

What you need to know about marine invasive species.....

How do they get here?

There are many ways marine invasive species can get to Guam. Some of the methods and pathways for introduction include:

- commercial shipping
- recreational boating
- aquaculture
- aquarium trade
- in-water recreational activities
- buoys
- in-water construction materials
- marine debris

Commercial shipping and the exchange of ballast water and hull-fouling of ships serve as one of the largest invasion pathways for marine invasive species. Every day, every hour, an estimated 7,000 marine and coastal species travel unnoticed within ships ballast water tanks. Once a ship reaches its intended port, the ballast water -- and its stowaway species -- are let out into a new environment. Another invasion pathway of concern for Guam is the release (either intentional or accidental) of species brought in for aquaculture.

Ballast Water Exchange



Hull fouling



Aquaculture

How are they a problem?

While not all introduced species will become invasive, those that do will have a negative impact on the surrounding area where they become established. Some of the negative impacts from invasive species include the following:

- loss of native biodiversity
- loss of tourism revenues
- decrease in property values
- impacts to fisheries
- human health risks
- increase in shipping costs
- impacts to recreational activities
- costs associated with control

The costs associated with global economic losses from damage caused by invasive aquatic species were estimated at over \$7 billion in 2004/2005 (Battle 2009). In Hawaii, the costs associated with removal of invasive algae from beaches, reduced property values, and reduced occupancy rates for hotels and condominiums in impacted areas is estimated at over \$20 million lost in potential revenue (Shluker 2003).



Does Guam have marine invasive species?

Guam has been receiving species from other areas as long as ships have been traveling to Guam. To date, Guam has at least 100 known species which are not native to our waters; as of yet, none of these species has become invasive. However, with the increase in vessel traffic associated with the military build-up, there is concern for more non-native marine species to enter Guam with the possibility for one or more to become invasive.

What is the solution?

Management practices and the creation of appropriate regulations which prevent invasions are far more economical and practical than trying to stop a species from spreading once it arrives. Since Guam does not currently have any known invasive marine species, we have the perfect opportunity to prevent as many from coming in as possible. Some strategies to prevent marine invasive species introductions to Guam are:

- Ensure all vessels and equipment, including barges, dry docks, and dredging equipment, are free from fouling organisms before entering Guam's coastal waters
- Require a biofouling management plan for all vessels entering Guam waters
- Ensure all aquaculture facilities of non-native species are secure, including from natural disasters

For more information regarding marine invasive species please contact the Marine Invasive Species coordinator at guammarineinvasives@gmail.com

Rattle, J. (ed.). World Wildlife Fund International. *Silent Invasion - The spread of marine invasive species via ships' ballast water*. 2009.

Shluker, A. Hawai'i Department of Land and Natural Resources, Division of Aquatic Resources. *State of Hawai'i Aquatic Invasive Species Management Plan*. N.p. 2003.