



Non-Native Invasive Species Assessment

Assessment

Aquatic

Ecosystem Condition: Mixed
Ecosystem Trend: Unchanging

Terrestrial

Not Assessed

State of the Ecosystem

The status of invasive species in the Great Lakes is *Mixed, Unchanging* for non-native aquatic species, based on an assessment of two indicators. The non-native species indicator is broad and has not yet been fully developed for terrestrial species. However, from the information reported and other anecdotal evidence, we can expect the number of non-native invasive species to increase in both aquatic and terrestrial components of the Great Lakes basin ecosystem.

Aquatic

The Great Lake Fishery Commission (GLFC) and fishery management agencies have agreed on target abundances for sea lamprey populations in each lake, at which level the mortality rates of lake trout should be reduced to tolerable levels. Sea lamprey abundance is currently within the target range for Lake Ontario and Lake Erie, but populations have been increasing in Lake Michigan and Lake Superior and have exceeded the target range since 1998 and 1999, respectively. In Lake Huron, abundances fluctuate year-to-year, but over the past 20 years, the population level was within the target range only once, in 2002. The GLFC has increased stream treatments and lampricide applications in response to the increasing abundances from 2001 through 2004. Efforts are being focused on research and development of alternative control strategies, and computer models are being used to best allocate treatment resources. The potential for sea lamprey to colonize new locations, however, is increased with improved water quality and removal of dams from tributaries that provide spawning habitat. Any areas newly infested with sea lamprey will require some form of control.

The total number of non-native species introduced and established in the Great Lakes has increased steadily since the 1830s, but the number of ship-introduced species has increased exponentially during the same time period. Human activities associated with shipping are responsible for over half of non-native species introductions to the Great Lakes. Contrary to expectations, the rate of introductions increased following initiation of voluntary ballast management guidelines in 1989 and mandated in 1993. Recent studies indicate the Great Lakes may vary in vulnerability to invasion in space and time. Of particular concern are aquaria, garden ponds, bait fish and live food fish markets. In the United States, the Lacey Act prohibits interstate transport of some aquatic nuisance species. However, there are currently shortcomings in legal safeguards relating to commerce in exotic live fish.

Researchers are studying the links between vectors and donor regions, the receptivity of the Great Lakes ecosystem, and the biology of new invaders in order to make recommendations to reduce the risk of future invasions. Without measures that effectively eliminate or minimize the role of ship-borne and other emerging routes of entry, we can expect the number of non-native species in the Great Lakes to continue to rise, with an associated loss of native biodiversity and an increase in unpredicted ecological disruptions.

Terrestrial

Invasive non-native species destroy wildlife habitats and crowd out competitors, thereby threatening biodiversity. The negative impact of a wide range of non-native species, such as reed canary grass, garlic mustard, common buckthorn, and purple loosestrife, has been documented throughout the Great Lakes basin. However, the extent of invasion by other terrestrial non-native species is not well known. Some efforts are underway in the Great Lakes basin to set priorities for prevention and control of terrestrial invasive species and for public education. Additional activities are expected to lead to the formulation of a protocol for tracking invasive, non-native terrestrial species.

Acknowledgments

Karen Rodriguez, U.S. Environmental Protection Agency.

INVASIVE SPECIES

ID #	Indicator Name	2005 Assessment (Status, Trend)					
Aquatic							
18	Sea Lamprey						
9002	Non-Native Species (Aquatic)						
Status				Trend			
							?
Good	Fair	Poor	Mixed	Improving	Unchanging	Deteriorating	Undetermined