"Make no little plans": Developing Biodiversity Conservation Strategies for the Great Lakes

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In a Nutshell

The Great Lakes biodiversity plans were created primarily by the US-Canada Great Lakes Water Quality Agreement (TTC-1972), the Great Lakes Water Quality Agreement (1972), and the Great Lakes Water Quality Agreement (2012). These plans for biodiversity conservation

Planning Approach

We employed the Conservation Action Planning (CAP) method to develop the plans (www.conservactionplanning.org/ConservationPlanning). The purpose of CAP is to help conservation practitioners:

1. Identify and assess the health or viability of conservation targets
2. Identify and rank threats to conservation targets
3. Develop strategies to abate the most critical threats and enhance the health of the conservation targets
4. Identify measures for tracking project success

Priority Area Analysis

Participants in each blueprint project expressed the desire for a detailed set of spatial priority conservation areas that focused more on coastal and aquatic systems. Coastal terrestrial systems and coastal wetlands were ranked spatially in all blueprints, and aerial migrants, tributaries, islands, and migratory fish were considered in some. Each plan applied criteria to assess biological significance and condition to rank spatial units on a relative scale (see for example, Figure 3). The criteria varied by plan.

Conservation Planning for Great Lakes

Biodiversity conservation strategies for the four Great Lakes and their immediate coastal areas are complete. These "blueprints" define multi-agency visions for biodiversity conservation, offer shared strategies to protect and restore the lakes, describe the benefits to people, generated baseline information on species and habitats, and promote coordinated conservation action.

Comparison of Threats

Each plan identified a set of conservation targets (Table 1). To assess current viability (health) status of the conservation targets, we developed a key Ecological Attributes (KEAs) and indicators, building on previous efforts in each lake. For many indicators we completed GIS analyses to establish current status ratings. For others we relied on the judgment of experts. An example of a single indicator is in Figure 2.

Strategies – Consistent Themes

The Chrysler Foundation, The Mott Foundation, The Nature Conservancy, and Nature Conservancy Canada worked with multiple partners, we have developed strategies for the four Great Lakes and their coastal areas. These "blueprints" define multi-agency visions for biodiversity conservation, offer shared strategies to protect and restore the lakes, describe the benefits to people, generated baseline information on species and habitats, and promote coordinated conservation action.

Conservation Focus and Viability

Table 2. Indicators and viability status ranks for conservation targets in four Great Lakes biodiversity conservation strategies. Ratings are from poor to good: 1= poor, 3= marginal, 5= good, 7= excellent. 

Lake Superior

Lake Michigan

Lake Huron

Lake Erie

Figure 2. Four phases of the CAP process. The plans focus upon the first two phases.

Figure 3. Coastal wetland biological assessment through the Lake Huron blue book. Coastal development or human impact around Lake Huron

Table 3. Threat ratings (colors) and ranks (numbers) within each lake. Ratings are indicated by color: Red = Very High; Orange = High; Green = Medium. The relative rank of each threat within one lake is indicated by the numeric value.

Table 3. Threats and response actions for each program

Table 4. Comparison of strategies from four Great Lakes blueprints.

Lessons Learned and Recommendations

1. Engage representative stakeholders
2. Use stratification units to report results at various spatial scales and ecological units
3. Viability and threat assessments should be refined as new information becomes available
4. Threat assessments should account for professional or regional bias
5. Give equal weight to restoration needs in strategy development
6. Define the scope of strategies and key constraints at the outset of the plan
7. Priority area identification in the context of conservation planning for Great Lakes ecosystems should provide general guidance, representing a first step
8. Evaluate how implementing conservation strategies will benefit people

Figure 1. Sources of Great Lakes biodiversity assessments and strategies over 2004-2019 (image of freshwater lakes). The plans can be downloaded from the following sources: Lake Erie, Huron, Michigan, and Ontario. Ontario: www.conservactionplanning.org/ConservationPlanning/ConservationPlanningByGeography/LakeSuperior/LakeMichigan/LakeHuron/LakeErie/LakeErieLakeshore/LakeErieMichigan/ConservationPlanningAssessment-For-LakeSuperior-Vol2-FinalDraft.pdf

Table 2. Indicator and viability status ranks for conservation targets in four Great Lakes biodiversity conservation strategies. Ratings are from poor to good: 1= poor, 3= marginal, 5= good, 7= excellent.

Table 1. Spatial strategy (barriers) and risks (barriers) within each lake. Ratings are indicated by color: Red = Very High; Orange = High; Green = Medium. The relative rank of each strategy within one lake is indicated by the numeric value.

Table 4. Comparison of strategies from four Great Lakes blueprints.