



INVASIVE SPECIES



A variety of foreign microbes, plants, and animals enter estuarine waters where they face few, if any, native predators or diseases that could prevent them from becoming established in coastal ecosystems and upsetting natural habitats, marine life, and water quality. Important pathways of introduction for invasive species include ballast water, aquaculture, and marine recreational activities.

These intruders cling to the hulls of boats and other hard surfaces, including permanent floating docks and piers, ropes, buoys, and chains, even hitchhiking on the backs of native shellfish and other organisms. Once established, they can colonize and begin to smother native flora and fauna, killing off native populations by depriving them of space and food. Communities of fouling organisms can also damage piers and pilings and obstruct municipal water pipes. Pathogen- or disease-carrying invaders have the potential to threaten public health. Fortunately not every invader is harmful—some introduced species actually appear to be harmless—but among those that are, effective strategies are necessary to manage and control future invasions. The first step is recognizing what species are present and identifying potential sources and vectors.

THE NATIONAL ESTUARY PROGRAM IN ACTION

Massachusetts Bays Program

Since 2000, the Massachusetts Bays Program (MBP) and other NEPs in the Northeast have been addressing the problem in New England waters with an Invasive Species Rapid Assessment Survey (RAS), a quick, cost-effective approach similar to what NEPs in Washington and California have used. The MBP and its partners have conducted three RASs so far—a method that is less costly compared to other approaches but still provides high-quality data in a short period of time that can be shared

widely. Every few years, in mid-to-late summer when most marine organisms have matured and therefore are more easily identified, the MBP coordinates the week-long RAS at designated floating docks along the coast.

In 2007, and in partnership with a Massachusetts Institute of Technology (MIT) Sea Grant, the MBP was able to raise \$25,000 in funding from local, state, and Federal sources to survey sites from Maine to Cape Cod. Suc-

cess rested entirely on the work of a team of volunteer taxonomic experts and researchers brought together by the MBP and MIT. Compensated with little more than a place to sleep and three square meals a day, the team of scientists, educators, and students dispersed across docks to gather samples, including algae, tiny crustaceans, and other organisms. The effort even included the valuable addition of a diver and taxonomist from the Netherlands Natural History Museum on the team.

This enabled them to capture species on the underside of docks that seek habitat at greater depths.

After dropping the specimens into shallow pans of salty water for a quick examination, the scientists packed them in jars and plastic bags for identification at the University of New Hampshire, another vital partner. Specimens were documented and preserved in ethanol for possible use in future genetic studies. To complete the final RAS report, scien-

tists continued the identification process back at their home labs across the U.S., Canada, Brazil, and the Netherlands.

These baseline inventories are helping NEPs increase their knowledge about what species are present and to observe how things are changing in time and place. The information they collect can be shared and compared across estuary programs, putting researchers in a better position to understand trends in the presence and abundance of



species—important factors that help state and local governments develop effective early detection and rapid response plans, state management initiatives, public education, and increased volunteer interest in future monitoring efforts. The MBP is currently working with state agencies, particularly the Massachusetts Office of Coastal Zone Management (MCZM), to develop a coordinated statewide approach to detecting new invaders. MCZM and the MBP have developed a means of evaluating the threat posed by new invaders, and are now collaborating with the state Aquatic Invasive Species Working Group on the implementation of this evaluation method. To facilitate regional cooperation and communication, the MBP sits on the Northeast Aquatic Nuisance Species Panel, and has adopted some action items related to aquatic invasive species in

its Comprehensive Conservation and Management Plan. To fund their programs, MBP partners pursue grants to support ongoing citizen volunteer monitoring efforts.

Visit **www.massbays.org** to learn more about this and other MBP efforts.

EPA's National Estuary Program (NEP) is a unique and successful coastal watershed-based program established in 1987 under the Clean Water Act Amendments. The NEP involves the public and collaborates with partners to protect, restore, and maintain the water quality and ecological integrity of 28 estuaries of national significance located in 18 coastal states and Puerto Rico.

For more information about the NEP go to www.epa.gov/owow/estuaries.