

# **The Status of Natural Heritage Planning in Carolinian Canada**

Cynthia Lussier, Patrick L. Lawrence and J. Gordon Nelson  
Heritage Resources Centre, University of Waterloo, Waterloo, Ontario N2L 3G1

## **Abstract**

*The Carolinian Canada program was launched in 1984 as a partnership between WWF Canada, the Ontario Heritage Foundation, the Nature Conservancy of Canada, and the Richard Ivey Foundation. Carolinian Canada is the name given to the deciduous forest region of southern Ontario, and is bounded by Lake Huron, western Lake Ontario, and Lake Erie to the south. It is because of its distinct character and location in the most heavily populated and intensely fragmented landscape of the country, that conservation and restoration efforts in Carolinian Canada are critical.*

*In 1997, the Heritage Resources Centre at the University of Waterloo, in association with Parks Canada, began an investigation of the management, planning, and institutional arrangements in place for the protection of 38 critical Carolinian Canada sites in southwestern Ontario. The investigation was broken down into two major tasks: 1) the review and evaluation of existing land use planning arrangements for each Carolinian site and area municipality - the focus being on current official plan designations and secondary zoning by-laws; and 2) the review and evaluation of natural heritage strategies completed in the region. Between January and April 1998, we communicated with representatives from seven counties and six regional municipalities in southwestern Ontario, and examined all available documentation surrounding the protection of Carolinian sites in their respective jurisdictions. We are able to report the following results:*

- *All of the sites have had some type of biophysical inventorying completed. These inventories have been used by nine of the counties/ regional municipalities in developing natural heritage planning systems;*
- *Natural heritage policies exist (or are being prepared) in ten counties/ regional municipalities covering 29 of the Carolinian Canada sites;*
- *Management and environmental advisory committees have been organized to facilitate protection of Carolinian Canada sites and other natural areas in seven of the counties/regional municipalities;*
- *No formal or recent inventories, or designations for environmental protection are known to exist for the ten sites located in the Regional Municipality of Niagara and the Counties of Kent, Elgin, and Brant.*

*This work provides a snapshot of natural heritage planning in southwestern Ontario and makes possible an assessment of the region's potential to move towards landscape connectivity planning as envisioned in the 1997 Conservation Strategy for Carolinian Canada.*

## **Introduction**

The Carolinian Canada program was launched in 1984 as a partnership between the World Wildlife Fund Canada, the Ontario Heritage Foundation, the Nature Con-

servancy of Canada, and the Richard Ivey Foundation (Allen et al., 1990). The Carolinian Canada Zone is the name given to the deciduous forest region of southern Ontario, and is bounded by Lake Huron, western Lake Ontario, and Lake Erie to the south (Figure 1). The Zone is home to diverse species representative of southern habitats from which its name is derived (Reid, 1985). The Carolinian Canada Zone is the northernmost range of eastern deciduous forest in North America, but is also the southernmost range for many boreal species of Canada. The Carolinian Canada Zone contains more nationally rare species of plants and animals than any other region of the country (Reid, 1985). It is because of this distinct character, and its location in the most heavily populated and intensely farmed landscape of the country, that the conservation of 38 sites identified for priority protection (Table 1), and restoration of linkages between them, is critical.

This paper presents the results of a review of management and conservation arrangements for natural heritage planning in southwestern Ontario. The methods used to obtain, organize, review, and classify the information are described. This is followed by results and discussion concerning the potential for a regional natural heritage planning approach for the Carolinian Canada Zone and the important role of private stewardship for those regions and sites where no formal land use planning arrangements exist.

## Approach

In Ontario, a variety of institutional arrangements are in place for the conservation of natural heritage; arrangements that could prove to be important for the design of conservation corridors linking the 38 Carolinian Canada sites. The degree of conservation provided by each of the arrangements varies. This study is intended to identify and describe the planning arrangements for protecting natural heritage

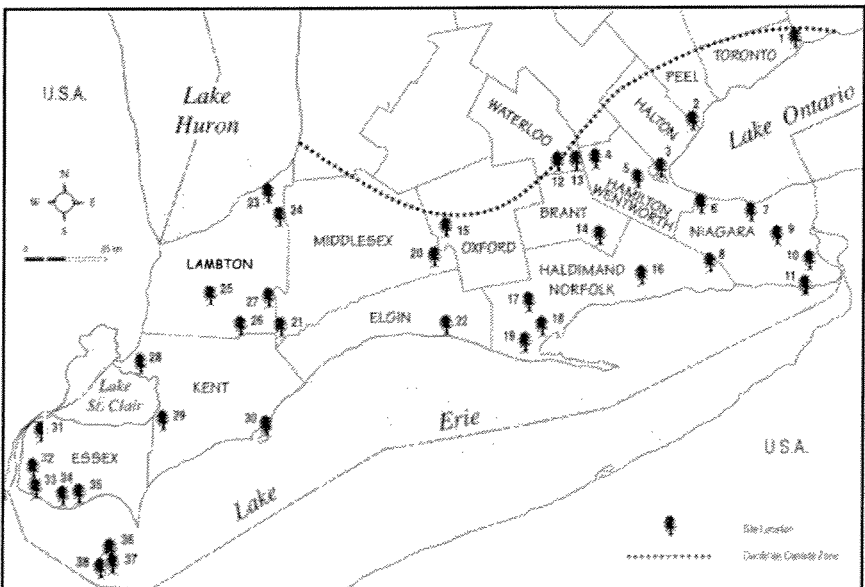


Figure 1. Carolinian Canada Zone in Southwestern Ontario

	Site	Location	Size (ha)	Comments
1	Rouge River Valley	City of Toronto	625	Forest valley/river complex
2	Iroquois Shoreline Woods	Halton Region	84	Upland forests on shoreline terrace
3	Sassafras Woods	Halton Region	n/a	Upland forest on clay valley
4	Beverly Swamp	Hamilton Wentworth	4,850	Lowland forested swamp
5	Dundas Valley	Hamilton Wentworth	2,400	Re-entrant valley in Niagara Escarpment
6	Grimsby-Winona	Niagara Region	280	Forested escarpment face and Escarpment slope/valley
7	Jordon Escarpment Valley	Niagara Region	180	Escarpment valley with terrace and floodplain
8	Caistor-Canborough Slough Forest	Haldimand-Norfolk	1,400	Forested slough/ridge patterned clay plain
9	Fonthill Sandhill Valley	Niagara Region	50	Short Hills Forests
10	Willoughby Clay Plain	Niagara Region	590	Oak forest complex
11	Point Abino Peninsula Sandland Forest	Niagara Region	345	Lake Erie coastal shoreline dunes and wetlands
12	Sudden Bog	Waterloo Region	69	Oak-hickory forest and bog complex
13	Grand River Valley Forests	Waterloo Region	755	Valley-forest lake complex
14	Six Nations Indian Reserve Forests	Brant County	92,000	Largest single block of Carolinian forest
15	Embro Upland Forest	Oxford County	120	Inland Forest
16	Oriskany Sandstone and Woodlands	Haldimand-Norfolk	335	Upland forest and sandstone outcrop
17	Delhi Big Creek Valley	Haldimand-Norfolk	330	River valley corridor and valley
18	St Williams Dwarf Oak Forest	Haldimand-Norfolk	n/a	n/a
19	Big Creek Valley-South Walsingham Sand Ridges	Haldimand-Norfolk	630	River valley complex sand plain forest
20	Dorchester Swamp	Middlesex County	380	Wooded peaty swamp
21	Skunk's Misery	Middlesex County	1,235	Upland and lowland forest communities
22	Catfish Creek Slope and Floodplain Forest	Elgin County	n/a	Valley forest with slope and bottomlands

(Continued...)

Table 1: Carolinian Canada Sites. Source: Eagles, P.J. and Beechey, T.J. (1984). *Critical Unprotected Natural Areas in the Carolinian Life Zone of Canada – Final Report*. World Wildlife Fund Canada.

	Site	Location	Size (ha)	Comments
23	Port Franks Wetlands and Forested Dunes	Lambton County	480	Coastal dune and wetland system
24	Ausable River Valley	Lambton County	1,780	Rocky gorge and river corridor
25	Plum Creek Upland Woodlots	Lambton County	220	Oak-hickory forest
26	Shetland Kentucky Coffee Tree Woods	Lambton County	4	Largest stand of Kentucky coffee-trees
27	Sydenham River Corridor	Lambton County	307	Stream system
28	Walpole Island Indian Reserve	Kent County	16,000	Wetland-prairie system and savannah
29	Lake St. Clair Marshes	Kent County	650	Shoreline marsh complex on sand plain
30	Sinclair's Bush	Kent County	50	Lowland to mesic woods with mature forest
31	Ojibway Prairie Remnants	Essex County	n/a	n/a
32	Canard River Kentucky Coffee Tree Woods	Essex County	99	Southern riverine community
33	Big Creek Marsh	Essex County	600	Wetland complex with open water
34	Oxley Poison Sumac Swamp	Essex County	40	Swamp lowland forests, thickets, meadow
35	Cedar Creek	Essex County	565	Creek valley system ; willow swamp
36	Middle Point Woods	Essex County	38	Deciduous woodlot
37	Stone Road Alvar	Essex County	50	Complex of meadows, prairies, savannah
38	Middle Island	Essex County	46	Forest on limestone island

Table 1 (Continued): Carolinian Canada Sites. Source: Eagles, P.J. and Beechey, T.J. (1984). *Critical Unprotected Natural Areas in the Carolinian Life Zone of Canada – Final Report*. World Wildlife Fund Canada.

areas, and to report results from a study of the natural heritage framework of area municipalities within the Carolinian Canada Zone in southwestern Ontario. Being informed about land use planning at the municipal or county level is key to conservation efforts of this nature. Riley and Mohr (1994: 5) indicate that,

*municipal land use planning is the most significant ecological 'experiment' going on in southern Ontario today because it exercises the most basic control over future land-use change. If properly designed and supported, the goals and requirements set by municipal, private and other land-use plans can significantly enhance the natural values of the landscape.*

Assessing the status of protected area planning in southwestern Ontario will provide the basis for a comparative analysis of the potential for landscape connectiv-

ity planning as envisioned in the *Conservation Strategy for Carolinian Canada* (1997). Municipalities with natural heritage systems are profiled herein as models against which remaining municipalities and counties could measure up.

Methods carried out during this study reflect the project objectives: 1) to review and evaluate existing land use planning arrangements for each Carolinian Canada site and area municipality - the focus being on current official plan and zoning by-law designations, and 2) to review and evaluate existing natural heritage strategies and discuss the range of land use planning, conservation, and management arrangements that should be considered for future efforts at natural heritage within the Carolinian Canada Zone.

The first step towards fulfilling these objectives began with the preparation of *Questions of Interest* designed to collect and organize key information required from area municipalities and Conservation Authorities within the Carolinian Canada Zone in southwestern Ontario. These *Questions of Interest* were included in a mailout distributed to key contacts for each of the 38 Carolinian Canada sites in each jurisdiction.

The mailout, which was distributed the first week of December 1997, was intended not only to inform potential partners about the investigation, but also to stimulate response and obtain sources of information and documentation. The general response from the mailout was unfavourable, prompting the need to schedule interviews with contacts in each jurisdiction. From December 1997 to February 1998, follow-up included interviews and discussion by mail or phone in an attempt to acquire and consolidate the remaining necessary information. The process yielded an abundance of background information and reports, copies of official plans and tree cutting by-laws, and natural heritage strategies and associated mapping from each area municipality.

The second step involved the review and evaluation of the information collected. Seven counties and five regional municipalities were examined and their official plans reviewed—where they existed. These included the Counties of Brant, Elgin, Essex, Kent Lambton, Middlesex and Oxford; and the Regional Municipalities of Haldimand-Norfolk, Halton, Hamilton-Wentworth, Peel and Waterloo. No response to the survey was received from the Regional Municipality of Niagara, thus its six Carolinian Canada sites are excluded from this survey due to lack of information. Township land use plans and secondary zoning bylaws were not examined in this exercise because of time constraints. In the special case of the Rouge River Valley Carolinian Canada site, which crosses several jurisdictions, the Rouge Park Management Plan was reviewed rather than the regional and local official plans.

## Results

In their strategy for the planning of natural heritage areas, the Ontario Ministry of Natural Resources (OMNR) defines natural heritage as:

*geological features and landforms; associated terrestrial and aquatic ecosystems; their plant species, populations and communities; and all native animal species, their habitats and sustaining environment (OMNR, 1992).*

Included among the land use planning and natural heritage arrangements used for the formal protection of the Carolinian Canada sites in southwestern Ontario are:

- Biophysical Inventories;
- Official Plans, Zoning By-laws, and the Provincial Policy Statement under the Planning Act;
- Environmentally Sensitive Areas;
- Natural Heritage Systems;
- the Provincial Wetlands Policy; and
- Areas of Natural and Scientific Interest (ANSIs).

### ***Biophysical Inventories***

All Carolinian Canada sites have had some type of biophysical inventory conducted in the past as part of either ANSI inventories, ESA inventories, or by the Identification Subcommittee of Carolinian Canada in producing their final report of *Critical Unprotected Areas in the Carolinian Life Zone of Canada* (Eagles and Beechey, 1985). Whether the information from these inventories was used in developing planning documents is a more complex issue. Many of the original inventories have been updated for use as the first step in developing a natural heritage system, while others have not been updated and have not been used since.

Biophysical inventories completed for the Regional Municipality of Haldimand-Norfolk and Oxford County formed the basis for official plan natural heritage policies, although natural heritage systems with proposed connecting links have not yet been developed. Although inventories have been done in the Counties of Kent, Elgin, Brant, these jurisdictions have no official plans or natural heritage systems, nor are they currently proposing to develop them.

### ***Official Plans***

All of the 38 Carolinian Canada sites have some form of local or regional planning designation with the exception of Catfish Creek Slope and Floodplain Forest (Elgin County), and the Six Nation Forest (Brant County), and Walpole Island Reserve Sites (Kent County) (Figure 2). Although not all designations are included within the natural heritage conservation policies of land use planning documents, some degree of protection is afforded under hazard land or agricultural designations and may be accompanied by flood and fill regulations or tree cutting by-laws.

### ***Environmentally Sensitive Areas (ESAs)***

Many municipalities, Conservation Authorities, and naturalist organizations have inventoried natural areas and evaluated the data against criteria for the designation of Environmentally Sensitive Areas (ESAs). No standard definition exists of what constitutes an ESA. Natural areas most often designated as ESAs are those representing special physical and biological features characteristic of an area (Riley and Mohr, 1994). A set of proposed criteria for the designation of ESAs were developed in the late 1970s at the University of Waterloo (Eagles, 1984). Twenty-five of the 38 sites are designated within municipal Official Plans as ESAs – or a similar type of designation (Figure 3).

### ***Natural Heritage Systems***

Natural heritage systems can consist of core conservation lands and waters; corridors; connecting links; or greenway strategies. Natural heritage strategies have

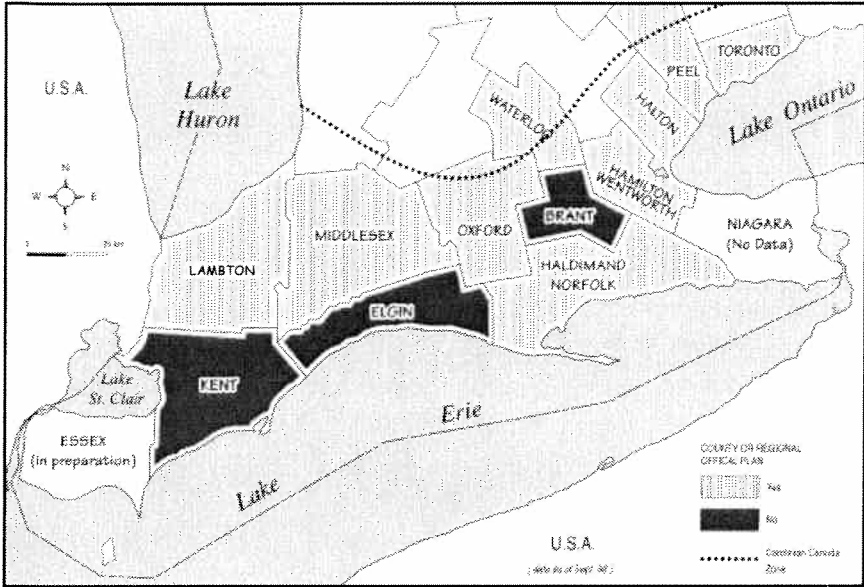


Figure 2: Status of County and Regional Official Plans

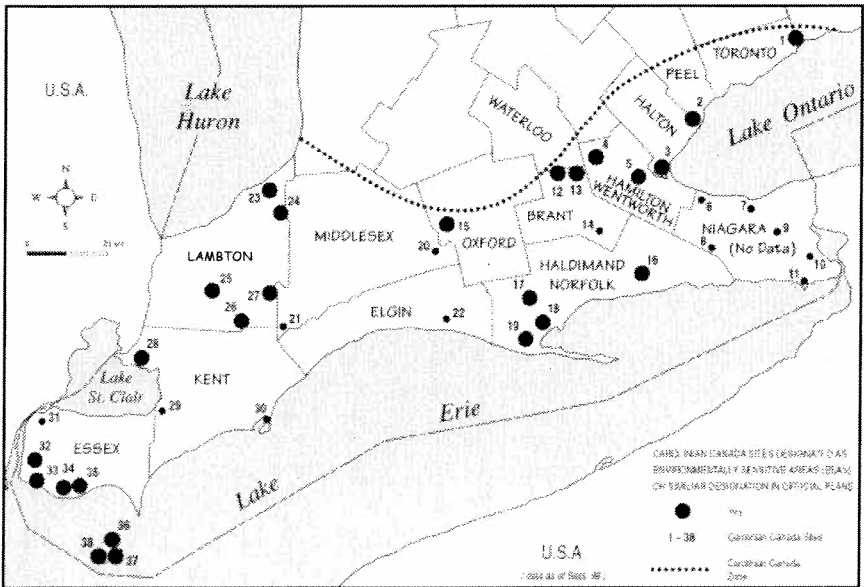


Figure 3: Carolinian sites with ESA or similar designation.

been developed for the Regional Municipalities of Halton, Hamilton-Wentworth, Peel, Haldimand-Norfolk (in preparation), and Waterloo; the Counties of Oxford and Essex (in preparation), Lambton, and Middlesex; and the Rouge River Valley (Figure 4). These municipalities can serve as a model to be followed by others, having made commitments to natural heritage inventories and databases, water-

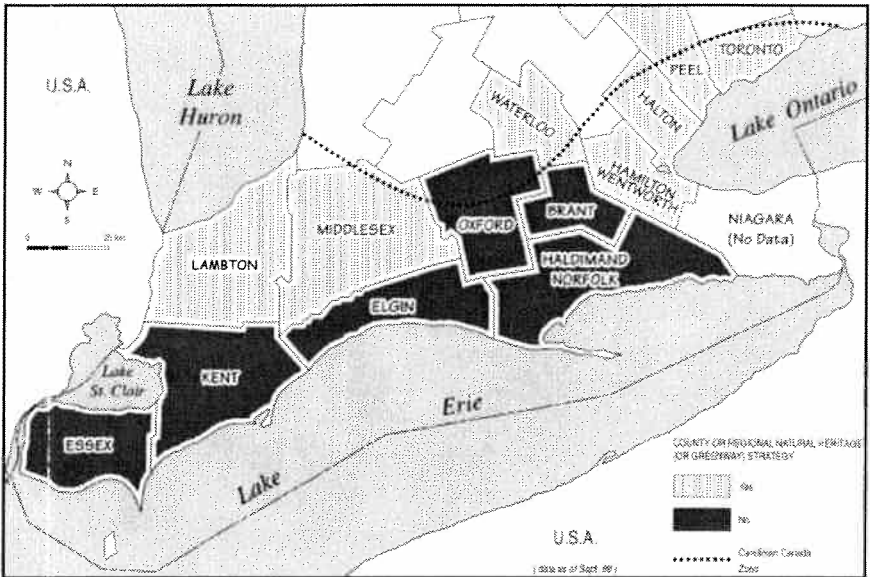


Figure 4: Status of County and Regional natural heritage strategies

shed studies, environmental impact assessment policies, and established environmental advisory committees.

From this study, a generalization can be made that those municipalities situated in highly developed, urbanized, and populated areas have a higher tax base from which to draw funds and resources for the development of more advanced land use planning and natural heritage conservation systems. These municipalities are also more likely to put more pressure on natural areas in their vicinity, thereby justifying the existence of a more advanced natural heritage planning arrangement.

### ***Provincially Significant Wetlands***

A provincial policy statement, which was issued under the previous government's review of the Planning Act in 1994, governs the classification, management, and protection of wetlands (Riley and Mohr, 1994). The Planning Act states that local governments "shall have regard to" the Provincial Wetlands Policy in developing land use programs, regulations and laws including Official Plans. This clause applies to most policies and programs presented in the sections that follow.

In the Carolinian Canada Zone, provincially significant and/or locally significant wetlands are afforded the highest degree of protection by those area municipalities having regional official plans. These wetlands are either included among core conservation lands and waters, or among corridor and linkage designations in regional natural heritage systems. Twelve of the 38 Carolinian Canada sites have been designated as Provincially Significant Wetlands (Figure 5).



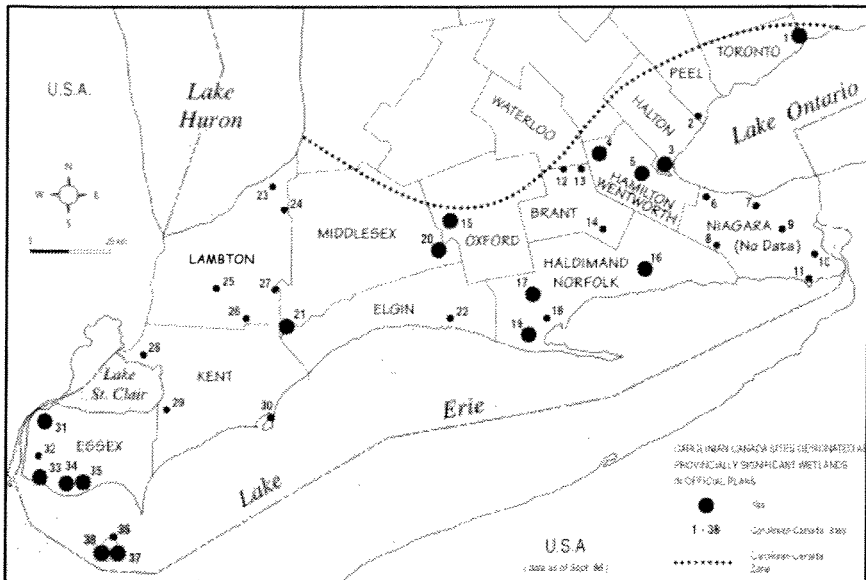


Figure 5: Carolina Canada sites designated as provincially significant wetlands in Official Plans

### ***Areas of Natural and Scientific Interest (ANSIs)***

Areas of Natural and Scientific Interest (ANSIs) are the product of an effort to conserve natural areas by the Parks and Natural Heritage Policy Branch of the Ontario Ministry of Natural Resources (OMNR) (Gonzalez, 1996). ANSIs are defined as areas of land and water containing natural landscapes or features which have been identified as having values related to protection, natural heritage appreciation, scientific study or education (Riley and Mohr, 1994).

The identification of ANSIs is based on the natural areas meeting a set of five selection criteria—representation, diversity, ecological functions, condition, and special features. Assessments are conducted by OMNR and are published in Life Science or Earth Science Site District Reports (Riley and Mohr, 1994; Gonzalez, 1996). Seventeen of the 38 Carolina Canada sites have been mapped and inventoried as Areas of Natural and Scientific Interest (ANSIs) by the Ontario Ministry of Natural Resources (Figure 6).

### ***Other Protection Arrangements***

A number of jurisdictions have additional approaches related to the protection of natural areas. These usually take the form of tree cutting bylaws, conservation statements, environmental impact statement policies, environmental advisory committees, natural heritage databases, or local conservation groups. The existence of these approaches implies a more advanced formal system for the identification, management, monitoring, and restoration of natural areas designated in official plans. These various approaches can also be key to the ability of area municipalities to move towards a landscape level approach to conservation and are evidence of established partnerships between government and the public.

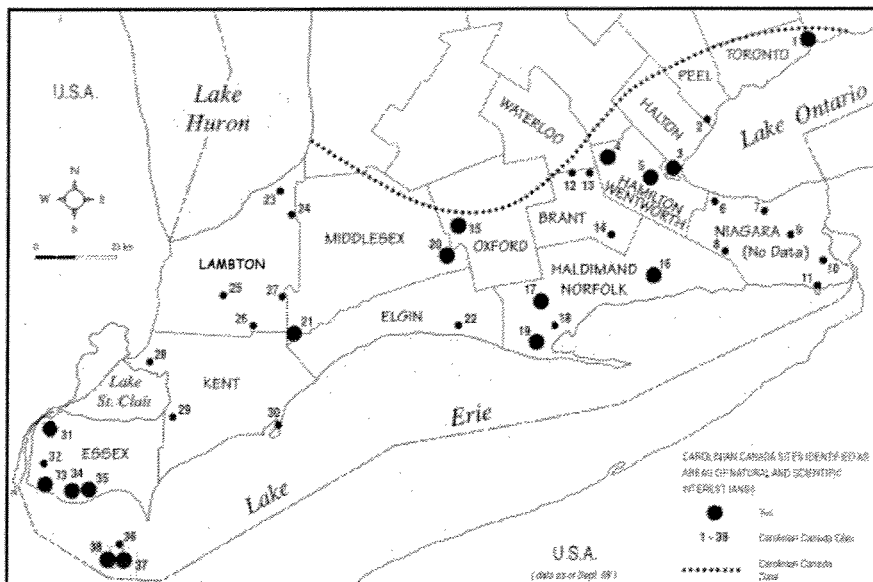


Figure 6: Carolinian Canada sites identifies as ANSIs

## Discussion

It is clear from the results of the analysis of institutional arrangements where the significant gaps lie in the natural heritage planning system in the Carolinian Canada Zone. The Counties of Brant, Kent, and Elgin represent major gaps. These counties pose gaps because their land use planning arrangements are weak in identifying the significant natural areas and features that exist within their jurisdiction and in developing natural heritage protection policies. These counties do not appear to have the planning and management resources in place to develop the programs needed to undertake a comprehensive natural area strategy. These areas will require the assistance of local naturalist groups and other non-government organizations in preparing for such an undertaking. At the county planning level, these areas need to examine the official plans of neighbouring municipalities in order to develop comparable efforts at natural area conservation and land use planning.

The results of this study also indicate which municipalities have developed comprehensive natural heritage planning systems. These municipalities are: the Regions of Halton; Peel; Haldimand-Norfolk; Hamilton-Wentworth; and Waterloo; and the Counties of Essex (in preparation); Lambton; Middlesex; and Oxford. The Rouge River Valley forms a special land use planning and conservation situation with an alliance of municipal planning jurisdictions. It should be noted that any system-wide planning done under the auspices of other planning agencies which cover multiple municipal jurisdictions in the Carolinian Canada Zone region, such as the Grand River Conservation Authority Watershed Plan and the Niagara Escarpment Plan, has not been included in this study. This project is intended only to cover and compare municipal planning arrangements for natural heritage protection.

What can be done in Carolinian Canada to bring all municipalities to a similar level of natural area conservation as a basis for landscape scale planning? Clearly, the identified gaps need to be addressed through close co-operation and communication with all municipalities. Independent, however, from action in the municipal planning arena, is necessary support from private landowners on whose lands many of the Carolinian Canada habitat is located.

Although a variety of land use planning institutions exist for the protection of natural heritage areas in Ontario, private land stewardship is increasingly seen as playing an important and complementary role in such an effort. With major changes in public policy and legislation occurring within the provincial government, the current planning system has clear limitations in ensuring the perpetuity of natural areas characteristic of the Carolinian Canada Zone. The current natural heritage conservation system in Ontario is also constrained by the allocation of fewer public resources directed towards protection of significant and threatened sites (Hilts and Reid, 1993). Undoubtedly, the fate of Carolinian Canada habitats in southwestern Ontario rests with a conservation strategy emphasizing increased connectivity and increased private stewardship

Since the Carolinian Canada program began in 1984, landowners have entered into agreements with land use agencies such as the Ontario Ministry of Natural Resources, Conservation Authorities, the Nature Conservancy of Canada, and the Natural Heritage League (NHL). Land stewardship agreements in Carolinian Canada form part of a larger project providing information and aims to encourage land care and assistance to landowners in protecting natural areas (Hilts, 1985). By 1990, 470 Carolinian Canada landowners were participating in the Natural Heritage Stewardship Program. They own approximately 5,400 hectares of significant natural area (Hilts and Moull, 1990).

## **Conclusions**

In the context of natural heritage planning within the Carolinian Canada Zone, a range of planning and management tools is required. The threat of expanding urbanization and associated land use pressures is altering the landscape in southwestern Ontario so that the continued long term existence of the fragmented and isolated protected natural heritage areas is uncertain. It has been necessary to examine the planning system and associated institutional arrangements for the protection of significant natural areas prior to considering a complex approach for natural connectivity planning in the Carolinian Canada Zone.

With regards to the institutional capabilities of municipalities to move towards a linked system of natural areas, the importance of co-operation and communication can not be over-emphasized. As seen by the results of this study, the current trend in municipal government is towards limited staff, funds, and lack of knowledge about how to proceed with such a venture. The gaps in planning arrangements have been identified as have the model jurisdictions whose expertise in this matter is invaluable. It is time for all area municipalities in the Carolinian Canada Zone to join together in order to assist with the important task of undertaking a landscape or regional natural heritage planning approach.

The results indicate a wide range of mechanisms used by planning agencies with considerable differences among municipalities within the Carolinian Canada Zone as well as varying degrees of effort and success. Generally urban municipalities with larger populations tend to have more advanced planning arrangements in place for conservation of natural areas with significant gaps in the application of these initiatives in the central portion of the Carolinian Canada Zone—Kent, Elgin and Brant Counties. A regional landscape planning approach for the Carolinian Canada Zone will require effective use of private stewardship—continuing and extending current and previous efforts in this regard—in addition to co-operation and communication among the various land use planning agencies and concerned private groups in order to develop more consistent conservation initiatives across the region. In this regard, the Carolinian Canada Committee, a joint collaborative effort of government agencies and private groups, is leading the way in developing a “Big Picture” approach for the Carolinian Canada area.

### Acknowledgements

Research conducted for this report was funded by Parks Canada, Ontario Region under the 1997/98 Memorandum of Understanding (MOU) with the Heritage Resources Centre at the University of Waterloo. The authors wish to thank Doug Van Hemessen, Ontario Ministry of Natural Resources and Bill Stephenson, Parks Canada for their assistance, suggestions and comments on this research. The results contained herein would not have been possible without the time and investment of conservationists and planners alike, who set time aside to respond to questions, participate in interviews, and assemble information.

### References

- Allen, G.M., P.F.J. Eagles, S.D. Price, eds. 1990. *Conserving Carolinian Canada*. Waterloo: University of Waterloo Press.
- Eagles, P.F.J. 1984. *The Planning and Management of Environmentally Sensitive Areas*. London: Longman.
- Eagles, P.F.J. and T. Beechey, eds. 1985. *Critical Unprotected Natural Areas in the Carolinian Life Zone of Canada*. Final Report. Ontario Ministry of Natural Resources, London, Ontario.
- Gonzalez, N. 1996. *A Citizen's Guide to Protecting Wetlands and Woodlands*. Federation of Ontario Naturalists, Don Mills.
- Government of Ontario. 1996. *Provincial Policy Statement*. Queens Printer for Ontario. Toronto, Ontario.
- Grumbine, R.E. 1994. What is ecosystem management? *Conservation Biology*. 8(1):27-38.
- Hilts, S.G. and T.C. Moull. 1990. The Natural Heritage Stewardship Program. In *Conserving Carolinian Canada*. G.M. Allen, P.F.J. Eagles and S.D. Price, eds. Waterloo: University of Waterloo Press, 49-54.
- Hilts, S.G. and R. Reid. 1993. *Creative Conservation: A Handbook for Ontario Land Trusts*. Federation of Ontario Naturalists, Don Mills.
- Ontario Ministry of Natural Resources. 1992. *A Natural Heritage Areas Strategy for Ontario*. Provincial Parks and Natural Heritage Policy Branch. Queens Printer for Ontario. Toronto, Ontario.
- Reid, R. 1985. Exploring Canada's Deep South. *Seasons*. 25(2)23-34.

- Reid, R., and R. Symmes. 1997. *Conservation Strategy for Carolinian Canada*. Unpublished.
- Riley, J.L. and P. Mohr. 1994. *The Natural Heritage of Southern Ontario's Settled Landscapes. A Review of Conservation and Restoration Ecology for Land-Use and Landscape Planning*. Queens Printer for Ontario. Toronto, Ontario.