

ID: W2968342942

TITLE: Coral Translocation as a Method to Restore Impacted Deep-Sea Coral Communities

AUTHOR: ['Charles A. Boch', 'Andrew DeVogelaere', 'Erica Burton', 'Chad King', 'Joshua Lord', 'C. Lovera', 'Steven Y. Litvin', 'Linda A. Kuhnz', 'James Barry']

ABSTRACT:

Corals and sponges in rocky deep-sea environments are foundation species postulated to enhance local diversity by increasing biogenic habitat heterogeneity and enriching local carbon cycling. These key groups are highly vulnerable to disturbances (e.g., trawling, mining, and pollution) and are threatened by expansive changes in ocean conditions linked to climate change (acidification, warming, and deoxygenation). Once damaged by trawling or other disturbances, recolonization and regrowth may require centuries or longer, highlighting the need for stewardship of these deep-sea coral and sponge communities (DSCSCs). To this end, the sustainability of DSCSCs may be enhanced not only by protecting existing communities, but also repopulating disturbed areas using active restoration methods. Here, we report one of the first studies to explore methods to restore deep-sea coral populations by translocating coral fragments of multiple coral species. Branches of deep-sea corals were collected by ROV from 800–1300 m depth off central California and propagated into multiple fragments once at the surface. These fragments were then attached to coral pots using two different methods and placed in the same habitat to assess their survivorship (n=113 total fragments, n=7 taxa, n=7 deployment groups). Mean survivorship for all translocated coral fragments observed within the first 365 days was ~52%, with the highest mortality occurring in the first 3 months. In addition to an initial temporal sensitivity, survival of coral fragments varied by attachment method and among species. All coral fragments attached to coral pots using zip ties died, while those attached by cement resulted in differential survivorship over time. The latter method resulted in 80–100% fragment survivorship after one year for *Corallium* sp., *Lillipathes* sp., and *Swiftia kofoidi*, 12–50% for the bamboo corals *Keratoisis* sp. and *Isidella tentaculum*, and 0–50% for the bubblegum corals *Paragorgia arborea* and *Sibogorgia cauliflora*. These initial results indicate differences in sensitivities to transplanting methods among coral species, but also suggest that repopulation efforts may accelerate the recovery of disturbed DSCSCs.

SOURCE: Frontiers in marine science

PDF URL: <https://www.frontiersin.org/articles/10.3389/fmars.2019.00540/pdf>

CITED BY COUNT: 9

PUBLICATION YEAR: 2019

TYPE: article

CONCEPTS: ['Coral', 'Aquaculture of coral', 'Threatened species', 'Ecology', 'Bottom trawling', 'Coral reef protection', 'Coral bleaching', 'Habitat', 'Resilience of coral reefs', 'Fishery', 'Biology', 'Trawling', 'Oceanography', 'Fishing', 'Geology']