

This Aquatic Invaders (AI) tool kit is designed as a comprehensive package for educators in Association of Zoos and Aquariums (AZA) member institutions to present an innovative, engaging and informative program. Our goal is to clarify basic components of the invasive species problem in the United States and to explain to visitors how to prevent new introductions and to reduce further spread of existing nonindigenous species. The Aquatic Invaders tool kit is the result of a partnership between AZA, North Carolina Sea Grant, Georgia Sea Grant, North Carolina Aquariums, and the University of Georgia Marine Extension Service. Funding was provided by the National Oceanic and Atmospheric Administration through the National Sea Grant College Program by award number NA16RG2251.

The kit contains instructions and props for your presentations of the Aquatic Invaders program. These items include:

Aquatic Invaders banner

Additional props: Signs (Letters N for native species and I for invasive species)

“Biodiversity & Billy B” music CD

Printed items:

- Sample bookmarks
- Sample text and program setup instructions
- Evaluation templates (Program and Project) with instructions
- Sample Aquatic Invaders fact sheets
- Frequently asked questions

A DVD showing sample presentations of the program

A set of two CD-ROMs containing digital files to support the program, as well as additional information and resources to facilitate the development of aquatic invasive species education programs for targeted audiences.

PROGRAM COMPONENTS ON CD 1

AI BANNER: Digital images of the centerpiece of the educational program. The top layer illustrates an aquatic environment before invasions, while the lower layer shows the same environment after invasive species are established. The design incorporates audience participation, as the program script explains.

AI BOOKMARKS: Templates for bookmarks (Hydrilla, spiny water flea, red lionfish, rusty crayfish and zebra mussel) to be distributed after each program. You can print additional bookmarks to supplement the printed bookmarks provided in the kit.

AI FACT SHEETS: Templates for fact sheets highlighting invasive species that may be included in the Aquatic Invaders program: Brazilian elodea, Caulerpa seaweed, Eurasian watermilfoil, Hydrilla, goldfish, green crab, koi, purple loosestrife, red lionfish, rusty crayfish, silver carp juveniles, spiny

waterflea, and zebra mussel. You may print these fact sheets to share with audience members who want more information.

This folder also includes a spreadsheet showing the pathways by which these species are spread, as well as regions in which they are problems, so that AZA educators may customize the program.

AI FREQUENTLY ASKED QUESTIONS: Answers to common questions relating to aquatic invasive species. Sources for further information are also provided.

AI LOGO AND PROGRAM GRAPHICS: The official Aquatic Invaders logo, in JPEG and EPS formats. Please use this logo widely to advertise the program and related materials. The folder also includes graphic files for props used in the program, such as signs to be worn by audience members participating in the program.

AI PROGRAM AND PROJECT EVALUATIONS: Templates for evaluation surveys. The “Program Evaluation” will assess audience members’ satisfaction with the program and understanding of key messages. Please use this survey to help the project team evaluate the effectiveness of the program.

The “Program Evaluation” is for AZA educators to evaluate the kit, including the ease of use, format of materials, and value that it adds to your facility’s educational programs. All educators who present the program are asked to review the kit.

AI PROGRAM SETUP: Program staging instructions.

AI SAMPLE TEXT: Sample regional text for educators presenting the programs. (Great Lakes, Gulf and South Atlantic, Mid-Atlantic, Mississippi River Basin, Northeast, Northwest, Southwest)

SUPPLEMENTAL MATERIALS INCLUDED ON CD 2

AI CHARACTERISTICS: Information sheet that provides a list of general traits often shared by successful invasive species.

AI DIGITAL IMAGES: Digital images of a selection of nonindigenous aquatic species of concern in the United States. Many of the images contained within this folder are copyrighted. Short credits are embedded in each image. You must include these credits when you use the images and all use must be restricted to the Aquatic Invaders education program. A separate document provides more detailed credits for the images.

Images are provided for the following species: Asian shorecrab; blue-green algae; Brazilian elodea; Caribbean treefrog; Caulerpa seaweed; channeled applesnail; Chinese mitten crab; Chinese mystery snail; club tunicate; compound seasquirt; dead man’s fingers; Eurasian watermilfoil; fishhook water flea; giant Salvinia; goldfish; green mussel; green crab; Hydrilla; Japanese knotweed; koi; lace bryozoan, marine clam, Mediterranean mussel; New Zealand mud snail; purple loosestrife; red-eared slider; red lionfish; red swamp crayfish; ruffe; rusty crayfish; sea lamprey; silver carp; snakehead; spiny water flea; swamp eel; water hyacinth; zebra mussel.

AI EDUCATIONAL RESOURCES: Spreadsheet providing a sampling of online educational resources about aquatic invasive species. The listing is alphabetized according to product type (book/booklet, brochure, CD-ROM, costumed character, curriculum, ID card, kit, map, photo, poster, screensaver, video and workshop). A subfolder contains a collection of useful PDFs relating to aquatic invasive species education.

AI GLOSSARY: Alphabetized compendium of frequently used terminology regarding aquatic invasive species. Program presenters may search by state, subject or common species name.

AI IMPACTS: Alphabetized listing of economic, ecologic and human health impacts of invasive species. These facts illustrate the consequences of invasions in a manner that the audience can remember. AZA educators may search the listing by state, subject or common species name. A subfolder also contains useful information in PDF format and a spreadsheet listing titles, URLs, site providers and details for resources on invasive impacts.

AI LEADERSHIP RESOURCES: Spreadsheet listing online resources relating to leadership on invasive species management and prevention. This listing is alphabetized according to site title and under the following categories: International organizations and resources; U.S. national organizations and resources; U.S. regional organizations and resources; and U.S. state organizations and resources. Subfolders provide useful information in PDF format: ANS Regional Panels (Aquatic Nuisance Species member state map and contacts); Great Lakes and Mississippi River Basin resources; mid-Atlantic resources; national resources; Northeast resources; organizations; Southeast and Gulf of Mexico resources; and Western resources.

AI PREVENTION: Information on how to prevent new introductions and how to reduce the spread of existing nonindigenous species. "Prevention Quick Quotes" summarizes problems and specific solutions relating to the spread of aquatic invaders. The focus is on pathways generated by the general public: boating, ornamental pond release, home and classroom aquarium releases, and live bait releases. The folder also includes a chart illustrating some of these pathways.

Additional files provide tools and information about the nationwide Aquatic Nuisance Species Task Force public awareness campaigns Habitattitude™ and Stop Aquatic Hitchhikers. These provide advice for aquarium hobbyists, backyard pond owners, water gardeners, and commercial and recreational water users and businesses. Federal laws relating to aquatic invasive species prevention and control are presented in the file "Prevention & Control Legislation."

A spreadsheet lists titles, URLs, site providers and details for prevention and control resources available online. These are organized into the following categories: Control, general pathways, ornamental plant release, aquaria release and recreational boating. Useful information in PDF format is included in the following subfolders: Aquaculture, boating, pets, ballast water, general pathways prevention and water gardens.

AI PUBLIC MONITORING & CONTROL: Information on how the public should report sightings of aquatic invasive species or unknown species to the U.S. Geological Survey or the U.S. Fish & Wildlife Service. USFWS contacts are listed by state as a resource for presenters or audience members. Additional useful information is provided in PDF format, including links to volunteer monitoring programs.

AI SPECIES: Information on specific invasive species. The "Table" subfolder contains a spreadsheet titled "Species Matrix" that summarizes the regions in which these species are present or a concern and the pathways associated with introduction and spread. "Related Species Handouts" has additional information to allow for program expansion and diversification. A spreadsheet provides a compilation of online resources for various species. It is alphabetized according to common name and then by site title. Common name categories are: general animals, fish, invertebrates, mammals, reptiles, amphibians and plants. Useful information in PDF format is organized into categories: amphibian, fish, invertebrate, plant and general species. Information about individual species is in a separate folder within these subfolders.

