



BIG PICTURE

REPORT CARD

DISCUSSION PAPER

Greening the Future, Together

YOU are **invited** to provide feedback as we shape this tool to measure our collective progress in greening the future of Carolinian Canada. Our network includes over 2,000 groups and individuals who save, steward and seed healthy ecosystems. Together, we advance a collaborative conservation strategy for the region.

This document launches a project to develop a landscape-level monitoring tool for use by diverse stakeholders to help inform, target and track conservation efforts. Your opinion counts. Get involved by commenting, contributing or collecting data. Use this tool to showcase your local efforts and stories relating to biodiversity and healthier ecosystems.



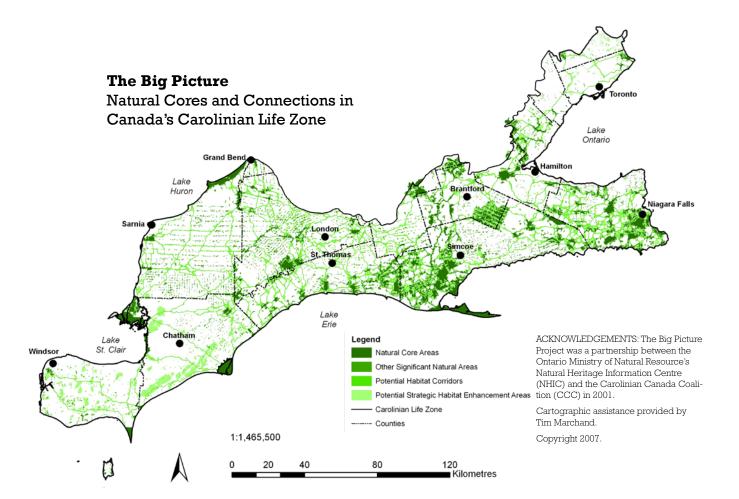
Be Part of the Big Picture. Watch for these milestones through our free EcoNews.

PHASE

- Launch, Discussion
 Document & Partner Survey
- Baseline Report Card & interactive website
- First Trends
 Report Card

Explore this project on-line to get more information and get involved.

CarolinianCanada.ca



BACKGROUND

BIG PICTURE VISION

Green, healthy landscapes are essential to our quality of life and economic prosperity. Conservation efforts in the past have focused on "islands of green" on landscapes where human uses and activities prevail. But scientific understanding has evolved and we now know that these "islands of green" cannot exist on their own. To remain viable they must be connected one to another in a "natural heritage system". Natural heritage systems are critical to maintaining the quality of our water and air, for species movement, and for adapting to climate change. In 2000, Carolinian Canada's "Big Picture" analysis identified such a natural heritage

system of core natural areas and connecting corridors in Canada's most biologically diverse ecological region, the Carolinian life zone of southern Ontario.

All the work of Carolinian Canada's extensive network of groups and concerned citizens contributes to the Big Picture vision some way. The Big Picture continues to inform and complement natural heritage planning by municipalities, conservation authorities, and provincial and federal departments. We are now working to update the Big Picture with new information, and find ways to monitor our progress in achieving the vision.

The endangered Prothonotary Warbler, a Carolinian icon

Photo credit: P. Allen Woodliffe





Did you know?

The Carolinian Life Zone (Ecoregion 7E) occupies only 0.25% of Canada, yet it is home to one quarter of Canada's human population. We share this relatively small sliver of landscape with over 40% of Canada's native plants, 50% of Canada's birds, and 66% of our reptiles! It's our most biologically diverse ecological region.

BIG PICTURE QUESTIONS

Are we realizing the Big Picture vision? Are southern Ontario residents living in a healthier landscape of thriving ecosystems, clean air, clean water, and prosperous human communities, than we were in the past? Or are things moving in the opposite direction? Are we making gains in some areas while losing ground in others? Where do we need to make changes to be most effective?

These are the questions Carolinian Canada's "Big Picture Report Card" will aim to answer. It will help measure the effectiveness of policies and programs in rebuilding and maintaining viable ecosystems. It will track stewardship and restoration successes of hundreds of groups and organisations across the landscape. And it will be a gauge of community engagement in our rich natural heritage and its conservation. The

Report Card will monitor trends zone-wide as well as at finer scales, such as by municipalities. It will be a living document, updated at regular intervals. And it will be highly accessible, webbased, easy to understand, and interactive.

What's happening on the other side of the Great Lakes?

The answer appears to be mixed. A 2015 report from the National Oceanic & Atmospheric Administration (NOAA) says, "four percent of the U.S. Great Lakes region saw changes to its land cover--paved surfaces, trees, forests, grasses, and wetlands--from 1996 to 2010. That figure represents 7,144 square miles, almost the equivalent of Lake Ontario's surface area.

"The region lost 150 square miles of wetlands over 15 years, but 218 square miles of wetlands were gained, representing a net gain of 68 square miles of wetlands present in 1996. Wetlands lost were largely due to development around Chicago, Cleveland, and Buffalo. Low water levels, such as those seen around Saginaw Bay, Michigan, dominate the areas of wetland gains.

"The Great Lakes region experienced a net loss of 1,735 square miles of forest cover (2,773 square miles of forests were cut while 1,038 square miles of forest were regrown). Many of the region's forested areas are undergoing transitions that do not result in permanent loss."



SOUND SCIENCE AND RELIABLE DATA

Carolinian Canada's Science Advisory Committee, made up of experts from a broad range of sectors (academic researchers, various levels of government, NGOs, consultants) recommend the following broad categories for monitoring by the Big Picture Report Card:

- Physical Landscape (land cover trends; air, soil and water quality)
- Ecosystems and Biodiversity (ecological functions, habitat health, species diversity)
- **Protection, Restoration and Stewardship** (protected areas, restoration and stewardship, action plan implementation, monitoring)
- **Policy and Planning** (environmental laws, regulations, zoning, incentives, funding)
 - **Public Awareness and Engagement** (general ecological knowledge, school curricula, events, media coverage, levels of financial support, human health and wellbeing)

Sample Data

Below are examples of currently available data relating to some of the above criteria. We welcome input on other available data sets, and how other information might be monitored and measured. **Note:** *Information presented in the tables below is preliminary, illustrative, and should not be taken as statistical fact; in some cases we need to further verify accuracy.*

HOW MUCH HABITAT IS ENOUGH?

Environment Canada's "How Much Habitat is Enough?
(3rd edition, 2013)" describes the minimum amounts of habitat needed to help support populations of wildlife in Canada. The report provides an extensive literature review and guidelines to assist restoration, land use planning and other conservation

practitioners to restore and protect wildlife habitat. The guidelines include: 30% to 50% minimum forest cover, the greater of 10% wetland cover per watershed or 40% of historic wetland cover, 75% of the length of a stream naturally vegetated, less than 10% impervious cover in a watershed, and average grassland

patch sizes of greater than or equal to 50 hectares. This publication has influenced land use planning, restoration projects and land securement initiatives across multiple jurisdictions and is a standard conservation biology and landscape ecology reference.

Trends in Natural Cover

Sample Table A shows trends in natural cover between the inaugural year of the Big Picture vision, 2000, and the year 2010, based on the province's "Southern Ontario Land Resources Information System" (SOLRIS) land cover mapping. The data are displayed for each upper tier municipality, a selection of urban areas, and all First Nations in Carolinian Canada. A downward trend in natural cover is evident in all the major categories, and across the ecoregion as a whole, but a number of areas showed modest gains in natural cover over the 10-year period.

Trends in Connectivity and Climate Change Readiness

Many groups, including municipalities, are actively addressing habitat connectivity issues through natural heritage systems planning, zoning, habitat restoration, eco-passages and even seasonal road closures. Riparian areas along rivers and stream corridors are already protected to some degree by legislation, and as a result often provide the best, if not the only, remaining opportunities for species movement from one habitat patch to another, an important function in the face of climate change. Natural cover along riparian zones is critical to maintain water quality, temperature regimes, fish and other aquatic species populations. It also reduces erosion, agricultural and urban run-off, and flooding risks, contributing greatly to community health and safety. The Big Picture Report Card will provide an opportunity track our collective efforts to protect and restore riparian zones across the ecoregion. Sample Table A also shows the extent of natural vegetation along waterways (riparian).

The O'Neill Nature Preserve, a refuge along a watercourse on the edge of Chatham



Photo credit: Municipality of Chatham-Kent

SAMPLE TABLE A 1

(Preliminary) Natural Cover Trend 2000-2010 (based on SOLRIS 2000, 2010)

	Total Area	NATURAL COVER					RIPARIAN CONNECTIVITY		
	in Carolinian Zone (ha)	Natural cover gained/lost 2000-2010 (ha)		Natural Cover in in 2000 2010		Trend since 2000	Total Riparian (km2)		Natural Riparian cover ²
Upper Tier Municipalities									
Brant County	84893		43	18.68%	18.73%	a 0.27%	83.54		65.78%
Chatham-Kent	246768	•	-376	6.40%	6.24%	▼ -2.38%	187.63		26.02%
Durham Region	1677	\blacksquare	-2	24.99%	24.86%	v -0.48%	2.41		77.52%
Elgin County	184899		102	19.55%	19.60%	▲ 0.28%	164.77		66.07%
Essex County	172123	\blacksquare	-31	8.50%	8.49%	▼ -0.21%	110.29		33.81%
Haldimand County	125995	•	-21583	19.51%	17.79%	▼ -8.78%	141.90		55.76%
Halton Region	54201	\blacksquare	-29	16.51%	16.45%	▼ -0.32%	55.92		62.70%
Huron County	10554		5	15.23%	15.27%	a 0.31%	8.45		37.66%
Lambton County	285127	•	-45	13.82%	13.80%	▼ -0.11%	212.28		43.03%
Middlesex County	218648		141	16.11%	16.17%	▲ 0.40%	189.44		58.72%
Niagara Region	188322	•	-116	21.53%	21.46%	▼ -0.29%	174.24		68.09%
Norfolk County	161628	A	296	28.02%	28.20%	▲ 0.65%	107.65		73.31%
Oxford County	88436		27	14.93%	14.96%	a 0.20%	55.23		57.39%
Peel Region	45613	•	-76	6.70%	6.53%	▼ -2.49%	37.73		45.90%
Waterloo Region	7361		14	29.00%	29.20%	a 0.66%	3.14	•	87.88%
York Region	39406	•	-98	9.36%	9.11%	▼ -2.66%	33.04		63.83%
Total Upper Tier	1915651	•	-2303	15.69%	15.57%	▼ -0.77%	1567.66		53.72%
Major Cities									
Brantford	7353	•	-17	0.12	0.1158	▼ -0.0196	4.24		0.4678
Hamilton	80169	•	-138	0.1602	0.1584	▼ -0.0107	100.62		0.5537
London	42135	•	-214	0.1322	0.1271	▼ -0.0384	31.53		0.5564
St. Thomas	3588	•	-4	0.1639	0.1627	-0.0068	3.25		0.7109
Toronto	63436	•	-64	0.0756	0.0746	▼ -0.0133	27.52		0.6978
Windsor	14555		54	0.06	0.0677	▲ 0.06	6.60		0.2896
Total Cities	211236	•	-383	0.1212	0.1193	▼ -0.02	173.76		0.5679
First Nations									
Chippewa of the Thames	3921		4	42.00%	42.10%	a 0.24%	4.33		82.02%
Glebe Farm	41		0	29.27%	28.11%	0.00%	< 0.01		97.20%
Kettle Point	919		0	65.07%	65.04%	0.00%	0.41		76.50%
Delaware Nation	1241		2	55.44%	55.59%	▲ 0.29%	1.38		80.67%
Munsee-Delaware	1105	A	2	55.38%	55.58%	▲ 0.33%	1.41		94.50%
New Credit	2483	•	-5	35.16%	34.97%	▼ -0.57%	1.08		77.73%
Oneida	2223	A	2	27.76%	27.86%	▲ 0.32%	2.95		86.02%
Aamjiwnaang	1157	•	-2	78.65%	78.46%	▼ -0.22%	0.85		84.62%
Six Nations	18565	•	-11	41.21%	41.15%	▼ -0.14%	16.18		83.09%
Bkejwanong (Walpole)	15032	•	-63	67.46%	67.04%	▼ -0.62%	22.94		73.04%
Total First Nations	46687	•	-71	50.87%	50.71%	▼ -0.30%	51.53		78.85%
OVERALL	2173575	_	-2757	16.10%	15.97	v -0.79%	1,792.95		54.74

- 1 Net gains in natural cover highlighted in green, net losses in red.
- 2 Jurisdictions with >75% natural riparian cover highlighted in green.
- 3 We suspect this is a land classification anomaly between the two versions of SOLRIS; figures require verification.

Trends in Biodiversity

Monitoring populations of key "indicator" species and biological diversity as a whole can tell us a lot about the health of our ecosystems. Many ongoing citizen science initiatives make it possible for anyone to submit their species observations for use by experts (e.g., the Ontario Breeding Bird Atlas, eBird, the Ontario Reptile and Amphibian Atlas, Backyard Frogs, eButterfly). Other monitoring programs are designed specifically to track species found in specific habitats (e.g., Marsh Monitoring Program) or species at risk. Compiling, synthesizing and reporting on general results from such programs will be an objective of the Big Picture Report Card. Such a compilation will allow us to see zone-wide trends and help us make informed conservation and stewardship decisions. The Big Picture Report Card will also complement broader-scale biodiversity tracking initiatives, such as the "State of Ontario's Biodiversity Report".

"Globally, 20% of reptiles and 41% of amphibians are considered at-risk. In Ontario 75% of reptiles and 35% of amphibians are listed as a species at risk. These species are an essential part of many ecosystems including wetlands, rivers, prairies, forests and alvars. Habitat loss and road mortality are two of the largest threats to these species. By monitoring, we can assess the regional and local impacts on each population, understand the habitat requirements, and help ensure proper habitats are in place for the species to survive."

Tanya Pulfer CITIZEN SCIENCE COORDINATOR, ONTARIO NATURE

Trends in Land Protection

According to a 2014 report by the International Union for the Conservation of Nature (IUCN), "15.4% of terrestrial and inland water areas ... are now protected—highlighting growing global awareness of the need to safeguard the natural resources." However, this still falls short of the IUCN target of protecting 17% of terrestrial areas across the globe by 2020.

Now, consider that less than 2.5% of Ontario's Carolinian life zone is formally protected (compared to more than 12% of central Ontario) as parkland or private nature reserve. This is especially concerning in light of the exceptional biological diversity of the Carolinian zone, its high concentration of species at risk, and the importance of natural areas to ecosystem and human health.

Much of the landscape is stewarded by conscientious landowners and conserved to some degree by zoning, but securing formally protected areas in Carolinian Canada is a major challenge. More than 95% of the land is privately owned, land prices are high, and there are many competing land use interests. Also, the economic value of the ecological services provided by protected lands is generally not figured into decision-making. Nonetheless, some significant land securement has been accomplished by private organisations such as The Nature Conservancy of Canada and local land trusts, as well as by public agencies, as shown in **Sample Table B**. Help from Report Card partners is needed to fill data gaps and update information in **Sample Table B**.

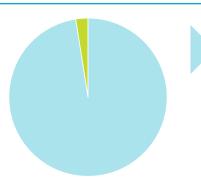


Juvenile Eastern Hog-nosed Snake, threatened in Canada

How much land is protected in Carolinian Canada?



2.5%
Conservation Land
- includes parks,
conservation areas,
agreement forests,
private nature
reserves and easements



97.5%
Urban and agricultural land, as well as areas with conservation zoning and habitat projects on private land

The Big Picture Report Card will show how wild species and spaces are supported across the landscape

SAMPLE TABLE B

(Preliminary) Protected Lands and Land Securement 2000-2014

Upper Tier Municipality	Total area in ecoregion (ha)	Protected Areas ⁴ (ha)	% Protected	Land securement 2000-2014 (ha) ⁵
Brant	84,893	729	0.86%	no data
Chatham-Kent	246,768	4,402	1.78%	5776
Elgin	184,899	1,164	0.63%	221.5 ⁷
Essex	172,123	3,046	1.77%	655
Haldimand	125,995	1,036	0.82	no data
Halton	54,201	2,409	4.44%	no data
Hamilton	80,169	3,031	3.78%	no data
Lambton	285,127	2,887	1.01%	372
Middlesex	218,648	484	0.22%	377 ⁸
Niagara	188,322	3,849	2.04%	53
Norfolk	161,628	~10,700	6.62%	3,338
Oxford	88,436	281	0.32%	no data
Peel	45,613	108	0.24%	no data
Toronto	63,436	843	1.33%	no data
Carolinian Life Zone	2,173,575	49,939	2.24	5,048

- 4 Very approximate data, with different vintages and sources; includes national parks and wildlife areas, provincial parks, conservation authority areas and private nature reserves, but not municipal parks (unless owned by conservation authorities), nor areas protected by zoning or other legislation (e.g., "Niagara Escarpment Natural"). Not all these areas are necessarily fully protected (e.g., campgrounds, park infrastructure). Durham, Huron, Waterloo and York excluded for this preliminary sample version because of minimal Carolinian zone coverage.
- 5 By The Nature Conservancy of Canada and its partners (source: The Nature Conservancy of Canada, 2015)
- 6 Includes ~130 ha property bequeathed to St. Clair Conservation Foundation in 2013 and ~50 ha of lands secured by Lower Thames Valley Conservation Authority in 2014.
- 7 Includes 133.5 ha secured by Thames Talbot Land Trust
- 8 Includes 229 ha secured by Thames Talbot Land Trust (possible double-counting)



Trends in Stewardship and Restoration

Formal protection is not the only way to "save, steward and seed" ecosystems. Great strides are being made across the Carolinian zone by hundreds, if not thousands, of stewardship and ecological restoration projects. Many of these projects are within 13 "biodiversity hotspots" for which **Conservation Action**Plans (CAPs) have been developed by Carolinian Canada with more than 130 local partner groups and agencies. Additional hotspots have Natural Area Conservation Plans (NACPs) developed by The Nature Conservancy of Canada.

Conservation Action Plans in Carolinian Canada⁹

	Year Completed	Partners	Strategic Actions	Actions Underway
Essex Forests and Wetlands	2009	10	26	25
Ausable River – Kettle Point – Pinery	2009	11	18	17
Upper Thames River	2009	9	8	8
Niagara River Corridor	2011	16	12	12
Short Hills	2011	16	13	13
Hamilton – Burlington	2011	15	46	43
Elgin Greenway	2012	15	30	25
Rondeau – Erie Coast	2013	15	22	22
Lake St. Clair Coastal	2013	12	15	14
Sydenham River	2014	14	81	t.b.d.
Grand River	2014	9	73	t.b.d.
Lower Thames River	2015	5	39	t.b.d.
Rouge River	2015	9	t.b.d.	t.b.d.

⁹ The Nature Conservancy of Canada leads and implements complementary Natural Area Conservation Plans (NACPs) for the Western Erie Islands and Southern Norfolk Sand Plain biodiversity hotspots, and the Thames Talbot Land Trust leads an NACP in the Skunk's Misery area.

Carolinian Life Zone: Conservation Plans

Each year, Carolinian Canada collects information about the implementation of these plans from our partners. 10

Sample Table C summarizes some of these accomplishments and highlights the opportunity for the conservation community to provide collaborative input for the entire ecoregion.



 $^{10\ \} These\ 100+page\ monitoring\ reports\ are\ available\ for\ viewing\ and\ download\ at\ carolinian canada. ca.$

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How does your project fit into the Big Picture Report Card?

SAMPLE TABLE C:

Selected examples of Big Picture implementation in Essex and Chatham-Kent¹¹

Municipality (CAP	Stewardship		Restoration		Volunteer	Notes		
/ NACP) Timefram	Land-owner	Hectare	Landowner	Hectare				
Essex (Essex Forests & Wetlands + Western Erie Islands) since 2006	>40	>144	3+	>265	>5,000	Figures do not include Phragmites control at Nature Conservancy of Canada (NCC) properties, and along >10km of shoreline at Point Pelee National Park.		
Chatham-Kent (Rondeau + Lake St. Clair + Lower Thames) since 2013	>10	>20	>8	>226	>300	Figures are minimum totals for 2013-2014 projects involv- ing Lower Thames Valley Conservation Authority, Mu- nicipality of Chatham-Kent, St. Clair Conservation Foundation, MNRF, Ontario NativeScape and Carolinian Canada		

¹¹ The terms "stewardship" and "restoration" will need to be clearly defined.





Count Yourself In

Where is conservation taking place? Who is taking part? Thousands of people and groups are quietly volunteering to help green the future in their backyards and communities. Count yourself in by exploring Carolinian Canada's Grow Wild website to - find habitat ideas for your property or community, share your story or pledge an action. Everyone can help and every action counts, from growing a native plant to becoming a Landowner Leader to planning an EcoTrail to saving an ecosystem. The Big Picture Report Card will highlight some of the best stories to share across the zone.



This discussion paper provides a just a snapshot of the kinds of conservation action and information Carolinian Canada partners can be tracking to evaluate progress in advancing a collaborative conservation strategy. Even from this small sample of data it is evident that the natural environment is losing ground in some areas of southern Ontario, but that communities and individuals are also making heroic efforts to care for and restore ecosystems.

An important part of this ambitious project will be extensive collaboration with the hundreds of agencies, organisations and groups in our network. Your input will help to determine: what is important to track; what data are needed to address critical

conservation challenges; which additional data sets are available for standardized, long term trend monitoring by the Big Picture Report Card.

Additional possible metrics might track: average natural area sizes; habitat connectivity; species abundance and diversity; species at risk populations; air and water quality; natural heritage systems planning and relevant legislation; conservation funding; nature education; and public knowledge of biodiversity and ecology. Your partnership will help make the Big Picture Report Card a

permanent, vital tracking tool for ecosystem health and conservation across Canada's "Deep South".



How will YOU benefit from the Report Card?



Conservation Action Plan Partners

The report card will be a tool to share your stories and highlight achievements.



First Nations, Planners & Municipalities

The Big Picture Report Card will demonstrate how your jurisdiction is managing for climate change, and maintaining the green infrastructure needed for the health and well-being of your communities.





Agencies and Organisations

You will be collaboratively tracking the health of ecosystems and quality of life in southern Ontario with a network of partner groups with shared interests and mandates.



Landowners Leaders Grow Wild Volunteers

The report card will be a way to see how individuals fit into the Big Picture, where your citizen science goes, and how your contribution is making a difference.



Caring Citizens & Media

The Big Picture Report Card will serve as an important tool to show the links between healthy ecosystems and healthy communities, and to gauge how well we



QUESTIONS FOR YOU

Is your group collecting environmental data or doing ecological monitoring?

Would you like to report your results?

Do you have suggestions on "Big Picture Report Card" monitoring criteria?

Are there key data sets available that we have missed in the examples above?

Are you a volunteer interested in Citizen Science?

Please send your thoughts to bigpic@carolinian.org or complete our partner survey at caroliniancanada.ca

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Explore Canada's Deep South

Carolinian Canada Coalition brings together thousands of groups and individuals to advance a collaborative 'Big Picture' vision for healthy ecosystems and thriving communities in the Canada's deep south... Stretching from Toronto to Windsor, Canada's Carolinian Life Zone is among North America's most vibrant and fragile ecoregions.

(CANADIAN REGISTERED CHARITY 83559 4722 RR0001)

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