

## Chapter 6

### Coral reef health and status

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#### SUMMARY

To prioritize ecologically resilient reefs for conservation action, we evaluated the sites surveyed in the Northeast Madagascar Marine RAP using resilience assessment methods developed by IUCN and CORDIO East Africa. Overall the region showed high coral cover (mean of 48%), and coral populations that spanned the expected size range for the genus in question, including large, mature colonies. The common occurrence of large colonies suggests that there has been no catastrophic mortality in the past few decades. Coral recruitment was present, but relatively low.

Even after an extended heating event that ended immediately preceding the survey, coral bleaching was relatively low, showing a mean ~5% of colonies affected. This, and the low impact detected from the 1998 mass bleaching event, suggests that the corals in this region have largely resisted the negative effects of heating events, and supports the hypothesis that these reefs are thermally resistant. In general, the northern three locations (Ambodivahibe, Nosy Ankaon, Loky Bay) showed greater coral cover, larger corals and fewer bleached colonies than the southern two sites (Andravina, and Vohemar). Coral recruitment was highest on the northern and southern extremes, in Ambodivahibe and Vohemar, though overall was comparatively low.

The generally intact structure of the reefs and apparent resistance to coral bleaching suggests that the region is a priority for conservation. We recommend conservation actions to enhance coral recruitment, a key factor for ecological resilience, through the targeted restriction of fishing pressure and watershed management to limit/reduce sedimentation.

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#### INTRODUCTION

Coral reefs and their associated seagrass beds and mangrove habitats support the highest marine biodiversity in the world (Knowlton et al. 2010) as well as the livelihoods and economies of millions of coastal people (Moberg 2009). The coral reefs of Madagascar have long been recognized as a key asset in supporting the dual aims of biodiversity conservation and poverty alleviation.

An issue of primary concern for coral reefs is climate change, now recognized as one of the greatest threats to coral reefs worldwide (Hoegh-Guldberg et al. 2007). Mass coral bleaching remains one of the most immediate impacts of climate change on corals reefs, as abnormally high water temperatures trigger the breakdown of the coral-algal symbiosis and can lead to mass coral mortality (Coles and Brown 2003). Other factors that affect reefs in the region include cyclones, terrestrial sediment run-off, predator outbreaks such as crown of thorns sea-stars, and anthropogenic threats such as fishing, pollution, and nutrient additions (Wilkinson 2004).

Each of these factors affects the ecological state of reefs, and alone or in concert they can act to drive the reef from a highly diverse system capable of providing sustenance for many people