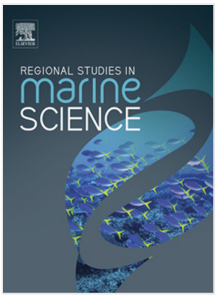
# Accepted Manuscript

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# Assessment of wild and restored staghorn coral *Acropora cervicornis* across three reef zones in the Cayman Islands

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Abstract

Interest in restoring staghorn coral *Acropora cervicornis* has grown following the widespread decline of this species in recent decades. To date, thousands of nursery-reared *A. cervicornis* have been outplanted to restore degraded reefs, but survivorship and growth among outplanted colonies can be spatially variable. In particular, data on distribution of remnant wild populations and outplant performance in varying reef zones is lacking. To address this gap, we conducted a study to characterize existing wild populations and assess performance of nursery-reared, outplanted *A. cervicornis* among three reef zones of varying depth at Little Cayman Island: the shallow back reef (0-3 m), the intermediate spur-and-groove reef (8-15 m), and the deep reef terrace (>15 m). Wild populations of *A. cervicornis* were present in each reef zone, and colony height and prevalence of predation by *Stegastes* spp. were highest in the intermediate zone. For outplanted *A. cervicornis*, survivorship differed among sites and was lowest for outplants in the deep zone during the 85-day observation period. Post-outplant growth and branching was lowest among outplants in the shallow zone due to high rates of colony breakage. Following the conclusion of the study, a mortality event occurred in which 90% of outplants at the shallow plots died during a period of elevated sea temperature. The information provided in this study suggests that intermediate spur-and-groove reefs are optimal for outplanting activities in Little Cayman using existing restoration methods. These data could be useful for coral restoration practitioners and government agencies in the Caribbean, particularly the Cayman Islands, which is actively expanding its coral nursery program. New strategies must be developed to improve restoration outcomes in shallow and deep zones.

Key Words: coral, restoration, endangered species, conservation, Caribbean Sea, Cayman Islands