



Science Needs Assessment Introduced Species

Conservation Issue

Introduced species are a major economic and environmental threat to the living resources and habitats of Monterey Bay National Marine Sanctuary (MBNMS), as well as the commercial and recreational uses that depend on these resources.

Description

Introduced species in marine and estuarine environments alter species composition, threaten native biodiversity (especially threatened and endangered species), modify ecosystem structure and function, and can disrupt commercial and recreational activities. It is necessary to identify the pathways by which new species are introduced into the sanctuary and prioritize which pathways pose the greatest threat to sanctuary resources. Researchers need to establish baseline information and monitor for new invasions to rapidly evaluate the most feasible and efficient methods of eradication, containment, or management of existing and future introduced species. This is critical for minimizing the impact of introduced species on MBNMS resources and implementing the protection of species and habitats threatened by introductions.



The invasive seaweed *Undaria pinnatifida* appeared in Monterey Harbor in 2001. Photo: NOAA

Data and Analysis Needs

1. Ecological and economic impacts of introduced species within MBNMS
2. Pathways by which species are introduced into MBNMS; method(s) for evaluating the risk level associated with these pathways; and agencies, organizations, regulations, or policies that already address introduction pathways
3. Methods for early detection of new invasions.
4. Feasible and efficient methods for eradication, containment, or management of existing and future introduced species in MBNMS
5. Optimal locations, methods, and duration for introduced species monitoring studies in the MBNMS
6. Ecological and economic impacts of introduced species in MBNMS

Potential Products

- Map of the distribution and abundance of introduced species in MBNMS
- An evaluation of detection and response options specific to individual introduced species
- Develop and implement prevention program for known introduction pathways
- Identify incentives and necessary infrastructure and training to reduce risk of introduction
- Develop early detection and response programs

Suggested Scientific Approach and Actions

- Assess known pathways of introduction, e.g. aquaculture, aquarium trade, ballast water, biological control, fisheries enhancement, hull fouling and other non-ballast vessel introductions, live bait, commercial businesses, scientific research institutions, and dispersal of adults, eggs, and larvae
- Establish baseline data collection and monitoring programs, including an expansion from the Elkhorn Slough region to investigate areas of Santa Cruz and Pillar Point harbors and the outer coast

Key Partners

Regional Water Quality Control Board, California Department of Boating and Waterways, California Sea Grant, California Department of Fish and Wildlife, Marine Pollution Control Studies Lab, Elkhorn Slough National Estuarine Research Reserve, Smithsonian Environmental Research Center, University of California, California State University, local divers

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