Managing For Resilience: The Current Health Of And Management Implications For Coral Reefs In Bazaruto Archipelago National Park

Authors : Evan Trotzuk[1], Rod Salm[2], Mishal Gudka[3], David Obura[3], Melita Samoilys[3], Isabel da Silva[6], Ed Warner[7]
[1]African Parks,[2]The Nature Conservancy,[3]CORDIO East Africa,[4]Universidade Lúrio,[5]Independent

E-mail Address: evant@africanparks.org

ID: 11994

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Background

Despite both local and global pressures, the coral reefs within Bazaruto Archipelago National Park (BANP) continue to host biodiversity representative of the region and provide valuable economic and social benefits to local stakeholders. Coral reefs are critically important habitats within BANP, as they contribute to artisanal fisheries that ~ 90% of local community members rely on for their livelihoods. However, as in other parts of the ocean, BANP's corals are stressed by a variety of factors. BANP has lacked a consistent coral reef monitoring program, but historical records indicate that the health of many sites has declined.

Method

To assess the current health of BANP's reefs, researchers evaluated three overarching qualities of different sites: overall resilience through a semi-structure timed swim; benthic cover and characteristics via two 25 m transects; and the abundance, biomass, and diversity of 11 functionally-important reef fish families using 5 25 by 5 m transects. Over sixteen days in October 2021, the team visited 17 different sites throughout BANP, totaling around 110 underwater survey hours.

Results

Fish communities were characterized by relatively low diversity (among surveyed families), and biomass ranged from 181 SD 96 to 1121 SD 299 kg ha-1 (mean: 644 kg ha-1). The higher end of this range is comparable to the more productive true accreting reefs in northern Mozambique, indicative of unexpectedly high abundance and size at several locations. This may be partially driven by high biomass of planktivrous fishes (surgeonfishes) likely indicative of high nutrients on the algae dominated reefs. Hard coral cover varied from roughly 2 – 51%, a wide range characteristic of BANP's temperate-tropical hybrid reefs, which usually have patches of hermatypic coral on sandstone. There are, however, a few true accreting reefs, such as areas of Two Mile, Five Mile, and Lighthouse Reefs, where coral cover exceeded 25%. Branching Acropora corals covered the most surface area amongst all hard coral communities (4.5% of total hard coral surface area), while Pocillopora was the most common recruit. Sedimentation and storm damage severely constrain coral recruitment, growth, and health throughout the seascape. Fishing, tourism, and coastal development remain potential threats to certain reefs, if not already present. Some sites, such as the southern, seaward portion of Two Mile Reef, were associated with multiple measures of good health such as balanced fish populations including relatively abundant and diverse butterflyfish and groupers indicative of the

relatively high coral cover and other indicators of resilience.

Conclusion

Management of BANP's reefs will need to recognize that most current threats are natural and have persisted for several thousand years. The consequence is that management needs to focus heavily on reducing compounding stress from coastal development and people's use of the reef systems and on doing everything possible to maintain and enhance the coral community's ability to recover.