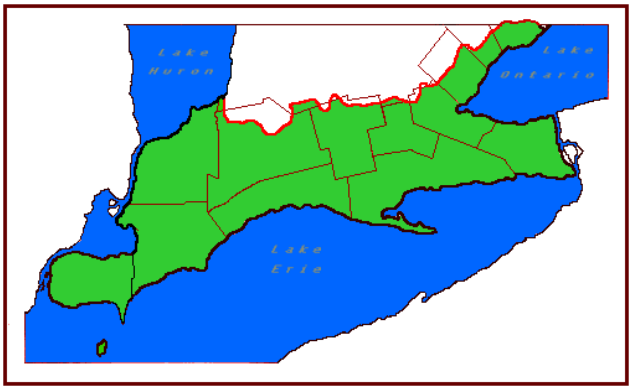
Practical Options for the Greening of Carolinian Canada



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SUMMARY

Carolinian Canada comprises one-quarter of one percent of the country's land mass, but is home to nearly one-quarter of Canada's population. Agricultural land occupies 73% of the region, and expanding urban centers and rural residential development covers much of the remainder.

The result has been a severe decline in the extent and integrity of natural landscapes, with greatly reduced forest cover, wetlands, and other vegetation, and the highest concentration of endangered species in the country. Overall, less than 15% of Carolinian Canada still has natural vegetation cover, with less than 5% in many urban or agricultural areas.

Some of the best remaining natural areas have been retained through public ownership, public policy or private stewardship, but in total, less than 5% of the landscape is currently protected by ownership or provincial policy. In the 1980s and 90s, the Carolinian Canada program carried out extensive landowner contact and land acquisition within 38 significant natural areas. However, habitats and species continue to be lost at an alarming rate.

In large part, these losses are related to the increasing fragmentation and isolation of remnant habitats, causing loss of species requiring large blocks of habitat. Carolinian Canada provides a textbook example of the effects of fragmentation on wildlife, with 14 animals and 25 plants already extirpated from the region, and many others on the brink.

The *Big Picture* project provides a framework to extend conservation planning beyond existing "islands of green," to highlight the importance of relatively large core habitats and of natural corridors linking together these cores. This interconnected landscape should be better able to maintain viable wildlife populations and perhaps even restore some species now missing. Many of Ontario's top conservation scientists were involved in the GIS-based analysis that produced the *Big Picture* mapping, which provides a scientific context and rationale for local conservation initiatives, and a source of information to coordinate future activities across jurisdictions.

To achieve the *Big Picture* vision, new incentives, new approaches, and new resources will be needed. This paper examines a broad spectrum of possible new tools, drawing from programs currently in place in Ontario and in other jurisdictions. None of these tools has any official sanction at this point, but they are presented to stimulate thinking and discussion about the best bets for future progress. Potential tools are presented within five broad categories.

A. Sharing the Vision

To be successful, the *Big Picture* vision needs to be broadly accepted by government agencies, landowners, and residents as a road map to ecological health. Embedding the vision into a range of plans, strategies, and actions will hasten that acceptance.

- **Recognize the distinctive nature and needs of Carolinian Canada in government policies and programs.** The Province with other partners could develop a major regional conservation strategy including land use policies, education, private land stewardship, incentives and land securement for all or parts of Carolinian Canada. Special recognition could be given through the Province's Smart Growth initiative. Alternatively, natural heritage policies under the *Planning Act* could be modified to provide different and stronger rules for this region. The Ministry of Natural Resources could also address the special needs of this region within its Natural Heritage Strategy for Southcentral Region.

- **Broaden the focus of protection and recovery activities from species at risk to restoration of landscapes supporting multiple rare species**. Some progress in this area is already evident in recovery plans underway for Pelee Island and the Sydenham River, as well as in such organizations as Tallgrass Ontario. The agencies involved in species conservation and recovery could identify other habitat themes, such as forest interiors, wetlands or coldwater streams, for recovery strategies involving multiple species.

- **Encourage the use of planning tools that address landscape- and watershed-level issues**, building on existing programs such as watershed planning, natural heritage strategies, and the Biosphere Reserve designations for the Niagara Escarpment and Long Point areas. For example, municipalities and conservation authorities have the mandate to develop watershed plans and comprehensive natural heritage strategies within their jurisdictions, which can do much to protect and restore habitat. Parks Canada and other agencies could further promote and implement greater ecosystem planning

concepts to provide links to existing protected areas, as well as develop a marine conservation area for Lake Erie. Programs to restore the Great Lakes, including the Lake Erie LaMP process and six Remedial Action Plans within Carolinian Canada, offer opportunities to restore habitats and biodiversity.

B. Strengthening Incentives for Conservation

Most of Carolinian Canada is in private hands, and sharing responsibility for the environment through economic incentives is a concept increasingly being adopted, both in Ontario and in other jurisdictions.

- **Broaden the application of water quality incentives, and link these more strongly to biodiversity restoration**, particularly through renewal and expansion of rural water quality programs which also restore vegetated corridors along streams.

- **Expand financial incentives to encourage retirement of targeted rural lands to conservation**, for example by establishing a conservation reserve program for private lands modeled after successful American programs. A Ducks Unlimited Canada proposal for a national Conservation Cover Incentive Program, which is currently under consideration, could be a major step forward. Increased provincial incentives to encourage tree planting and to promote sustainable forestry as an income source could also influence the management of private lands.

- **Make property tax incentive programs more effective**, by broadening the Conservation Lands Tax Incentive Program to include other categories of natural lands, and by modifying the Managed Forests Tax Incentive Program to encourage forest creation and greater landowner participation and to better incorporate conservation objectives. The Farm Land Taxation Program could be revised to offer a further incentive to farmers to retain natural habitats. A comprehensive review to improve how the Conservation Lands, Managed Forests, and Farmland tax incentive programs interact is also needed.

- **Provide incentives to support First Nations in their protection of conservation lands**, through discussions about potential voluntary partnerships and ways to support compatible economic activities such as ecotourism.

C. Informing and Educating for Conservation and Restoration

To build a broad consensus about conservation priorities, it is necessary to inform rural landowners, urban residents, adults and children.

- **Upgrade, simplify and expand educational materials and technical advice for rural landowners**, through renewed private land stewardship programs provided by Stewardship Councils, conservation authorities and others, and by improving conservation information and financial support in programs of farm organizations, particularly the Environmental Farm Plan program.

- **Raise awareness of urban residents of the need for conservation and restoration of Carolinian ecosystems**, through distribution of educational materials for schools and through community-based naturalization and conservation projects.

D. Funding Land Securement and Restoration

Achieving the *Big Picture* vision requires a long-term investment in securing and restoring key parts of the landscape.

- **Expand the existing protected areas system** by using the Big Picture strategy to help establish land securement priorities and by acting on opportunities such as St. Williams Forest.

  Establish financial commitments by public agencies to support land securement and restoration, similar to the extensive federal and state funding programs currently in place in the United States. For example, the Canadian and Ontario governments could dedicate selected revenue sources to future land securement, either through special allocations similar to the Great Lakes Sustainability Fund or the Ontario Living Legacy Trust, or through dedication of a particular revenue source, such as a portion of the Land Transfer Tax. A charitable Carolinian Recovery Trust could also be created to develop funding resources for recovery and restoration projects.

- **Use the power of public-private partnerships to fuel land securement and restoration projects**, matching government programs and funding with volunteer involvement and private donations to complete cooperative projects.

- **Improve tax incentives to encourage full or partial donations of environmentally significant lands**, building on recent progress in the federal Ecogifts program to consider provisions to allow bargain sales or to reduce capital gains taxes for land sold to conservation organizations.

E. The Role of Land Use Planning and Management

Most of the planning controls affecting private land are implemented through the Official Plans and zoning bylaws of municipalities, but within overall policy direction provided by the Provincial Policy Statement and related guidelines.

- **Strengthen the Provincial Policy Statement and implementation to require protection of key natural features, encourage restoration and promote sound water management.** This could include changes to broaden application of "no development" policies to the full range of natural heritage features, adding a requirement for natural heritage system concepts and restoration policies, providing better guidance on water resource protection and strengthening the wording to ensure consistency in Official Plans. Limits could be placed on issues going to Ontario Municipal Board hearings and on OMB changes to municipal decisions.

- **Promote naturalization and increase tree cover in urban areas** by developing town and city forestry programs and enhancing urban naturalization partnerships.

$ **Encourage municipalities to make better use of existing planning and regulatory tools,** particularly by going beyond Provincial policy to incorporate natural heritage systems based on the *Big Picture* concept within their Official Plans. More effective controls on tree cutting could also be implemented through improved tree bylaws or regulation of forestry contractors.

$ **Update the regulatory role of conservation authorities,** through enactment of a proposed generic regulation approach for new flood, fill and alteration to waterways regulations.

What Next?

No single tool is going to ensure the *Big Picture* vision becomes a reality over the next several generations. Rather, a package of "carrots and sticks" is needed, drawing from the possibilities outlined in this report and involving all levels of government and non-government organizations.

At the national level, particular emphasis in the short term should be given to:

- Improvements in tax policy on full and partial land donations;
- Renewed financial support for Environmental Farm Plans and their implementation;
- A new conservation cover incentive program;
- A marine conservation area for Lake Erie;
- Progress on Lakewide Management Plans;
- A multi-species approach to species at risk.

At the provincial level, short term priorities include:

- Improvements to property tax incentive programs;
- Renewed support for rural water quality incentives and tree-planting programs;
- Improvements to the Provincial Policy Statement and its implementation;
- Strengthened conservation authority regulations and watershed planning;
- Coordination through a revised Southcentral Natural Heritage Strategy;
- Long-term investment in protection and restoration of natural areas.

At the local level, communities can:

- Develop natural heritage strategies, watershed plans and municipal policies
- Develop rural water quality programs
- Naturalize parkland, school yards and back yards in cities and towns
- Enact tree-cutting by-laws and / or forestry contractor regulation by-laws
- Secure and restore local Carolinian habitats

At the Carolinian Canada ecoregion level, the most promising option is the development of a regional conservation strategy for Carolinian Canada, perhaps through an advisory panel appointed by the Province using a similar process as the Oak Ridges Moraine.

1.0 Carolinian Canada - A Special But Threatened Landscape

In the context of Canada's land mass, the area from Toronto to Grand Bend southwards seems almost incidental - a mere quarter of one percent of the country's span. But this tiny region known as Carolinian Canada, tucked into the southward thrust of the Great Lakes, is both Canada's richest and most endangered ecosystem.

Why so rich? In part, the diversity of species and natural communities in Carolinian Canada is a reflection of its southerly latitude - its climate shares more with the "hot continental" regions of the adjacent central U.S. than the "warm continental" conditions that characterize most of southern and central Ontario. The moderating influence of Lakes Ontario, Erie and Huron which bound the region also plays a part, contributing to the longest growing season in the province. Much of the Carolinian region has a glacial legacy of deep rich soils, but there is also a diversity of shallow limestone plains, dolostone cliffs, and Great Lakes shoreline features which support specialized habitats. This region hosts the world's largest freshwater delta in Lake St. Clair, extensive dune and wetland complexes along the Lake Erie shore, and the natural wonder of Niagara Falls and its associated gorge.

But this is a region rich in human activity as well. Almost 7 million people, nearly a quarter of Canada's population, live and work here. Nearly all of Carolinian Canada east of the Niagara Escarpment has been urbanized or is under serious urban pressure, and other large urban centres have developed around Brantford, Cambridge, London, and Windsor. Seventy-three percent of the region is highly productive agricultural land, and farming is becoming increasingly intensive, particularly in the western sections of the region. Less productive areas, such as the Niagara Escarpment, are highly desired for rural residential development, especially those within reach of urban centres. A rapid shift in countryside demographics is underway, with fewer farm families, and significantly greater numbers of rural non-farm residents.

Changes resulting from this human activity have been described in several earlier studies (Jalava et al., 2000; Reid and Symmes, 1997). Not surprisingly, one result has been a severe decline in the extent and integrity of natural landscapes:

- Historically, 80% of the Carolinian region was covered with vast tracts of Maple, Ash, Elm, Oak and Pine forests, mostly in old-growth condition. Forest cover has now been reduced to 11%, with almost no old-growth, and with the remnant forests concentrated in areas where agricultural and urban pressures are less intense. And unlike most other parts of southern Ontario, forest cover in recent years has continued to decline in many areas.

- Wetlands have declined from an original 28% of the landscape to only 5%, and most of the remaining wetlands are being impacted by heavy loads of sediments and associated pollutants from upstream areas.

- Patches of savanna and prairie have been severely reduced in extent, while other specialized communities such as dunes, alvars, cliffs, bogs and prairie fens have always been rare. At this point, Carolinian Canada sustains at least 18 globally rare and 42 provincially rare vegetation communities.

- The region has the highest concentration of endangered species in the country, with over 400 plant and animal species classed as provincially rare, and many of these also nationally endangered or threatened.

- Most watercourses have been affected by agricultural or urban drainage, dams, channelization, and high loads of sediments, nutrients, and other pollutants, resulting in a high number of imperiled freshwater species.

Overall, less than 15% of Carolinian Canada's area still has "natural" cover, but most of these natural areas are highly disturbed, fragmented, and isolated. In the urban cores and the most intensive farming areas, natural cover of less than 5% is characteristic.

Earlier Conservation Efforts

Some of the best remaining natural areas within Carolinian Canada have been retained as a result of public ownership, public policy or good stewardship. However, the extent of these areas is very limited:

- Approximately 2% of the region's land area is protected through public ownership as national or provincial parks, wildlife areas, and conservation areas.
- High-quality examples of characteristic landform-vegetation patterns have been identified as Areas of Natural and Scientific Interest (ANSIs) and partially protected through planning policies; these areas occupy about 2.5% of the region.
- Most of the larger wetlands in Carolinian Canada have been evaluated and receive policy protection, comprising about 2.1% of the region; some agencies are also attempting to protect unevaluated wetlands.
- Natural areas along the Niagara Escarpment are protected through policies of the Niagara Escarpment Plan, and through an ongoing acquisition program.
- Several very significant natural areas are located on First Nation lands and have been retained by the traditional management practices on these lands; First Nation lands comprise about 2% of the region.

In the early 1980s, 38 of the most significant Carolinian sites on private land were identified to provide a focus for conservation action and stewardship (Eagles and Beechey, 1985). While these Carolinian Canada sites cover about 2.7% of the region, they generally overlap with ANSIs and wetlands. The other categories listed above also overlap to a large degree, suggesting that in total less than 5% of Carolinian Canada is currently protected as natural landscapes.

The initial $3.6 million Carolinian Canada program combined the expertise and resources of a coalition of environmental non-government organizations and government agencies to protect key sites through education, private land stewardship, research and acquisition. Through innovative landowner contact programs, over 6000 ha of the 38 sites were conserved through agreements with landowners. Roughly 800 ha were acquired for the region's protected areas. Educational projects, publications, natural areas inventories, and species-at-risk research made significant contributions as well (Allen et al. 1990).

After more than a decade of successful projects, a program review (Reid and Symmes, 1997) concluded that despite this progress, the landscape as a whole continued to lose natural habitats and species at an alarming rate. The partners within Carolinian Canada determined to develop a bioregional conservation strategy that could provide a framework to restore a functional natural heritage system.

2.0 Using Conservation Science as a Framework for the Future

For many years, conservation effort in Carolinian Canada, as in most regions, was oriented to the protection of remnant landscape fragments - "islands of green." But over the past two decades, conservationists have increasingly come to realize that by themselves these islands of habitat cannot sustain the full suite of native species in a region. As natural habitats are fragmented into smaller and smaller pieces, and become more and more isolated from each other, species requiring large blocks of habitat gradually die out. This pattern has been well documented for forest interior species (Burke and Nol, 1998; Wilcox and Murphy, 1985), and appears to hold true for marshlands and grasslands as well.

Carolinian Canada provides a textbook case on the effects of habitat fragmentation on wildlife species. At least 14 animals and 25 plants have been extirpated from the region, and as noted above, many other species are approaching the brink. A quarter of the region's mammal species no longer occur, including half of the large mammalian carnivores (Jalava et al., 2000). Even within the strictly protected habitats of Point Pelee National Park, 9 species of amphibians and reptiles have

been lost, compared to a total of 29 species remaining in the larger habitats at Long Point (Zammit, 1996).

The fundamental objective of The *Big Picture* project was to address these concerns, and to extend conservation planning beyond existing "islands of green." This approach recognizes that a single-species approach to conservation, addressing each endangered species individually, is too costly and impractical for this region. It highlights the importance of relatively large core areas, where viable populations of interior species can be sustained. And it endorses the concept that restoring natural corridors to link together core areas can be a valuable conservation technique.

The *Big Picture* approach is based on an understanding that natural areas function best as part of an inter-connected system. This network of green results in a whole that is greater than the sum of its parts - a connected landscape that should be able to maintain viable populations of species that would be doomed in isolated habitat patches, and perhaps even provide conditions for the re-colonization of some species now missing.

Creating the *Big Picture* involved the input of many of Ontario's top conservation scientists, and the sophistication of a multi-layered Geographic Information System (GIS) analysis carried out at the Natural Heritage Information Centre. A series of principles guided the development of the project, such as favouring large intact natural areas as cores, and identifying for protection all viable occurrences of globally rare species and communities. Broad targets were also established, such as a science-based planning goal of significantly increasing the extent of natural cover in each ecodistrict to support the full suite of plants and animals native to the region (Jalava et al., 2000).

The process began by identifying core areas of at least 200 hectares wherever possible, and smaller significant woodlands for townships with extremely low forest cover. A series of additional values was added to help map "least-cost" connections among the cores through corridors with a minimum width of 200 metres. The resulting map - Figure 1, the *Big Picture* - provides an overall goal for conservation and restoration within Carolinian Canada. It provides a scientific context and rationale for local conservation initiatives, and a source of information to coordinate future activities across jurisdictions.

From Vision to Reality

A glance at the map of cores and corridors quickly shows that a substantial increase in the size and quality of natural areas in Carolinian Canada will be needed to achieve this vision of the future. It is equally clear that the existing set of tools available to promote conservation will not be sufficient. In a landscape where the demands of ever-growing populations and industry dominate decision-making, conservation needs have not been able to compete. New incentives, new approaches, and new resources will be needed.

That's the purpose of this paper - to examine a broad spectrum of possible new tools that could be added to the conservation toolkit with the aim of making the *Big Picture* a reality. Some are short-term; others might not be feasible for a decade or more. Some build on programs or initiatives now underway in Ontario; others draw from jurisdictions across the world. Some would not require new spending; others require some new investment. The advice and input of many people in various fields are gratefully acknowledged, but none of these potential tools have any official sanction at this point, from the Carolinian Canada Coalition or anyone else.

But all are intended to stimulate thinking and discussion about the best bets for future progress. Think of this as a shopping list of potential opportunities - which ones should be at the top of the list?

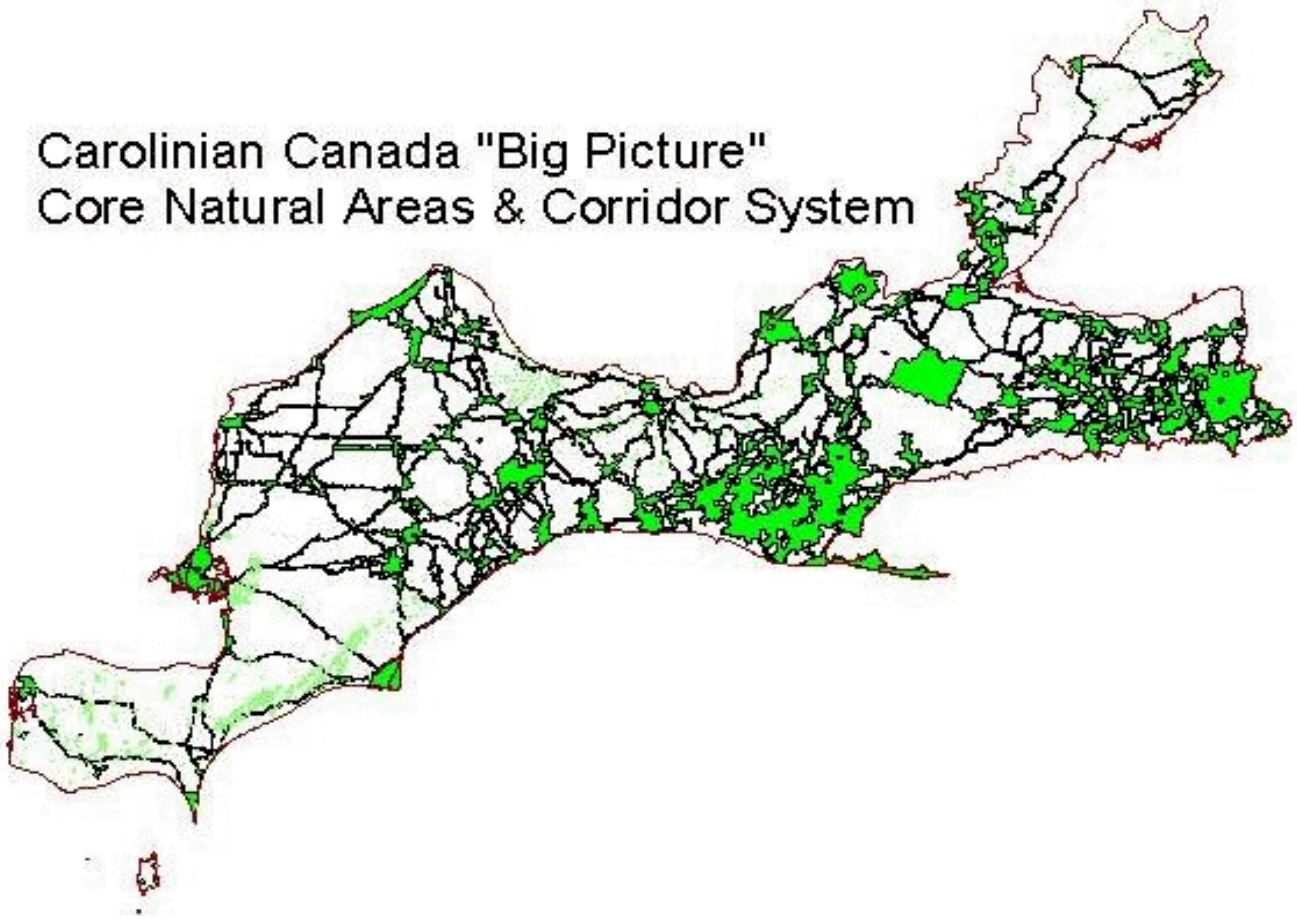

Figure 1. "Big Picture" Core Natural Areas and Corridors

3.0 Sharing the Vision

The *Big Picture* vision for a healthy and sustainable Carolinian Canada will become real only if it is shared - by government agencies at all levels; by landowners and land managers; and by the people who live here. In a sense, we are asking groups and individuals to "Think regionally, Act locally" in their daily decisions.

Informing the residents of Carolinian Canada about the *Big Picture* vision – in schools, community groups, even one-on-one – is an essential component of this communication. But that education process can be hastened if the vision is also embedded in a wide range of plans, strategies, and actions that influence how the land base is used in the future. Encouraging agencies to include *Big Picture* thinking in their own agendas, and to work in partnerships towards coordinated actions, will do much to advance the vision as quickly as possible.

Recognize The Distinctive Needs of Carolinian Canada

While the Carolinian Canada program has done an excellent job of increasing recognition of the concentration of threatened species and habitats in this area, and of the intensity of the threats to their future, this recognition has not yet been adopted formally in government policies or programs.

In other jurisdictions, it is not uncommon to provide special designations for ecologically important and threatened landscapes, as a basis for joint planning, regulations, or incentives. The New Jersey Pine Barrens, for example, an oasis of rare species covering over 1 million acres, has been the subject of special federal and state designation since 1979, and now has a comprehensive management plan and a land use Commission to protect its biodiversity (see webpage **http://www.state.nj.us/pinelands/**). In England, 22 Environmentally Sensitive Areas are identified on over 1.1 million ha of mostly private lands, where farmers can enter into voluntary agreements for annual payments for conservation activities (England Rural Development Programme, 2000). France uses a similar designation to target agri-environmental programs in sensitive natural landscapes such as the Pyrenees (DGVI Commission, 1998).

A Carolinian Canada Regional Conservation Strategy

The Ontario Government could develop a regional conservation and land use strategy for all or parts of Carolinian Canada.

Where land use conflicts threaten special ecological and scenic values, the Province has acted in the past to protect those values. One long-standing example of this Provincial action is the Niagara Escarpment (which overlaps with a section of Carolinian Canada), where a special land use plan and a Provincially-appointed Commission with powers to control development have been established. Within the past year, the Province has also passed legislation to protect the Oak Ridges Moraine, along with a land use plan for that sensitive area (Ontario, 2001c). The Ministry of Natural Resources has also initiated integrated planning for a mix of public and private lands along the Great Lakes Heritage Coast, in recognition of the special values and threats within that landscape feature (Chudleigh, 2001). Indeed, the first Carolinian Canada program was a form of a regional conservation strategy sponsored by the province.

In each of these cases, a mix of strategies was used – both "carrots" and "sticks." Land use controls are in place in the Niagara Escarpment and Oak Ridges Moraine. In both those areas a program of education, private land stewardship, research and incentives are also in place.

The $28 million Niagara Escarpment Land Acquisition and Stewardship Program funded acquisition, stewardship, public education projects for 12 years. The proposed $15+ million Oak Ridges Moraine Foundation will do the same. Natural areas under each plan are, or will be, recognized under the Conservation Land Tax Incentive Program (CLTIP). The Great Lakes Heritage Coast proposals also offer "educational stewardship services and incentives to encourage landowners to protect habitats and ecological functions" (Chudleigh 2000).

In theory, the Ontario Government could also introduce new Provincial land use controls across the entire span of Carolinian Canada, either through new legislation or by using its authority under such existing legislation as the *Ontario Planning and Development Act*. In practice, however, this step appears unlikely and perhaps even counter-productive. Another option would be for the Province to modify its natural heritage policies under the *Planning Act* to provide different and stronger rules for the Carolinian Canada region, in the same way that those policies now differentiate between Canadian Shield and off-Shield regions. Strongly encouraging municipalities and conservation authorities to develop inter-linking regional natural heritage strategies would be yet another approach.

A new provincial partnership strategy, encompassing land use policies, public education, private land stewardship, incentives and land securement, could be well suited to the Carolinian zone. Such a program could even be concentrated in some sections of Carolinian Canada with particular potential or special needs, based on low forest cover, poor water quality and the *Big Picture* analysis. So, for example, a program of policies, education, stewardship and incentives might be tailored to assist conservation of existing natural areas and restoring riparian and other ecological corridors in areas with forest cover of less than 10% or with the most degraded watercourses. A similar approach is taken in the U.S. Environmental Quality Incentives Program (EQIP) where funding is directed primarily to watersheds with poor water quality (Vysatova and Greenberg, 2000).

Special Consideration through the Smart Growth Initiative

The Ontario Government could provide special recognition of Carolinian Canada through its Smart Growth initiative.

During 2001, the Government of Ontario undertook consultations on a made-in-Ontario strategy for Smart Growth - a concept that involves managing growth to achieve a strong economy, strong communities, and a healthy environment (Ontario, 2001a). Subsequently, the Province has proposed to establish five regionally-based Smart Growth management councils--three now set up, with a mandate to develop integrated management plans, including strategies to protect significant natural systems (Ontario, 2001b). These plans could include strategies for defined sub-regions. As the Smart Growth management councils and plans emerge, this integrated approach to regional issues could provide an excellent opportunity to boost the formal level of recognition for the Carolinian Canada area and the *Big Picture* concept.

Southcentral Region Natural Heritage Strategy

The Ministry of Natural Resources could address the special needs of Carolinian Canada within its Natural Heritage Strategy for Southcentral Region.

In March of 2001, MNR produced a draft version of a natural heritage strategy to guide its future activities in the broad region south of the French River corridor (OMNR, 2001a). This document seeks to clarify and integrate the Ministry's role in Southcentral Ontario, and refers to such tools as Integrated Landscape Planning & Natural Heritage Systems, and Regional Conservation Plans. While the draft document includes many valuable concepts, such as viewing protection and conservation of natural heritage features and areas as part of a larger natural landscape, it does not recognize the differing characteristics and needs among the three broad site regions (5E, 6E, 7E) included under the Strategy.

Doing so would greatly strengthen the usefulness of the Natural Heritage Strategy, and would provide an opportunity to examine more closely the special role that MNR could play in promoting the *Big Picture* concept for Carolinian Canada. For example, proposing a Regional Conservation Plan for the Carolinian zone (7E) could provide a useful framework to coordinate MNR efforts to conserve the region's ecosystems.

Multi-Species Approaches to Species-at-Risk Recovery

In the past, conservation activities have often focused on one species at a time. For example, recovery plans for endangered species typically relate to a single species. Carolinian Canada, however, contains a large number of species at risk, concentrated into relatively small remnant fragments of natural habitat. In this part of the province at least, a more integrated approach to focus on endangered habitat types and their associated species could be more efficient and more beneficial. Such an approach would almost certainly highlight the importance of the core areas and corridors identified through the *Big Picture* project.

Some progress towards a more integrated approach is already evident. The Canadian Wildlife Service is sponsoring a broad-scale recovery plan for Pelee Island, which is home to more than 20 nationally listed plant and animal species at risk. On the Sydenham River, which hosts an exceptional concentration of native mussels and other aquatic species at risk, a joint federal-provincial program has developed a recovery strategy based on an ecosystem approach, which seeks to address the cumulative effects of many interacting stresses (see EBR Registry Number PB02E6002).

Perhaps the best example of integrated recovery work is Tallgrass Ontario, an organization devoted to conserving and restoring prairie and savanna communities, which mostly occurred in the Carolinian Canada region, and which have an abundance of associated rare species. This organization, which hosts forums and educational events and carries out landowner contact, is sponsored by MNR and several private foundations. On a broader scale, the Great Lakes Wetlands Conservation Action Plan, coordinated by Environment Canada but involving many organizations, provides a focus on coastal wetland areas.

Recovery Strategies for Multiple Species

MNR, CWS and other organizations involved in species conservation and recovery could identify other themes for recovery strategies to involve multiple species.

Beyond the work already underway, this kind of integrated approach may be well suited to such critically endangered Carolinian habitats as forest interiors, wetlands and coldwater stream habitats.

Landscape- and Watershed-Level Planning Tools

Most planning processes focus primarily at the site level, or on relatively small areas of land. The *Big Picture* process recognized the need to look beyond small isolated “islands of green” to an interconnected system of terrestrial and aquatic habitats. That same message needs to be repeated, wherever possible, in various planning approaches that will gradually influence the way that agencies and landowners view the landscape.

A true ecosystem approach is needed, integrating terrestrial habitat planning and aquatic, watershed and water quality approaches. Watershed planning and natural heritage systems or greenlands planning efforts take this integrated ecological approach. These approaches are similar and complementary in how natural area conservation is addressed.

Watershed and subwatershed planning in their comprehensive approaches generally address the creation of an interlinked natural areas system and also link terrestrial and aquatic ecosystem management (Ministry of the Environment and Energy and Ministry of Natural Resources. 1993a, b, c). In 1997, voluntary implementation of watershed planning was recommended by the Watershed Planning Implementation Project Management Committee (1997). But times have changed--and the post-Walkerton, post-Val Gibbons report, Smart Growth era policy environment may be more favourable to broader implementation of watershed planning.

The "Managing the Environment" report (Val Gibbons) stressed the need for watershed and other "place-based" approaches. The new Oak Ridges Moraine Conservation Plan will require watershed planning. The Walkerton Inquiry Part II report may also have some ideas regarding watershed planning (see for example Conservation Ontario 2001).

Natural heritage system planning or greenlands planning (Riley and Mohr 1994; OMNR, 1999) adopts a similar comprehensive approach to natural systems but focuses more particularly on natural heritage features and functions.

Another example of this kind of thinking is the Man and Biosphere program, sponsored by UNESCO, which emphasizes a tiered approach with sensitive natural areas protected in reserves, surrounded by a gradation to more active human-use areas. Biosphere Reserves are currently in place on the Niagara Escarpment and the Long Point basin. Other recent planning exercises, such as the Lake Ontario Greenway Strategy, also promote recognition of the importance of natural connections, and natural processes such as sand transported along lakeshores by wave action.

A Lake Erie Marine Conservation Area & Greater Park Ecosystem Planning

Parks Canada and other agencies could further promote and implement greater ecosystem planning concepts and a marine conservation area for Lake Erie.

Parks Canada has been among the first to recognize the vulnerability of relatively small National Parks such as Point Pelee to the ecological effects of habitat isolation. As a result, studies have been carried out on the "greater ecosystem" beyond the park boundaries, along with discussions on how this federal agency could influence land use patterns in a positive way and promote improved habitat connections. For example, restoring a connection over time between the marshlands of Point Pelee and those of Hillman Marsh just a few kilometres away would yield many ecological benefits. The same kind of "thinking beyond the boundaries" could be encouraged for National Wildlife Areas (such as Long Point and St. Clair), provincial parks, and conservation areas with significant habitats. These areas form many of the core natural areas identified in the *Big Picture*.

The ecological importance of the Great Lakes waters, islands, and shorelines is well-established, but to date only Lake Superior is well-advanced in establishing a marine conservation area. Parks Canada is committed to identifying and establishing similar reserves in all five Great Lakes. A marine conservation reserve in the western basin of Lake Erie, for example, would recognize that area's high levels of aquatic productivity, diverse shorelines, and islands with many rare species and communities.

Great Lakes Programs

Binational and federal-provincial programs to restore the Great Lakes offer opportunities to restore habitats and biodiversity.

Binational Lakewide Management Plans (LaMPs) are well underway for both Lake Ontario and Lake Erie (Lake Erie LaMP, 2000, 2002; Lake Ontario LaMP, 2000, 2001). These plans are oriented towards restoring any beneficial use impairments (such as water quality and healthy fish communities in the lakes). They are based on an ecosystem approach, and also consider habitat conditions and needs within the tributary watersheds. For example, a modeling exercise for the Lake Erie LaMP determined that land use has a major impact on the lake ecosystem (Colavechhia et al., 2001). A recent report for the Canadian watershed of Lake Ontario (Reid, 2001) documents habitat status and trends in that area. The LaMP processes for Lake Erie and Lake Ontario, as well as a future binational process for Lake Huron, provide important opportunities to incorporate the *Big Picture* results into a set of strategic plans that will guide government priorities for some time to come.

Remedial Action Plans (RAPs) also work to restore beneficial use impairments within the six Areas of Concern within Carolinian Canada - St. Clair River, Detroit River, Wheatley Harbour, Niagara River, Hamilton Harbour, and Toronto. RAPs typically consider water quality and habitat issues within the immediate watersheds feeding into each Area of Concern, and provide a focal point for federal funding for restoration activities. Habitat targets relating to riparian buffers, upland and wetland habitats are often included as delisting criteria for these AOCs, and RAPs encourage habitat restoration through natural heritage strategies and watershed report cards (North-South Environmental, 2001; website http://www.on.ec.gc.ca/glimr/raps/Ontario)

Conservation Ontario is also promoting a Healthy Great Lakes program which would support habitat restoration and other projects along the Great Lakes shore outside of these RAP sites.

Inter-Linking Municipal Natural Heritage Strategies

Municipalities and conservation authorities have the mandate to develop comprehensive natural heritage strategies within their jurisdictions.

In recent years, some Counties and Regions have been moving from the traditional approach of identifying isolated Environmentally Sensitive Areas in their Official Plans to the development of interconnected natural heritage systems (Community Development Group Ltd., 1999). While progress has been uneven, municipalities such as Hamilton-Wentworth have led the way. Conservation authorities also participate strongly in this area, producing such plans as the Essex Region Biodiversity Strategy. Conservation authority watershed plans and sub-watershed plans usually include development of local natural heritage systems (MOEE and MNR 1993a, b, c).

Recent initiatives such as the Middlesex County Natural Heritage Study are cooperative projects between the municipality and its corresponding conservation authorities (see webpage **http://www.thamesriver.org/MNHS/MNHS.htm**). These strategies have the potential to use the results of the *Big Picture* project directly, together with local information and priorities. If all municipalities and conservation authorities completed inter-linking natural heritage strategies, together these would provide a region-wide system. Carolinian Canada's *Big Picture* data would provide a useful starting point for these regional strategies.

In many municipalities, development proposed within an environmentally sensitive area requires Development Assessment Reports or Environmental Impact Studies to determine what conditions are necessary to protect natural features and functions. In most cases, the guidelines which direct these studies require information and analysis only at the site specific level. These guidelines could be modified to require the consideration of landscape-level effects of development as well, particularly effects on natural cores and connectivity.

Pilot Restoration Projects

Pilot restoration strategies could take components of *Big Picture* results into implementation steps.

The *Big Picture* provides a framework for conservation activities in Carolinian Canada, but more detailed strategies are essential to protect and restore individual core areas and corridors. A few projects of this kind of implementation strategies are underway, which could serve as examples elsewhere in the region. Within the Long Point Conservation Authority watershed, efforts are underway to re-establish connections among remaining blocks of woodland. The Thames Talbot Land Trust, in cooperation with the City of London and the Upper Thames Conservation Authority, has recently undertaken detailed planning of the Dingman Creek corridor south of London, which would provide a natural corridor linking Komoka Provincial Park and Dorchester Swamp. The large-scale wetland restoration at Lake St. Clair wetlands, under the Eastern Habitat Joint Venture, is one of the largest efforts of its kind in the region.

4.0 Strengthening Incentives for Conservation

The vast majority of the Carolinian landscape is in private hands, supporting an intensive mix of agriculture, rural residential, and urban uses. The ideas and actions of private landowners and industries are critical elements in the stewardship and restoration of ecological quality in the region.

Many economists are calling for ways to ensure the marketplace rewards good environmental practices and that costs of environmental damage are considered. The real economic contribution of "ecological services" to our economy is now being recognized, whether for water quality, energy use reduction, recreation, or other functions. Our

taxation system and the marketplace should be structured to encourage activities that enhance the environment. Many jurisdictions are now creating incentives and removing disincentives to good environmental practices.

The importance of shared responsibility for the environment, rather than governments bearing all responsibility, is being increasingly recognized. For example, the recent "Managing the Environment" (Val Gibbons) report examining future directions for the Ontario government's environmental policies (Executive Resource Group, 2001) notes that: "the current leading thinking is that our complex environmental problems require more collective solutions including broader participation, changes in behaviour, and cooperation among all stakeholders and across jurisdictions." This report recommended a "place-based" approach to environmental management, which recognizes that the natural environment has its own ecological and biophysical boundaries, and emphasizes geographic convergences of water, land, and air, particularly within watersheds. It also concluded that: "Economic instruments also have an important place in the compliance tool kit. Many jurisdictions in the U.S. and Europe have gone beyond the pilot or experimentation stage in using economic instruments to increase environmental compliance."

Examples of such economic incentives include the agri-environmental programs in the European Union, which pay income losses and costs for participating farmers, and now cover 900,000 farms, about 20% of all EU farmland. Nature protection measures and maintenance of landscapes associated with these programs have been evaluated as highly positive (DGVI Commission, 1998).

Ontario has some incentives in place, but could strengthen their effectiveness. A number of new incentives have been proposed that have considerable merit and have been successful elsewhere.

Broaden Rural Water Quality Incentives

The significance of degraded water quality within Ontario's rural landscape has been highlighted by the tragic events in Walkerton and the subsequent public inquiry. Restoration of water quality in agricultural areas has received considerable attention as a focus for effective incentive programs. A recent paper commissioned by the Walkerton Inquiry (Johns, 2001) concludes that: "Of the instrument strategies compared, voluntary, cost-share, subsidy-based instruments are the most effective policy regimes" for agricultural pollution prevention.

Similarly, a background study commissioned in association with the Gibbons report concluded that: "numerous applications in the U.S. have demonstrated the potential of economic instruments to manage watershed pollutant concerns, including agricultural waste" (International Institute for Sustainable Development, 2000).

In many instances, the kinds of actions taken to improve rural water quality - creating vegetated buffer strips along streams, planting of trees and shrubs, excluding livestock access, controlling manure and field erosion - also help restore biodiversity and habitat connections. Public investments in these activities generally yield the greatest improvements in the environment at the lowest cost.

Provincial, federal, and municipal governments could renew and expand rural water quality programs.

Rural water quality programs are funded through federal Great Lakes RAPs programs, the provincial Healthy Futures for Ontario Agriculture Program, and municipal funding, with conservation authorities usually playing a key role in implementation. Within Carolinian Canada, programs are currently in place in Essex, Middlesex, Oxford, Waterloo, Brant, Niagara Peninsula, Hamilton, and Halton. Programs are being developed in several other areas.

One example of an effective initiative is the Rural Water Quality Program funded through a $1.5 million commitment by the Region of Waterloo, along with other partners. This program provides 50% to 75% of project costs for best management practices identified by farmers through their Environmental Farm Plan, including such actions as restricting livestock access to watercourses. Some projects such as stream buffer strips and fragile

agricultural land retirement can receive a performance incentive for up to three years (see **http://www.region.waterloo.on.ca/web/region.nsf/c56**).

Appropriate and sustained funding in this area is a key need. Even though 63% of the phosphorus entering Lake Erie now comes from "non-point" runoff from agriculture and other land uses, only about 4% of clean-up funds are directed to these sources on the U.S. side of the basin (Baker, 1996), and the situation is similar in Ontario. Municipalities with a lower population base do not have the financial capacity to sustain effective programs on their own.

The provincial Healthy Futures for Ontario Agriculture program, which provided $22.7 million (as of 2001) for rural water quality projects, is scheduled to wind up in 2003 (see website **http://www.gov.on.ca/OMAFRA/english/hfoa/update.html**). The lack of continuity of previous programs such as the Clean Up Rural Beaches program has hampered the programs' effectiveness. A long-term provincial commitment, together with expanded federal participation, is essential. Increased municipal funding for agricultural cost-sharing would also be an excellent "value-for-money" investment for municipalities to improve local water quality.

Land Retirement and Private-land Forestry Programs

Many jurisdictions offer financial incentives to farmers to enhance conservation values on their lands. For example, European countries such as Greece, Italy and Germany have programs to create farmland "set-asides," particularly in areas with valued wildlife habitats (DGVI Commission, 1998). In Australia, federal taxation incentives are provided to rural landowners who invest in landcare activities to conserve water or tree-planting (Australia Natural Heritage Trust, 1999). The Woodland Grant Scheme in England provides payments to encourage the creation and management of woodlands and forests, with the level of payment linked to the type of forest being planted, the agricultural potential of the land, and any agreement for providing public access (England Rural Development Programme, 2000).

In general, this is a program area that is currently poorly developed in Ontario, but one that has considerable potential. A number of U.S. federal and state programs could serve as good models, since conservation programs for agricultural lands have expanded considerably there over the past two decades. These include programs to pay farmers to set aside some of the most sensitive lands, and programs to limit access to many federal farm program benefits to producers that did not meet conservation program requirements (Zinn, 2002).

Agriculture and Agri-Food Canada, a federal department, recently released its Agriculture in Harmony with Nature II Strategy (AAFC, 2001). Objectives within the Strategy include improving the conservation of natural biodiversity through research, education and awareness. It also proposes consultation with farm groups on better links between income support programs and food safety and environmental objectives, and may offer important opportunities for progress in this area. The new Agricultural Policy Framework being developed by the federal and provincial governments is to seek implementation of these concepts.

A Conservation Reserve Program for Canada

The federal or provincial governments could establish some form of conservation reserve program for private lands.

A wide range of reserve or set-aside programs are available in the U.S. to provide incentives for landowners to commit some of their lands to conservation uses (Vysatova and Greenberg, 2000).

A Wetlands Reserve program purchases either permanent or 30-year conservation easements, or 10-year restoration agreements, to help farmers take agricultural lands out of production and restore them as wetlands. The Conservation Reserve program targets land with high erosion rates, riparian zones or other environmentally sensitive areas, and provides annual payments under a 10 to 15 year agreement based on an approved

conservation plan. An interesting model for Carolinian Canada might be the Environmental Quality Incentives Program, which provides incentive payment and cost sharing for conservation practices within defined priority areas, including "watersheds, regions or areas of special environmental sensitivity or those having significant soil, water, or related natural resource concerns."

In addition to these federal programs, many States also sponsor reserve programs of some type, and most of these programs are popular with landowners and fully subscribed. The Reinvest in Minnesota Reserve Program, for example, has purchased nearly 4000 conservation easements since 1986 to protect and restore environmentally sensitive lands (see website **http://www.bwsr.state.mn.us**). A joint federal/state Conservation Reserve Enhancement Program in Ohio targets the western basin of Lake Erie, and uses a basket of financial incentives to encourage landowners to enroll for a minimum of 15 years. The program expects to enlist 67,000 acres over the next 10 years with a mix of riparian buffers, wetland restoration, hardwood tree planting, and wildlife habitat creation (see website **http://www.fsa.usda**).

A reserve program on a limited scale was undertaken in Ontario (and across Canada) from 1990-93 through the Permanent Cover Programs I & II, involving agreements of up to 15 years signed with Agriculture Canada, with administration provided by the Ontario Soil and Crop Improvement Association. About Ontario 1800 farmers participated, with projects to retire fragile lands, create stream and wetland buffers, and plant trees. While the program was popular with farmers and considered effective, it was not further funded (OMNR, 2001).

Ducks Unlimited Canada has developed a proposal for a $103 million national Conservation Cover Incentive Program which would provide a similar set of incentives in this country. This program would convert 170,000 ha of Ontario farmland to protected buffers along rivers and wetlands, essentially by paying farmers to take it out of production. Five federal departments are currently studying the Ducks Unlimited proposal, and it has already received support from some provinces (see website **http://www.ducks.ca**) Such a federal initiative, perhaps coupled with provincial incentives targeted at the high-value lands of Carolinian Canada in a similar way to the Ohio program, could be a major boost towards achieving the *Big Picture* goals.

A similar proposal called Alternate Land Use Services (ALUS) has been developed in Manitoba, but is proposed for use across Canada through provincial Crop Insurance Corporations (Delta Waterfowl and Keystone Agricultural Producers, 2001). ALUS goes beyond a traditional set-aside program to provide payment to farmers for the active provision of ecological services such as endangered species recovery, wildlife or fisheries habitat enhancement, or water quality improvement. In essence, it seeks to broaden the range of products that farmers can produce and be compensated for.

A recent study of the economic justification for retiring marginal farmland in Ontario showed that gross margins were less than fixed costs in three of the five fields analyzed (Brethour et al, 2001), suggesting that set-asides to achieve ecological benefits might be possible with relatively small levels of incentive.

Support for Private Land Tree-Planting & Links to Climate Change Strategies

The Province and industry could undertake a significant role in assisting tree-planting on private lands.

To achieve the *Big Picture* vision, a massive program of restoring tree cover to selected parts of the Carolinian Canada landscape is necessary. Since the late 1800's, the Province has recognized that planting trees provides benefits to society and to the environment as well as the private landowner. In the past century, over 1 billion trees have been planted on private lands in this province, largely through Provincial and other afforestation programs (OMNR, 2001b).

However, due to expenditure constraints, by the mid-1990s long-standing Provincial programs such as Agreement Forests, Woodlot Improvement Act projects, and public tree nurseries were ended. From 1949 to 1993, provincial programs consistently planted more than 15 million trees/year, with only a few exceptions at slightly

lower levels. Tree-planting peaked in 1972 at just over 30 million trees. But since 1997, tree-planting has plummeted to under 4 million trees/year (OMNR, 2001b).

Some conservation authorities continue to sponsor tree-planting programs, although on a reduced scale. Several private programs, such as Project Tree Cover, operated during the 1990s, but on a relatively small scale.

While it appears unlikely that the Province would restore its past programs in this area, it could take several steps to significantly increase tree-planting rates. Availability of good quality, genetically appropriate planting stock is one obstacle. A recent review of tree seedling production by private nurseries concluded that increased production could be achieved by the establishment of a central agency to coordinate forecasting of future demand, seed collection, and stock production and distribution in southern Ontario (OMNR, 2001c). This would help to overcome the reluctance of nurseries to produce stock for sale in several years without firm orders. A rolling loan system to help finance increased production was also suggested, along with quality control measures, increased public education and marketing, and development of MNR policies on private land forestry.

The cost of tree-planting is also a major constraint, since nursery stock is no longer subsidized by government. These costs could be addressed through several avenues. A part of federal and provincial spending to meet the Canadian commitment to the Kyoto Protocol could be directed to assisting private landowners with tree-planting in order to create future carbon sinks. Industry contributions could also be significant. Ontario Power Generation has started a program to fund tree and vegetation planting (http://www.opg.com/envComm/C_planting.asp), as utility companies in the U.S. have done. Currently dormant mechanisms such as the Trees Ontario Foundation could be re-activated to act as a conduit for government and industry contributions to support tree-planting.

Recent surveys of rural landowners show that they would respond to monetary incentives to encourage them to plant trees, and that owners of smaller properties are especially interested in entering agreements with local conservation authorities or other agencies rather than growing trees on their own (Environics, 2000; 2001a)

Both the federal and provincial governments could selectively remove tax disincentives for interested private landowners, for example by allowing the costs of tree-planting and forest management to be deducted from other income in calculating income tax.

Potential Future Income from Sustainable Forestry

Sustainable forestry could be promoted as a good source of income in the longer term for rural landowners.

Potential income from sustainable forestry by farm and non-farm landowners could be a major long-term economic incentive for replanting of Carolinian forests. Sustainable forest management practices allow both wildlife benefits and an economic return for landowners. But new tax incentives may be needed to encourage the long-term investment needed to achieve this goal.

Agroforestry is one approach which could contribute to increasing tree cover within selected areas of the Carolinian Canada landscape. This term includes maple syrup operations, nut tree and Christmas tree plantations, intercropping systems, farm woodlot management, and a variety of other similar activities. The Ontario Ministry of Agriculture, Food and Rural Affairs has a program to encourage agroforestry; more information can be found in their State of the Industry Report 2001 (see website http://www.gov.on.ca/OMAFRA/english/crops/facts/ info_state2001.htm).

Some landowner organizations such as the Ontario Woodlot Owners Association are acting as a local information resource on sustainable forestry practices. Other innovative ideas could be explored such as timber cooperatives to purchase timber rights on private properties and manage forests sustainably. Forest certification also provides an opportunity for a competitive advantage to woodland owners. The Eastern Ontario Model Forest is currently working on a project to test the feasibility of forest certification for small woodlots in southern Ontario (Oatway et al., 2000).

In the United States, a series of financial incentive programs are in place to support sustainable forestry on private non-industrial lands (see website http://www.pinchot.org/pic/farmbill/Programs.html). The Forestry Incentives Program provides up to 65% of the costs of tree-planting, stand improvement, and site preparation for natural regeneration. The Forest Stewardship Program provides support for developing forest stewardship plans, of which nearly 149,000 had been completed by 1998. The Forest Legacy Program funds the purchase of conservation easements on private forests. The Urban and Community Forestry program provides up to 50% funding for urban and community forestry projects, including some tree planting.

Property Tax Incentives

Southern Ontario currently has three property tax incentive programs. The Conservation Lands Tax Incentive Program (CLTIP) exempts enrolled landowners from paying property tax on provincially significant wetlands and Areas of Natural and Scientific Interest (ANSIs), habitat of endangered species, and Niagara Escarpment natural areas. The Managed Forests Tax Incentive Program (MFTIP) reduces property taxes by 75% on lands managed for forestry according to an approved management plan. The Farmlands taxation program (FL) also reduces taxes by 75% for any lands included within a registered farm, including up to 10% of the area as woodland.

Farm Land Taxation Program

Few farmers subscribe to the CLTIP because the marginal increase from 75% to 100% tax reduction on a small part of their lands makes little difference to their overall tax bill. While non-farm landowners are provided an incentive to conserve natural areas and woodlands, the degree of incentive for active farmers is much less. Chronic low net farm incomes create market pressure to have as much land as possible under production.

Concerns have been expressed about the overlap and inter-actions among the three property tax programs, which causes confusion and hampers their effectiveness. A joint assessment of how the three property tax programs interact would be especially valuable, to ensure that the property tax system provides a real incentive for conservation for both farmers and rural non-farm landowners and to provide a on-window approach to applications. One option might be to modify the Farm Land Taxation Program to provide the 100% tax reduction on forests and other natural habitats on farms, but with eligibility contingent on completing an Environmental Farm Plan. This could encourage retention of woodlands and other habitats on farms.

A related concern stems from the shift from a provincial tax rebate system in the mid-1990s to the current tax reduction or exemption programs, which has the effect of shifting the cost onto municipalities. Part of a joint review of the programs could address how municipal concerns in this area could be fairly addressed.

Conservation Lands Tax Incentive Program

The CLTIP could be broadened to include other categories of natural lands and to provide increased incentives.

A recent review of the Conservation Lands Tax Incentive Program recommended that the program should be gradually broadened to incorporate all natural lands recognized as provincially significant, with extension to cover significant woodlands as a first step.

The Community Conservation Lands category is a priority to be reinstated immediately to fully exempt all natural lands and conservation easements held by land trusts and other conservation charities. Another possible addition is a category to allow municipalities to designate other lands at their discretion, so that regional Environmentally Sensitive Areas could be added if desired. *Big Picture* core areas and corridors could also be considered for eligibility for CLTIP applications.

A recent proposal for the Community Conservation Lands which would reinstate only a few Provincially-significant lands is a backward step, inadequate and counter-productive to conservation efforts (EBR Registry Number: PB00E6007).

A serious problem has also been identified with how property assessments are calculated on properties eligible under both this program and MFTIP, which has the effect of shifting most of the tax burden onto the residential portions of properties. This process needs to be modified to provide a stronger incentive for conservation. Closer coordination among the three tax incentive programs and with other conservation programs would also strengthen the effectiveness of the CLTIP in Carolinian Canada and elsewhere.

Managed Forests Tax Incentive Program

The MFTIP could be modified to encourage greater landowner participation, forest creation and better incorporate conservation objectives.

The Managed Forests Tax Incentive Program has also recently undergone an internal MNR review, as well as receiving recommendations for changes from other sources. Several proposed changes should help to encourage participation, such as extending the life of a management plan to ten years from the current five years, increasing the amount of open land (such as rock barrens, beaver ponds) allowed within the plan, and developing a revised stewardship planning document.

Within the Carolinian Canada region, additional improvements to specifically encourage tree planting within priority restoration areas and to provide specific forest management guidelines for Carolinian forests could be considered. The current size limitation of 10 acres for MFTIP also needs review, since this makes many Carolinian Canada woodlots ineligible. One possible approach could be the inclusion of 5 acres of existing forest and 5 acres of new tree- or vegetation-planting to meet the 10-acre minimum.

More broadly, under a provincial reforestation initiative, MFTIP could be used to encourage forest replanting by reconfigured the program to allow eligibility of expansion of forests to include newly planted areas under a management plan.

A special category of MFTIP lands oriented primarily to wildlife conservation and passive recreation could also be developed, with a simplified stewardship plan required for eligibility.

Incentives for First Nations

Within Carolinian Canada, First Nations control a larger land base than all existing parks and protected areas combined. While some of this land has been converted to agriculture and other uses, significant portions of First Nations lands are ecologically significant, and these often form potential core areas within the *Big Picture* vision. However, First Nations peoples are understandably sensitive about suggestions on how they should manage their land base, and the future of this legacy of biodiversity will depend on the wisdom of their decisions.

At this point, it would seem prudent for conservationists to continue to engage in discussions with individual First Nations about possible future partnerships or other incentives to assist them in conserving or restoring biodiversity on their lands. These discussions could include exploration of ways to support ecotourism or other compatible economic activities that would provide an economic return from protected natural areas.

5.0 Informing and Educating for Conservation and Restoration

Building a new vision for a healthier Carolinian landscape requires a broad public consensus. The *Big Picture* vision is a long-term vision for gradual restoration over several generations through voluntary mechanisms. Education in the broadest sense is the major tool needed to build that

community consensus. Carolinian Canada hopes to encourage all members of the community to increase their understanding of Carolinian ecosystems and to participate directly in conservation and restoration activities. Educational activities should target all groups including rural landowners, urban residents, adults and children.

Educational and Technical Information for Landowners

Providing educational materials and technical advice to landowners has been a traditional approach to conservation, with a considerable record of success. While many of these programs should continue in their present form, others may need to be modified. One goal should be to reduce the complexity of programs for landowners, since many find the number of programs and organizations involved to be confusing, and this complexity may prevent some landowners from accessing information.

Stewardship Councils, conservation authorities, and other organizations could continue and renew private land stewardship programs.

Landowner contact programs, which deliver educational and stewardship messages directly to private landowners, have been carried out for many of the significant wetlands in Carolinian Canada, as well as for natural areas along the Niagara Escarpment. Other landowner contact programs have been carried out on a watershed basis, such as a long-running program in the watersheds of Hamilton Harbour (now being expanded to other watersheds in Hamilton-Halton), and a community-based approach to habitat rehabilitation in the Rondeau Bay watershed. In recent years, some landowner contact programs have been constrained by a lack of funding, and continuity of contact has suffered as a result.

About half of the landowners within the 38 original Carolinian Canada sites were contacted in the early 1990s, and over one-third of their total area was enrolled under the Natural Heritage Stewardship Award program or over 15,000 acres (Carolinian Canada, 1994). A renewed program to continue contact with landowners and provide annual opportunities for learning was proposed as part of the Conservation Strategy for Carolinian Canada (Reid and Symmes, 1997).

A landowner contact program has recently been established for owners of tallgrass prairie and savanna habitats, and MNR's Stewardship Councils and some conservation authorities continue to work with owners of natural areas as much as their resources permit. Some Stewardship Councils are also actively involved in strategic planning for landscape conservation, such as the Niagara Landcare program.

In general, however, private land stewardship is an area with considerable untapped potential in implementing the Carolinian Canada *Big Picture* strategy. Effective coordination among agencies of landowner contact and stewardship programs is an ongoing need.

Farm Organization Programs

Improve conservation information and financial support in programs of farm organizations.

Several excellent programs targeting the environmental practices of the agricultural sector are already sponsored by farm organizations. A series of Best Management Practices booklets, produced by the federal and provincial governments and the Ontario Federation of Agriculture, include advice on farm forestry and habitat management, water management, and fish and wildlife management. Opportunities could be sought to update these booklets to include more recent information on the *Big Picture* concept and rare species and habitats associated with Carolinian Canada.

The Environmental Farm Plan program, created by the Ontario Farm Environment Coalition and administered by the Ontario Soil and Crop Improvement Association, encourages farmers to assess environmental issues in their operations, including the health and management of natural areas. During the 1993-2000 period, EFP uptake in the Carolinian Canada region was somewhat less

than the provincial average, at 22.8% of registered farms compared to 30.5% province-wide. Oxford and Brant Counties were particularly low, at about 10.7% (Ontario Farm Environment Coalition, 2000). The EFP program recognizes the need to incorporate new issues including protection of species, reduction of greenhouse gases, carbon sequestering, and regulation in support of stewardship. Enhancements in response to these issues could offer opportunities for significant progress. The EFP worksheets and info sheets on wildlife and habitat issues could be revised to add new information related to Carolinian species and ecosystems.

Long-term funding for the EFP program is also needed. Increasing participation requires ongoing and consistent support. Federal and provincial financial and in-kind support has helped get the program to this point. A new government commitment would help get more farmers participating and more complete implementation of action plans developed as part of EFP. Opportunities may also exist to seek private foundation funding for specific portions of the program.

Increased linkages of agricultural grants to completed Environmental Farm Plans could act as strong incentives to encourage participation in this program. Some local programs already do this (such as the Waterloo program noted above). Some other provinces have also applied this concept, such as Prince Edward Island's Agriculture and Environmental Resource Conservation Program, which requires completion of an EFP before farmers can qualify for 66% funding for such practices as riparian zone tree planting or fencing (see website **http://www.gov.pe.ca/af/aerc/index.php3**).

Awareness of Town & City Residents

Raise awareness of town and city residents of the need for conservation and restoration of Carolinian ecosystems.

Many different approaches are needed to raise the general awareness of people of towns and cities in Carolinian Canada to the need for and benefits of conservation and restoration. School age, young people already have greater awareness than adults. But teachers, working with the curriculum, have a significant role to play. Carolinian Canada published thousands of copies a tabloid and poster aimed at schools in 2000 publicizing the *Big Picture* and the need for action. Other possible future projects could include producing a teacher's guide to linking Carolinian ecology and the *Big Picture* to the new curriculum.

Recent polling shows that most urban residents believe that trees and woodlots are very important, both within the city and generally throughout southern Ontario (Environics, 2001b). More than eight in ten people expressed concern about the conditions of woodlots and forests in rural areas, with human settlement and development seen as the greatest threats. A majority of urban residents surveyed supported the passing of local by-laws to restrict the cutting of trees, and agreed that rural landowners should be compensated for taking land out of agriculture to grow more trees.

Community-based restoration demonstration projects are excellent means of raising awareness and getting volunteer involvement in towns and cities. Conservation authorities, municipalities, environmental groups, service clubs and many other organizations already undertake such work. The Evergreen Foundation, with support from the federal government, has excellent programs to support naturalization projects at home, school and in public spaces. Permanent signs and other interpretive information for these projects allow continuing awareness building.

6.0 Funding Land Securement and Restoration

Achieving the *Big Picture* vision simply cannot happen without an investment in securing and restoring key parts of the landscape. Currently, less than 2% of Carolinian Canada lands are held in protective ownership. The *Big Picture* analysis has identified core natural areas and habitat corridors.

While the overwhelming majority of lands within the region will remain in private ownership, mechanisms to secure key properties through land purchase or conservation easements are needed. Ecological restoration projects, even those depending largely on volunteer labour, are expensive, and long-term funding sources are needed in this area as well.

A recent Environics International public opinion poll concluded that Canadians are willing to pay for more parks through additional taxes (Environics, 2001c). 80% of Canadians said they would be willing to add one dollar a month to their municipal taxes to support natural park spaces in and around their communities. This public willingness to pay stands in contrast to government allocations, which have been continuously shrinking over the past decade.

Expanding the Protected Areas System

The existing protected areas system includes a mosaic of national and provincial parks, national wildlife areas, conservation authority lands, land trust properties, municipal lands and conservation easements. In a few areas, gradual expansion of these areas is underway through land donation or purchase, or through the donation of conservation easements. Other forms of protected areas, including marine conservation areas and conservation reserves could see application within the Carolinian Canada region in coming years.

These protected areas form one of the essential keystones to achieving the *Big Picture* vision, and every opportunity to gradually expand their extent and connectedness should be seized. Building on the existing system of protected areas, particularly within the natural core areas outlined in the *Big Picture*, will be an important element of future action.

Land Securement Priorities

The *Big Picture* analysis could be used to set priorities for future land securement.

At present, there is no coordinated system of priority-setting for land acquisition within Carolinian Canada. Ontario Parks, Nature Conservancy of Canada, conservation authorities, land trusts, and other agencies each set their own priorities. While the objectives of these agencies differ and they will always have to make individual decisions about current priorities, the consensus-based ecoregional approach provided by the *Big Picture* should influence land securement priorities and strategies in future. Increased communication and information sharing among various organizations about potential acquisitions could be helpful and lead to better conservation solutions.

St. Williams Forest

St. Williams Forest provides an immediate opportunity for protected area expansion.

The St. Williams Forest in Norfolk County has well-documented natural heritage values, and the Ministry of Natural Resources has recently announced their intention to consider its designation as a provincial park. This very important step could be complemented by examining the larger landscape around the St. Williams site to identify linkages and strategies to protect other significant natural areas in its vicinity.

Public Funding for Land Securement & Restoration

The Carolinian Canada program began with a commitment of $3.6 million to help secure 38 key sites, though private land stewardship and some land purchases. In recent years, however, public sector financing for land acquisition has almost disappeared. Most new acquisitions for southern Ontario provincial parks have been arranged through the Ontario Parks Legacy 2000 partnership

between Ontario Parks and the Nature Conservancy of Canada.

The provincial Natural Areas Protection Program allocated $5 million annually towards acquiring lands only along the Niagara Escarpment, Rouge Valley, and Lynde Creek Marsh. This program ends in 2002, and is slated to be replaced by an Ecological Lands Acquisition Program (ELAP). While details of this new program are unknown, it will almost certainly provide less money, spread over a larger number of sites. A special focus on the Carolinian zone could be proposed as an important theme in the new program.

Conservation authorities are the largest conservation landowners in the Carolinian zone. But authorities have had difficulties in maintaining the previous scale of land securement programs in the late 1980s and beyond. Matching provincial grants for land acquisition ended completely, except for the limited geographic area covered by the Natural Areas Protection Program. Authorities with a large population base have continued land acquisition programs, often with lower funding levels. Most rural conservation authorities continue with limited programs of land acquisition. Conservation foundations set up in parallel to most authorities often provide the fund-raising behind land securement projects, but this mechanism also tends to be more successful in urban and near-urban areas where populations are larger.

In recent years, many of the land securement projects in this part of Ontario have been undertaken by non-government conservation organizations, often acting in partnership with government agencies. The Nature Conservancy of Canada (NCC) has spearheaded such projects as securing Clear Creek Forest in Elgin County and Middle Island in Lake Erie, and works formally in a partnership called Legacy 2000 to secure natural lands of interest to the provincial parks system. NCC is also working in concert with The U.S. Nature Conservancy on joint strategies to protect the islands of western Lake Erie. Local land trusts and naturalists' clubs own significant natural areas, and represent a rapidly growing force in land conservation.

The federal government has been involved in contributing towards the acquisition of a few specific sites within Carolinian Canada, such as wetland acquisition projects through the Eastern Habitat Joint Venture program. But currently there are no general federal programs to financially support land securement.

This situation contrasts strikingly with the United States, where the federal government has a wealth of funding programs for land acquisition related to drinking water protection, coastlines, endangered species, forests, and open space. For example, the Forest Legacy program has conserved over 120,000 acres of forest lands through grants to states for the purchase of environmentally-sensitive land or conservation easements (see website **http://www.lta.org/public policy/flshort.htm**).

The U.S. federal Land and Water Conservation Fund, which was created in 1965 with revenues from offshore oil and gas production, can allocate up to $900 million annually (although usually less is actually authorized) to several federal and state acquisition programs. Proposals for the current year would expand the use of some of this funding to include landowner incentives and private land stewardship, and give priority to innovative projects involving conservation easements, purchases of development rights, and land exchanges (see website **http://www.doi.gov/news/010409c.html**).

State governments have also been very active in parks and open space conservation, primarily through bond issues authorized by referenda. Between 1998 and 2001, voters passed a total of 529 referenda, giving support to more than $19 billion in open space funding, according to figures compiled by the Land Trust Alliance and the Trust for Public Land (see website **http://www.lta.org/publicpolicy/landvote2001.htm**). In New York State, the Clean Water State Revolving Fund provides municipalities and not-for-profit organizations low-interest rate financing to fund land acquisition projects that protect water quality, with a goal of preserving one million acres of open space over the next decade (see website **http://www.state.ny.us/governor/press/year02/jan18_02.htm**). In Florida, the Florida Forever program receives $105 million annually for land acquisition, conservation easements, environmental restoration, and public land management (see website **http://www.dep.state.fl.us/lands/carl_ff/**).

While programs of this scale and vision would be unprecedented in Canada, there are several mechanisms that could be developed to address the needs of the Carolinian Canada region.

Special Dedicated Funding Mechanisms

Federal and provincial governments could dedicate selected revenue sources to future land securement.

In recent years, both the federal and provincial governments have tended to create special funding mechanisms, either jointly or separately, to address priority areas. For example, the Great Lakes Sustainability Fund is a five-year, $30 million federal program, announced in July 2000, to fund restoration initiatives on behalf of eight federal departments (see website **http://sustainabilityfund. gc.ca/intro-e.html**).

The Province has allocated funds to assist in implementing its Ontario Living Legacy program through the Living Legacy Trust Fund, administered by an arms-length Board of Directors. More recently, the Province has also established a similar fund to support land acquisition on the Oak Ridges Moraine, with the intent of attracting financial support from other levels of government and the private sector as well.
Given that Carolinian Canada is the most threatened ecosystem in both Ontario and Canada, and that the *Big Picture* vision provides a framework for conservation actions, a similar commitment of partnership funding for land securement would not be an unreasonable expectation. Ideally, such a funding commitment could be tied to a dedicated funding source, in a manner similar to the U.S. Land and Water Conservation Fund. One source which could make sense for Carolinian Canada would be the allocation of a portion of the Land Transfer Tax proceeds, since this links the resources available for land conservation to the intensity of development activities. A portion of the proceeds from the sale of provincial Crown lands could also be directed towards this program.

Much of the delivery of such a program could come through conservation authorities, land trusts and similar organizations. In some areas, particularly the more urbanized parts of Carolinian Canada, municipal investments in green space could also be a significant factor.

Carolinian Canada Recovery Trust

A charitable Carolinian Canada Recovery Trust could be created to develop funding resources for restoration projects.

The ability to support small-scale restoration projects that would contribute to the *Big Picture* vision would be greatly enhanced by the creation of a special-purpose body to attract and administer funds. A charitable organization to be called the Carolinian Recovery Trust has been proposed, with the intent of coordinating a pool of federal, provincial, and private funds, with projects funded through the Trust to provide further matching funds or labour. Projects to be funded could include habitat enhancement and stewardship agreements with individual or corporate landowners, recovery plan projects for endangered species, and various education and communications projects.

Initial federal and provincial funding for the Trust could be derived from species at risk programs, but over time other sources could also be explored, such as climate change funding or agricultural programs. Corporate and private foundation funding could also be encouraged.

The proposed Oak Ridges Moraine Foundation is a model that could also be used for the Trust if interest was high in a more comprehensive approach.

Public-Private Partnerships

Partnerships between public agencies and non-profit organizations can draw on the strengths of both types of organizations. Such partnerships have become a mainstay of conservation in the 21st century.

Non-government organizations are now deeply involved in land securement and ecological restoration projects. The Federation of Ontario Naturalists purchased environmentally significant land on Pelee Island, and is involved in controlled burns and other techniques to restore alvar habitats there. The Long Point Basin Land Trust is working to restore connections among natural woodlands on

the Norfolk sand plain. Several citizen groups have planted thousands of trees within the Rouge, Don, and Humber watersheds in the Greater Toronto Area, and the Evergreen Foundation sponsors small-scale restoration projects. Ducks Unlimited Canada and Wildlife Habitat Canada have sponsored dozens of wetland restoration projects.

Non-government organizations bring several advantages – enthusiasm, a growing expertise in restoration techniques, good relations with many landowners, and an ability to access community and foundation funding sources that are difficult for governments. With an increasing level of maturity and coordination, they could improve their ability to attract funding from individuals, corporations, and private foundations. Public agencies – conservation authorities, federal and provincial departments, municipalities – have different strengths to offer. Expertise, infrastructure, public lands and links with the planning process are among the strengths of the public sector.

Income Tax Incentives for Donation of Lands

A series of federal budget provisions has resulted in the establishment of the Ecogifts program, which reduces the income tax payable by donors of land or conservation easements, and which also reduces the inclusion rate for any capital gains resulting from ecogifts (Environment Canada, 2001). Properties within one of the 38 original Carolinian Canada sites are automatically eligible for this program, as are significant wetlands, ANSIs, and many other categories of ecological lands. However, a specific reference to lands within *Big Picture* core areas or corridors could be helpful in assuring potential donors that they would qualify for this tax incentive.

Conservation organizations in the United States have considerably more flexibility in structuring conservation land deals than in Canada because they are able to employ "bargain sales," in which the landowner donates part of the value of a property, and receives payment for the rest. A change in the federal regulations governing charitable gifts to allow a similar practice here could be helpful in many situations.

Another potential tax incentive is currently being proposed in the U.S. as part of President Bush's 2002 Budget – a provision to exclude 50% of a landowner's capital gain from federal tax if the sale of land or a conservation easement is to a conservation organization or agency (see website **http://www.lta.org/publicpolicy/taxreduction.htm**). This provision would particularly benefit rural landowners who are "land rich, cash poor," who could realize some of the value of their property without incurring a major tax liability. A similar incentive could be enacted by Canada's federal government, providing an incentive for landowners who wish to sell their land to give first chance, and potentially a reduced price, to conservation organizations.

The Province could also participate in assisting conservation land securement by following the example set by British Columbia to exempt land transfers to conservation organizations from land transfer tax and land registration fees. In some jurisdictions such as Spain, conservation agencies and organizations are given right of first refusal for lands sold for tax arrears.

7.0 The Role of Land Use Planning and Management

Land use planning and other land use management programs can have a major influence on the future mosaic of natural landscapes in Carolinian Canada. On private lands, land use planning and management is largely delivered through municipalities and conservation authorities, based on authority provided through provincial legislation, particularly the *Planning Act* and the *Conservation Authorities Act*.

In a few instances, the Province takes a more direct role. Land use along the Niagara Escarpment is controlled through a development permit system administered by a provincially appointed body, the Niagara Escarpment Commission. In this area, a special plan with an emphasis on environmental features has been developed, which guides decisions by the Commission and by municipalities. The Province also has a direct role in enforcing the provisions of the *Endangered*

Species Act, and in future could be expected to be involved in the implementation of regulations of some agricultural operations under the proposed *Nutrient Management Act*. Under the *Fisheries Act*, the federal Departments of Fisheries and Oceans and Environment are playing a larger role.

The major land use planning role, however, comes through the Official Plans of both upper-tier (Counties, Regions) and lower-tier municipalities, as well as zoning bylaws, secondary plans, and similar planning mechanisms to implement planning policies at the lower-tier level. The Province has provided overall policy direction through its Provincial Policy Statement (Ontario, 1997), which is in the process of a five-year review and may be amended. Additional direction on the application of natural heritage policies has been provided through a Natural Heritage Reference Manual (OMNR, 1999).

Strengthen the Provincial Policy Statement and its Implementation

The current Provincial Policy Statement (PPS) does not permit development within provincially significant wetlands and significant portions of the habitat of endangered and threatened species. Other natural heritage features, including significant woodlands, valleylands, fish and wildlife habitats, and ANSIs, can be developed if an environmental study determines that there will be no negative impacts on the natural features or ecological functions. In practice, this often means that developments are permitted to proceed, with a gradual cumulative effect on these features.

Upgrade the Provincial Policy Statement

The Province could strengthen the wording of the Provincial Policy Statement and the Planning Act to require protection of natural features and encourage restoration and sound water management.

The PPS could readily be strengthened by simply applying the “no development” policy to the full range of natural heritage features. Another important change would be to incorporate the kind of natural heritage system thinking embodied in the *Big Picture* strategy into the PPS, so that development applications would have to be considered for their effects on a broader system as well as their site-specific impacts. Thirdly, the need for consideration of ecological restoration as part of the planning process could also be incorporated into the PPS, particularly within the Carolinian Canada region.

Many conservation organizations and some municipalities have also recommended changing the Planning Act reference to the Provincial Policy Statement from “have regard to” to the stronger wording “be consistent with."

Section 2.4 of the PPS states that "the quality and quantity of ground water and surface water and the function of sensitive ground water recharge/ discharge areas, aquifers and headwaters will be protected and enhanced". But little specific direction has been provided regarding implementation or performance monitoring of this section. The new Oak Ridge Moraine Conservation Plan has many innovative water policies linked to land use and natural areas. For example, watershed plans and water budgets are made mandatory, rather than voluntary as is the practice elsewhere.

A new reference manual could provide direction on the implementation of the Water Quality and Quantity policies, addressing a variety of issues such as watershed planning, stream and wetland buffers, groundwater protection, and well head protection.

Another policy area which needs renewal is the implementation of the ANSI program, which in southern Ontario has been largely static for many years. An updated gap analysis program to review the adequacy of current ANSIs and the appropriateness of their boundaries would be useful, as well as a provincial commitment to overcome the current gridlock in designating new ANSIs.

When revisions are made to the Natural Heritage Reference Manual (OMNR, 1999), reference could

be made to the bioregional planning approach and *Big Picture* analysis methodology specifically. The *Big Picture* data is currently available and could be posted on the Internet for easy access and use.

Provide Performance Monitoring and Research

Monitoring systems are needed to track the effects of planning policies and other tools, along with ongoing research and data-sharing.

A system should be developed to monitor how effective the Provincial Policy Statement and the planning system are in conserving environmental quality. After 5 or 10 years we should be able to assess for example, whether woodland and wetland loss is continuing or whether fragmentation is increasing, and determine the origins of any changes. Policies could then be adjusted. The Niagara Escarpment Commission has developed a comprehensive monitoring framework that could serve as a starting point for a southern Ontario-wide framework. Such a system is also proposed for the Oak Ridges Moraine.

A related program is needed to monitor the ongoing effectiveness of the entire basket of protection and restoration tools, and to determine where adjustments to specific programs might be needed to increase their effectiveness.

In many areas relating to natural heritage, ongoing research is necessary to provide a sound basis for action. As well, data-sharing agreements are needed to ensure that knowledge is shared among agencies in an effective way.

Ontario Municipal Board Reform

Most contentious land use decisions now end up before an Ontario Municipal Board (OMB) hearing, in a time-consuming battle of consultants and lawyers. Unfortunately, the OMB has developed a reputation as very development-oriented, and in many instances has downplayed legitimate environmental concerns.

Among both environmentalists and municipalities, there is a growing sense that the OMB involvement results in poorer planning decisions, less accountability for elected officials, and expensive and inefficient processes.

Other provinces do not have an equivalent hearing body to review municipal land use decisions. Even if the OMB were retained, its role could be improved by regulatory changes. For example, the number of hearings could be reduced by requiring that appellants first demonstrate clear evidence that a municipality had acted in bad faith or contravened specific policies in its decision – like a "leave to appeal" process in the court system. And rather than setting aside a municipal decision and making a fresh decision, the OMB could be restricted to deciding only that a municipal decision was flawed, and sending the matter back to the municipality for re-consideration.

Better Use of Existing Municipal Tools

Municipalities have a responsibility to prepare Official Plans and zoning bylaws in accordance with the PPS, and may go further in enacting protective planning policies if they choose. A review of natural heritage policies in County and Regional Official Plans showed that most upper-tier municipalities at least make reference to natural heritage features, but only a few go beyond basic policies to provide more detailed or more effective policies (Community Development Group Ltd, 1999). The Region of Hamilton-Wentworth and the Counties of Lambton and Oxford were cited as having particularly progressive policies at that time. Other Official Plans are in the process of being updated, with work on natural heritage systems currently underway in Middlesex County, Niagara Region and Halton Region. The status of Official Plans for lower-tier municipalities is unknown, but there appears to be a wide variability in the degree of environmental policy at that level.

Implementing Inter-linking Natural Heritage Strategies

Municipalities could incorporate natural heritage systems based on the *Big Picture* concept within their Official Plans.

Some municipalities have addressed natural heritage policies in a comprehensive and integrated way, by developing a system of cores and corridors, including restoration areas to provide landscape buffers and connections. Some, such as the City of London, have developed planning tools to implement policies on significant woodlands. Programs to encourage municipalities to learn from each other and to develop natural heritage systems based on the *Big Picture* concept could be used to make rapid progress in this area. Carolinian Canada makes the *Big Picture* data available to all interested municipalities.

Conservation authorities play an important role in this area, both by incorporating Big Picture concepts into watershed plans, and by providing technical support and advice to municipalities. As well, the Province could do much more to provide technical assistance to municipalities in developing natural heritage systems, especially through the use of GIS tools, and to provide technical support to municipalities if their natural heritage policies are challenged at the OMB.

Tree-Cutting Bylaws & Contractor Regulation

More effective controls on tree-cutting could be implemented through tree-cutting bylaws or regulation of contractors.

Municipalities have the authority to enact bylaws controlling tree-cutting within their jurisdictions, but passage of such bylaws are often contentious and sometimes create a backlash of indiscriminate cutting in advance of their implementation. This may be another area where information-sharing among municipalities could be helpful in defining effective approaches. At least seven upper-tier and one lower-tier municipalities within Carolinian Canada have tree bylaws in place (Fitzgibbon and Summers, 2001), and a working group of provincial and other agencies is currently developing a new model tree by-law.

Some municipalities, such as Norfolk County, have in place procedures which require prior notification of tree-cutting, with applications being cross-checked against records of MFTIP or CLTIP incentive programs. Closer linkage of tree-cutting bylaws to incentive programs may be one area to be explored. Improving enforcement powers under the *Forestry Act*, and basing bylaws on good forestry practices rather than diameter limit cutting, could also make this mechanism more effective.

Another potential avenue would be the licensing and regulation of cutting contractors, to weed out the worst offenders and improve the calibre of forest management. Local policies to require professional marking of tree stands before harvesting or to require the use of "approved" contractors could greatly improve practices.

Naturalization & Forestry in Towns & Cities

Municipalities and others could promote naturalization and increase tree cover in towns and cities.

Restoration of ecological health to Carolinian Canada is not just a rural issue. Cities and towns can benefit from restoration and naturalization of river valleys and parkland and from tree planting. These activities increase urban residents' connection with Carolinian species and ecosystems. "Urban forests" have huge potential benefits including improved air quality, microclimate amelioration, increased property values and aesthetics, storm-water attenuation, energy conservation, noise attenuation and wildlife habitat (Kenney 2001).

Many municipalities are moving in this direction and some, like York Region (Munt 2001), are linking urban forestry programs with greenlands strategies, restoration, and tree-cutting bylaws in more comprehensive strategies. Retaining forest cover and ecological linkages during development is a particularly important area. Technical support from the province, or even federal agencies such as Canadian Forestry Service, could help to promote a

broader landscape context for urban forestry.

The non-profit sector also plays an important role in urban naturalization, including groups like the Urban Forest Network, the Ontario Urban Forest Council, and the Local Enhancement and Appreciating Forests (LEAF) group in Toronto. Some groups such as the Evergreen Foundation and Friends of the Don are active in urban restoration projects on the ground.

Conservation Authorities Act Regulations

Conservation authorities have had the ability for many years to enact "flood, fill, and alteration to waterways" regulations, and a patchwork of these regulations now applies to valleylands and parts of the Great Lakes shorelines in Carolinian Canada. A proposed generic regulation approach under Section 28 of the Conservation Authorities Act would considerably broaden those powers, so that conservation authorities could regulate development and site alterations within all of their valleys and shorelines, as well as activities that would "interfere with" wetlands within their watersheds. As well as aligning conservation authority activities in these areas more closely with Planning Act controls, these changes would allow some control over conversion of existing wetlands to agricultural or other uses.

The proposed generic regulations are currently awaiting MNR approval and enactment, but could be a significant step forward in protecting basic elements of the *Big Picture* cores and corridors.

8.0 What Next?

Clearly, no one "magic bullet" is going to provide the tools to ensure that the *Big Picture* vision of ecological conservation and restoration becomes a reality over the next several generations. Progress may be incremental, uneven, and often frustratingly slow.

However, this study suggests that there is a wide range of potential tools to choose among, and that many of them are already well-seasoned by successful use elsewhere. As in many conservation endeavours, the keys to success for Carolinian Canada may be a mix of persistence, creativity, and opportunism.

The good news is that we don't need to wait for new tools before we can get started. Carolinian Canada already has a substantial legacy of good science, rising awareness, and significant conservation accomplishments. And much can be done with the tools now at hand. Pushing to create new and more effective conservation tools is vital to long-term success, but so is continued progress on the ground now.

National Actions

Some of the tools suggested in this study have application well beyond Carolinian Canada. Improvements to federal tax policy on conservation land donations and sales, renewed financial support for Environmental Farm Plans, and a new conservation cover program for rural land retirement would help sustain conservation progress across the province or across the country. For these kinds of mechanisms, it would seem most effective for the Carolinian Canada Coalition to join with other groups of similar interests to advocate their adoption.

Other national initiatives are more specific to this region. Development of a marine conservation area for Lake Erie and continued progress on the Lake Erie Lakewide Management Plan are both important federal actions. Adopting a multi-species approach to species at risk would be particularly beneficial in this region.

Provincial Actions

In the short term, the Province could play a particularly important role in developing or enhancing incentive programs and land use controls. Improvements to coordinate and upgrade the three existing property tax incentive programs should be a priority, along with renewed support for rural water quality programs and associated benefits such as riparian buffers. Much more could be done through the *Planning Act* provisions, including improvements to the Provincial Policy Statement and its implementation. Improved technical support to municipalities, a reduced role for the OMB, and improvements to performance monitoring could all play important roles. Strengthening regulatory powers under the Conservation Authorities Act and increased emphasis on development of watershed plans are also important initiatives. A revised Southcentral Natural Heritage Strategy could form a coordinating mechanism for priority Provincial actions.

In the longer term, a renewed Provincial commitment to investing in protection and restoration of natural areas, equivalent to the effort put forth in other jurisdictions, is essential.

Local Community Actions

Actions by innovative communities, municipal governments, conservation authorities and environmental groups often lead the way on conservation issues.

Completion of watershed plans and natural heritage strategies and adoption of strong official plan policies would help implement conservation and restoration across Carolinian Canada. Connecting these natural heritage strategies across municipal and watershed boundaries is also important to build a system for all of Carolinian Canada. Rural water quality incentive programs could be developed by municipalities and conservation authorities where these programs do not yet exist. Naturalization of parkland and programs to build the "urban forest" in towns and cities could be pursued by municipalities with assistance from community groups. More municipalities could adopt tree-cutting by-laws and regulation of forestry contractors.

Conservation authorities and land trusts could act to secure Big Picture core areas and use *Big Picture* data to inform and inspire their land securement efforts. Local farm organizations could work to increase participation in the Environmental Farm Plan and integrate Carolinian habitat restoration into those farm plans.

Local environmental and community groups including naturalists clubs, ratepayer groups, and schools could take up the challenge of the *Big Picture* vision and promote it in their communities.

Towards a Carolinian Canada Ecoregion Conservation Strategy

Stemming the loss of species and ecosystems in Carolinian Canada and reversing the decline of ecological health requires concerted action. Certainly if all the national, provincial and local actions listed above were taken most issues would be addressed. But a regional approach may provide a better bet for early action.

One option which deserves particular consideration is the development of a regional conservation and land use strategy for Carolinian Canada, incorporating both stronger Provincial direction for land use planning and special incentives and resources tailored to meet the special needs of this region. This would be analogous to the provincial programs already in place or being developed for the Niagara Escarpment, Oak Ridges Moraine and Great Lakes Heritage Coast. All of these current programs are worthy, but even a quick review of the natural values at severe risk in Carolinian Canada demonstrates that this region is equally deserving of Provincial attention.

What is needed is a package of "carrots and sticks" – incentives and planning controls – that will gradually shift the way land is used to restore the natural cores and connectors envisioned in the *Big Picture*. Municipalities and conservation authorities could lead the way in incorporating *Big Picture* concepts into Official Plans. Eligibility for property tax incentive programs could be modified to better fit the conditions in Carolinian Canada. A special focus on Carolinian habitat securement, involving partnerships among governments and

private funders, could be established under the new Ecological Land Acquisition Program. A Carolinian Canada Recovery Trust could assist in the delivery of these programs, as the Oak Ridges Moraine Foundation is proposed to do.

Putting together the details of such a package needs the involvement and creativity of many partners. The process created by the Provincial government for the Oak Ridges Moraine could provide a model for this region as well – an advisory panel representing a broad range of stakeholders, charged with the responsibility of developing a balanced strategy to achieve conservation goals. With the backing of the technical work already done to develop the *Big Picture*, and the support of the relevant Provincial ministries, such a panel could provide a catalyst for a great leap forward in conservation activity.

A vital role for the Carolinian Canada Coalition and its member groups in the coming years will be identifying opportunities for progress and making the case for special consideration for this region. The *Big Picture* project has provided a sound basis for doing so, and should provide a blueprint for progress for decades to come.

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