

Aliens on the Reef: The Potential Impacts of Aquatic Nuisance Species on Hawaiian Coral Reef Ecosystems

Dave Gulko

Hawai'i Department of Land & Natural Resources

Hawai'i has amongst the highest level of endemism on coral reefs anywhere on the world. These unique fish, algae, coral and other invertebrates evolved without defenses against competitively superior alien species found outside Hawai'i. In contrast, Aquatic Nuisance Species (ANS) often have life history characteristics that promote rapid spread and growth including tolerance to a wide range of physiological/environmental conditions, and competitively superiority at capturing food. These features make such ANS difficult to control.

Ballast water and hull fouling ANS vectors are commonly known for temperate and sub-tropical systems. In addition to these vectors, alien seaweeds are introduced through research and aquaculture activities. The marine ornamental trade and the results of past fisheries enhancement raise additional challenges and impacts. The mechanisms involved are quite different from those being dealt with currently at a national level, and the management concerns and responses vary significantly. Solutions may need to include stronger control and oversight of research and aquaculture activities to minimize accidental introductions, greater support for broad public educational campaigns and targeted efforts at specific marine resource user groups. While more focused research into life history characteristics of coral reef aliens and innovative mechanisms of control is desired, there is a strong need for an immediate and actively-supported program for direct control of those aliens causing complete phase shifts on coral reefs. While currently these are Hawaii issues, they could reasonably be expected to crop up in the near future on other U.S. reef ecosystems.