

Thinking Big, Wild Ideas

Conserving Carolinian Landscapes & Species-at-Risk
20th Anniversary Conference

October 1-2, 2004, Port Franks Community Centre on Lake Huron



Complete Conference Papers

Note: All papers submitted by presenters are included in this document. Some presenters used PowerPoint slides only, and these are available elsewhere on the proceedings CD.

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Keynotes and Plenaries

Carolinian Canada 20th Anniversary Conference
Port Franks, Ontario, October 1-2, 2004

Carolinian Canada: Past, Present & Future

Panel Discussion

Anne Redish

Community Leader

Congratulations! I am absolutely delighted and amazed by all that has been achieved in the past 20 years and especially in the past 7. This conference and all of you here are the evidence of what has been done and of how the recognition of the importance of the Carolinian Canada area is spreading.

You have heard from Paul Smith, Paul Eagles and Stu Hiltz how the original Carolinian Canada Program was set up in 1984; a Steering Committee was established of 3 government and 3 NGO members (later expanded to 12 members) and a budget of \$3,600,000. This was put in place for 3 years but by means of some creative financial efforts involving partnerships with conservation minded organizations, it actually lasted for almost 10. Original members were the Nature Conservancy of Canada, Wildlife Habitat Canada, the World Wildlife Fund, the Ministries of Natural Resources, and of Citizenship and Culture and the Ontario Heritage Foundation.

In 1993 I was appointed to the Ontario Heritage Foundation and because I was already on the Niagara Escarpment Commission and therefore known to be more interested in environmental concerns than e.g. archaeology, I was appointed as the OHF member on the Carolinian Canada Program Steering Committee. I found a group that had already achieved a great deal. There was, however, a considerable worry as to how to proceed since the original funding was practically exhausted.

Fortunately the Committee was able to procure a further grant from the Richard Ivey Foundation of \$100,000 per annum for 3 years if we could obtain matching funds. This gave us a breathing space in which to recognize that life in the mid 1990s was very different from life in the 80s, both financially, and in our understanding of the whole conservation picture. While, therefore, existing work of the Program was continued, we were able to give considerable thought to the future. For this purpose the Committee retained Ron Reid and Ric Symmes to prepare a Conservation Strategy for Carolinian Canada. With their help issues and options were identified which led to the establishment of a Vision for Conservation and five major Goals. One of the major problems confronting the Steering Committee was to find a way of implementing their exciting new proposals.

It had become fairly obvious that the time had come for a change in the structure of the Program; more and more it was clear that we could no longer rely on government sources as the major providers of funds, but that the private sector was now our primary source. We therefore proposed that a new NGO be established, to be called the Carolinian Canada Coalition, with an open membership. The original proposal was that there should be about 60 members, mostly from various local and provincial conservation organizations, but membership was to be open to anyone who supported the goals of the coalition. Obviously, the concept of individual membership has been very successful. And so in November 1997 at a Carolinian Canada Forum the Coalition was formed, I retired as Chair and Ric Symmes will tell you the rest.

You are going to hear a lot today about different activities taking place in the Carolinian zone. I want to take this opportunity to tell you a little about 2 areas that I have been involved in since 1997 and which may not be the first places you think of as "Carolinian". The first is the Niagara Escarpment. This landform, which stretches from Queenston Heights above the Niagara River to the tip of the Bruce Peninsula, is a good example of "Big Picture" thinking, and is protected by the Niagara Escarpment Planning and Development Act; it is also a World Biosphere Reserve. The intersection between the escarpment and Carolinian Canada occurs in the Niagara, Hamilton and Halton areas; in the Hamilton area alone there are 14 protected Niagara Escarpment Parks and Open Spaces including one of the original "Islands of Green", the Dundas Valley Conservation Area. This site is more than 1000 ha. in size and is home to 406 vascular plants, 57 different butterflies, 24 different species of reptiles and amphibians, including the rare Jefferson salamander and 92 breeding birds, including threatened, vulnerable and endangered species. Furthermore, over the last two years it has been the site of the restoration of a rare oak savannah. Altogether this is a site of remarkable biodiversity, the more remarkable in that it is within 10 kilometers of a major downtown core.

Another area I would like you to think about is the Great Lakes, particularly of course the shores of Lakes Ontario, Erie and Huron. The one I know most about is Lake Ontario and particularly Hamilton Harbour. About the same time that people were becoming aware of the dangers facing the Carolinian zone the International Joint Commission took action to clean up the pollution of the Great Lakes. Hamilton Harbour, along with others was designated an Area of Concern, (AOC) and mandated to establish a Remedial Action Plan (RAP) with recommendations for the restoration of the beneficial uses of the water.. One of the major goals of our RAP is the restoration of fish and wildlife habitat and considerable strides have been made here. An ambitious Fish and Wildlife Habitat Restoration Project was established under the RAP in 1992 to restore and enhance both fish and wildlife habitat at 9 sites; these sites lie within the shores of the Harbour itself, the western extension of the harbour known as Cootes Paradise, the Grindstone Creek which feeds into the harbour and the adjacent Red Hill marsh. By 2001, 337 ha of habitat had been restored over 6 sites, resulting in 170 ha of aquatic plants returning to the littoral zone of the Harbour, an increase from 10 native plant species in Cootes Paradise to 18 species and the return of previously extirpated amphibians such as bullfrogs and spotted salamanders in the reviving Cootes Paradise Marsh. At the same time secure habitat for 983 nesting pairs of Caspian and common terns, was created in the harbour. None of this work would be possible without funding and many partners have been, and still are involved, including the local municipalities and members of the public. Special mention must be made of the Royal Botanical Gardens for its lead support of the Cootes Paradise Project and of the federal

government through both the Department of Fisheries and Oceans and the Great Lakes Cleanup (now Sustainability) Fund. The latter in particular has been of great importance to all the AOCs by providing funds for a wide range of activities including not only direct fish and wildlife habitat restoration projects but also watershed stewardship projects and the monitoring of implementation results.

The "Big Picture " project is a wonderful inspiration for the protection of the biodiversity of the Carolinian region. As I see it there are now 4 levels of protection in existence:

- The Individual - either through a Conservation easement or a Stewardship handshake;
- The Area - through a Land Trust , which can be used for a larger parcel;
- The Municipal - through OPs, and subsidiary plans. At this level also would be municipal and conservation land acquisition ;
- The Legislative - such as the Niagara Escarpment and the Oak Ridges Moraine Acts.

In the long term I would hope to see a legislative recognition of the Carolinian natural heritage system; meanwhile I would like to see work in two areas; I'm not sure I would call either of them "Big Wild Ideas" but that's for you to judge. The first of these is overall monitoring : Carolinian Canada has always prided itself on the scientific basis of its work, but in order to know how well this work is succeeding it is important to monitor the results. The NEC has had a monitoring program with its own suite of indicators for some time and under the Hamilton RAP there is now a Monitoring Catalogue bringing together all monitoring activities that take place in the Harbour. In addition, the Monitoring Committee of the local citizens group, the Bay Area Restoration Council (BARC) prepares an annual report, entitled "Towards Safe Harbours". These activities I believe to be important in the long run. My second thrust is in the area of stakeholder involvement, not only at such events as this but on an ongoing basis. I am wondering if the time is ripe for the Coalition to evolve a further stage by becoming incorporated and possibly obtaining "Charitable " status. This may be a route that would lead to increased public membership and I believe that it is only through the enthusiasm and commitment of an educated, public grassroots movement that we will eventually implement all the goals of "THE BIG PICTURE"

Carolinian Canada Award Ceremony

Vicki McKay
Carolinian Canada

Good evening and if you have just arrived, welcome to the 20th Anniversary Carolinian Canada Conference.

Before the banquet we would like to present this year's Carolinian Canada Conservation Awards.

These awards have been presented to recognize individual and groups for outstanding contributions to the conservation of natural heritage in the Carolinian Life Zone.

Occasionally, we also present Lifetime Achievement Awards to those individuals or groups showing exceptional contributions over extended periods of time. And we will have the opportunity tonight to recognize such an individual.

In addition, this year we have added a youth category to recognize young people within their own peer group. We hope to receive more nominations in the future in this category.

This year we have received many nominations and we would like to thank the nominators for recognizing conservation efforts in their area.

In the near future we plan to update the Carolinian Canada website to provide more detailed direction regarding nominations. We encourage each of you to consider the valuable environmental work that happens in your area and consider nominating a deserving individual or group in the future.

A call for next year's nominations will appear in our winter newsletter.

This year, we received a total of 17 nominations and it was inspiring to see such a wide range of very important and worthwhile efforts in the Carolinian Life Zone.

Efforts included communications products, educational outreach programs, conservation planning, habitat and species management and restoration, natural area protection, monitoring stewardship, clean-ups, volunteer coordination and the involvement and in many cases of environmental groups.

The quality of all these efforts made the selection of award recipients difficult.

We would like to recognize the nominees tonight as well as the award recipients.

Gord Hamilton, Halton Watershed Stewardship Program and Joanne Rzadkin will now present certificates to the award nominees.

Tom Bird

Tom Bird manages his 30-acre wood as a demonstration site for good woodland stewardship. He undertook swamp restoration to correct historic wetland drainage. Identifying a need of landowners for more information and support he founded the Oxford County Woodlot Owners' Association and chaired the Stewardship Council. "Tom's effective leadership enabled the new council to work together, and agree to goals and objectives for the program that suited the needs of the Oxford County landowners." - Jim Collins, Past coordinator of Oxford County Stewardship Council



Branksome Green

Branksome Green is Ravine Woodland Restoration Project initiated by the Branksome school in Toronto and has been running for over 9 years. The students were careful to collect the best science on the site and monitor the results. This project has raised awareness and has been a catalyst for other ravine landowners in the Lower Don River Valley to restore their own properties. "The school is very rooted in the community and has its own extended family of students, parents, faculty and alumnae. It is in many ways the ideal group for a landscape restoration. It has a history and a future. They are a relentless group. The results are showing." - Tanny Wells, Past chair, Bring Back the Don



The Natural Heritage Program of Walpole Island Heritage Centre (Nin Da Waab Jig)

The Natural Heritage Program of Walpole Island Heritage Centre (Nin Da Waab Jig) promotes stewardship of extensive Tallgrass habitats, Carolinian forests, coastal waters and one of the largest wetland systems in the Great Lakes on Walpole Island First Nation on the St. Clair River delta, a Carolinian Canada signature site. The program has protected 84 acres of significant habitat and engages in research and outreach. "This lively program is active in informing and educating the Walpole Island First Nations community about species and risk and promoting habitat stewardship. WIFN is home to 51 Species at Risk



including several that have their Canadian stronghold here, or occur nowhere else in Canada." - Dr. Jane Bowles, Ecological Consultant

Sarnia Urban Wildlife Committee

Sarnia Urban Wildlife Committee is a city committee initiated by concerned citizens to protect wildlife from the effects of urbanization and develop an urban ecosystem policy and program. It works with City and private landowners to protect and restore natural areas such as Dennis Rupert Prairie Reserve and species at risk American Chestnut and Dwarf Sandcherry. The volunteer group also makes community outreach a priority. "This committee has done extremely fine conservation work since its inception in 1994. Their accomplishments are many." - Gerry Clements, Lambton Wildlife



Bill Prieksaitis

Bill Prieksaitis has been the driving force of the West Elgin Nature Club for over 30 years. He is the tireless volunteer who has motivated and inspired the residents of Elgin County to care for nature. Through his leadership, the West Elgin Christmas Bird Count is now one of the country's largest relative to club size. He has been instrumental in creative deals to protect natural areas such as the Dutton-Dunwich Prairie which the club leases from its railway owner to implement specialized management. He has been a key player in numerous projects including a 306-page book, *Elgin Birds - a Century of Change*. Bill gives away thousands of Carolinian trees that he grows from seed so future generations can know and admire these representative species of the Carolinian Zone. "Bill's actions and activities are not just restricted to those of his own home club, the West Elgin Naturalists, but are widespread throughout Elgin County. He leads by example. He has done just about everything that can be done from the manual of stewardship actions and activities. You name it; he's done it." - Dave Martin, ecological consultant



Thinking Big in Space, Time and Ambition

Dr. Reed F. Noss

University of Central Florida

I am going to talk today about how we might expand our perspective in space, time, and ambition. By thinking big, I do not mean to imply that we should think only about big areas and forget about small areas, or only about long spans of time and not about short-term urgencies. Rather, I mean being willing and able to consider each problem within a broader context.

By thinking big, I mean being able to think across scales, to match questions to their appropriate scale of analysis. Many of the most persistent controversies in ecology stem from observers viewing a phenomenon from different spatial or temporal scales, or at different resolutions. This is true for everyday experience. Consider football...Superdome in New Orleans...the crowd.....the players on the field and the image inside a football.

Probably all of us here love nature, and we're drawn to particular species in particular places. I know I am.

But we may need to think bigger. Biodiversity is much more than the diversity of species. It can be viewed from many different levels of resolution or levels of organization. We can recognize compositional, structural, and functional aspects of biodiversity, and each at multiple levels of organization. We need to maintain the full richness of life at genetic, population, species, community, and ecosystem levels.

All aspects of biodiversity change across space and time. We need a broad spatio-temporal perspective in conservation. Let's first consider time.

We know that things change over time...relationships change...Biodiversity also changes over time. We know, for instance, that since hard-bodied organisms started getting fossilized about 600 mya, diversity of species has increased markedly.

However, the overall increase in diversity has been punctuated by 5 main setbacks – mass extinctions. It took at 20 million years or more after each mass extinction for diversity to increase to former levels. The last mass extinction in the fossil record occurred 65 mya, when we lost the dinosaurs. The last mass extinction was caused by a meteorite 10 km in diameter striking the earth just off the Yucatan peninsula.

More recently, we had the glacial cycles of the Pleistocene, which profoundly affected biodiversity. Just 18,000 years ago, for example, eastern North America had the Laurentide ice sheet extending southward nearly to the Ohio River, fringed by tundra, then boreal forest, and temperate forest only in the extreme south. Florida was more than twice its present size. The glacial-interglacial cycles did cause some extinctions, but it seems produced about as many new species, by dividing ranges of formerly widespread species, as they eliminated old species.

At other times over the last few million years, sea level was much higher, and the only portions of Florida above water were the northern Highlands and the Brooksville, Lake Wales, and Atlantic Coastal Ridges. The isolation of these ridges promoted speciation, esp. on the Lake Wales Ridge (the most isolated) which explains the large number of endemics. In terms of conservation planning, we need to recognize that high sea levels are likely to return, so we need to maintain high connectivity in the landscape for species to move away from the coast and up into these refugia.

In the late Pleistocene, the diversity of large mammals in North America was unmatched anywhere in the world. Comparing it to the modern-day Serengeti is illustrative, but actually an understatement. Beginning in the late Pleistocene, extinction has generally outpaced speciation. Virtually all biologists agree that we are now well into the sixth great mass extinction event, which began around 40,000 years ago (13,000 years ago on this continent), and is caused at least in part by over-hunting by humans (evidence now suggests this over-kill was the major factor).

This seems to be more than an interesting coincidence. Years ago, Jared Diamond described our species as “man the exterminator.”

Losses of large mammals in the late Pleistocene were particularly severe in the Americas. This consideration of “deep time” is important to remind us what we’ve lost.

Things have gotten worse over the last few centuries. The number of known extinctions, has been rising as the human population rises. Consider the passenger pigeon – a real wake-up call. Once the most abundant bird in the world...

In the U.S. and Canada, the greatest losses at the species level have been of freshwater animals. >10% of freshwater mussel species have gone extinct since European settlement (“possibly” is overly conservative; these are taxa that haven’t been seen for many years...)

Society’s response to the extinction crisis, in part, was enactment of the U.S. ESA of 1973, which has a lofty goal...Of course, the U.S. Act was recently emulated by Canada, unfortunately in weaker form. Implementation of the U.S. Act, however, has been largely species by species, site by site...pathetic.

It has become clear that not only species are endangered, but entire ecosystems. Two colleagues and I did a review of endangered ecosystems of the United States in the early 1990s...(Noss, LaRoe, and Scott 1995)... reported in the NY Times.

World-wide, ecosystems in the temperate zone have been more disrupted by humans than ecosystems in the tropical, boreal, or arctic biomes. The loss of grasslands in the United States and Canada has been staggering. Most of these have been permanently converted to anthropogenic habitats. In the U.S. 99% of the tallgrass prairie east of the Missouri River has been destroyed, as has 85% west of the Missouri River. Remaining patches are on small sites generally too rocky, sandy, dry, or wet to plow.

As of 1993, 27 federally listed species and 99 candidates...RCW is the best studied. It makes sense to develop a recovery plan for the longleaf pine ecosystem as a whole, with associated plans for the most highly endangered species.

In the conservation field we have generally assessed the relative conservation value of various sites based on what they contain – their contents. Recent appreciation of the effects of broad-scale environmental change suggests that we also must consider the landscape context of these sites.

One of the best-studied phenomena in conservation biology is habitat fragmentation, which involves two components....Loss of area is probably the major threat, up to some threshold, beyond which the configuration of remaining patches becomes more important...the figure here is from a pioneering paper by J.T. Curtis in 1956, showing change from 1831 to 1950 for a single township in Wisconsin....There are basically 4 ways that a species could persist in a heavily fragmented landscape...

A tremendous amount of research on birds has documented declines of forest-interior species in fragmented landscapes, due to declines in food supply, increased predation and cowbird parasitism near edges, and other factors.

Some species, especially large carnivores, are vulnerable to fragmentation at broader spatial scales. Results of a spatially-explicit population model in the Y2Y region for grizzly bear – note predicted sources and sinks, fragmentation of populations in the southern part of the potential distribution (Idaho currently has no grizzly bears, thanks to Gale Norton canceling the reintroduction project, but our results show suitable source habitat exists there).

We also have to think bigger when it comes to natural disturbances, especially for forest types subject to stand-replacing fires. Basically, fire and other disturbances need room to move.

In 1978, Pickett and Thompson introduced a new criterion for designing protected areas. Whenever possible, a reserve should be larger than the minimum dynamic area. For some kinds of ecosystems this minimum dynamic area is again measured in many millions of acres. For example, the largest recorded fire in Canada's boreal forest covered 3.5 million acres.

Corridors are a popular tool for conservation planning – perhaps too popular, as they've become a fad and sometimes their functions are not considered critically. We need to expand our concept of connectivity, especially when we recognize that few, if any, single parks or other protected areas are big enough. Conservation corridors have usually been identified as discrete, linear features at a fairly narrow spatial scale, but they are important at multiple scales. Connectivity is often critical for population persistence. In essence, a well connected system of habitat patches can be a whole greater than the sum of its parts....Probably most species are distributed as metapopulations.

Consider the black bear...In Florida, the threatened subspecies of black bear is distributed among increasingly isolated subpopulations, none of which by itself is large enough to be viable in the

long term. This fragmented distribution matches the pattern of conservation lands in Florida, here shown in the early 1980s

Increasing roads and traffic in Florida is leading to increases in mortality...

So, beginning with Professor Larry Harris of the University of Florida in the early 1980s, people began suggesting the protection and restoration of linkages between conservation areas.

Although at first people laughed at this proposal, the Pinhook Swamp now has been mostly protected by The Nature Conservancy and transferred to the USFS.

At a broader scale, I proposed a statewide network of protected areas and connecting corridors. Although perceived as radical at first, this idea is now well accepted. In 1991 a workshop of biologists refined my proposal into this map, which became the basis for Florida's first \$3-billion land acquisition program, Preservation 2000. (We are now well into a second \$3-billion program, Florida Forever.) The proposed network of conservation areas is being continuously refined in an iterative fashion, as more than \$300 million has been spent each year for the last couple decades adding land to the system (albeit habitat is still being destroyed faster than it can be protected...).

Other major linkage initiatives are being proposed across the continent – for example “A2A,” as defined here by the top 10% of modeled wolf habitat (albeit this depends on the critical assumption that wolves can cross the St. Lawrence, which they used to, but is not as easy today).

We can think bigger still! TWP is concentrating its reserve network design activities within four major megalinkages in North America. We are adding a couple more megalinkages, one incorporating the grassland ecosystems of the Great Plains, the other a Gulf coastal corridor linking the southeast to the southwest (which was a very imp. Biogeographic corridor in the Pliocene and Pleistocene).

Which brings us to vision...A vision requires a set of values which, in turn, rest upon an ethical foundation. Some people claim that science should strive to be value-free. I disagree. We expect our physicians, engineers, and other applied scientists to behave ethically, and we should expect the same of conservation biologists. Because conservation biology addresses biodiversity and the health of the ecosystem – not just human health – our ethical framework needs to be expanded beyond humans. Charles Darwin pointed out that compassion for other living things is an extension of naturally selected moral sentiments. Aldo Leopold asserted that an extension of ethics to the land is “an evolutionary possibility and an ecological necessity.” Whereas, at a primitive stage of moral development, we may care only about ourselves or our kin or social group, and expansion of ethics encompasses other people and species and ultimately the earth itself.

In keeping with these ethical principles, we should have broad and ambitious goals for biological conservation. We can't be satisfied with maintaining the status quo. We need to reverse the trends of biotic impoverishment. Often this will require intensive restoration activities, for example prescribed burning...

Although my presentation has emphasized the need to consider large spatial scales and long spans of time in conservation, what some call top-down planning, we need to reconcile top-down and bottom-up approaches... (Taken to the extreme, top-down planning is ecofascism, imposing the “greater good” on local people, often with great costs. On the other hand, bottom-up planning often is highly parochial and biased, and fails to appreciate the broader context.)

How to Support Community Conservation

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Panel Discussion: What Can People Do Locally to Add to the Big Picture Malcolm Boyd MPI, MCIP, RPP, Land Use Planning Consultant

When developing a local naturalization project it is really important to have the local people and especially the Local Government to buy into your plans.

St. Clair Township Council (an amalgamated council of Moore and Sombra Townships) was a key partner in the recent purchase of a large part of the Bickford Oak Woods. They contributed \$100,000.00, which was unheard of in Lambton. They also have a definite interest in how the lands are managed, and their concerns will be listened to, because they are one of the major partners in the purchase. The local Ducks Unlimited official was a key to obtaining municipal support for the project. He had been heavily involved with Lambton Rural Stewardship and local government. The efforts of St. Clair Township Council can now be held up when dealing with other municipalities, who until now have not placed the protection of the natural environment as a priority.

(As the funding of natural heritage projects by the Trillium Foundation comes out of the \$100 million from Charity Casinos, I suggested that delegates should drop into the Point Edward Charity Casino by the Bluewater Bridge, to help support conservation... the Village of Point Edward also benefits from the Casino and I was the Village's planner when the Casino was developed).

Ontario's Commitment to Greenspace Protection and Biodiversity Saturday Afternoon Address

Mike Brown
Ministry of Natural Resources

Good afternoon everyone. It's a great pleasure to be here today representing the Ministry of Natural Resources. It's also a great pleasure to visit this very special area of the province. Minister David Ramsey sends his regrets that he couldn't join us, and has asked me to convey his best wishes for a successful conference. The minister also asked me to pass on his congratulations on this 20th anniversary of Carolinian Canada. This is a milestone for your organization and for conservation partnership in Ontario.

I'd like to talk to you today about some of the things this government is doing to support that spirit of conservation partnership. I want to talk about the progress we've made, and the challenges we still face, in protecting green spaces and ecosystems across the province. I also want to talk about the new directions we're setting for greenspace protection, particularly here in southern Ontario.

First of all, I must emphasize that reducing the loss of greenspace in Ontario is a priority for this government. We know that natural areas support biodiversity and contribute to cleaner air, cleaner water and a cleaner environment. We know that sustainable economic growth will not succeed without sustainable, healthy natural environment. And we know that reducing the loss of greenspace across the province is essential to providing the quality of life that Ontarians need and deserve.

In the golden horseshoe, and southern Ontario generally, 90% of the land is privately owned. That makes preserving natural areas challenging and, in most cases, expensive. This area is also where we find the province's greatest biodiversity. For these reasons, the government is taking a comprehensive approach to protecting green space and managing growth in southern Ontario. The **Greenbelt Protection Act** – which was introduced in the House last December and received Royal Assent on June 24 – is a major step toward protecting the environment and managing growth in the Golden Horseshoe area of southern Ontario.

Families should not have to drive ever-increasing distances to experience the countryside. We want to ensure that future generations have greenspace to enjoy close to urban and suburban centres. The government is working to put in place the protection mechanisms needed to preserve important natural areas in southern Ontario through a continuous and connected system of open space. I know this is very much in keeping with the "Big Picture" approach of Carolinian Canada.

To protect these lands from development, we will use a wide array of creative solutions. We already have in place a number of measures including tax credits, conservation easements, land trusts, land swaps, and new protected area designations. And the ministry will continue to work closely with conservation authorities, nature organizations, farmers, municipalities and private landowners. I want to highlight that private land stewardship is key to the success of species recovery, and we all owe a great deal to the landowners who are volunteering to help with recovery programs.

The Ministry of Natural Resources has an important role to play in this effort. The ministry is responsible for the sustainable management of Ontario's natural resources. We're also responsible for mapping and cataloguing natural heritage values across the province. It's our task to ensure those values are recognized and protected – not just here in the south but across the entire province.

You will be glad to know that Minister Ramsay is putting more emphasis than ever before on **biodiversity conservation**. In fact, he has made development of a provincial biodiversity strategy a ministry priority this fall. The provincial biodiversity strategy will actually be an umbrella for a number of management strategies, including invasive species, wetlands, protected areas and species at risk.

Carolinian Canada has been a great leader in protection for species at risk. I applaud the tremendous work your organization has contributed to the monitoring, restoration and rehabilitation of species and their habitat.

The ministry is putting in place the necessary tools to further protect and recover plants and animals at risk. These include:

- Considering a **review of Ontario's Endangered Species Act** to strengthen provincial protection of species at risk and complement the federal Species at Risk Act.
- Developing the **first ever Provincial Species at Risk Strategy for Ontario**.
- Identifying key areas of cooperation for a bilateral agreement between the Ontario and federal governments for the conservation of species at risk in Ontario. This agreement will help coordinate provincial and federal programs.

Protecting natural areas in southern Ontario presents many challenges. It will take creative thinking and a range of innovative measures to achieve our goals. At the ministry of Natural Resources, and across the government, we have laid the groundwork for important progress in the protection of green spaces and species at risk in Ontario.

As we proceed, we will be seeking out the best practices from around the world. We will also be counting on the support of our partners and landowners. I know that Minister Ramsey will continue to look for advice and ideas from organizations such as Carolinian Canada, the Ontario Stewardship program, Ontario Nature, Nature Conservancy Canada and others, to keep the momentum going.

Uncontrollable loss of green space is no longer an option if we want strong, healthy and liveable communities. Uncontrollable loss of green space is no longer an option if we want strong, healthy and liveable communities.

In closing, I want to again thank you for the work you do to focus public attention on why we need to protect species at risk and their habitat. I know that Carolinian Canada represents more than 40 conservation groups and many individuals. Your collective efforts inspire, encourage and make possible grassroots action on the ground, where it counts.

Thank You

Tools for Thinking Big

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Securing Core Protected Areas Introduction

Jim Oliver
Long Point Region Conservation Authority

A large part of the thrust of the Carolinian Canada program over the past 20 years has been to look at the landscape or “Big Picture” scale to identify representative or “core” sites of Carolinian habitat, to find some means of “protecting” the sites or at least the features within the sites that make them special, and ultimately to link those sites across the landscape and by so doing, a degree of protection is achieved for the landscape feature itself.

In the early days of the Carolinian Canada program, we recognized that much of the lands or waters deemed to be significant and representative of Carolinian habitats were held in private hands. In response to this, we developed programs such as the landowner contact program and heritage stewardship awards and “handshake agreements”. These achieved a level of awareness by and recognition for landowners, which we hoped, would convince them to do the right thing. For many important sites, the percentage of landowner uptake and/or acres “protected” in these ways hovered around the 50% level at best.

Significant lands and waters held in public hands or held by conservation NGOs were and still are assumed to be “protected” by virtue of their public ownership or NGO custodianship.

With all of the above scenarios, there can still be the risk of negative impact on the species, habitats or landscapes of significance and interest, and what we can think of as “second order protection measures” may still be required or beneficial to give us the desired, higher level of comfort. Thus, we have the theme for this session, “Securing Protected Areas”. This title seems to imply redundancy, but this is not necessarily the case.

I can cite the example of my own conservation authority, the LPRCA, where we have recently made the corporate decision to provide a higher level of protection to a portion of our forest land holdings, now known as “natural heritage woodlands”. The LPRCA Board designated approximately 20% of our forest lands to be under this special protection mandate, based on selection criteria both within our 20-year forest management plan and provided by an external, technical experts’ committee. We are currently preparing management plans and stewardship strategies for adjacent, private landowners around our designated properties that we hope will provide the highest level of protection for these sites and the species of flora and fauna they hold.

Our three speakers will provide their perspective and experience with this dilemma and need to ensure and enhance the protection of protected areas.

In discussing a potential marine conservation area for the Carolinian Zone, Doug Yurick of Parks Canada (*A Lake Erie Marine Conservation Area*) notes that globally 10-12% of Earth's terrestrial landscape has some degree of protection where as less than 1% of the Aquatic landscape has such protection.

James Duncan of Nature Conservation of Canada (*The Nature Conservancy of Canada – 3 Decades of Carolinian Conservation*) states that we have to use both opportunity and design in implementing our land protection strategies.

Fiona Walker of the Ministry of Natural Resources (*Planning for Compatible Public Use: St. Williams Conservation Reserve*) advised that “conservation reserves” may provide protection through compromise for important public lands in the southern Ontario landscape.

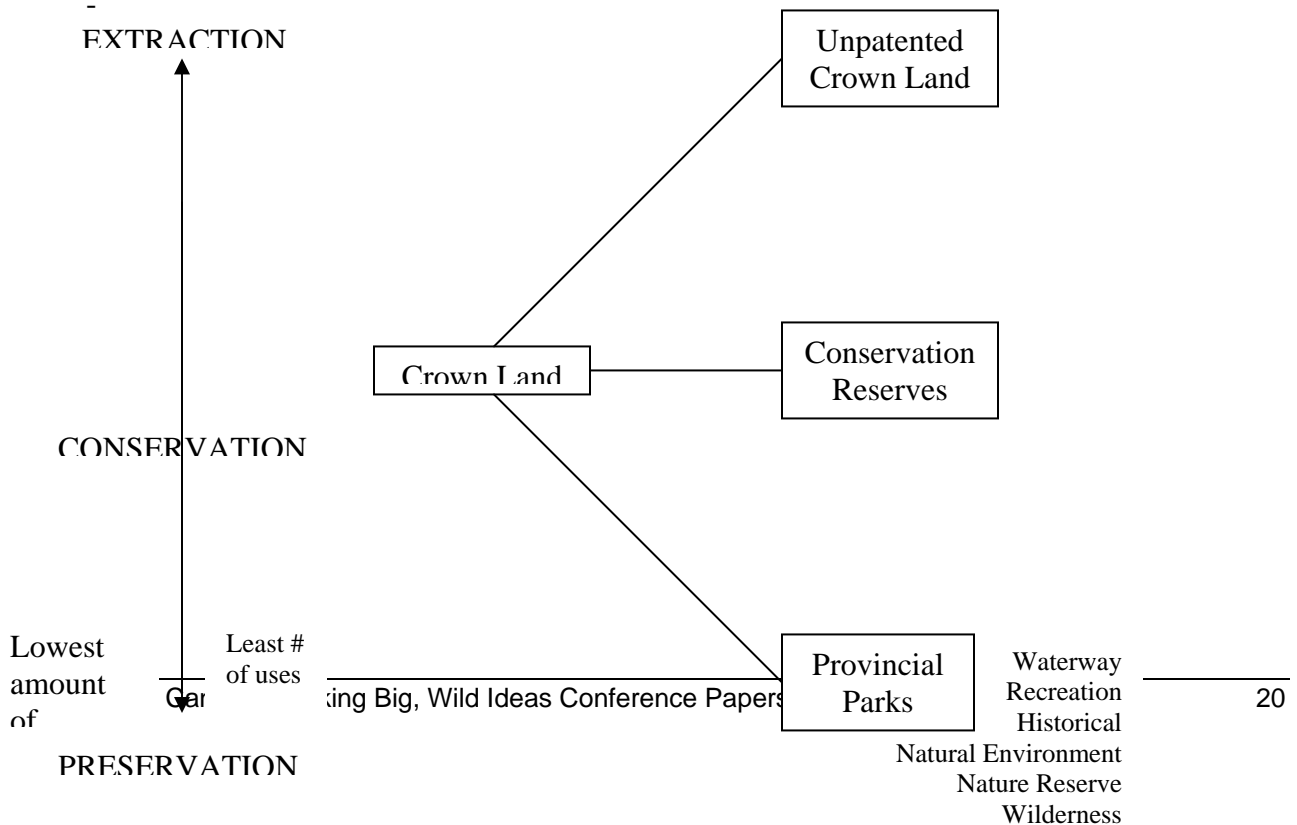
Securing Core Protected Areas St. Williams Crown Forest Protection

**Fiona Walker
 Ministry of Natural Resources**

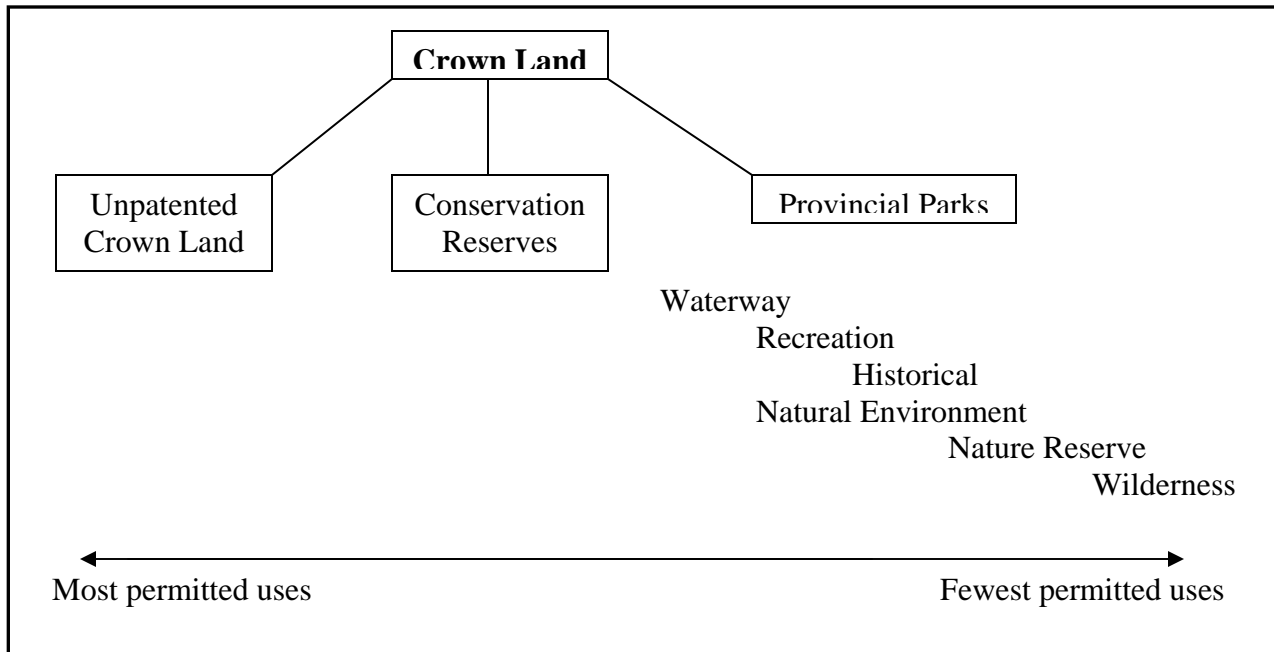
In the 1800s focus was mostly on clearing land and agriculture, not conservation. In the 1900s tree harvest and agriculture practices had turned this area into sand barrens and ‘wastelands’. 1908 saw the province begin land assembly and operations of a tree nursery, eventually to become the largest tree seedling plant in the world. The 1930s saw demonstration woodlots begin to be set up in Southern Ontario with seedlings and know-how from the St. Williams Conservation Reserve. In the 40s and 50s production of tree seedlings of various species continued for landscape restoration and more sustainable timber harvest practises began. In the 1960s Turkey Point Provincial Park was created and the Woodlands Improvement Act added Agreement Forests to the destinations of SWCL seedlings. The late 80s and early 90s saw that the plantations were reaching maturity and natural regrowth of hardwoods; attempts were made to develop a Forest Management Plan.

1992 a decision was made at the corporate level that the Ministry of Natural Resources will no longer be operating tree nurseries. Following this in 1996 nursery production lands were leased to private companies and the remaining forested lands became the responsibility of the local District office. In the late 90s the local District office began background work for a Forest Management Plan:

- **Policy Context for Conservation Reserves.**



Policy Framework for Conservation Reserves



Greatest amount of disturbance

Least amount of disturbance

Extraction – Consumption – Conservation – Protection - Preservation

Recent planning for the St. Williams Conservation Reserve saw public consultation, which are still ongoing regarding the care and maintenance of these lands. Since public consultation an Alternative Service Delivery Model has been developed along with a Technical Advisory Group assembled that have recommended a Conservation Reserve for the St. Williams area.

In 2002 a Life Science Inventory was accomplished showing that some level of disturbance is desirable for the vegetation communities. Finally in 2004 St. Williams was designated a conservation reserve and the MNR are currently working on a resource for St. Williams.

A Management Plan for St. Williams Conservation Reserve has been developed that includes three public consultation periods, initiation of process, draft and final plan. The objective of this management plan is to continue principle of demonstrating restoration work, protecting natural heritage while still permitting compatible uses for the public.

In the future the St. Williams Conservation Reserve will have many challenges and opportunities. As the population increases so to will the level of use within this reserve.

Conflicts will ensue when there'll be a high volumes of people using this reserve for so many different activities. Controls have been and will be difficult with this reserve because it is highly accessible by the road. The proliferation of unauthorized trails will require enforcement and provide operational challenges due to an increase in motorized vehicle use and dumping. At the same time the protection of the Species at Risk and their habitats along with the fiscal limitations must be considered.

In the future this reserve will also provide some great opportunities where research and education can take place as well a provide recovery for species at risk habitats.

The St. Williams Conservation Reserve will be a model of compatible multi-use of public land for regions to follow for generations to come.

Eco-Regional Planning for Nature and People Introduction

**Michelle Kanter
Carolinian Canada**

Over the past two decades, eco-regional planning has emerged as a THE way to plan for healthy landscapes into the future. Our history of traditional planning has created eco-poor settlements and unhealthy environments for community growth. Land use plans in the past have had little or no connection to the landscape, to the point that they were interchangeable. In contrast, eco-regional planning connects people with nature. Landscape provides the framework for communities that protect natural features and communities benefit immensely from wild spaces. From a conservation science perspective, it is a powerful tool to identify protection and restoration priorities.

Eco-regional planning has lofty goals but how does it play out in the real world? The Big Picture initiated by Carolinian Canada is a large-scale vision of a functional natural heritage system. At Carolinian Canada we regularly get requests for Big Picture data and it is evident that momentum is building to implement eco-regional planning across the zone. In this session, Mike McMurty of Natural Heritage Information Centre (*A Big Picture Approach to Natural Heritage Planning*) will talk about the Big Picture and its use as a planning tool that provides a framework for eco-regional planning.

The birth of the Big Picture was dependent on the development of GIS mapping techniques that have allowed us to identify and set conservation targets in a highly informed way. GIS is a critical tool, integral to eco-regional planning at multiple scales: globally, nationally, provincially and regionally. Kara Brodribb and Dan Kraus of Nature Conservancy of Canada (*Design of a Conservation Blueprint for Biodiversity & Applying the Great Lakes Conservation Blueprint for Strategic Protection of Biodiversity*) will share how they use the Big Picture and other GIS layers to identify national conservation targets.

Eco-regional planning provides an opportunity to protect natural heritage at a very fundamental level. It promotes conversation within communities about which piece of green we each want to save in our neighbourhoods. It puts natural heritage on everyone's agenda. Conservation Authorities and municipalities are key players at this scale. In this forum, Dan Lebedyk of the Essex Region Conservation Authority (*Essex Region Biodiversity Strategy*) will outline a county-wide strategy that uses Big Picture principles.

Eco-regional planning has become recognized as a path to a better, more sustainable and successful future. However, the path may not always be smooth. The transition to an eco-regional approach has great challenges at a very practical level, which will only be worked out

overtime. GIS, for example, is a wonderful tool but computer maps are worthless without ground-truthing, testing, monitoring and collaboration, especially with landowners.

The next significant step for the eco-regional planning movement is to integrate small scale and large scale “pictures” by sharing lessons and data learned....as we are doing in this forum. In this way, we will create a stronger, coordinated approach to eco-regional planning, one that will have a more effective results and people and nature both win.

Eco-Regional Planning A Big Picture Approach to Natural Heritage Planning

**Mike McMurtry
Natural Heritage Information Centre
Ontario Ministry of Natural Resources**

Introduction

The Natural Heritage Information Centre (NHIC) acts as a central repository for natural heritage data in Ontario. This includes information on natural areas, ecological communities and rare species. The NHIC also works with conservation partners to identify natural areas of highest conservation priority. This paper will review the need for landscape scale natural heritage planning and summarize the methodology and findings of the Big Picture 2002 project.

Why Do We Need a Big Picture Approach to Natural Heritage Planning?

Natural areas in southern Ontario are, in Don Gordon's phrase, "dying a death of a thousand cuts as we chip away at them lot by lot" (Gordon 2001). The image in Figure 1 is from Richmond Hill, on the Oak Ridges Moraine, but this process is also occurring in southwestern Ontario, or Carolinian Canada. We are now past the point in where conservation alone is sufficient; we also need to restore and rehabilitate natural areas that have been lost.

There are continuing losses of biodiversity with fragmentation of the landscape; more species and their habitats are becoming at risk. At the time of writing there are 50 native taxa (a few are not at the species level) known to be extirpated from Ontario and 108 Ontario taxa designated as threatened or endangered by the Committee on the Status of Endangered Wildlife in Canada (NHIC database, November 24, 2004). These aren't just terrestrial species - aquatic species are especially at risk because they integrate the stresses going on both on land and in the water. Much of the biodiversity in Ontario, including most species at risk, is concentrated in southwestern Ontario. It is no mystery why these losses of biodiversity are occurring; they are largely the result of our own land-use activities.

Natural Heritage System Properties

What are the properties of a natural heritage system that would maintain biodiversity and support a wide range of ecosystem functions? The following summary is gleaned from basic conservation biology texts (Table 1). First, such a system must be adequate in size. There is literature to indicate that approximately 30 % of the landscape must be kept in a natural state to retain the full diversity of forest-dwelling bird species (Cadman 1999, Freemark 1988, Environment Canada 2004). The bulk of this area should be in core natural areas that are large

enough to maintain ecological functions that support these species and withstand disturbances like major blow-downs.

Second, the system must adequately represent the full range of species, ecological communities and landscape features that are present in the environment.

Third, when the underlying matrix of the landscape is human-dominated, as it is in southern Ontario, there should be inter-regional corridors that provide for genetic exchange and seasonal movements of wildlife. We also need local linkages to enhance the functionality of small cores and to provide habitat along watercourses. Restoration of linkages at the local level is more controversial because this can increase the edges where non-native species invade and predators access their prey.

Finally, we need to protect the most sensitive and undisturbed natural areas from human activities through buffers.

Big Picture Objectives and Scope

The Big Picture 2002 project was developed to identify a system of cores and linkages that would address the criteria just described. Its specific objectives were to: 1) assemble and interpret the best available, digitally-mapped data on the biological diversity of southern Ontario; 2) identify high-value core natural areas and most promising linkages; and 3) generate replicable, rule-based mapping of a landscape-scale natural heritage system (Riley et al. 2003). It did not explicitly consider buffers; these can be planned for at finer scales.

There were two phases to this project: the first, called simply the Big Picture (Jalava 2000, Jalava et al. 2001), considered Ecoregion 7E or Carolinian Canada, and the second, called Big Picture 2002, extended the approach to all of southern Ontario (Riley et al. 2003). The study area of the Big Picture 2002 included all of southern Ontario up to and including a portion of the Canadian Shield within 100 km of the contact line with the paleozoic bedrock of the south.

Big Picture Methodology

What made this project possible was the availability of Geographic Information System (GIS) technology and a wealth of digital base data on land cover, rare species and communities, evaluated wetlands, Areas of Natural and Scientific Interest, parks and protected areas, watercourses and other landscape features (Table 2).

Numeric scores were assigned to pixels comprising each data layer based on its natural heritage value through consultation with a group of experts. The layers were overlain to form an overall sum of these scores per pixel. Minimum criteria were established for cores areas. These differed slightly by ecoregion; in Ecoregion 7E a core had to be 200 ha in size and score a minimum of 12 points per pixel. The polygons meeting these criteria were identified as core natural areas. Isolated patches of natural cover meeting a less demanding set of criteria were mapped as well. The details of these criteria and other aspects of the methodology are described in Riley et al. (2003). The path of least resistance across the landscape between cores was calculated to identify

potential linkages, taking advantage of any intervening natural areas including watercourses. Finally, the cores and linkages were supplemented with adjacent natural cover to approach the target of 30 % natural cover within a site district.

Big Picture Results

The results for the cores and linkages analysis are shown as part of a natural heritage system (Figure 2). Cores are shown in dark green, linkages in lighter green. Areas identified as cores agree with areas of known biodiversity such as Rondeau Provincial Park, Pinery Provincial Park, Walpole Island and the Bruce Peninsula.

Areas of adjacent natural cover are colour coded as for the adjacent feature; the smaller isolated “island cores” are coloured olive green (Figure 2). A contrast in the amount of remaining natural cover is apparent at the edge of the Canadian Shield.

The Compact Disc product, available from the NHIC, allows a closer inspection of selected regions in the Big Picture study area (Figure 3). For example, there is a core along the Lake Huron shoreline from Kettle point to Grand Bend with potential linkages leading along the shore and inland. Port Franks is a small gap in the core. The boundary between Ecoregions 6E and 7E is visible near Grand Bend.

Applications/Caveats

The primary purpose of this project was to provide a landscape-level vision of what can be achieved if we protect what we have, enhance our core natural areas and restore connections between them. This approach can be applied to heritage planning at the local level but a concerted effort is needed to compile additional detailed information on local features, locally significant biota and their habitat and buffers required.

The data employed were the best available at the time of the project, hence including the year 2002 in the name, but new information is always becoming available.

The results can be used to target areas for restoration – for example areas adjacent to cores or areas within potential linkages where there is a lack of natural cover.

Anticipated Developments

The Big Picture is one of the analysis tools now available for natural heritage planning in Ontario. The Great Lakes Biodiversity Conservation Blueprint is another means of identifying areas of conservation priority that is being developed by the Nature Conservancy of Canada and the Natural Heritage Information Centre (see the Brodrigg et al. paper from this session for more details).

The availability of new data layers is a significant development for natural heritage planning. Another MNR partnership project called Southern Ontario Land Resources Inventory System, or SOLRIS, will soon provide data on ecological communities that can be used as a template for

conservation planning (Mussakowski 2004). This project uses an array of remotely sensed imagery, digital elevation data, hydrology, geology and rare plant community data to generate maps of ecological communities at the community series level, in Ecological Land Classification terminology (Lee et al. 1998). More detailed data on ecosites, collected during fieldwork, can be nested within the community series classes. A continuous coverage of community series data should be available for southern Ontario within a year or two.

Summary Remarks

We need a bigger vision to help us see beyond our property or local jurisdiction and show us how we can contribute to an overall landscape that is biologically diverse and sustains healthy functioning ecosystems. Even the best examples of natural areas are vulnerable to encroachment and destruction as development continues in southern Ontario. The final image (Figure 5) shows one of the remaining high quality core natural areas in the Carolinian life zone: the area comprising Komoka Provincial Park and the adjacent natural cover along and including the Thames River. The Big Picture project highlights the value of this and other core natural areas and identifies connections between significant natural areas in Carolinian Canada.

Acknowledgements

Funding for the Big Picture 2002 was provided by the Nature Conservancy of Canada and the Natural Heritage Information Centre of the Ontario Ministry of Natural Resources. Other participating organizations include Ontario Parks, Parks Canada, the Federation of Ontario Naturalists (now Ontario Nature), Ontario Power Generation, the Carolinian Canada Coalition and Ducks Unlimited. Individuals that have made important contributions include, in alphabetical order: Jane Bowles, Eric Boysen, Dawn Burke, Mike Cadman, Peter Carson, Bill Crins, Jim Faught, Mary Gartshore, Don Gordon, Sophia Graine, Jason Henson, Steve Hounsell, Jarmo Jalava, Jim MacKenzie, John Riley, Peter Sorrill, Tracy Sorrill, Paul Smith, Bill Stephenson, Silvia Strobl and Anthony Zammit.

References

Cadman, M. 1999. Conserving what's left of southern Ontario's forest birds. Pages 24-28, *In* Southern Ontario Woodlands: The Conservation Challenge. Federation of Ontario Naturalists, Don Mills, Ontario.

Environment Canada. 2004. How much is enough. Second Edition. A Framework for Guiding Habitat Rehabilitation in Great Lakes Areas of Concern. Environment Canada. Web address: www.on.ec.gc/wildlife/docs/habitatframework-e.html. Accessed Sept 23, 2004.

Freemark, K. 1988. Landscape ecology of forest birds in the Northeast. Pages 7-12, *In* DeGraaf, R.M., and W.M. Healey, (eds.). United States Department of Agriculture, Northeast Forest Experimental Station, General Technical Report NE-140. 32 pp.

Gordon, D. 2001. A thousand cuts. Pages 9-11 *In* Proceedings of Natural Heritage Planning Conference held at King's College, London, Ontario, May 1, 2002. Carolinian Canada Coalition, London, Ontario.

Jalava, J.V. 2000. The big picture project: developing a natural heritage vision for Carolinian Canada. Ontario Ministry of Natural Resources. Ontario Natural Heritage Information Centre Newsletter Vol. 6 (1): 1-6.

Jalava, J.V., J.R. Riley, A.E. Zammit, P.J. Sorrill, T. Holden, and J. Henson. 2001. Big picture applications of bioregional planning in Ontario. Pages 25-35 *In* J. Porter and J.G. Nelson with D. Bazely, T. Beechey, W.R. Stephenson, J. Marsh and T. Nudds (eds.). Parks and Protected Areas Research in Ontario, 2001 Proceedings. Parks Research Forum of Ontario, University of Waterloo, Waterloo, Ontario.

Lee, H.T., W.D. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig and S. McMurray. 1998. Ecological land classification for southern Ontario: first approximation and its application. Ontario Ministry of Natural Resources, Southcentral Science Section, Science Development and Transfer Branch. SCSS Field Guide FG-02. 225 p.

Meffe, G.K., and C.R. Carroll. 1997. Conservation reserves in heterogeneous landscapes. Pages 305-343 *In* Meffe, G.K., C.R. Carroll (eds.) and contributors. Principles of conservation biology, second edition. Sinauer Associates, Inc., Sunderland, Massachusetts.

Mussakowski, R. 2004. Presentation prepared for 2004 Showcase Ontario Conference, September 13-15, 2004, Toronto, Ontario.

Noss, R.F., and A.Y. Cooperrider. 1994. Saving nature's legacy: protecting and restoring biodiversity. Island Press, Washington, D.C. 416 p.

Primack, R.B. 1993. Essentials of conservation biology. Sinauer Associates, Inc., Sunderland, Massachusetts. 564 p.

Riley, J.L., M.J. McMurtry, P.J. Sorrill, T.D. Sorrill, and J. Henson. 2003. Big Picture 2002: identifying key natural areas and linkages in southern Ontario, compact disc and poster. Natural Heritage Information Centre, Ontario Ministry of Natural Resources, Peterborough, Ontario; and Nature Conservancy of Canada, Toronto, Ontario.

Table 1. Basic properties of a natural heritage system (summarized from Meffe and Carroll 1997, Noss and Cooperrider 1994 and Primack 1993).

- Core natural areas of adequate size and low edge-to-volume ratio
 - Representation of landforms, ecological communities and species in core areas
 - Inter-regional corridors and smaller-scale linkages
 - Buffers
-

Table 2. Data layers included in the Big Picture 2002 analysis.

- Life Science Areas of Natural and Scientific Interest
 - Evaluated Wetlands
 - National and Provincial Parks
 - Conservation Reserves
 - Ontario Living Legacy Sites
 - Carolinian Canada Sites
 - Algonquin Park Protected Zones
 - Forest Cover, Forest Interior Habitat, Older Growth
 - Watercourses and waterbodies
 - Land Cover Classes from Satellite (LANDSAT28) Imagery
 - Occurrences of Rare Species and Communities
 - Niagara Escarpment Plan Areas
 - Oak Ridges Moraine Conservation Plan Areas
 - Urban Areas
 - Utility Corridors, Abandoned Railways
 - Roads
-



Figure 1. An example from Richmond Hill of the fragmented landscape in southern Ontario. Photograph by M.J. McMurtry.

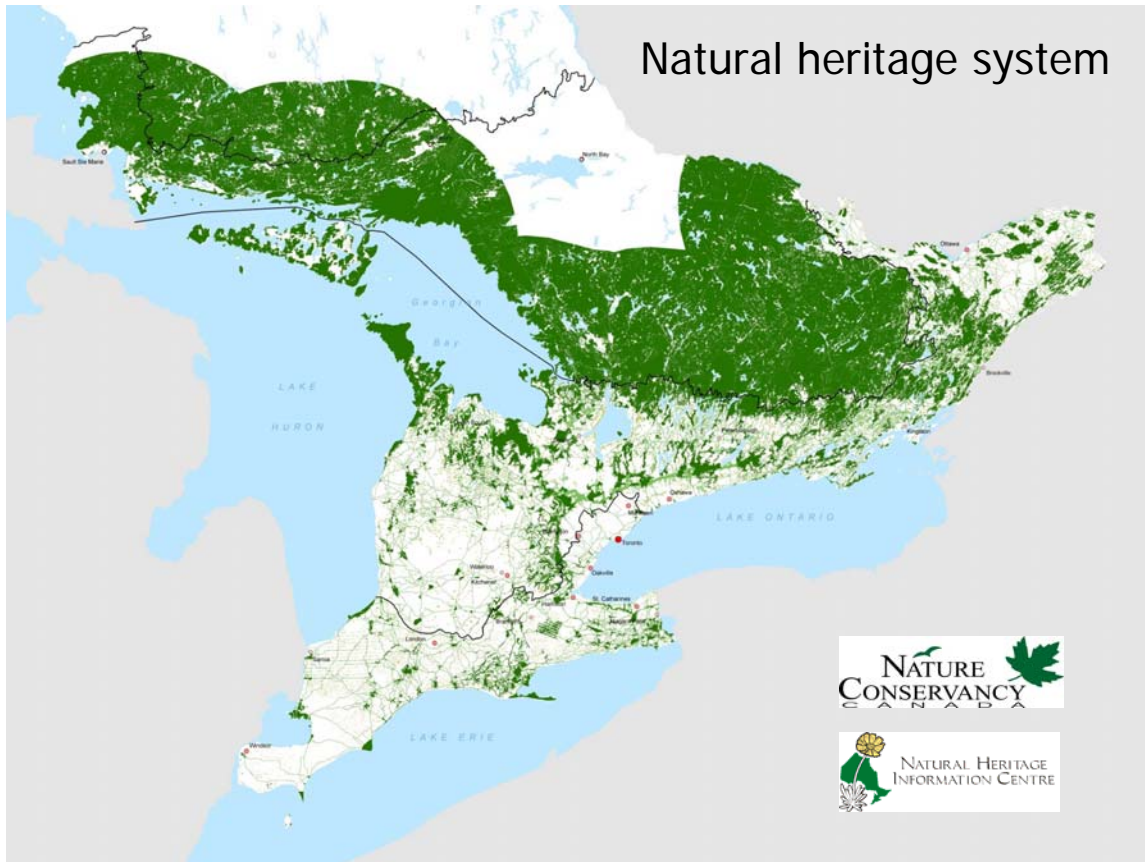


Figure 2. The Big Picture 2002 natural heritage system.

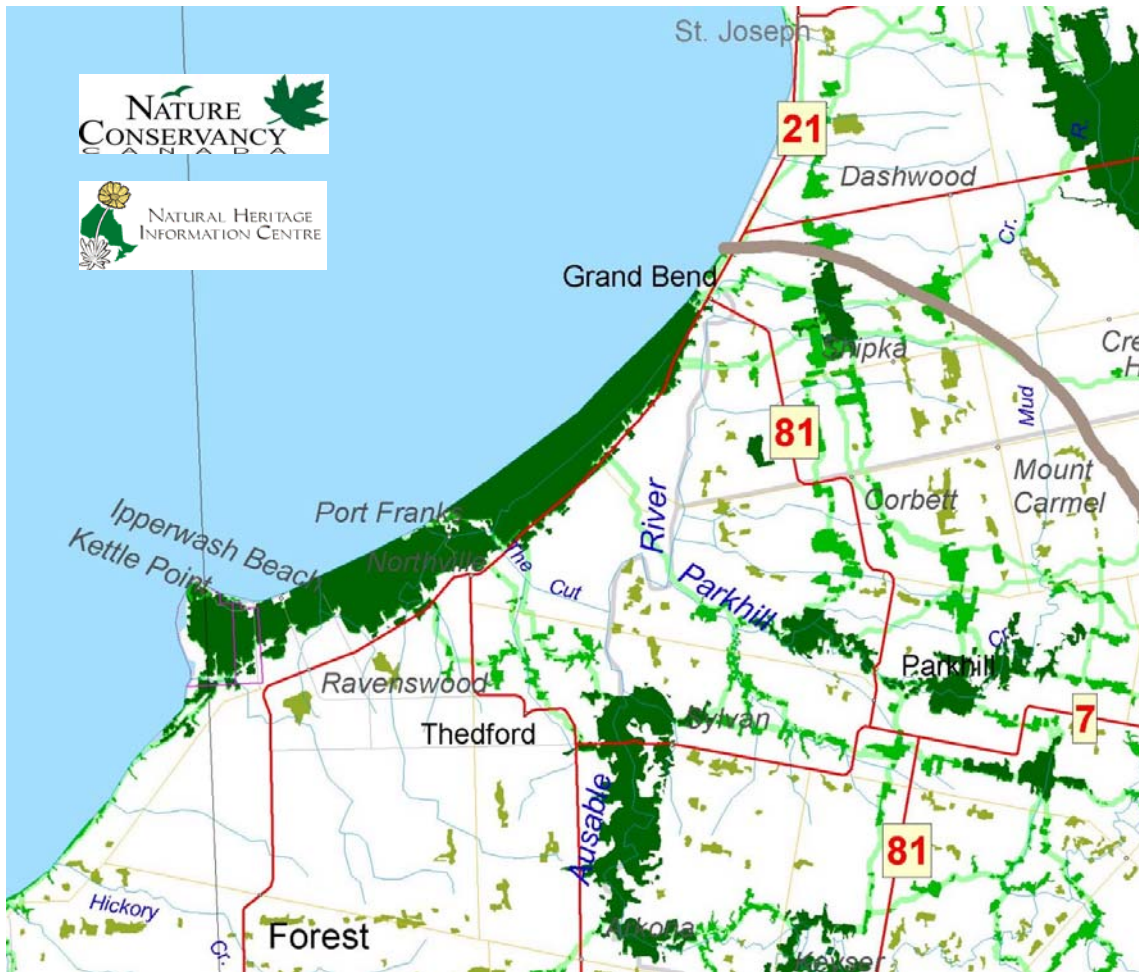


Figure 3. The Big Picture 2002 natural heritage system, in the vicinity of Port Franks, Ontario, the location of the 2004 Carolinian Canada Conference.



Figure 4. A core natural area in Carolinian Canada: the view from Komoka Provincial Park along the Thames River. Photograph by W.D. Bakowsky, NHIC Archives.

Eco-Regional Planning ***Essex Region Biodiversity Conservation Strategy***

Dan Lebedyk
Essex Region Conservation Authority

Parks Canada/Point Pelee National Park, Environment Canada Great Lakes 2000 Cleanup Fund, Ducks Unlimited Canada, Human Resources Development Canada, Essex County Stewardship Network, and the ERCA fund the Essex region Biodiversity Conservation Strategy

“It was realized in the latter half of the nineteenth century that too much timber had been wastefully cut; in many cases only to reveal land that was not profitable to farming. Some criticized earlier generations that had ‘ripped away’ the forest. They believed that the solutions to the problems lay in replacing the trees.”

From: Fur Trade To Farmstead (ERCA, 1986) paraphrasing the Bureau of Forestry in 1885

The natural area status today sees an overall loss of approximately 97% of the original wetland area and 95% of the original forest area. The region has become highly fragmented with a degraded ecosystem. The natural habitat of Essex County constitutes the lowest percentage of any region in all of Ontario where there are only few remaining small and isolated remnants of a once lush green landscape. Today forest cover only constitutes 5.0% and wetlands only 2.5% of the total landmass, where as the total agriculture/urban landmass constitutes 92.5%.

Even with this small and isolated natural habitats found in the Essex Region they still pose significance to our natural history. There is no other region in Ontario or the country for that matter with the highest biodiversity, a greater number of significant (rare) species, and a greater diversity of habitat types. For example, the Essex Region alone is home to more than 240 Federally or Provincially rare species of plants or animals.

The Essex Region Biodiversity Conservation Strategy is to produce a spatial database of all natural areas in the Essex Region, conduct an analysis of the terrestrial, wetland, and riparian habitats to identify the extent of existing natural vegetation, and prioritize opportunities for habitat restoration and enhancement. The objective of this strategy is to increase the size, extent, and quality of key natural heritage features, natural corridors, and greenway linkages, thereby improving ecosystem diversity and ecological functions.

Geographic Information Systems (GIS)

- 1:10,000 OBM
- 1:25,000 OMAFRA Drainage

- 1:50,000 NTS
- Data Correction
- Data Analysis
- Map Generation

One of the guiding principles for this plan is to protect existing habitat by halting any further losses of existing significant natural features. The ERCA intends to do this by identifying and preserving significant environmental features and ecological functions, perpetuating existing significant communities, restricting the loss of natural areas, ceasing the loss of habitat along streams, and by identifying and preserving sensitive water quality and quantity features and hydrologic functions.

Another guiding principle is to restore lost habitat by achieving a net increase in natural cover and enhance existing habitats. The ERCA intends to do this by restoring appropriate biological communities, increasing the area of naturally sustaining or successional vegetation, retaining and improving the existing woodland communities without losses, retaining and improving the existing wetland communities without losses, retaining existing habitat and restoring riparian communities, retaining existing tallgrass prairie/savanna/alvar habitats and enhancing where appropriate, and by reducing the impacts of existing agricultural and/or urban land uses in an effort to reduce degradation of natural ecosystems.

Lastly the final guiding principle the ERCA intends to follow is to develop Linkage/Nodes/Monitor programs. To Create and improve linkages between natural areas a net gain of appropriate, priority linkages and corridors will be created. To prescribe for the creation/restoration of larger contiguous areas of natural communities the ERCA will identify, protect, and restore (using existing fragments) major natural nodes. The ERCA intends to monitor guiding principles and goals, as they provide a direct measure of the state of the environment; and modify as appropriate so as to accommodate new information and/or changes that occur.

Guidelines - Forest Habitat

- Percent forest cover: variable
- Size of largest forest patch: more than one 100 ha forest patch which is a minimum 500 m in width
- Percent of watershed that is forest cover 100 m from edge: >10%
- Percent of watershed that is forest cover 200 m from edge: >5%
- Forest shape and proximity to other areas: circular or square in shape and in close proximity to adjacent patches (within 2 km)
- Fragmented landscapes and the role of corridors:
 - corridors designed to facilitate species movement should be a minimum of 100 m in width
 - corridors designed for specialist species should be a minimum of 500 m wide and refined to meet the needs of the target species
- Forest quality - species composition: as naturally diverse as possible

Guidelines - Riparian Habitat

- Percent of natural vegetation along first to third order streams: 75% of stream length should be naturally vegetated - either woody or grassy
- Amount of natural vegetation adjacent to streams:
 - generally, 30 m naturally vegetated buffer on both sides would be optimal. For specific functions:
 - <species diversity - 3 to 100 m
 - <wildlife movement (corridors) - 3 to 200 m
 - <sediment removal - 10 to 60 m
 - <nutrient removal - 3 to 90 m
 - <water temperature moderation - 15 to 30 m
- Total suspended solids concentrations: <25 mg/l for the majority of the year
- Percent of urbanized watershed that is impervious: <15%

Guidelines - Wetland Habitat

- Percent wetlands in watershed or sub-watershed:
- 10% in each major watershed; 6% in each sub-watershed; or original percentage
- Amount of natural vegetation adjacent to wetland: 240 m of adjacent natural habitat
- Wetland type: marshes and swamps
- Wetland location: original headwater swamps; on-stream or floodplain marshes and swamps on second and third order watercourses; lacustrine wetlands; any other location
 - Wetland size: swamps - as large as possible; marshes - range of sizes
 - Wetland shape: swamps - regularly shaped with minimum edge and maximum interior habitat; marshes - irregularly shaped with maximum interspersion

Guidelines - Other

Fish Habitat:

- Through implementation of Fish Habitat Management Plans.

Tallgrass Prairie, Savanna, & Alvar

- Guidelines for tallgrass communities follow the recent Tallgrass Communities of Southern Ontario: A Recovery Plan produced by the World Wildlife Fund in cooperation with the Ontario Ministry of Natural Resource

Vulnerable, Threatened, & Endangered Species:

- Guidelines from individual species Recovery Plans.

Canard Valley Restoration Site found immediately adjacent to the Canard Valley Kentucky Coffeetree Woods ESA is 100 acres of tree planting "filling in" forest canopy. This riparian tree planting along Canard River will improve fish habitats. There is also swamp thicket shrub planting to buffer the existing wetland area. In addition large stock tree planting is occurring in the Hawthorn thicket to assist the succession to forest.

Native Tree and Shrub Species

Forest Restoration:

- Silver Maple *Acer saccharinum*
- Red (Green) Ash *Fraxinus pennsylvanica*

- White Oak *Quercus alba*
- Red Oak *Quercus rubra*
- Kentucky Coffeetree *Gymnocladus dioicus*
- Shagbark Hickory *Carya ovata*
- Bitternut Hickory *Carya cordiformis*
- Sycamore *Platanus occidentalis*
- Black Walnut *Juglans nigra*
- Nannyberry *Viburnum lentago*
- Northern Hackberry *Celtis occidentalis*
- Staghorn Sumac *Rhus typhina*
- Eastern Red Cedar *Juniperus virginiana*

Wetland Buffer:

- Silver Maple *Acer saccharinum*
- Buttonbush *Cephalanthus occidentalis*
- Cottonwood *Populus deltoides*
- Pin Oak *Quercus palustris*
- Swamp White Oak *Quercus bicolor*
- Red Osier Dogwood *Cornus sericea*
- Sycamore *Platanus occidentalis*

In conclusion the Essex Region Conservation Strategy is a long-term, scientifically based study that will guide all future habitat restoration. This strategy is highly regarded by funding agencies and as a result from the implementation of this strategy future generations will benefit.

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***Eco-Regional Planning
Applying the Great Lakes Conservation Blueprint for
Strategic Protection of Biodiversity***

**Dan Kraus
Manager of Conservation Science
Nature Conservancy of Canada**

Conservation planning at large scales has become more accessible through new GIS technologies, natural heritage information and remote imagery. The Nature Conservancy of Canada (NCC) and the Ontario Natural Heritage Information Centre (NHIC) recently completed aquatic and terrestrial conservation blueprints for biodiversity in the Great Lakes ecoregion (Henson & Brodribb 2005, Wichert et al 2005). Initial steps in the project involved gathering digital data on biodiversity and land-use in the Great Lakes, and establishing a network of scientific peers to participate on the core science teams of the projects. The aquatic project dedicated considerable time towards a first-ever physical characterization of freshwater habitats in the basin. Both the aquatic and terrestrial project focused on mapping the best representative examples of coarse and fine filter biodiversity targets, across different spatial scales. In addition to the conservation blueprints themselves, the project has resulted in the creation of several new GIS layers, a compilation of existing data on biodiversity and the geography of the Great Lakes, new reporting tools on biodiversity and conservation lands, and the creation of new methods for using GIS to assist with conservation planning.

The conservation blueprints were designed using automated GIS methods at ecodistrict and tertiary watershed scales, using data that was available for the entire ecoregion. Although the data inputs and outputs are at fine resolutions, the 'raw' conservation blueprint portfolios require careful interpretation prior to proceeding with conservation action. While the sites in the conservation blueprints outline areas of important biodiversity significance, they do not provide a reliable, precise delineation of the total area that is required to maintain viable occurrences of conservation targets. In order to apply the blueprints towards a successful landscape conservation strategy there is additional work that can be done including the validation of key data inputs, incorporation of additional fine-scale data sets, consideration of landscape cores and corridors, and the life history requirements of conservation targets.

A key area of focus for Blueprint implementation has been the development of strategies to apply a landscape based conservation plan to drive effective local actions. Engagement and building strong support of local partners is key for the success of landscape based conservation (Low, 2003). Mechanisms to deliver ecoregional assessments have challenged conservation planning. Groves et al (2003) identified that for conservation to occur, we need to find better ways to deliver information to local jurisdictions in a form that is not only usable but compelling as well.

Implementation of the Great Lakes Conservation Blueprint will involve three key steps:

- A. Defining priority landscapes
- B. Focussing of conservation goals
- C. Developing and implementing partnership based strategies and action steps.

A. Defining Priority Landscapes

At a landscape level of conservation planning, the Blueprints will be used as a guide to direct NCC and partners to the areas of most critical need for conservation action. The “priority landscapes” will be defined at the Ecodistrict scale, and selected based on the following criteria:

- Conservation targets – status, viability, irreplaceability
- Threats
- Amount of existing protected lands & stewardship attention
- Organizational capacity to deliver success.

The conservation blueprint will be used to identify and define priority areas. The priority landscape framework will create a transparent process that allows NCC to communicate to partners how landscapes are strategically selected to conserve biodiversity based on multiple criteria.

B. Focussing Conservation Goals

As priority landscapes for conservation action are identified, additional conservation planning information must be integrated into the Conservation Blueprints, particularly for sites of the highest action priority. This will include updating element occurrence data from the NHIC, ensuring protected areas and conservation lands boundaries are current, and integrating information from the aquatic and terrestrial portfolios. Additional information, not included in the Conservation Blueprint should be integrated wherever possible. This information could include:

- County forests
- Other provincial/ federal/ municipal lands
- Other NGO lands
- Natural Heritage strategies
- Municipal zoning
- First Nations lands

Within each priority landscape, conservation goals will then be focussed based on the suite of biodiversity targets identified in both the terrestrial and aquatic Conservation Blueprints. Not all biodiversity targets identified in the blueprints will be a priority – good landscape-scale conservation planning begins with an understanding of the priority conservation targets - each landscape (priority ecodistrict) having one or more prima facie reasons it is important for conservation (Low, 2003). This process will identify the key elements of biodiversity that NCC should focus resources. These priority targets may include ecological systems, vegetation communities, species, and other important natural resources. Priority targets for each ecodistrict will be established based on:

- Target status (priority to globally rare species and communities)

- Matrix systems (often acting as an umbrella for species and communities of conservation concern)
- Ecological systems and communities with multiple, nested targets
- Viability (assessing the habitat requirements to maintain or enhance the viability of biodiversity targets. – priority given to extremely high quality examples of biodiversity targets)
- Irreplaceable targets and systems (occurs in only 1 or 2 ecodistricts)
- Threats (i.e. is the target already protected?)
- Exemplary examples of ecological systems

The initial catalogue of priority targets will be peer-reviewed by NCC staff and provincial science partners. These lists will then be shared with local partners for their review, input and revision. This local review is critical to conservation success. While landscape-scale projects are very strong at providing the context of conservation targets (i.e. how important is it and why?), specific information on target viability and threat often resides with local experts and partners and needs to be included in decisions on conservation.

An example of focal conservation targets and selection rationale for 7E5 (Niagara Peninsula) would include:

Site District	Type	Priority Targets	Selection Criteria	Comments
7E-5	SPP	<i>Bromus nottowayanus</i>	GRANK/ irreplaceable	7E5 only
7E-5	SPP	<i>Sida hermaphrodita</i>	GRANK/ irreplaceable	7E5 only
7E-5	SPP	<i>Crataegus conspecta</i>	GRANK/ irreplaceable	7E5 and 7E3
7E-5	SPP	<i>Crataegus Formosa</i>	GRANK/ irreplaceable	7E5 only
7E-5	COM	Pin Oak Mineral Deciduous Swamp Type	GRANK/ irreplaceable	7E5 and 7E1
7E-5	COM	Shagbark Hickory - Prickly Ash - Philadelphia Panic Grass Treed Alvar Grassland Type	GRANK/ irreplaceable	7E5 and 6E1
7E-5	ELU	Beach and Shorecliff Forest Complex	Umbrella	
7E-5	ELU	Clay Plain Deciduous Forest Complex, including swamp complex	Umbrella/ Matrix System	>60% of remaining natural cover. The largest concentration of clay plain systems in Ontario.
7E-5	ELU	Limestone Plain Deciduous Forest Complex	Umbrella	
7E-5	ELU	Fen & Bog complexes	Umbrella	

This step will result in a data set that includes local information on biodiversity and conservation, and will be maintained as a dynamic strategic planning document, to ensure that the work done by NCC is based on the most current available information on biodiversity targets, threats and builds upon previous conservation actions.

C. Developing and implementing partnership based strategies and action steps.

With revisions from peer and partner review, priority targets will be mapped in each ecodistrict. It is at this stage that NCC will delineate ‘conservation landscapes’ based on conservation blueprint information, ancillary data and collaboration with local partners. This will include the examination and incorporation of the many Natural Heritage and Greenlands strategies that have been prepared by municipalities and Conservation Authorities.

Within these conservation landscapes, key areas for protecting biodiversity will occur. NCC and local partners will identify these project areas based on biodiversity mapping and socio-economic information. Action sites will include a core area identified in the Conservation Blueprints, or subsequent landscape planning, and other lands based on an assessment of viability needs. This could include areas of high biodiversity and/or ecological integrity identified during field studies, or areas that are needed to enhance the viability of conservation targets by expanding the habitat or creating linkages to other areas.

References

Groves C.R. 2003. Drafting a conservation blueprint: a practitioners guide. Island Press and The Nature Conservancy.

Henson, B.L. and K.E. Brodribb. 2005.

Great Lakes conservation blueprint for terrestrial biodiversity. Vol. 1 and 2. Nature Conservancy of Canada and Natural Heritage Information Centre. Available on-line: www.natureconservancy.ca

Low, G. 2003.

Landscape-scale Conservation – A Practitioner’s Guide. The Nature Conservancy – Efroymson Fellowship Program. 36 pp.

Poiani, KA, BD Richter, MG Anderson & HE Richter. 2000.

Biodiversity Conservation at Multiple Scales: Functional Sites, Landscapes, and Networks. *BioScience* 50-2: 113-146.

Wichert, G., K.E. Brodribb, C. Phair and B. L. Henson. 2005.

Great Lakes conservation blueprint for aquatic biodiversity. Vol. 1 and 2. Nature Conservancy of Canada and Natural Heritage Information Centre. Available on-line: www.natureconservancy.ca

