

Regulating the Sale and Possession of Aquatic Species in the Great Lakes: Potential species, criteria, and risk assessment methods

By: The Nature Conservancy, Great Lakes Project¹

We examined 15 risk assessment tools or databases that provide information that could inform regional efforts to align state and provincial regulated species lists. Broadly, methods for evaluating species invasion risk (introduction, survival, establishment, spread and impact) are: 1) expert review, 2) literature review, or 3) statistical models. Some tools apply to both plants and animals, and some only to plants, or only to animals:

For each species we assess whether it is established in any Great Lakes state (U.S. Geological Survey Nonindigenous Aquatic Species Database). Evidence of establishment in the region is considered to be evidence of climate match. In addition we explored whether any of the tools assess climate match and found that the following do: Wisconsin DNR literature review, EPA (GARP modeling), USFWS, DFO, USAWRA.

We then assess whether any of the 15 methods (described above) determine whether a species has:

1) a history of invasion or invasion impacts, Or 2) a prediction to be invasive

Each method uses different screening criteria or risk evaluation. Not all methods assess every variable. When several methods are considered together, multiple lines of evidence begin to suggest that there is strong scientific support that a particular species should be prohibited across the basin to avoid economic, social, and environmental risk to the Great Lakes region.

We rank species, which are prohibited by at least one state or province and have a climate match to the region, by the weight of evidence reported by these risk assessment methods. A total numerical score is based on how often a species is identified by a method as having either a history of invasion or impacts, or predicted invasion. All risk assessment methods are given equal value (score of 1 each).

The following assess history of invasiveness or impacts: Wisconsin DNR literature review, EPA, USFWS, ISSG, DFO, and the New York State Ranking System.

The following predict invasiveness: Keller et al., Kolar and Lodge (2002), DFO, - USAWRA (Gordon et al 2012), Indiana Rule, and the New York State Ranking System.

Michigan, Minnesota, and Ohio use expert panels to identify prohibited species. An additional 0.33 points is assigned each species prohibited by one of these states (maximum score 1 if listed in all three states). Expert panel determinations are not given equal value as the other methods because they have not been subject to peer review, and it is unclear what scientific evidence was used to reach the panel's decision. However, we consider that if multiple expert panels independently reached the same decision, it had more value than a determination by a single panel.

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Assessment /database	weblink
1. State Expert panels (MI, MN, OH)	
2. Wisconsin Literature Review	http://dnr.wi.gov/topic/Invasives/species.asp?filterBy=Aquatic&filterVal=Y&catVal=PlantsReg#RegSelect
3. Invasive Species Specialist Group (ISSG)	http://www.issg.org/database/species/List.asp
4. EPA (2008)	http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=190305
5. NOAA GLANSIS watch list	http://nas.er.usgs.gov/queries/greatlakes/Search.aspx
6. USGS Nonindigenous Aquatic Species Database	http://nas.er.usgs.gov
7. Lacey Act	http://www.fws.gov/international/laws-treaties-agreements/us-conservation-laws/lacey-act.html
8. USFWS Ecological Risk Screening	http://www.fws.gov/injuriouswildlife/Injurious_prevention.html
9. Mollusk Risk Assessment (Keller et al. 2007)	http://aquacon.nd.edu/research/invasive-species/documents/kelleretal2007fecundity.pdf
10. Canada Department of Fisheries and Oceans (DFO)	http://www.dfo-mpo.gc.ca/science/coe-cde/ceara/index-eng.htm
11. Kolar and Lodge (2002)	http://www.webpages.uidaho.edu/fish510/PDF/Kolar%20Invasive%202002.pdf
12. New York State Ranking System	http://nyis.info/?action=israt
13. U.S. Aquatic Weed Risk Assessment (USAWRA)	http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0040031
14. USDA Federal Noxious Weed List	http://plants.usda.gov/java/noxious
15. Indiana Rule (2012)	http://www.in.gov/dnr/fishwild/files/fw-AIS_PossessionRules.pdf