

HEALTHY BIODIVERSITY

How it can help us to adapt to climate change

For many of us, the term “biodiversity” is still elusive. It simply refers to the rich diversity of life – wildlife, fish, bird, insect, and plant species – as well as important ecosystems and habitats such as grasslands, wetlands, lakes, rivers, and forests. This mix of ecosystems and species provides us with clean air and water; helps to battle pollution; prevents flooding and erosion; and also provides important economic and recreational services and income that we benefit from every day.

The relationship between climate change and biodiversity is closely interconnected – climate change seriously threatens biodiversity – yet healthy and sustainable biodiversity can help us to adapt to climate change impacts.

Why Do We Need Biodiversity?

In a report released in May 2010, the Ontario Ministry of Natural Resources estimates that biodiversity provides about \$84 billion each year in ecosystem services.¹

Specific examples of the types of services that forests, wetlands, plants, animals, birds, and fish provide include:

- ▶ controlling flooding and erosion;
- ▶ cleaning water sources;
- ▶ managing drought;
- ▶ pollinating crops;
- ▶ recharging our water sources;
- ▶ providing valuable green space; and



▶ storing carbon emissions.

Economically, biodiversity helps to produce energy; supplies water to industry and individual households; contributes to tourism, timber, fisheries, and recreation industries; provides food; and much, much more. Clearly, biodiversity plays a direct and important role in rural and urban economies, our environment, and even to us as individuals.

Unfortunately, despite efforts, biodiversity around the world continues to struggle.²

In order to draw attention to the crisis around biodiversity, the United Nations declared 2010 the International Year of Biodiversity. They identify a number of threats to biodiversity that vary around the world. Climate change is one of those threats.

1 Estimating Ecosystem Services in Southern Ontario, Spatial Informatics Group, Austin Troy & Ken Bagstad (2009) for Ontario Ministry of Natural Resources, report: <www.mnr.gov.on.ca/stdprodconsume/groups/lr/@mnr/@lueps/documents/document/279512.pdf>; website: <www.mnr.gov.on.ca/en/Business/LuEPS/2ColumnSubPage/279467.html>.

2 State of Ontario’s Biodiversity 2010 Highlights Report, Ontario Biodiversity Council, <www.ontariobiodiversitycouncil.ca>.

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Climate Change Impacts Municipalities

It is agreed that climate change impacts such as increased flooding and drought, frequent heat waves, extreme rain events, decreased water flow in our streams, fluctuating lake levels, decreased fisheries, and degraded water quality are being experienced.³

According to a report published in 2006 by the Canadian Climate Impacts and Adaptation Research Network (*Adapting to Climate Change – An Introduction for Canadian Municipalities*⁴), these conditions will continue to significantly impact various types of municipal infrastructures. This includes *built systems* (roads and bridges), as well as *natural systems* (wetlands, forests) and *people*.

Northern communities, in particular, are expected to experience significant impacts from climate change. Communities that rely on climate-related economies, such as agriculture, forestry, and fisheries, could be at risk.

Stewardship Practices Build Biodiversity Resiliency

Stewardship initiatives are often a simple and cost effective way to help to build resiliency in biodiversity.

Through stewardship initiatives and conservation planning, we can:

- ▶ **protect and restore important wetlands and forests** to prevent flooding and erosion, store excess water

during intense rainfall events, and capture carbon emissions;

- ▶ **rehabilitate and restore important vegetation along river courses** to help manage flooding, reduce the flow of sediment, and improve water quality;
- ▶ **conserve water and keep water in the water cycle** through careful planning and stewardship programs;
- ▶ **protect urban green spaces** to provide a place for residents to visit and cool off;
- ▶ **work with agricultural producers to implement stewardship activities** that promotes better soils, keeps water flowing and protects water quality; and
- ▶ **maintain important green corridors and habitats** for birds, fish, and animals.

Community groups, all levels of government, conservation authorities, environmental agencies, and landowners are working together to plant trees, rehabilitate and restore ecosystems, and improve water quality. They also identify and track biodiversity in a wide range of monitoring and reporting programs.

In Ontario, the province's 36 conservation authorities have long recognized the importance of climate change adaptation and are already working to address the increasing impacts of climate change on water and related biodiversity. The general goal of conservation authority watershed stewardship programs is "to care for our land, water, air, and biodiversity on a watershed

basis recognizing that everything is connected in a watershed and affected by both natural and human activities."

Conservation authorities ensure the conservation, restoration, and responsible management of water, land, and natural habitats through programs that balance human, environmental, and economic needs. Specifically, they:

- ▶ plan and deliver programs and initiatives that protect, manage, and restore ecological features and functions;
- ▶ offer technical expertise in watershed management, watershed stewardship, and source water protection planning;
- ▶ collect data and conduct analysis;
- ▶ map water sources and threats; and
- ▶ plan and implement watershed stewardship programs and projects with landowners.

Working with partners at all levels (federal, provincial, and local), conservation authorities protect biodiversity through programs such as source water protection, watershed stewardship, environmental education, natural heritage planning and monitoring, as well as conservation area management and land acquisition.

Protecting Biodiversity Requires Integrated Watershed Planning and Management

Human activity has a direct influence on the quality and quantity of surface water, groundwater, and biodiversity in the watershed. What happens upstream can influence river flows, water quality, ecosystems, and species downstream. Therefore, by using the "watershed" as the basis for planning and managing, we can more effectively address the upstream – downstream issues that stress species and their related habitats.

Rather than focusing piecemeal on individual problems, an integrated

³ Biodiversity and Climate Change Action, Recent CDB scientific findings on biodiversity and climate change, 2009 Secretariat of the Convention on Biological Diversity.

⁴ Adapting to Climate Change: An Introduction for Canadian Municipalities, Canadian Climate Change Impacts & Adaptation Network (CCIARN) 2006, Lead Authors – B. Mehdi, C. Mrena, A. Douglas.

watershed management approach takes a *holistic view* and considers how our activities impact the natural functions and processes of our biodiversity. This is done across jurisdictional boundaries, looking for solutions that minimize negative environmental impacts and ensure healthier communities.

The watershed planning process used by conservation authorities relies on a collaborative effort by all of those who must take action including governments, agencies, industry, and the general public. This process brings together key stakeholders to consider the issues, fairly allocate resources, and plan how programs and projects will be implemented.

Integrating biodiversity protection into local planning already happens, to some degree, through conservation authority watershed plans and some municipal official plans. Conservation authorities routinely support municipal programs with watershed-based knowledge and analysis, and provide input to the municipal official planning process

in a variety of ways, including through the development and support of watershed and resource management plans and strategies. This relationship can also support municipal adaptation initiatives around biodiversity.

Climate change adaptation is a significant challenge, due to the scope and complexity of the issues to be addressed. Using an integrated watershed management approach to manage biodiversity issues can be an efficient and effective response.

Mapping the Way Forward

In its 2010 Highlights report, the Ontario Biodiversity Council (OBC) points out that much more work needs to be done to protect biodiversity. Climate change is impacting biodiversity, more and more invasive species are being identified, and important habitat is being lost in nearshore areas of the Great Lakes. As well, information gaps and a lack of data analysis make it very difficult to address the stressors on biodiversity.

More conservation efforts need to take place on the ground; however, in Ontario, spending on biodiversity today is minimal. The OBC report points out that less than one percent of provincial public sector and charitable giving was allocated to biodiversity management and conservation.⁵ Given the important connections between our lives and biodiversity, it is clear that more needs to be done – and soon.

While the challenge of losing biodiversity is urgent, there are still many promising opportunities to do something good about it. The path forward lies by leveraging the considerable resources of the public sector, conservation partnerships, and local expertise that already exists between governments (including municipalities), agencies, conservation authorities, and community groups.

Healthy biodiversity will ensure healthy communities, and is the means to help us all adapt more effectively to climate change impacts. *MW*

⁵ Note 2, *supra*, p. 40.

as published in

Municipal World

CANADA'S MUNICIPAL MAGAZINE – SINCE 1891

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