

Figure 40: Aerial View of Snake Road Outcrop (westward from over Goulbourn Forced Road)
[Dotted line indicates approximate extent]

Figure 41: Exceptionally Large Black Cherry Tree South of Kanata Pond (centre)

4) NEA Official Plan and By-law Considerations

The direction and regulation of conservation lands within areas involving a variety of land uses is complex and constitutes a new initiative for most municipal structures. The Ontario Ministry of Natural Resources has developed a very useful policy document which can be beneficially applied to the NEA needs of Kanata (OMNR 1978) to assist in developing these direction and regulatory statements. That set of provincial nature reserve standards will be drawn upon in the following discussion.

Official Plan

At present, Natural Environment Area zoning is applied to specific lands in the urban area of the city in the Kanata Official Plan (Haigis, McNabb & Deleuw 1991); rural area conservation lands would be variously considered under Conservation or Marginal Resource (Restricted) zoning.

To effectively manage NEA lands in Kanata a hierarchy of objectives needs to be recognized in the Official Plan that establishes the primacy of natural environment protection.

NEA lands in Kanata should be dedicated first and foremost to protecting significant and representative earth and natural environment and earth science resources and features. Recognition of the role of people at such sites should clearly limit involvement to non-destructive passive recreation, environmental education and research.

If these areas are to maintain the natural values for which they were appreciated and designated in the first place, it must be understood that NEAs are not parks or recreational facilities. They are important natural ecosystems in which recreational activities must be cautiously and sensitively initiated - if at all. From a pragmatic perspective, however, some forms of appropriate heritage appreciation oriented activities in and about these sites are necessary in order the develop the appropriately proprietary sense of worth by the NEA's stakeholders - the citizens of Kanata. Appropriate management means a balancing of these two, with emphasis on protecting the ecological integrity of the site(s) remaining dominant.

An official plan amendment incorporating the objectives described above and providing consistent planning direction to NEA lands, be they in rural or urban portions of the city, is required.

Municipal By-law

There is a need for a municipal by-law which clearly directs the management of NEA areas and which is based on the objectives identified in the preceding discussion of Official Plan implications. It should require the following:

- that a management plan be drawn up for all Kanata NEA areas, designed to identify the core natural area as well as a protective buffer and which will be structured in accordance with the standard established by the Province of Ontario for the planning and management of nature reserves (OMNR 1978).

- that no facilities, including buildings, roads, surfaced trails and bridges, etc. (*non-conforming developments*) be built or placed within NEAs without the prior acceptance by Council of an ecologically appropriate NEA management plan.

- that the preparation of NEA management plan be undertaken with the direction of a technical steering committee including ecological specialists from the Regional Municipality of Ottawa-Carleton, Ontario Ministry of Natural Resources, Mississippi Conservation Authority (as appropriate) and with representatives of the city and the appropriate community association(s).

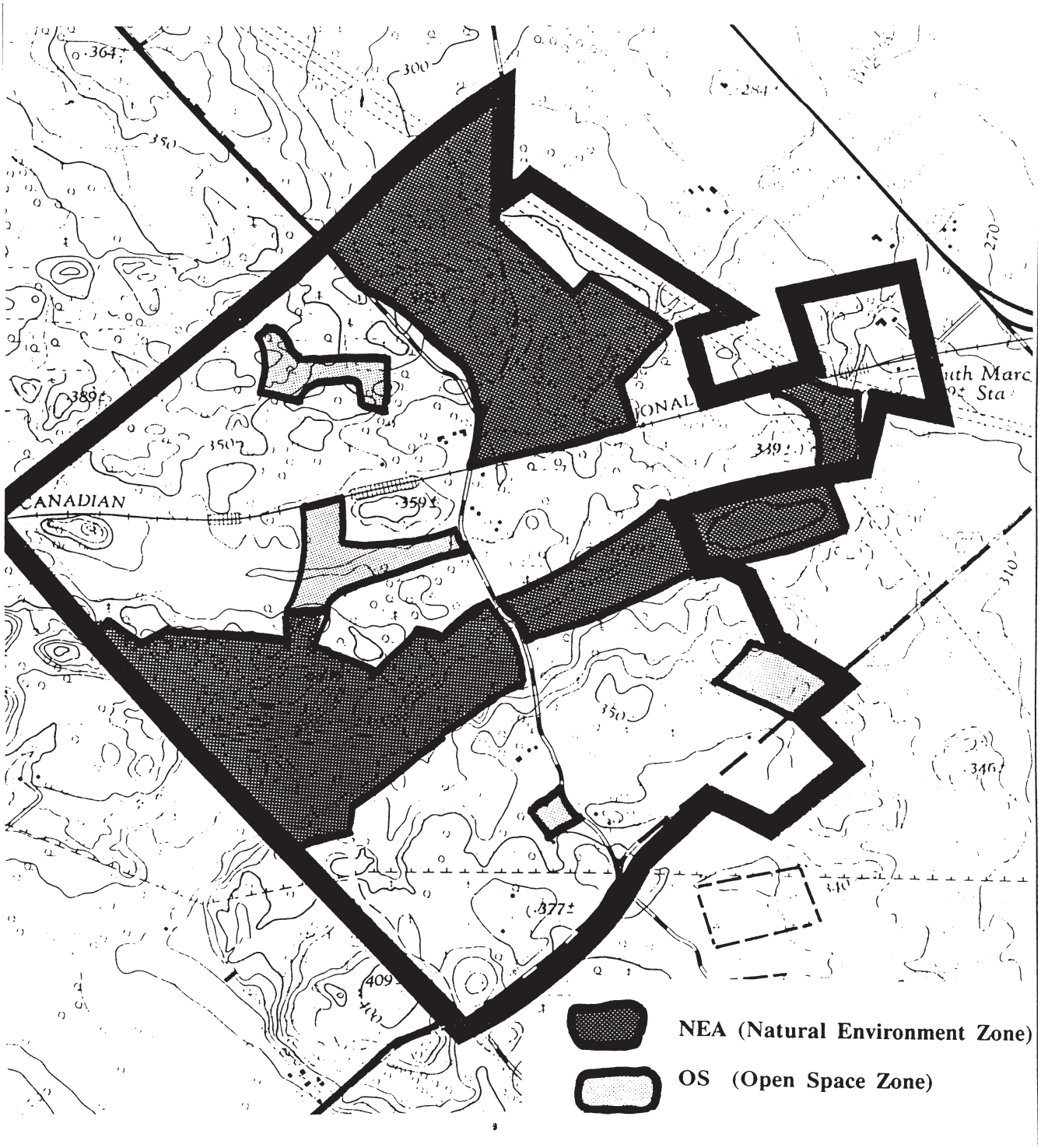

Figure 42: Existing NEA and OS (Open Space) Zones in the Kanata Lakes Study Area

Such a plan would be based on the understanding that the limited recreational/interpretive development permitted within an NEA would be at the margin of the site, that some core areas would have no development and that interpretation/environmental education would be the primary purpose of whatever facility development would be deemed appropriate and ecologically sustainable.

5) Recommendations

The recommendations of this natural environment inventory and analysis of the Kanata Lakes Study Area are as follows:

1) that the Kanata Official Plan be amended and a municipal by-law developed to consolidate, clarify and expedite sound ecological planning and management direction for Natural Environment Areas, as proposed in this study;

2) that the zoning changes proposed herein (page 85) to refine and enhance the Natural Environment Area zone locations and boundaries be accepted;

3) that the lands contained within these revised boundaries be eventually deeded to the city of Kanata by the landowner(s) exclusively for the establishment and maintenance of Natural Environment Area areas;

4) that ecological management plans, as described above (page 92), be prepared for each Natural Environment Area for the approval of Council and that no development or landscape manipulation occur within Natural Environment Areas beyond the constraints of an approved management plan.

5) that realignments of Goulbourn Forced Road and Terry Fox Drive roadways (see Transportation Corridors, page 87) be undertaken during subdivision development to avoid ecological damage to established Natural Environment Areas;

6) that creative subdivision development attempt to provide small areas of reserved lands which accommodate the protection needs of locally significant natural environment values (see Site Development, page 90);

7) that non-conforming activities and developments (see Environmental Impacts, page 82; Municipal By-law, page 92) in the candidate Natural Environment Areas be removed and their impacts mitigated;

8) that consideration be given to the addition to the Trillium Woods Natural Environment Area of the forested land between Snake Road and the hydroline corridor north of the existing Kanata Lakes Study Area boundary.

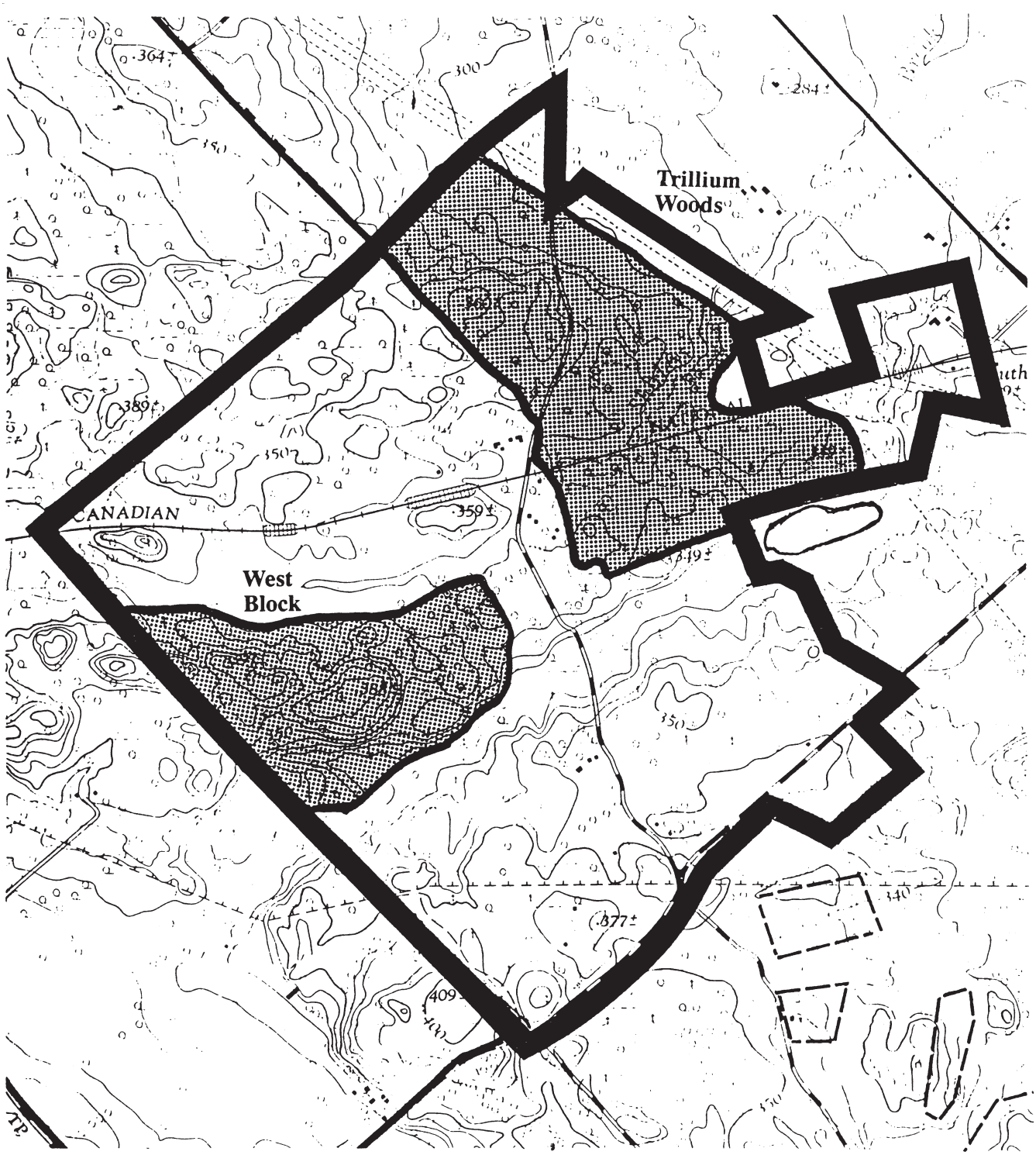

Figure 43: Proposed NEA Zones in the Kanata Lakes Study Area

Figure 44: Artificial Shorelines at North End of Kanata Pond

APPENDIX 1: Vascular Flora of Kanata Lakes Study Area

The following lists the 486 vascular plants taxa known from in the study area, based largely on 1991 field studies and archival research. Nomenclature typically follows Morton & Venns' (1990) Ontario checklist while family order is that of Gillett & White's (1978) Ottawa checklist. Departures from the Ontario list occur occasionally, whereupon the name used in that authority is cited in synonymy (in brackets).

Voucher collections were obtained for a number of significant species and these are indicated by the notation of the D. F. Brunton collection number in brackets following the listings for each, with a brief discussion of status, habitat and site(s). The first set of these vouchers in deposited in the Royal Ontario Museum herbarium (TRT), Toronto, with replicates in the author's private herbarium (DFB) in many cases. In the absence of such a voucher, other collections or sight records may be credited. Collection numbers for common species are also noted, but are listed (in brackets) without discussion.

Significant Flora section are noted **in bold type**. Names followed by a double asterisk (**) are those of non-native taxa.

The acronyms used in the second column for significant species indicate the recorded status in the Regional Municipality of Ottawa-Carleton, as inferred from Gillett and White (1978), as up-dated by subsequent reviews (Darbyshire 1979; Brunton 1985). The acronyms are:

R = Rare in the Regional Municipality of Ottawa-Carleton

SP = Sparse in the Regional Municipality of Ottawa-Carleton

UN = Uncommon in the Regional Municipality of Ottawa-Carleton

The status, location and habitat of uncommon or rare Introduced (non-native) taxa are also listed but since these are of limited or no natural significance, they are **not** highlighted in bold type.

LYCOPODIACEAE		
Huperzia lucidulum (Michx.)Trev.		
(= Lycopodium lucidulum Michx.)		(10980)
Lycopodium clavatum L.		
Lycopodium dendroideum Michx.		
Lycopodium digitatum A. Br.		
Lycopodium obscurum L. (s. st.)	SP	Rare in dry-mesic maple-hemlock forest at W end of Shirleys Brook (10975)
EQUISETACEAE		
Equisetum arvense L.		
Equisetum hyemale L.		
Equisetum sylvaticum L.		
OPHIOGLOSSACEAE		
Botrychium virginianum (L.)Sw.		
Ophioglossum vulgatum L.		
(= O. vulgatum, auct.)	SP	Rare in low, grassy area along Snake Road (Frankton 2343, 15 July 1971)

OSMUNDACEAE

Osmunda cinnamomea L.

ADIANTACEAE

Adiantum pedatum L.	UN	Common in mesic loam in mature Sugar Maple forest in Trillium Woods (DAO).

POLYPODIACEAE

Polypodium virginianum L.

DENNSTAEDTIACEAE

Pteridium aquilinum (L.)Kuhn

THELYPTERIDACEAE

Phegopteris connectilis (Michx.)Watt
Thelypteris palustris (Salisb.)Schott

ASPLENIACEAE

Asplenium trichomanes L. ssp. trichomanes	R	Uncommon on shaded rock outcrop in mature Sugar Maple forest in Trillium Woods (11021).
Athyrium felix-femina (L.)Roth		
Athyrium pycnocarpum (Spreng.)Tidestr.	SP	Rare (declining population) in wet to wet-mesic seepage area in mature Sugar Maple forest in Trillium Woods (0653).
Athyrium thelypteroides (Michx.)Desvr.	UN	Rare in mesic loam in Sugar Maple forest in Trillium Woods (C. & E. Frankton 2517 - DAO).
Cystopteris bulbifera (L.)Bernh.		
Cystopteris fragilis (L.)Bernh.		
Cystopteris tenuis (Michx.)Desv.		
(= C. fragilis var. mackayi Lawson)		(10925)
Dryopteris carthusiana (Vill.)Fuchs		
(= *D. spinulosa (Muell.)Watt*)		
Dryopteris clintoniana (Eat.)Dow.	SP	Uncommon in wet sandy loam in mature Red Maple swamp forest in Trillium Woods (10933).
Dryopteris clintoniana (Eat.)Dow		
x goldiana (Hook.)Gray	R	Rare in Red Maple-Yellow Birch-Black Ash forest in Trillium Woods (11020).
Dryopteris cristata (L.)Gray	UN	Rare in wet organic ground in flooded mixed swamp forest along First Line allowance (10788).
Dryopteris goldiana (Hook.)Gray	R	Rare in wet sandy loam in mature Red Maple-Yellow Birch swamp and Sugar Maple forest in Trillium Woods (10934; 11018); a small population at the N end of

		the Trillium Woods in mesic loam in mature Sugar Maple forest was in 1991.
Dryopteris intermedia (Muhl.)Gray		
Dryopteris marginalis (L.)Gray		
Dryopteris x triploidea Wherry (= D. carthusiana x intermedia)		
Gymnocarpium dryopteris (L.)Newm.		
Matteuccia struthiopteris (L.)Todaro		
Onoclea sensibilis L.		
Polystichum acrostichoides (Michx.)Schott	UN	Common in mesic loam in mature Sugar Maple forest in Trillium Woods (DAO).
Woodsia ilvensis (L.)R. Br.	R	Uncommon on dry bedrock outcrops throughout (10921; 10973; 10785).

TAXACEAE

Taxus canadensis Marsh.	UN	Locally common in wet lowland mixed forest near first line allowance at head of Watts Creek (10981).

PINACEAE

Abies balsamea (L.)Mill.
Larix laricina (Du Roi)K.Koch
Picea glauca (Moench)Voss
Pinus strobus L.
Tsuga canadensis L.

CUPRESSACEAE

Juniperus communis L.
Thuja occidentalis L.

TYPHACEAE

Typha latifolia L.

SPARGANIACEAE

Sparganium chlorocarpum Rydb.	SP	Uncommon in marsh vegetation in Shirleys Brook and Watts Creek (10780).

POTAMOGETONACEAE

Potamogeton pusillus L.	UN	Locally common in open water of beaver pond drain by 1st line allowance near Richardson Side Road (10784) and in Shirleys Brook (10412).

ALISMATACEAE

Alisma triviale Pursh
Sagittaria latifolia Willd.

HYDROCHARITACEAE

Elodea canadensis Michx.		

POACEAE

Agropyron repens (L.)Beauv.**		
Agrostis gigantea Roth **		
Agrostis stolonifera L.		
Agrostis scabra Willd.	UN	Uncommon on dry bedrock outcrops and exposed mud banks of dried beaver ponds throughout.
Bromus inermis Leyss.**		
Calamagrostis canadensis (Michx.)Nutt.		
Dactylis glomerata L.**		
Danthonia spicata (L.)Beauv.		
Digitaria ischaemum (Schreb.)Muhl.**		
Echinochloa wiegandii (Fassett)McNeill & Dore		
Elymus hystrix L.	UN	Uncommon in dry-mesic Sugar Maple forest in Trillium Woods (DAO, CAN).
Elymus virginicus L.		
Festuca rubra L.**		
Glyceria borealis (Nash)Batch.		
Glyceria grandis Wats.		
Glyceria striata (Lam.)Hitchc.		
Leersia oryzoides (L.)Sw.		
Leersia virginica Willd.	R*	[UN in overall Region but R away from rivers]; Locally common in wet-mesic sandy ground in low swales in disturbed hardwood forest in Trillium Woods (by Shirleys Brook (10769) and along Snake Road, and north of Kanata Pond (10928).
Muhlenbergia glomerata (Willd.)Trin.	UN	Common along railway by Trillium Woods (10773).
Muhlenbergia mexicana (L.)Trin.		
Oryzopsis asperifolia Michx.		
Oryzopsis racemosa (Sm.)Ricker	UN	Locally common in dry-mesic, slightly calcareous hardwood forests throughout (10764).
Panicum acuminatum SW. (= *Dichanthelium acuminatum (Sw.)Gould & Clarke*)		
Panicum capillare L.		
Panicum linearifolium Scribn. (= *Dichanthelium linearifolium (Scribn.)Gould*)		
Panicum philadelphicum Bernh.	SP	Common on exposed, dry bedrock outcrop areas near north of Watts Creek (10927; 10971).
Phalaris arundinacea L.		
Phleum pratense L. **		
Poa compressa L.**		
Poa palustris L.		

Poa pratensis L. **		
Poa saltuensis Fern. & Wieg.	UN	Uncommon on mesic loam by rocky outcrops in Sugar Maple forest, Trillium Woods (4135; 10410).
Puccinellia distans (L.)Parl.**	UN	Uncommon along railway, Trillium Woods.
Schizachne purpurascens (Torr.)Sw.		
Setaria glauca (L.)Beauv. **		
Setaria viridis (L.)Beauv.**		
Sporobolus neglectus Nash		
Sporobolus vaginiflorus (Torr.)Wood		

CYPERACEAE

Carex albursina Sheld.	UN	Rare in rich Sugar Maple-White Pine forest in Trillium Woods and along Campeau Drive.
Carex arctata Boott		
Carex bebbii Olney		
Carex blanda Dew.		
Carex bromoides Willd..		
Carex brunnescens (Pers.)Poir.	SP	Rare in wet Black Ash - Red Maple swale in Trillium Woods (10932).
Carex cephaloidea (Dew.)Dew.	SP	Rare in wet Black Ash swale in Trillium Woods (10399); site partially (?) destroyed by recreational pathway.
Carex communis Bailey		
Carex crawfordii Fern.		(10954)
Carex crinita Lam.		(10398)
Carex cristatella Britt.		
Carex deweyana Schw.		
Carex gracillima Schw.		(10396)
Carex grayii Carey	SP	Rare in Sugar Maple-Eastern Hemlock forest by Shirleys Brook (Trickling Falls); site destroyed by recreational pathway (10413).
Carex hirtifolia Mack.	SP	Rare in low Sugar Maple-Black Maple forest in Trillium Woods and N of Kanata Pond (10924).
Carex hitchcockiana Dew.	R	Rare in Sugar Maple-White Pine forest along Campeau Drive (10765).
Carex intumescens Rudge		
Carex lupulina Willd.		
Carex pallescens L.		(10357).
Carex peckii Howe		
Carex pedunculata Willd.		
Carex plantaginea Lam.	UN	Common in rich Sugar Maple forest, Trillium Woods (DAO).
Carex projecta Mack.		(10397).
Carex pseudo-cyperus L.		

Carex radiata (Wahl.)Sm. (= *C. rosea, auct.*)		(10363).
Carex retrorsa Schw.		(10767).
Carex rosea Schkuhr ex Willd. (= *C. convoluta Mack.*)		
Carex sparganioides Willd.	R	Rare in rocky Sugar Maple forest N of Watts Creek (10421).
Carex sprengelii Dew.		(2841).
Carex tenera Dew.		
Carex tuckermanii Boott		(10400).
Carex utriculata Boott (= *C. rostrata, p.pt.*)		
Carex vulpinoidea Michx.		
Eleocharis acicularis (L.)R.& S.		
Eleocharis obtusa (Willd.)Schultes		
Elocharis smallii Britt. (= *E. palustris, p. pt.*)		
Scirpus atrovirens Willd.		
Scirpus cyperinus (L.)Kunth		
Scirpus microcarpus Presl. (incl. *S. rubrotinctus Fern.*)		
Scirpus pendulus Muhl.	UN	Rare in disturbed ground by Goulbourn Forced Road N of Watts Creek (10426).

ARACEAE

Arisaema triphyllum (L.)Schott		

LEMNACEAE

Lemna minor L.		
Spirodela polyrhiza (L.)Schleid.	UN	Rare in shallow water of beaver pond by Watts Creek (C. & E. Frankton, 19 June 1971).
Wolffia borealis (Engelm.)Land.	UN	Locally abundant along Shirleys Brook and in Watts Creek.
Wolffia columbiana Karst.	UN	Locally abundant along Shirleys Brook and in Watts Creek.

JUNCACEAE

Juncus bufonius L.		
Juncus effusus L.		
Juncus filiformis L.		
Juncus tenuis Willd.		
Luzula acuminata Raf.	SP	Uncommon in rocky Sugar Maple forest along First Line at Richardson Side Road, in Trillium Woods (C. & E. Frankton, 6 May 1973) and W of Snake Road near N boundary (10374).

LILIACEAE

Allium tricoccum Ait.		
Clintonia borealis (Ait.)Raf.		
Convallaria majalis L.**	SP	Escaping from cultivation at old Graham Farm, Goulbourn Forced Road.
Erythronium americanum Ker.		
Hemerocallis fulva L. **		
Lilium philadephicum L.	UN	Rare in young,dry hardwoods on outcrops N of Richardson Side Road E of Goulbourn Forced Road (C. & E. Frankton, 1971).
Maianthemum canadense Desf.		
Maianthemum racemosum (L.)Link (= *Smilacina racemosa (L.)Desf.*)		(10268)
Maianthemum stellatum (L.)Link (= *Smilacina stellata (L.)Desf.*)		
Medeola virginiana L.		
Polygonatum multiflorum (L.)All. **	R	Rare escape (garden dumping ?) along Snake Road (C. & E. Frankton 2389).
Polygonatum pubescens (Willd.)Pursh		
Trillium erectum L.		
Trillium grandiflorum (Michx.)Salisb.		
Uvularia grandiflora Sm.		

IRIDACEAE

Iris versicolor L.		
Sisyrinchium montanum Greene		

ORCHIDACEAE

Cypripedium calceolus L.	UN	Rare in dry, open, Sugar Maple forest in Trillium Woods.
Epipactis helleborine (L.)Crantz **		
Galearis spectabilis (L.)Raf.	SP	Uncommon in silty-clay soil in mature Sugar Maple forest, Trillium Woods and N of Kanata Pond (4931).
Goodyera pubescens (Willd.)R. Br.	R	One population W of Goulbourn Forced Road in mature Sugar Maple forest (73 plants in 1986, *fide* (C. & E. Frankton; 127 plants 1991) (DAO).
Malaxis monophyllos (L.)Sw.	UN	Rare, (C. & E. Frankton,17 June 1976).

SALICACEAE

Populus balsamifera L.		
Populus deltoides Marsh. [planted ?]		
Populus grandidentata Michx.		(10966)
Populus tremuloides Michx.		
Salix bebbiana Sarg.		
Salix lucida Muhl.		

Salix petiolaris Sm.

JUGLANDACEAE

Carya cordiformis (Wang)K. Koch
Juglans cinerea L.

BETULACEAE

Alnus incana (L.)Moench
ssp. incana (Duroi)Clausen
(= *A. rugosa (Du Roi)Spreng.*)
Betula alleghaniensis Britt.
Betula papyrifera Marsh.

Carpinus caroliniana Walt.	UN	Locally common in wet depressions in rich Sugar Maple forest in Trillium Woods, N of Kanata Pond and N of Watts Creek.

Corylus cornuta Marsh.
Ostrya virginiana (Mill.)K.Koch

FAGACEAE

Fagus grandifolia Ehrh.
Quercus rubra L.
Quercus macrocarpa Michx.

ULMACEAE

Ulmus americana L.

Ulmus rubra Muhl.	UN	Rare N of Kanata Pond at edge of rich Sugar Maple-Black Maple forest (10922).

Ulmus thomasii Sarg.

URTICACEAE

Boehmeria cylindrica (L.)Sw.	UN	Common in wet swales in mature hardwood forest throughout (10789).

Laportea canadensis (L.)Wedd.
Pilea pumila (L.)Gray
Urtica dioica L.
ssp. gracilis (Ait.)Selander

ARISTOLOCHIACEAE

Asarum canadense L.

POLYGONACEAE

Polygonum achoreum Blake
Polygonum aviculare L. **
(incl. *P. monspeliense Thieb.*) (10970)
Polygonum cilinode Michx.

Polygonum convolvulus L.	UN	Rare in rich Sugar Maple forest, (C. & E. Frankton, 7 September 1991).
Polygonum hydropiper L.		
Polygonum hydropiperoides Michx.	SP	Rare in wet meadow along Shirleys Brook (C. & E. Frankton, 30 August 1975).
Polygonum lapathifolium L.		
Polygonum pensylvanicum L.		
Polygonum persicaria L. **		
Polygonum sagittatum L.	UN	Rare in wet swale in young hardwoods N of Kanata Pond.
Polygonum scabrum Moench		
Rumex acetosella L. **		
Rumex crispus L. **		
Rumex obtusifolius L. **	UN	Uncommon along wet, disturbed woodland edges N of Watts Creek and along Shirleys Brook.
Rumex orbiculatus L.	UN	Uncommon in shallow beaver pond thickets along First Line.
Rumex triangulivalvis (Dans.)Rech.f.	SP	Rare in dry, thin soil on outcrops S of Kanata Pond (C. & E. Frankton, September 1991).

CHENOPODIACEAE

Atriplex patula L. **		
Chenopodium album L. **		
Chenopodium capitatum (L.)Aschers	UN	Rare on bedrock outcrop W of Goulbourn Forced Road (C. & E. Frankton, 19 June 1971).
Chenopodium gigantospermum Aellen		(10947)
Chenopodium glaucum L. **		
Chenopodium strictum Roth var. glaucophyllum (Aellen)Wahl		
Salsola pestifer Nels. **	UN	Common along railway track (10772)

AMARANTHACEAE

Amaranthus retroflexus L. **

PORTULACEAE

Claytonia caroliniana Michx.		
Claytonia virginica L.	R	A small population in low Sugar Maple-Black Maple woods in the Trillium Woods (C. & E. Frankton, 29 May 1972; spec in DAO); now apparently extirpated.

Portulaca oleracea L. **

CARYOPHYLLACEAE

Arenaria serpyllifolia L. **	UN	Common on rock outcrops throughout (10358B).
Cerastium fontanum Baumg. **		
Dianthus armeria L. **		
Dianthus deltoides L. **	R	Rare escape near Goulbourn Forced Road (C. & E. Frankton, 9 June 1983).
Moehringia lateriflora (L.)Fenzl **(= *Arenaria lateriflora L.*)**	SP	Low, wet swale, Trillium Woods (C. & E. Frankton, 9 June 1975).
Silene armeria L. **		
Silene vulgaris (Moench)Garcke **		
Stellaria graminea L. **		
*Stellaria media (L.)Cyrillo **	*UN*	*Rare in wet ground along trail in Sugar Maple- Eastern Hemlock woods at headwaters of Watts Creek (10979)*

CERATOPHYLLACEAE

Ceratophyllum demersum L.		
Ceratophyllum echinatum Gray	R	Common in a shallow drainage channel of an abandoned beaver pond along First Line (10783).

RANUNCULACEAE

Actaea pachypoda Ell.
Actaea rubra (Ait.)Willd.
Anemone canadensis L.
Anemone cylindrica Gray.
Anemone virginiana L.
Aquilegia canadensis L.
Caltha palustris L.
Clematis virginiana L.
Hepatica acutiloba DC.
Ranunculus abortivus L.
Ranunculus acris L. **
Ranunculus pensylvanicus L.f.
Ranunculus recurvatus Poir.

Thalictrum dioicum L.

BERBERIDACEAE

Caulophyllum giganteum (Farw.)Loc.
var. giganteum Farw.
(= *C. thalictroides (L.)Michx*, p.pt.)

PAPAVERACEAE

Sanguinaria canadensis L.

FUMARIACEAE

Corydalis sempervirens (L.)Pers.
Dicentra canadensis (Goldie)Walp.
Dicentral cucullaria (L.)Bernh.

BRASSICACEAE

Barbarea vulgaris R.Br. **		
Brassica rapa L. ** (= *B. campestris L.*)		
Capsella bursa-pastoris (L.)Medic **		
Cardamine pensylvanica Muhl.		
Dentaria diphylla Michx.		
Dentaria laciniata Muhl.	SP	Uncommon in dry, rich Sugar maple forest on either side of Goulbourn Forced Road, Trillium Woods (DAO).
Draba nemorosa L. **	UN	Uncommon on outcrop area along Goulbourn Forced Road near Richardson Side Road (10359).
Erucastrum gallicum (Willd.)Schultz **	SP	Uncommon in disturbed ground by Trillium Woods (10930).
Erysimum cheiranthoides L. **		
Lepidium campestre (L.)R. Br. **	UN	Uncommon along roadways.
Lepidium densiflorum Schrad. **		
Rorippa palustris (L.)Bess.		
Rorippa sylvestris (L.)Bess. **	SP	Rare along Watts Creek below Kanata Pond.
Sisymbrium altissimum L. **		
Thlaspi arvense L. **		(10364)

CRASSULACEAE

Penthorum sedoides L.	UN	Uncommon along wet trail through mature Sugar Maple forest, Trillium Woods.
Sedum acre L. **		
Sedum hispanicum L. **	R	Rare on outcrop by Richardson Side Road feldspar mine (10972).
Sedum sarmentosum Bunge **	Unrecorded	Common on outcrop by Richardson Side Road feldspar mine (10973) and rare on outcrop along First Line near Richardson Side Road (10787).

SAXIFRAGACEAE

Mitella diphylla L.
Mitella nuda L.
Saxifraga virginiensis Michx.
Tiarella cordifolia L.

GROSSULARIACAEAE

Ribes americanum Mill.

Ribes cynosbati L.		
Ribes glandulosum Grauer		
Ribes hirtellum Michx.		(10977)
Ribes rubrum L. **	SP	Rare along shoulder of Goulbourn Forced Road, Trillium Woods (10768).

ROSACEAE

Agrimonia gryposepala Wallr.		
Amelanchier arborea (Michx. f.)Fern.		
var. arborea	SP	Rare on rocky outcrop in Sugar Maple forest, Trillium Woods.
var. laevis (Wieg.)McKay		
Crataegus chrysocarpa Ashe		
var. chrysocarpa		(10365)
Crataegus punctata Jacq.	UN	Rare at edge of Goulbourn Forced Road, Trillium Woods (10779).
Crataegus submollis Sarg.		
Fragaria vesca L.	UN	Rare in disturbed hardwoods along Campeau Drive.
Fragaria virginiana Duchesne		
Geum aleppicum Jacq.		
Geum canadense Jacq.	UN	Common in hardwood forests throughout.
Malus pumila L. **		
Potentilla argentea L.		
Potentilla norvegica L.		(10423)
Potentilla recta L. **		
Potentilla simplex Michx.	SP	Common in meadow by Kanata Pond.
Prunus nigra Ait.		
Prunus serotina Ehrh.		
Prunus virginiana L.		
Rubus allegheniensis Porter		
Rubus occidentalis L.		
Rubus odoratus L.		
Rubus pubescens Raf.		
Rubus strigosus Michx.		(10425)
Spiraea alba Du Roi (s. st.)		
Spiraea tomentosa L.		
Waldsteinia fragarioides (Michx.)Tratt.		

FABACEAE

Amphicarpaea bracteata (L.)Fern.		
Desmodium canadense (L.)DC.		
Lotus corniculatus L. **		
Medicago lupulina L. **		
Melilotus alba Desr. **		
Melilotus officinalis (L.)Desr. **		

Robinia viscosa Vent. **	R	Escaped from cultivation near old Graham farm (C. & E. Frankton 2135, in 1969)
Trifolium hybridum L. **		
Trifolium pratense L. **		
Trifolium repens L. **		
Vicia cracca L. **	(forma alba - 10778)	

GERANIACEAE

Geranium bicknellii Britt.	UN	Common on bedrock outcrops along Goulbourn Forced Road and near Kanata Pond (10361).
Geranium robertianum L.		(10786)

OXALIDACEAE

Oxalis acetosella L.		
Oxalis fontana Bunge		
(= *O. stricta, auct.; O. europea Jord.*)		
Oxalis stricta L.		
(= *O. dillenii Jacq.*)	UN	Rare in disturbed outcrop area along Campeau Drive.

EUPHORBIACEAE

Acalypha rhomboidea Raf.		
Euphorbia glyptosperma Engelm.	SP	Uncommon in dry ground along the railway track (10774) and near the Mica mine (10968).
Euphorbia helioscopia L. **	R	Rare in disturbed ground (C. & E. Frankton 2590, in 1983).
Euphorbia maculata L.	SP	Common along railway (10948).
Euphorbia vermiculata Raf.		(10969).

ANACARDIACEAE

Rhus typhina L.		
Toxicodendron radicans (L.)Kuntze		
(= *Rhus radicans L.*		
***ssp. negundo (Greene)McNeill*)**	SP	Rare on dry, rocky outcrop in scrubby deciduous forest along Snake Road.
Toxicodendron rydbergii (Rydb.)Greene		
(= *Rhus radicans L. var. rydbergii (Sm.)McNeill)*		

AQUIFOLIACEAE

Ilex verticillata (L.)Gray

CELASTRACEAE

Celastrus scandens L.

ACERACAE

Acer negundo L. **		
Acer nigrum Michx. f.	UN	Locally common in moist areas in rich Sugar Maple forest throughout (10263; 10771; 10923).
Acer rubrum L.		
Acer saccharinum L.		
Acer saccharum Marsh.		

BALSAMINACEAE

Impatiens capensis Meerb.		

RHAMNACEAE

Rhamnus cathartica L. **		
Rhamnus frangula L. **		

VITACEAE

Parthenocissus quinquefolius (L.)Planch (= P. vitacea, p. pt.)	SP	Rare in Sugar Maple-Black Maple stand in Sugar Maple forest, Trillium Woods.
Parthenocissus vitacea (Knerr)Hitchc.		
Vitis riparia Michx.		

TILIACEAE

Tilia americana L.		

CLUSIACAE

Hypericum perforatum L. **		
Triadenum fraseri (Spach)Gl.		

VIOLACEAE

Viola canadensis L.		
Viola cucullata Ait.		
Viola conspersa Reich.		
Viola pubescens Ait.		
Viola rostrata Pursh	R	Rare in rich, mature Sugar Maple Woods, Trillium Woods (C. & E. Frankton, 5 June 1971).
Viola sororia Willd.		

THYMELAEACEAE

Dirca palustris L.		

LYTHRACEAE

Lythrum salicaria L. **		

ONAGRACEAE

Circaea lutetiana L. ssp. canadensis (L.)Asch. & Magnus		
Epilobium angustifolium L.		
Epilobium ciliatum Raf. ssp. glandulosum (Lehm)Hoch & Raven		(10775)
Epilobium leptophyllum Raf.	UN	Rare in marsh along Campeau Drive (10766).
Ludwigia palustris (L.)Ell.		
Oenothera parviflora L.		

ARALIACEAE

Aralia nudicaulis L.		
Panax trifolius L.	UN	Rare in rich Sugar Maple forest, Trillium Woods (DAO).

APIACEAE

Cicuta bulbifera L.		
Cryptotaenia canadensis (L.)DC.	UN	Rare in low deciduous forest N of Watts Creek (10424) and along First Line.
Daucus carota L. **		
Osmorhiza claytonia (Michx.)Clarke		
Pastinaca sativa L. **		
Sium suave Walt.		(10781)

CORNACEAE

Cornus alternifolia L.f.
Cornus canadensis L.
Cornus stolonifera Michx.

PYROLACEAE

Monotropa uniflora L.
Pyrola elliptica Nutt.

PRIMULACEAE

Trientalis borealis Raf.

OLEACEAE

Fraxinus americana L.
Fraxinus nigra Marsh.
Fraxinus pennsylvanica Marsh.
Syringa vulgaris L. **

GENTIANACEAE

Gentiana andrewsii Griseb.	UN	Rare in thicket swamp along hydroline at N end Trillium Woods (10931).

APOCYNACEAE		
Apocynum androsaemifolium L.		
ASCLEPIADACEAE		
Asclepias incarnata L.		
Asclepias syriaca L.		
Cynanchum rossicum (Klep.)Barb. ** (= C. medium R. Br.)	SP	A large, expanding patch on a rock outcrop in mature Sugar Maple forest, Trillium Woods
CONVOLVULACEAE		
Calystegia sepium (L.)R.Br. ssp. americanum (Simms)Brumm. (= *Convolvulus sepium L.*)		
Ipomoea purpurea (L.)Roth **	R	Rare along grassy edge of Goulbourn Forced Road by Trillium Woods (10967).
POLEMONIACEAE		
Phlox divaricata L.	UN	Uncommon on dry outcrops in rich Sugar Maple forest in Trillium Woods (DAO).
HYDROPHYLLACEAE		
Hydrophyllum virginianum L.		
BORAGINACEAE		
Cynoglossum officinale L. **		
Echium vulgare L. **		
Hackelia virginiana (L.)Johnst.	UN	Rare on outcrops in Sugar Maple forest, Trillium Woods (C. & E. Frankton 1937 (DAO) in 1969)
Lithospermum officinale L. **		
VERBENACEAE		
Verbena hastata L.		
Verbena stricta Vent.	R	Uncommon along disturbed hardwoods in grassy clearing, Snake Road (C. & E. Frankton 2065).
Verbena urticifolia L.	SP	Common along disturbed hardwoods, Snake Road (10669) and occasionally along disturbed tracks throughout.
LAMIACEAE		
Galeopsis tetrahit L.**		(10965)
Glechoma hederacea L. **		
Leonurus cardiaca L. **		

Lycopus americanus Muhl.		
Lycopus uniflorus Michx.		
Mentha arvensis L.		
Nepeta cataria L. **		
Origanum vulgare L. **		
Prunella vulgaris L. **		
Satureja vulgaris (L.)Fritsch **		
Scutellaria galericulata L.		
Scutellaria lateriflora L.		

SOLANACEAE

Physalis heterophylla Nees		
Solanum ptycanthum Dunal **(= *S. americanum, auct.*)**	UN	Uncommon in disturbed ground along Snake Road and the Goulbourn Forced Road (10945).

SCROPHULARIACEAE

Chaenorrhinum minus (L.)Lange **	UN	Common along the railway track (10976) and scattered along roadways.
Chelone glabra L.		
Linaria vulgaris Hill **		
Mimulus ringens L.		
Penstemon digitalis Nutt.		
Penstemon hirsutus (L.)Willd.	UN	Locally common along Snake Road (3476) and along Watts Creek west of Goulbourn Forced Road.
Verbascum thapsus L. **		
Veronica arvensis L. **	UN	Common on rock outcrops throughout (10360).
Veronica officinalis L. **		
Veronica scutellata L.	UN	Uncommon on grassy shore of beaver pond along First Line.
Veronica serpyllifolia L. **		

OROBANCHACEAE

Epifagus virginiana (L.)Bart.

LENTIBULARIACEAE

Utricularia vulgaris L.

PHRYMACEAE

Phryma leptostachya L.		(C. & E. Frankton 1936 in DAO)

PLANTAGINACEAE

Plantago lanceolata L. **

Plantago major L. **		
Plantago rugelii Ducne.		(10964)

RUBIACEAE

Galium aparine L.	SP	Common on slopes of rock outcrops in rich Sugar Maple forest in Trillium Woods (4133).
Galium boreale L.	SP	One large patch in meadow E of Shirleys Brook near Kanata Pond; partially destroyed by trail construction.
Galium mollugo L. **	UN	Common in low meadows along Goulbourn Forced Road (10358).
Galium palustre L.		(10411).
Galium triflorum Michx.		

CAPRIFOLIACEAE

Linnaea borealis L.	SP	Rare in cedar grove in upland mixed woods, Trillium Woods (C. & E. Frankton 2255 (DAO) in 1970).
Lonicera canadensis Bart. ex Marsh.		
Lonicera dioica L.	UN	Rare in mixed forest along the First Line allowance.
Lonicera tartarica L. **		
Sambucus racemosa L. ssp. pubens (Michx.)House (= *S. pubens Michx.*)		
Symphoricarpos albus (L.)Blake	UN	Rare in dry upland forest, Snake Road (C. & E. Frankton, 1970).
Triosteum perfoliatum L.	SP	Uncommon in dry upland woods by outcrops in Trillium Woods and along Snake Road (DAO).
Viburnum acerifolium L.		
Viburnum lentago L.		
Viburnum opulus L. var. americanus Ait. **(= *V. trilobum Marsh.*)**	UN	Uncommon in thicket swamp edge of marsh by Goulbourn Forced Road in Watts Creek (10976).

CAMPANULACEAE

Campanula rapunculoides L. **

LOBELIACEAE

Lobelia inflata L.

ASTERACEAE

Achillea millefolium L.
Ambrosia artemisiifolia L.

Anaphalis margaritacea (L.)Benth. & Hook.		
Antennaria howellii E. Greene		
ssp. canadensis (E.Greene)Bayer		
(= A. canadensis E. Greene)		
ssp. petaloides (Fern.)Bayer		
(= A. petaloides Fer.)		(10926)
Arctium minus Bernh. **		
Artemisia vulgaris L. **		
Aster ciliolatus Lindl.		
Aster cordifolius L.		
Aster lanceolatus Willd.		
ssp.lanceolatus		
Aster lateriflorus (L.)Britt.		
Aster macrophyllus L.		
Aster puniceus L.		
Bidens cernua L.		
Bidens frondosa L.		
Chrysanthemum leucanthemum L. **		
Cichorium intybus L. **		
Cirsium arvense (L.)Scop. **		
Cirsium vulgare (Savi)Tenore **		
Conyza canadensis (L.)Cronq. **		
Erechtites hieracifolia (L.)Raf.	UN	Common along wetter slopes along the railway track (10777) and on disturbed ground by Kanata Pond.
Erigeron annuus (L.)Pers.		
Erigeron philadelphicus L.		
Eupatorium maculatum L.		
Eupatorium perfoliatum L.		
Eupatorium rugosum Houtt.		
Euthamia graminifolia (L.)Nutt.		
Gnaphalium uliginosum L.		(10978B).
Heliopsis helianthoides (L.)Sw.	SP	Common in a disturbed, overgrowing meadow along Snake Road (C. & E. Frankton 2551).
Hieracium aurantiacum L. **		
Hieracium x floribundum Wimm.& Grab. **		
(= *H. caespitosum Dum. x lactucella*)	SP	Uncommon on rock outcrops near Watts Creek and Kanata Pond.
Hieracium pilosella L. **	SP	Rare in weedy field S of Watts Creek headwaters (10422).
Hieracium piloselloides Vill. **		
(= *H. florentinum All.*)		
Inula helenium L. **		
Lactuca biennis (Moench)Fern.		
Matricaria matricarioides (Less.)Porter **		
Prenanthes altissima L.		

Rudbeckia hirta L.		
Senecio pauperculus Muhl.		
Solidago altissima L.		
Solidago caesia L.		(10988)
Solidago canadensis L.		
Solidago flexicaulis L.	UN	Uncommon N of Watts Creek in dry, rocky Sugar Maple forest (C. & E. Frankton).
Solidago gigantea Ait.		
Solidago hispida Muhl.	UN	Rare W of Goulbourn Forced Road N of Watts Creek.
Solidago juncea Ait.		
Solidago nemoralis Ait.		
Solidago rugosa Mill.		
Sonchus arvensis L. **		
Sonchus asper (L.)Hill **		
Sonchus oleraceus L. **		
Taraxacum officinale Weber **		
Tragopogon pratensis L. **		
Virgulus novae-angliae (L.)Rev.& Keen.		
Xanthium strumarium L.		

APPENDIX 2: Fauna in the Kanata Lakes Study Area

A comprehensive understanding of the natural environment values of an area by means of an assessment of its faunal data requires considerably more field time and human resources to be expended than is required with analyses of vegetation and flora. Accordingly, most faunal data are gathered as supplemental information to the vegetation and floral data and are less complete than the latter, although bird populations were examined in some detail (see below).

The faunal data gathered in the study area are confined to birds, mammals and, amphibians and reptiles.

1) Birds

Bird data were gathered and analyzed by Bruce Di Labio, with supplemental data provided by D. F. Brunton. Di Labio conducted field surveys of all sections and habitats of the study area between 17 June and 1 August 1991. He also examined a wide variety of published literature as well as unpublished data collections and his own extensive set of field data gathered during more than 20 years of field ornithology in the Ottawa area.

The following lists the bird species observed in the study area during field investigations in 1990, as well as through a review of regional bird literature in Trail & Landscape (1967 -1991), The Shrike (1976-1986), the Ontario Breeding Bird Atlas (Cadman et al. 1987), Dunrobin-Breckenridge Christmas Bird Census data (1981-1986) and Ottawa Field-Naturalists' Club spring and fall bird census' (1969-1991) and the Di Labio personal data base. They are listed in standard checklist order and following the nomenclature of Godfrey (1986).

Underlined species are confirmed to have bred in the study area, utilizing the criteria of Cadman et al. (1987) for determining definite breeding. The habitat or habitats utilized by that species are noted in the right hand column, signified by the code utilized in Figure 8 and in the habitat descriptions in the text. Species observed simply passing by and not utilizing any particular habitat are, accordingly, not given a habitat code.
Significant species are noted **in bold type**.

American Bittern	*1*
Great Blue Heron	*1*
Green-backed Heron	*1, 2*
Canada Goose	*1*
Wood Duck	*ow*
American Black Duck	*ow, 1*
Mallard	*ow, 1*
Blue-winged Teal	*ow, 1*
Hooded Merganser	*ow*
Turkey Vulture	*R, S, M, D*
Osprey	*ow*
Bald Eagle	-
Northern Harrier	*1, M*
Sharp-shinned Hawk	*8,9*
Cooper's Hawk	*8,9*
Northern Goshawk	*8,9*
Red-shouldered Hawk	*8*
Red-tailed Hawk	*S,M,8*

Broad-winged Hawk	*7,8*
Rough-legged Hawk	*n/a*
American Kestrel	*D,M,S*
Ruffed Grouse	*S,2,8,9*
Killdeer	*D,M*
Solitary Sandpiper	*1*
Spotted Sandpiper	*1*
Common Snipe	*1,2,M*
American Woodcock	*2,S,8*
Ring-billed Gull	*ow,D*
Herring Gull	*ow,D*
Rock Dove	*D*
Mourning Dove	*D,M,S*
Black-billed Cuckoo	*8*
Eastern Screech Owl	*7,8*
Great Horned Owl	*M,S,7,8,9*
Barred Owl	*7,8*
Great Gray Owl	*M*
Long-eared Owl	*8,9*
Northern Saw-whet Owl	*8,2*
Whip-poor-will	*8*
Chimney Swift	*M*
Ruby-throated Hummingbird	*M,S,8,9,10,R*
Belted Kingfisher	*ow,2*
Red-headed Woodpecker	*S,8*
Downy Woodpecker	*8,9*
Hairy Woodpecker	*7,8,9*
Northern Flicker	*5,6,7,8,9,10*
Pileated Woodpecker	*5,6,7*
Eastern Wood Pewee	*5,6,7*
Alder Flycatcher	*2*
Least Flycatcher	*7,8*
Eastern Phoebe	*D,M,S*
Great Crested Flycatcher	*5,7,8*
Eastern Kingbird	*D,M*
Horned Lark	*D*
Purple Martin	*M*
Tree Swallow	*M, 4,8*
Bank Swallow	*D,M*
Cliff Swallow	*D,M*
Barn Swallow	*D,M*
Blue Jay	*7,8,9*

American Crow	*D,M,7,8,9*
Common Raven	*D,M,R*
Black-capped Chickadee	*2,3,4,5,6,7,8,9,10*
Red-breasted Nuthatch	*9,10*
White-breasted Nuthatch	*5,6,7,8*
Brown Creeper	*5,7,8,9*
House Wren	*M,S,8*
Winter Wren	*8,9*
Golden-crowned Kinglet	*8,9*
Ruby-crowned Kinglet	*8,9*
Eastern Bluebird	*D,M,S*
Veery	*8*
Swainson's Thrush	*7,8,9,10*
Hermit Thrush	*7,8,9,10*
Wood Thrush	*7,8*
American Robin	*D,S,M,R,1,4,8,9*
Gray Catbird	*2,S*
Brown Thrasher	*S*
Water Pipit	*-*
Bohemian Waxwing	*2,8*
Cedar Waxwing	*4,7,8,9*
Northern Shrike	*S*
European Starling	*D,M,4,8,9*
Warbling Vireo	*4*
Red-eyed Vireo	*5,6,7,8*
Tennessee Warbler	*7,8,9,10*
Nashville Warbler	*7,8,9,10*
Northern Parula Warbler	*5,7,8,9,10*
Yellow Warbler	*1,2,S*
Chesnut-sided Warbler	*7,8,9,10*
Magnolia Warbler	*7,8,9,10*
Cape May Warbler	*7,8,9,10*
Black-throated Blue Warbler	*7,8,9,10*
Pine Warbler	*10 (historic (1943) record)*
Yellow-rumped Warbler	*7,8,9,10*
Black-throated Green Warbler	*7,8,9,10*
Bay-breasted Warbler	*7,8,9,10*
Black & White Warbler	*3,8*
American Redstart	*S,8*
Ovenbird	*7,8,9*
Common Yellowthroat	*1,2*
Canada Warbler	*7,8,9,10*

Scarlet Tanager	*7*
Rose-breasted Grosbeak	*7,8*
Indigo Bunting	*8*
American Tree Sparrow	*2,S,8,9*
Chipping Sparrow	*D,M,S*
Field Sparrow	*S*
Savannah Sparrow	*M*
Song Sparrow	*1,M,S*
Swamp Sparrow	*2*
White-throated Sparrow	*8*
White-crowned Sparrow	*D,M,S*
Dark-eyed Junco	*S,8,9,10*
Snow Bunting	*M,D*
Bobolink	*M*
Red-winged Blackbird	*D,M,1,2*
Eastern Meadowlark	*D,M*
Rusty Blackbird	*2,3,8,9*
Common Grackle	*D,M,1,2,4,S*
Brown-headed Cowbird	*D,M,2,4,7,8,9,10,S*
Northern Oriole	*D,8,9*
Pine Grosbeak	*8,9,S*
Purple Finch	*5,6,7,8,9*
White-winged Crossbill	*9*
Common Redpoll	*D,M,S,8*
American Goldfinch	*S,M,8*
Evening Grosbeak	*7,8,9*
House Sparrow	*D*

2) Amphibians and Reptiles

The following lists the amphibian and reptile species observed in the study area during field investigations in 1991. The hot, dry summer of 1991 significantly reduced the number and diversity of amphibian sightings. Accordingly, species likely in the study area by virtue of their distribution and status in the Region (Cook 1981; Weler & Oldham 1988) but not noticed during this study are also listed (in brackets).

The species are listed in standard checklist order and following the nomenclature of Cook (1984).

The significant species (cf. T. Norris, Ontario Ministry of Natural Resources, Kemptville, in lit.) are indicated by **bold** type.

Amphibians	*Reptiles*
(Blue-spotted Salamander)	*Midland Painted Turtle*
(Red-backed Salamander)	***Blanding's Turtle***
American Toad	*Eastern Garter Snake*
Spring Peeper	*(Northern Redbelly Snake)*

Tetraploid Gray Treefrog *(Midland chorus Frog)*
Wood Frog
Leopard Frog
Green Frog

3) Mammals

The following lists the mammals observed during the 1991 field studies. These observations were made incidentally to other investigations and are not considered a reliable indication of mammal diversity in the study area. This list includes the imprecise references to mammal collections of Reed (1975) which appear to be attributable to the study area.

None of the mammals recorded from the study area appear to be Regionally significant from a natural environment perspective (cf. Rand 1945; Peterson 1966), although White-tailed Deer can be considered Locally Significant here.

Common Shrew
Smoky Shrew
Little Brown Bat
Cottontail Rabbit
Eastern Gray Squirrel (Black phase)
Red Squirrel
Woodchuck
Eastern Chipmunk
Beaver
Deer Mouse
Meadow Vole
Meadow Jumping Mouse
Porcupine
Coyote
Black Bear (reported 1991)
Red Fox
Raccoon
Mink
Striped Skunk
White-tailed Deer

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