

Aquatic Nuisance Species

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Aquatic Nuisance Species Training Agenda

- **Introduction: Nuisance species and pollution**
- **What is a nuisance species (NS)?**
- **How do NS move around?**
- **What is the impact of NS?**
- **Nuisance (aka *Invasive*) plants**
- **Nuisance animals**
- **Solutions – how can you help?**
- **Tips for boaters**



Introduction

Water pollution is the act or process in which a change in a water environment . . .

- **Causes harm to living organisms**
- **Makes water unfit for one or more uses**



A note about this training . . .

- This training will help you understand *invasive species* and, in particular, *Aquatic Nuisance Species (ANS)*
- Whether you are on boatcrew out on patrol, teaching a public education course, or conducting vessel examinations, ANS will increasingly be a topic of concern



Pollution

- **Well-known effects of water pollution**
 - Surface and groundwater contamination
 - Habitat modification and destruction
 - Harm or death to plants, animals and humans
 - Loss of fresh drinking water supplies
- **Effects of pollution on the environment can be complex**
- **Humans are the number one cause of pollution**



Directorate P

- **What is the role of the Marine Safety Department within the Prevention Directorate?**



What is a nuisance species?

Part 1: Some basic definitions

- **An ecosystem is a community where plants and animals interact with one another in a supportive way**
- **Plant and animals in their native ecosystems are part of the natural food web and are beneficial**
- **When plants and animals move out of their natural geographic ranges, they are considered alien species**
- **Humans can cause this disruption**



What is a nuisance species?

Part 2: Additional points

- Sometimes movement of a species out of its natural ecosystem can be beneficial
- Invasive species (aka exotic species) can be plants, animals or disease-causing micro-organisms
- Impact to biological pollutants often increase over time unlike other pollutants
- The U.S. has over 4,500 species of invasive plants and animals known to have established populations
- Executive order 13112 (1999)



Questions

- **What term defines a community where plants and animals interact in a supportive way?**
- **What is an example of a beneficial introduction of an alien species?**



Questions

- **Supply the missing term: nuisance species are also known as _____ species.**
- **How are biological pollutants unlike other pollutants?**



How do nuisance species move?

- Vast majority enter non-native ecosystems by **human action**
- The number of ANS has increased dramatically in recent years
- San Francisco Bay is an example



Questions

- **What causes the majority of nuisance species to enter non-native ecosystems?**
- **True or False: The number of nuisance species has remained stable in recent years**



How nuisance species move

- **Nuisance species can enter another ecosystem by accident**
 - **Transport of nuisance species can occur by land, air and water**
 - **The means of transport is called a vector. Vectors include automobiles, trains, airplanes, boats, and other animals**



How nuisance species move

- **Boats and ships are primary vectors for ANS**
 - **Many ANS are transported by ships in their ballast water**
 - **Fouling organisms such as barnacles, seaweeds and mussels move from location to location on hulls, anchors, propellers, and boat trailers**



Questions

- **In general, if an nuisance species is introduced into an area on purpose, is it more or less likely to cause harm to the environment than one that is introduced by accident?**
- **Specifically, how does a ship's ballast water transport and introduce nuisance species?**



What is the Impact of Nuisance Species?

Economic impact:

- **\$137 billion per year, \$9 billion due to ANS**
- **Industries affected:**
 - **Commercial and recreational fishing**
 - **Tourism**
 - **Recreational boating**
 - **Shipping**
 - **Agriculture and aquaculture**
 - **Drinking water production**



Economic Impact

Aquatic Nuisance Species	Annual Cost (\$ bil.)
Fish (includes Eurasian ruffe, sea lamprey, flathead catfish, alewife)	5.4
Zebra/Quagga mussels	1.0
Asiatic clam	1.0
West Nile virus	1.0
Aquatic plants	0.5
Shipworm (aka Teredo)	0.2
Green crab	0.1



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Question

- **Why should the Coast Guard and the Auxiliary be concerned about the economic impact of nuisance species?**



Ecological Impact

- **Nuisance species degrade habitat, threaten biodiversity and disrupt entire ecosystems**
- **Nuisance species are thought to be responsible for 42% of the endangered species at risk of extinction**
- **Nuisance species are thought to have contributed to more than 70% of native North American freshwater species extinction**



Question

- **Two examples of ecological damage done by nuisance species are they degrade habitat quality and threaten biodiversity.**
- **What is the third?**



Impact on Humans

- **Spread or introduce diseases**
- **Threaten life and safety through drowning in ANS plant entanglement**
- **Alteration of landscape that increases risk from hurricanes and wildfires**



Question

- **How much extra money would the U.S. as a society have each year if there were no nuisance species?**



Aquatic Nuisance Plants

- **Aquatic plants are vital because they**
 - protect shorelines from erosion,
 - act as filters against pollution,
 - provide oxygen, food, shelter, and habitat for wildlife
- **There are three types of aquatic plants:**
 - Floating plants
 - Emergent plants
 - Submerged plants



Questions

- **What good things are accomplished by aquatic plants?**
- **What negative effects do invasive weeds have?**



Water Hyacinth



Source: Vermont Dept of Environmental Conservation



Purple Loosestrife



Source: Vermont Dept of Environmental Conservation



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Eurasian Milfoil



Source: Government of Ontario



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Questions

- **Fill in the missing term: Water Hyacinth was introduced to Florida and Louisiana in the late 1880s as a _____ plant.**
- **Even though Hydrilla is native to Africa, what might you incorrectly expect could kill it?**



Aquatic Nuisance Animals

- **Types:**
 - **Amphibians**
 - **Crustaceans**
 - **Fish**
 - **Mammals**
 - **Reptiles**
 - **mollusks**



Zebra Mussel



Source: WAMU, American University



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European Green Crab



Source: Cornell University College of Agriculture
and Life Sciences



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Eurasian Ruffe



Source: Vermont Dept of Environmental Conservation



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Questions

- **How were Zebra Mussels spread throughout the Great Lakes, Mississippi River Basin and beyond?**
- **What particular man-made structure is the Zebra Mussel known to clog?**
- **Which type of ANS is able to spread more quickly between water bodies -- invasive plants or animals? Why?**



Solutions – How you can help

The only real way to stop nuisance species is to prevent them from entering the environment in the first place!

- **Ways to help in general**
 - **Don't release exotic pets and animals**
 - **Buy/plant only native trees/plants**
 - **Identify invasive species in your area and report to authorities**
 - **Inspect, clean and dry equipment used in the water after every use**
 - **Prevent/help clean up pollution on land and water**
 - **Obey all laws regarding invasive species and educate others regarding them**



Solutions – How you can help

The only real way to stop nuisance species is to prevent them from entering the environment in the first place!

- **Scuba divers and snorkelers**
 - **Inspect your equipment and clean it before leaving the water**
 - **Drain water while at the dive site**
 - **Wash diving suit in 104 degree water and allow to dry completely**



Solutions – How you can help

The only real way to stop nuisance species is to prevent them from entering the environment in the first place

- **Waterfowl hunters**
 - **Use elliptical, bulb-shaped or strap anchors on decoys**
 - **Inspect/clean decoy lines and anchors**
 - **Thoroughly clean clothes and equipment**



Solutions – How you can help

The only real way to stop nuisance species is to prevent them from entering the environment in the first place

- **Fishermen**

- Know/observe live bait collection laws
- Never release live bait into a different body of water
- Thoroughly wash and dry fishing tackle, buckets, etc.
- Drain your live well before leaving the boat ramp
- Report alien species to authorities



Solutions – How you can help

The only real way to stop nuisance species is to prevent them from entering the environment in the first place

- **Tips for boaters - ANS often spread between waterways by "hitching" a ride on boats and boat trailers**
 - **A great deal of the tips for recreational boats and personal watercraft are covered in Auxiliary ABS classes**
 - **Recreational boaters: wash your boat after each use**
 - **Jet Ski-drive systems: all of what recreational boaters do plus . . .**



Aquatic Nuisance Species Review

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- **What is the impact of NS?**
- **Invasive plants**
- **Invasive animals**
- **Solutions – how can you help?**
- **Tips for boaters**

