Population Monitoring and Contaminants Affecting the American Otter
Indicator #8147

This indicator report was last updated in 2002.

Overall Assessment

<table>
<thead>
<tr>
<th>Status</th>
<th>Mixed</th>
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<tr>
<td>Trend</td>
<td>Not Assessed</td>
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Lake-by-Lake Assessment

Separate lake assessments were not included in the last update of this report.

Purpose

- To directly measure the contaminant concentrations found in American otter populations within the Great Lakes basin
- To indirectly measure the health of Great Lakes habitat, progress in Great Lakes ecosystem management, and/or concentrations of contaminants present in the Great Lakes

Ecosystem Objective

As a society we have a moral responsibility to sustain healthy populations of American otter in the Great Lakes/St. Lawrence basin. American otter populations in the upper Great Lakes should be maintained, and restored as sustainable populations in all Great Lakes coastal zones, lower Lake Michigan, western Lake Ontario, and Lake Erie watersheds and shorelines. Great Lakes shoreline and watershed populations of American otter should have an annual mean production of >2 young/adult female; and concentrations of heavy metal and organic contaminants in otter tissue samples should be less than the No Observable Adverse Effect Level found in tissue sample from mink. The importance of the American otter as a biosentinel is related to International Joint Commission Desired Outcomes 6: Biological Community Integrity and Diversity, and 7: Virtual Elimination of Inputs of Persistent Toxic Chemicals.

State of the Ecosystem

A review of State and Provincial otter population data indicates that primary areas of population suppression still exist in southern Lake Huron watersheds, lower Lake Michigan and most Lake Erie watersheds. Data provided from New York Department of Environmental Conservation (NYDEC) and Ontario Ministry of Natural Resources (OMNR) suggest that otter are almost absent in western Lake Ontario (Figure 1). Most coastal shoreline areas have more suppressed populations than interior zones.

Areas of otter population suppression are directly related to human population centers and subsequent habitat loss, and also to elevated contaminant concentrations associated with human activity. Little statistically-viable population data exist for the Great Lakes populations, and all suggested population levels illustrated were determined from coarse population assessment methods.

Figure 1. Great Lakes shoreline population stability estimates for the American otter.
Source: Thomas C.J. Doolittle, Bad River Band of Lake Superior Tribe of Chippewa Indians
Pressures
American otters are a direct link to organic and heavy metal concentrations in the food chain. It is a relatively sedentary species and subsequently synthesizes contaminants from smaller areas than wider-ranging organisms, e.g. bald eagle. Contaminants are a potential and existing problem for many otter populations throughout the Great Lakes. Globally, indications of contaminant problems in otter have been noted by decreased population levels, morphological abnormalities (i.e. decreased baculum length) and decline in fecundity. Changes in the species population and range are also representative of anthropogenic riverine and lacustrine habitat alterations.

Management Implications
Michigan and Wisconsin have indicated a need for an independent survey using aerial survey methods to index otter populations in their respective jurisdictions. Minnesota has already started aerial population surveys for otter. Subsequently, some presence-absence data may be available for Great Lakes watersheds and coastal populations in the near future. In addition, if the surveys are conducted frequently, the trend data may become useful. There was agreement among resource managers on the merits of aerial survey methods to index otter populations, although these methods are only appropriate in areas with adequate snow cover. NYDEC, OMNR, federal jurisdictions and Tribes on Great Lakes coasts indicated strong needs for future assessments of contaminants in American otter. Funding, other than from sportsmen, is needed by all jurisdictions to assess habitats and contaminant levels, and to conduct aerial surveys.

Comments from the author(s)
All state and provincial jurisdictions use different population assessment methods, making comparisons difficult. Most jurisdictions use survey methods to determine populations on state or provincial-wide scales. Most coarse population assessment methods were developed to assure that trapping was not limiting populations and that otter were simply surviving and reproducing in their jurisdiction. There was little work done on finer spatial scales using otter as an indicator of ecosystem health.

In summary, all state and provincial jurisdictions only marginally index Great Lakes watershed populations by presence-absence surveys, track surveys, observations, trapper surveys, population models, aerial surveys, and trapper registration data.

Michigan has the most useful spatial data that could index the largest extent of Great Lakes coastal populations due to their registration requirements. Michigan registers trapped otter to an accuracy of 1 square mile. However, other population measures of otter health, such as reproductive rates, age and morphological measures, are not tied to spatial data in any jurisdiction, but are pooled together for entire jurisdictions. If carcasses are collected for necropsy, the samples are usually too small to accurately define health of Great Lakes coastal otter verses interior populations. Subsequently, there is a large need to encourage and fund resource management agencies to streamline data for targeted population and contaminant research on Great Lakes otter populations, especially in coastal zones.

Acknowledgments
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Last Updated
SOLEC 2002
[Editor's note: A condensed version of this report was published in the State of the Great Lakes 2003.]