

## Biodiversity Conservation Sites

Indicator #8164

*Note: This is an indicator in development that was proposed for SOLEC 2006.*

### Overall Assessment

Status:	<b>Not Assessed</b>
Trend:	<b>Undetermined</b>
Rationale:	<b>Information on Biodiversity Conservation sites is limited at this time making the status and trend of this indicator difficult to assess.</b>

### Lake-by-Lake Assessment

*Individual lake basin assessments are not available at this time.*

### Purpose

- To assess and monitor the biodiversity of the Great Lakes watershed

### Ecosystem Objective

The ultimate goal of this indicator is to generate and implement a distinct conservation goal for each target species, natural community type and aquatic system type within the Great Lakes basin. Through establishing the long-term survival of viable populations, the current level of biodiversity within the region can be maintained or even increased. This indicator supports Great Lakes Quality Agreement Annexes 1, 2 and 11 (United States and Canada 1987).

### State of the Ecosystem

#### Background

In 1997, the Great Lakes Program of The Nature Conservancy (TNC) launched an initiative to identify high priority biodiversity conservation sites in the Great Lakes region. Working with experts from a variety of agencies, organizations, and other public and private entities throughout the region, a collection of conservation targets was identified. These targets, which represented the full range of biological diversity within the region, consisted of globally rare plant and animal species, naturally occurring community types within the ecoregion, and all aquatic system types found in the Great Lakes watershed.

In order to ensure the long-term survival of these conservation targets, two specific questions were asked: how many populations or examples of each target are necessary to ensure its long-term survival in the Great Lakes ecoregion, and how should these populations or examples be distributed in order to capture the target's genetic and ecological variability across the Great Lakes ecoregion? Using this information, which is still limited because these questions have not been satisfactorily answered in the field of conservation biology, a customized working hypothesis, i.e., conservation goal, was generated for each individual conservation target. Additionally, to effectively and efficiently achieve these conservation goals, specific portfolio sites were identified. These sites, many of which contain more than one individual target, support the most viable examples of each target, thus aiding in the preservation of the overall biodiversity within the Great Lakes region.

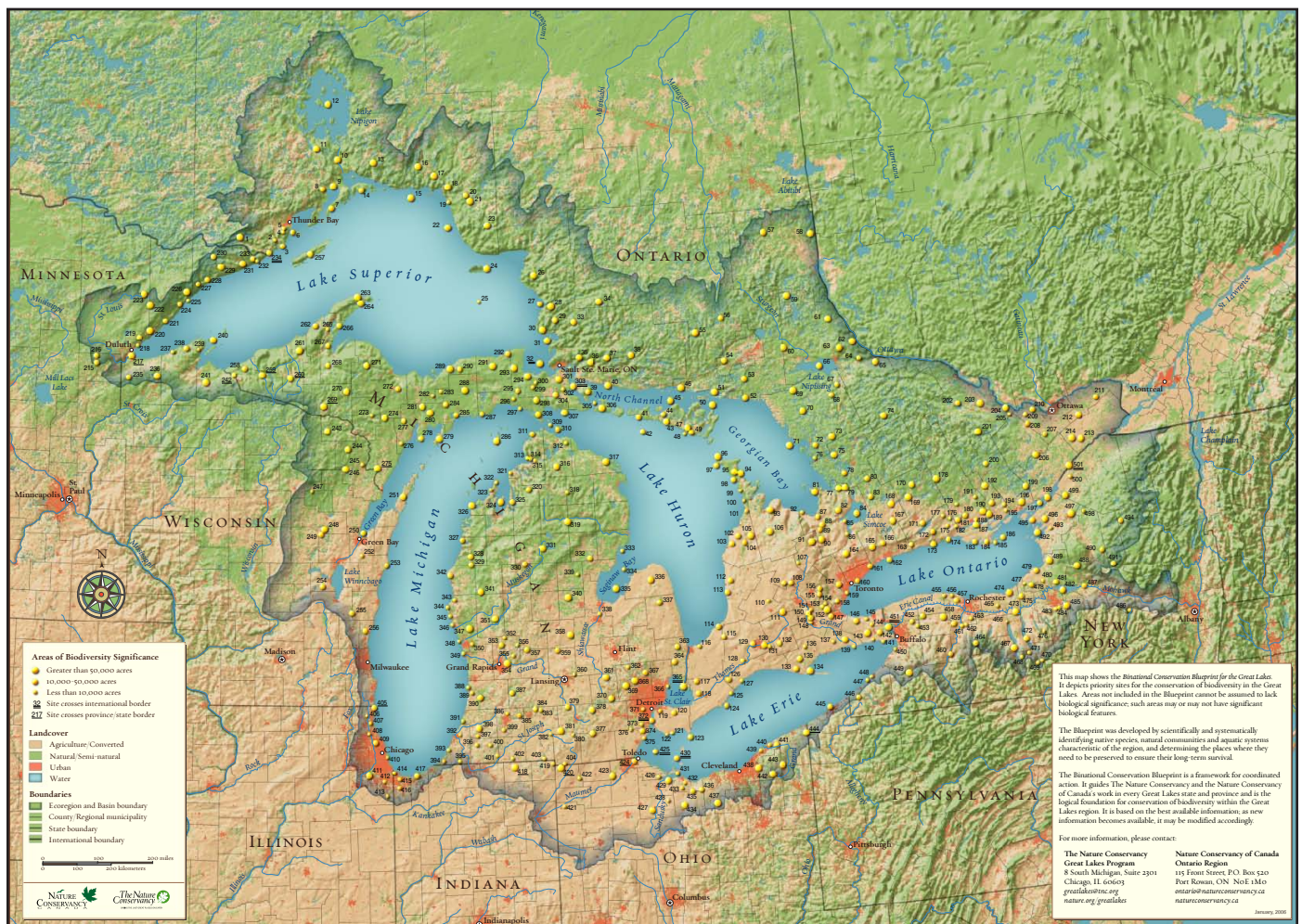
With support from TNC, the Nature Conservancy of Canada has undertaken a similar initiative, identifying additional targets, goals, and conservation sites within Ontario. However, as the commencement of this project occurred some time after its U.S. counterpart, there is a wide discrepancy in the information that is currently available.

#### Status of Biodiversity Conservation Sites in the Great Lakes Basin

Within the U.S. portion of the Great Lakes region, 208 species (51 plant species, 77 animal species and 80 bird species) were identified. Of these, 18 plant species and 28 animal species can be considered endemic (found only in the Great Lakes region) or limited (range is primarily in the Great Lakes ecoregion, but also extends into one or two other ecoregions). Furthermore, 24 animals and 14 plants found within the basin are recognized as globally imperiled. Additionally, 274 distinct natural community types are located throughout the ecoregion: 71 of which are endemic or largely limited to the Great Lakes, while 45 are globally imperiled. The Great Lakes watershed also contains 231 aquatic system types, all of which are inextricably connected to the region, and thus do not occur outside this geographical area.

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A total of 501 individual portfolio sites have been designated throughout the Great Lakes region: 280 of which reside fully within the U.S., 213 are located entirely in Canada, while the remaining 8 sites cross international borders (The Nature Conservancy and The Nature Conservancy of Canada 2006a). The number of conservation priority sites found in the U.S. is not distributed equally among the Great Lake states, since over half are completely or partially located within the state of Michigan. New York State contains the second greatest number of sites with 56; Wisconsin, 29; Ohio, 25; and Minnesota, 20. Furthermore, 9 sites are located within the state of Illinois, 7 sites in Indiana, while only 2 sites are found in the state of Pennsylvania (11 sites cross state borders, while one international and one U.S. site cross more than one border). The sizes of the selected portfolio sites have a wide distribution, ranging from approximately 24 to 61,000 hectares (60 to 1,500,000 acres); with three-fourths of the sites having areas which are less than 8,000 hectares (20,000 acres).



**Figure 1. Map of Biodiversity Conservation Sites within the Great Lakes Region.**

[http://www.nature.org/wherewework/northamerica/greatlakes/files/tnc\\_great\\_lakes\\_web.pdf](http://www.nature.org/wherewework/northamerica/greatlakes/files/tnc_great_lakes_web.pdf)

The currently established conservation sites provide enough viable examples to fully meet the conservation goals for 20% of the 128 species and 274 community types described within the Great Lakes conservation vision. Additionally, under the existing Conservation Blueprint (The Nature Conservancy and The Nature Conservancy of Canada 2006b), 80% of the aquatic systems are sufficiently represented in order to meet their conservation goals. However, these figures might not present an accurate depiction of the current state of the biodiversity within the region. Due to a lack of available data for several species, communities, and aquatic systems, a generalized conservation goal, e.g. “all viable examples” was established for these targets. As such, even though the conservation goals may have been met, there might not be an adequate number of examples to ensure the long-term



survival of these targets.

In order to sustain the current level of biodiversity, i.e., number of targets that have met their conservation goals, attention to the health and overall integrity of the conservation sites must be maintained. While approximately 60% of these sites are irreplaceable, these places represent the only opportunity to protect certain species, natural communities, aquatic systems, or assemblages of these targets within the Great Lakes region. Only 5% of all U.S. sites are actually fully protected. Furthermore, 79% of the Great Lakes sites require conservation attention within the next ten years, while more than one-third of the sites need immediate attention in order to protect conservation targets. These conservation actions range from changes in policies affecting land use, i.e. specific land protection measures (conservation easements or changes in ownership), to the modification of the management practices currently used.

## Pressures

In the U.S., information was obtained from 224 sites regarding pressures associated with the plants, animals, and community targets within the Great Lakes basin. From these data, four main threats emerged. The top threat to biodiversity sites throughout the region is currently development, i.e., urban, residential, second home, and road, because development is affecting approximately two-thirds of the sites in the form of degradation, fragmentation, or even the complete loss of these critical habitats. The second significant threat, affecting the integrity of more than half the sites, is the impact exerted by invasive species, which includes non-indigenous species such as purple loosestrife, reed canary grass, garlic mustard, buckthorn, zebra mussels, and exotic fishes, as well as high-impact, invasive, native species such as deer. Affecting almost half of the U.S. sites, hydrology alteration, the third most common threat to native biodiversity, includes threats due to dams, diversions, dikes, groundwater withdrawals, and other changes to the natural flow regime. Finally, recreation (boating, camping, biking, hiking, etc.) is a major threat that affects over 40% of the sites.

## Management Implications

A continuous effort to obtain pertinent information is essential in order to maintain the most scientifically-based conservation goals and strategies for each target species, community and aquatic system type within the Great Lakes basin. Additional inventories are also needed in many areas to further assess the location, distribution and viability of individual targets, especially those that are more common throughout the region. Furthermore, even though current monitoring efforts and conservation actions are being implemented throughout the watershed, they are generally site-specific or locally concentrated. A greater emphasis on a regional-wide approach must be undertaken if the long-term survival of these metapopulations (populations of the same species that are distinct, but that can interact) is to be ensured. This expanded perspective would also assist in establishing region-wide communications, thus enabling a more rapid and greater distribution of information. However, the establishment of basin-wide management practices is greatly hindered by the numerous governments represented throughout this region, (two federal governments, 100 tribal authorities, one province, and eight states (each with multiple agencies), 13 regional and 18 county municipalities in Ontario, 192 counties in the US and thousands of local governments) and the array of land-use policies developed by each administration. Without additional land protection measures, it will be difficult to preserve the current sites and implement restoration efforts in order to meet the conservation goals for the individual conservation targets.

## Acknowledgments

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## Sources

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## **Last Updated**

*State of the Great Lakes 2007*