

## Nonindigenous Aquatic Species Program

**The Nonindigenous Aquatic Species Program tracks the status and distribution of introduced aquatic organisms and provides this information in a timely manner for research, management and education.**

Nonindigenous species are ranked second only to habitat loss in the factors that threaten native biodiversity, however the geographic distribution of many of these organisms are poorly understood. As new taxa are introduced and the range of those previously established continues to increase, precise tracking of their status and distribution is imperative for decision making and resource management.



The green mussel (above) is a recent marine invader to the west coast of Florida. Native to Asia, it probably arrived attached to a ship's hull from that region. It is already having an impact in Tampa Bay as a power plant biofouler.

The Nonindigenous Aquatic Species Program (NAS) neatly parallels several major directives of the 1999 Executive Order on Invasive Species by offering a relevant program to detect, monitor, conduct research and promote public education on invasive species. In addition it meets a science priority of the USGS and BRD by determining

the status of biological resources in aquatic systems. An expansive spatial database underlies the NAS program, which was created in 1978 and continues to be updated and revised. It supports the underlying role of the NAS program, which is to provide a continual national assessment of the status and distribution of nonindigenous aquatic species.

The NAS database functions as a repository and central clearinghouse for occurrence information from across the country. It contains locality information on more than 1100 species introduced as early as 1850. Vertebrates, invertebrates, algae and vascular plants are tracked. Taxa include foreign species as well as those native to North America that have been transported outside of their natural range. Locality data is obtained from many sources including the literature, state, federal and local monitoring programs, museum accessions, on-line databases, professional communications and reporting forms. Before inclusion in the database, records are critically reviewed then geographically referenced to the finest USGS hydrologic unit in order to correlate locality data with river drainage. USGS hydrologic units are commonly employed by natural resource agencies for referencing many types of environmental data, physical as



The red-eared slider, common in the pet trade, is now established in non-native waters due to owners releasing their pets.

well as biological, and implemented for management at the watershed level.

### Program Goals

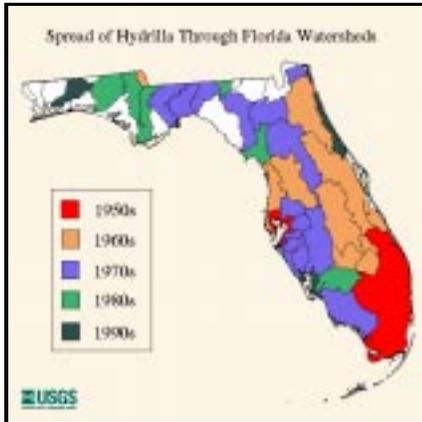
- Develop and provide an accurate ongoing assessment of the status and distribution of nonindigenous aquatic species nationwide.
- Identify geographic gaps in knowledge of the distribution of introduced aquatic organisms.
- Gain an understanding of the scope and scale of aquatic introductions in the United States.

### The NAS website

The website (<http://nas.er.usgs.gov>) provides immediate access to new occurrence records through a real-time interface with the NAS database. Website users can perform automatic queries to obtain lists of species according to state or hydrologic basin of interest. Fact sheets, distribution maps and news on new occurrences are continually posted and updated. Staff may be contacted for specific data, custom products and reports. The NAS website also provides information on reports and meetings and links to relevant sites.

## Applications of the NAS program

- ◆ Maps – Maps may illustrate the dynamics of distribution, pinpoint problem drainages, or assess vulnerability.



Map depicting spread of Hydrilla in Florida

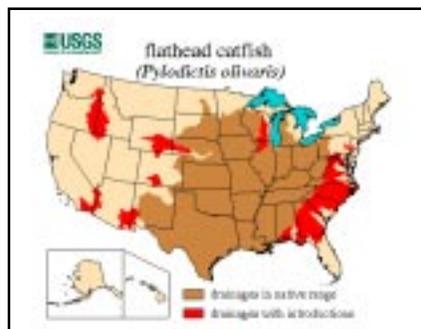
- ◆ Pathway analysis – Methods or pathways of introduction include intentional and unintentional stocking, pet and aquarium releases, ballast water, bait release and escape from cultivation or captivity.
- ◆ Risk Assessment – Analysis of distribution records has been instrumental in developing state legislation on prohibited species.
- ◆ Predicting Spread – Determined distribution of well established species might be used in estimating the potential spread of new species with similar origin or biological attributes.
- ◆ Publication products include peer-reviewed papers, book chapters, books, fact sheets and alert fliers. The Nonindigenous Fishes book, published 1999 by the American Fisheries Society, is based on more than 20 years of research. It summarizes the historical trends and spatial patterns of fish introductions nationwide.

## A Few Facts from the NAS Database

- ◆ Nonindigenous species have been recorded from nearly every aquatic system in the United States.
- ◆ In just five years, from 1988-1993, the zebra mussel spread to waters of 20 states. Currently they have been detected in 190 lakes that have no connection to the Great Lakes or to inland waterways.
- ◆ Introduced through the aquarium trade to seven states, the snail, *Melanoides tuberculata*, has been found carrying parasites fatal to native fish species in Texas.
- ◆ One of the nation's top problem aquatic weeds, hydrilla, currently infests 179 drainages in 16 states.
- ◆ More than 500 fish species have been introduced in the U.S., one-third are foreign the remaining are native species transported outside of their natural range.



Introduction of the flathead catfish can lead to the demise of native sunfish and bullheads through predation.



This species has been introduced to 16 states outside of its native range, both legally and illegally for sport fishing and through stock contamination.

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