**ecological effects of a community-managed marine reserve in the Bay of Ranobe, SW Madagascar**

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**Abstract**

Community-managed marine reserves have been widely implemented as a conservation tool to sustain coral reef fisheries and improve reef resilience. The Bay of Ranobe, in southwest Madagascar, is under increasing pressure from overfishing and climate change. In 2007, one of the first community-managed marine reserves in the region, the “Rose Garden”, was established in the Bay of Ranobe as part of a marine management program to improve the overall reef resilience in the region. Despite the presence of several marine reserves in Madagascar, data on their effectiveness are lacking. In this study, the effects of protection on benthic cover and fish density at Rose Garden were evaluated using long-term underwater visual census data, collected before and after the designation of the marine reserve. We also compared fish density and benthic cover in Rose Garden with non-protected reef sites in the Bay of Ranobe. Our results indicate that the creation of the marine reserve at Rose Garden resulted in significant increases in: i) overall fish densities ii) densities of commercially important species, and iii) densities of carnivorous and herbivorous fishes, throughout the 6 year study period. Analyses of the benthic cover at Rose Garden demonstrated a significant increase in coralline algae, a decreasing trend in fleshy algae, and stable hard coral cover following the creation of the marine reserve. In comparison with non-protected reef sites, fish density and live coral cover were significantly higher at Rose Garden. This evaluation indicates that small community-managed marine reserves have the potential to promote the recovery of over-exploited reef fish populations and prevent the shift to macroalgae dominance, consequently enhancing the natural resilience of a coral reef system.