

# PACIFIC MARINE INVASIVE SPECIES



## KEY POINTS

- Marine ecosystems are affected by both marine and terrestrial invasive species. Invasive species are the lead cause of extinction of endemic [Pacific species](#).<sup>1</sup>
- Terrestrial invasive species within catchments and the coastal zone seriously impact forest and ecosystem resilience, resulting in increased sediments and flood events and altering links (e.g. via seabirds) between terrestrial and marine life.
- Marine invasive species are spread through [ballast water and hull bio-fouling in ships](#).
- Invasive species can also spread via [marine debris](#), which they use as rafting habitats.
- Invasive species can alter the entire local ecology, leading to the collapse of [fisheries](#) and threatening [endangered species](#). Exotic algal species can also pose a risk to human health by contaminating seafood.
- Increased measures are needed to address the spread from shipping of marine and terrestrial invasive species. All international going vessels meeting the BWM Convention requirements will be subject to installation of treatment systems as per the Convention.
- Pacific island countries need increased development and implementation of early detection and rapid response systems.

## HOW ISSUE LINKS TO/IMPACTS SDGs BEYOND **SDG14 LIFE BELOW WATER**

- SDG2.4, 2.5: improved management of marine invasives will help ensure sustainable food production systems that help maintain ecosystems and genetic diversity of wild species
- SDG15.5: improved management will reduce habitat degradation and protect biodiversity

## BACKGROUND

1. **Increasing numbers of marine organisms are transported over the oceans as a result of globalisation, trade, and tourism.** Eighty-four percent of the world's marine ecosystems are already impacted by invasive species.<sup>2</sup> The costs associated with invasive species are in the tens of billions of dollars annually, often due mainly to scarce knowledge and research. Each new species introduced adds to the threat and costs. In contrast, protection against new introductions lowers these risks.
2. **Invasive species harm wildlife and ecosystems in many ways.**<sup>3</sup> Invasive species can compete with native species and humans for food resources, carry diseases, alter physical habitat structure, and alter ecosystem conditions, interactions, or services.
3. **Introduced marine organisms can also inflict economic losses on fisheries.** Around the world, serious declines in commercial fishery harvest, up to 90%, have been caused by invasive species.<sup>4</sup> In the Pacific, some of this decline has been attributed to the introduction of Tilapia for food security. The impacts on coastal and near-shore fisheries are unquantified in the Pacific region, although terrestrial impacts are large.<sup>5</sup>
4. **Deliberate imports must be identified and assessed.** At least 34% of the 269 introduced marine organisms investigated to date were deliberately imported for aquaculture breeding, such as Tilapia. A standard [assessment system](#) should be used to estimate the potential of a species displacing other organisms and to weigh the costs and benefits of introducing a species to a certain habitat. Species introduction is usually irreversible, or costly.
5. **Prevention is the most cost-effective form of management.** Government policy and environmental management must take a stronger stance to control the primary causes of species introduction, including uninterrupted monitoring of aquaculture and ballast water. International strategies practiced by all states bordering an ecoregion have greater chances of success than unilateral efforts at the national or local levels.



6. **Invasive species respond differently to disturbance than native species.** Disturbance can increase the potential for introduced species to invade, spread, or cause damage. For example, invasive tree species are more likely than natives species to fall and cause costly infrastructure damage and increased erosion (harming coral reefs) during storms.<sup>6</sup>
7. **Ballast water is responsible for transporting tens of thousands of different species between regions.** Ships load ballast water for stability with a small cargo load and release the water when new cargo is loaded at another port. Some 10 billion tonnes of ballast water are transferred around the world each year. This water contains thousands of species, including plankton, algae, fish, jellyfish, and other invertebrates. A small fraction are able to successfully reproduce and form a new population in a new location. Cases of newly imported species displacing native species have been documented in 84% of the 232 coastal ecoregions of the world.<sup>7</sup>
8. **The BWM Convention will enter into force on 8 September 2017.** The Convention contains standards and requirements for (1) ballast water treatment, (2) development of ballast water management plans, and (3) safe removal of sediments from ballast tanks; (4) guidelines for the testing and type approval of ballast water treatment technologies; and (5) an installation schedule of treatment systems in all vessels. With funding from IMO, the Secretariat of the Pacific Regional Environment Programme (SPREP) is assisting the Pacific region to develop National Ballast Water Management Strategies, as part of the regional strategy "Shipping-related introduced marine pests in the Pacific Islands".

- 1 SPREP. 2014. State of Conservation in Oceania.: Key Findings and Full Report. SPREP, Apia
- 2 Molnar et al. 2008. Assessing the global threat of invasive species to marine biodiversity. *Frontiers Ecol Envir* 6:485–492
- 3 SPREP 2016. *Battling invasive species in the Pacific*. SPREP, Apia. 36 p
- 4 *World Ocean Review* 1. 2010. Economic impacts of alien species.
- 5 Pacific Invasives Initiative. *Invasive species and food security in the Pacific*. 2 p
- 6 Airoidi & Bulleri. 2011. Anthropogenic Disturbance Can Determine the Magnitude of Opportunistic Species Responses on Marine Urban Infrastructures. *PLOS ONE* 6:e22985
- 7 Global Invasive Species Programme. 2008. *Marine biofouling and invasive species*. GLISP, UNEP. 68 p