State of Maryland Department of Natural Resources

Larry Hogan
Governor

Jeannie Haddaway-Riccio
Secretary

Fishing and Boating Services
580 Taylor Ave.
Annapolis, MD 21401
dnr.maryland.gov

Toll free in Maryland: 877-620-8305

Out of state call: 410-260-8305

TTY Users call via the MD Relay

Executive Summary

**Risk Assessment Tools Adopted to Scientifically Assess Risk
of Invasion from Aquatic Animals in Maryland**

Prepared by:

Jay Kilian and William Harbold

Monitoring and Non-tidal Assessment Division
Resource Assessment Service
Annapolis, Maryland

Adopted by:

Maryland Department of
Natural Resources

Invasive Species Matrix Team

April 2020

Executive Summary

The adoption and use of a risk assessment tool by the department creates a repeatable, transparent process that improves subjective assessments once used to identify high-risk aquatic animal species for prohibition under COMAR (08.02.19). Five risk assessment tools were evaluated by the department. Each considered three facets of invasion: probability of introduction; probability of establishment; and probability of causing environmental, economic, or social impacts. Assessments required statements of support with cited evidence. After comparisons, a subset of tools, when used in combination, provided an efficient, objective, scientifically defensible process for which to assess species risk, inform future regulatory changes, and determine where to focus management. The tools are integrated into a four step process of risk assessment.

Step 1. AS-ISK. The Aquatic Species Invasiveness Screening Kit (AS-ISK) risk assessment tool is the initial screening tool to assess risk to Maryland waters posed by aquatic animals. This tool is one of the most widely applied, tested, and calibrated tools available. It can be used for various taxa including amphibians (AmphISK), reptiles (RISK), marine fish (MFISK), freshwater fishes (FISK), and marine (MI-ISK) and freshwater invertebrates (FI-ISK). The risk score provided by the tool will be compared against the global threshold of 15.5[1] to distinguish high-risk species until calibration for Maryland can be performed.

www.cefas.co.uk/nns/tools/

Step 2. Climate Matching. While performing AS-ISK, the department assesses the habitat suitability for establishment in Maryland using CLIMATCH model.

https://climatch.cp1.agriculture.gov.au/

The Risk Assessment Mapping Program (RAMP) by the U.S. Fish and Wildlife Service may also be used to determine the degree of climate match in Maryland to other regions colonized by high risk species.

https://www.fws.gov/fisheries/ans/pdf_files/RAMP-SOP.pdf

Step 3. Great Lakes Assessment[2]. When warranted, the Great Lakes Assessment Framework is used to conduct risk assessments of species deemed high risk by the AS-ISK screening tool. This tool was modeled after the United Kingdom Scheme, adapted for use in the Great Lakes region and is applicable to Maryland and the Mid-Atlantic region. This tool includes risk screening for the species as well as risk for multiple pathways of introduction and propagule pressure. Final scores within the assessment allow managers to evaluate risk across pathways and prioritize actions that limit chances of introduction and establishment.

Step 4. Review and Adoption. Assessments are conducted similar to the process employed by the Maryland Invasive Plant Advisory Commission for invasive plant assessments in Maryland. The risk assessment is conducted by one expert and then reviewed separately by two reviewers. Peer-review by two reviewers improves transparency and quality of the assessments. All final, peer-reviewed species assessments follow a consistent template used by the U.S. Fish and Wildlife Service.

Possible sources of citable evidence: FishBase: A global information system on fishes (https://www.fishbase.in/home.htm); ITIS: Integrated Taxonomic Information System (https://www.itis.gov/); GBIF: Global Biodiversity Information Facility (https://www.gbif.org/); GISD: Global Invasive Species Database (http://www.iucngisd.org/gisd/); USGS NAS: Nonindigenous Aquatic Species information (https://nas.er.usgs.gov/).

For more information, please contact jay.kilian@maryland.gov or william.harbold@maryland.gov.

---

[1] Vilizzi, L., G.H. Copp, B. Adamovich, D. Almeida, J. Chan, P.I. Davison, S. Dembski, F.G. Ekmekci, A. Ferincz, S.c. Forneck, et al. 2019. A global review and meta-analysis of applications of the freshwater Fish Invasiveness Screening Kit. Reviews in Fish Biology and Fisheries 29:529-568.

[2] Fusaro, A., E. Baker, W. Conard, A. Davidson, K. Dettloff, J. Li, G. Núñez-Mir, R. Sturtevant, and E. Rutherford. 2017. A Risk Assessment of Potential Great Lakes Aquatic Invaders. NOAA Technical Memorandum GLERL-169.