

Helping marine protected area managers cope with coral bleaching: Reef resilience toolkit

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Sea surface temperatures are rising and bleaching events are increasing in frequency and intensity. There is an immediate need to apply our current knowledge, albeit limited, of the ecological effects of bleaching in order to protect coral reefs worldwide. The 1998 El Niño Southern Oscillation (ENSO) event and 1999 La Niña caused mass coral bleaching of unprecedented proportions worldwide and the near complete loss of live coral at some sites. This event stimulated a major shift in planning of marine protected areas (MPA), with the concept of putting emphasis on managing coral reefs that are *resistant* to bleaching (they do not bleach) or *resilient* to bleaching (corals bleach and may die but the coral community recovers).

Coral reef scientists and conservation practitioners were previously at a loss about how to address a seemingly intractable problem: massive bleaching and mortality of corals resulting from global warming. The Nature Conservancy and partners have developed the R² - Reef Resilience Toolkit to help MPA managers and policymakers respond to threats from global climate change by enhancing their planning and management strategies. The multimedia, CD-ROM toolkit outlines the steps necessary to select, protect and monitor coral reef communities that are likely to be a) resistant or resilient to bleaching and/or b) sites for spawning aggregations. For maximum utility and global reach, the toolkit includes technical information, resources and tools that work with a variety of media, including television and video, computers and the Internet.

The R² toolkit will help practitioners begin to build resilience into their coral reef conservation programmes so that these valuable natural systems can survive anticipated global changes and provide for escalating human needs. By protecting resistant or resilient coral reef communities, MPA managers can begin implementing a strategy that aims to counter the potentially devastating impacts of climate-related coral bleaching. By protecting commercially and environmentally important spawning aggregations, marine conservation prac-

tioners can establish refuges that harbor and safeguard important ecological processes necessary for the survival of reefs and fisheries.

The Nature Conservancy's resilience strategy includes several training workshops that will be conducted in the Asia-Pacific region and the Caribbean over the next two years. The application of resilience to field conservation programmes is a new and evolving field in which The Nature Conservancy is taking a leading role. The R² toolkit will be a living document, regularly updated to synthesise, interpret, and present developing resilience science in a form that is accessible to and useable by coral reef managers.

The Nature Conservancy resilience strategy

Following the release of the R² - Reef Resilience Toolkit, The Nature Conservancy's resilience work has shifted into a new phase of field application, testing the principles outlined in the R² toolkit. In developing the strategy to advance the concept and ultimately the application of resilience in the field, The Nature Conservancy determined that it was critical to have an integrated approach that includes three components: application, training and science. Application is necessary to apply the concepts and tools to MPA network design and management while building capacity for coral reef conservation and facilitating information exchange. Training is essential to share the resilience concepts and management strategies at global scales to enhance the integration of the resilience principles into coral reef management. Science provides the underpinnings of the toolkit by defining and improving the resilience principles through field testing and tracking the evolving science.

Reef managers play a crucial role in preparing for and responding to a mass bleaching; thus they need to have the tools in place to effectively handle such events. Often, reef managers working in remote areas lack the resources and skills to respond to emerging global threats. Additionally, there is a lack of scientific evidence to guide the

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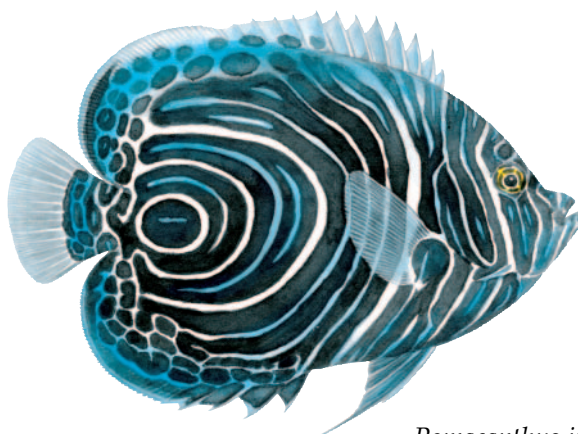
response to a bleaching event. Therefore, we need to continue to improve the science underlying the resilience principles.

In addition to improving the science underlying the toolkit, an important goal of the resilience strategy is to get the toolkit into the hands of as many practitioners as possible, establish a network of collaborating practitioners to further field test and refine the toolkit and the resilience principles, and improve the usability of the toolkit. A key element of the resilience strategy is the inclusion of both sites where The Nature Conservancy is active and other locations, where international partner organizations have a presence. An inclusive approach is essential for this effort to have

far-reaching impacts and to transform coral reef conservation across the globe.

The Nature Conservancy has hired a Resilience Coordinator to provide the essential capacity that will enable the organisation to further test the resilience principles and help diminish the levels of uncertainty concerning our resilience hypothesis. Developing and refining the resilience hypothesis will help to identify and protect reefs with the greatest chance of survival.

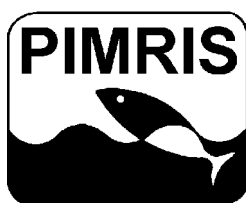
To request a copy of the R² - Reef Resilience Toolkit, please contact The Nature Conservancy's Global Marine Initiative at resilience@tnc.org.



Pomacanthus imperator

Image: Les Hata, © SPC

PIMRIS is a joint project of 5 international organisations concerned with fisheries and marine resource development in the Pacific Islands region. The project is executed by the Secretariat of the Pacific Community (SPC), the South Pacific Forum Fisheries Agency (FFA), the University of the South Pacific (USP), the South Pacific Applied Geoscience Commission (SOPAC), and the South Pacific Regional Environment Programme (SPREP). This bulletin is produced by SPC as part of its commitment to PIMRIS. The aim of PIMRIS is to improve



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the availability of information on marine resources to users in the region, so as to support their rational development and management. PIMRIS activities include: the active collection, cataloguing and archiving of technical documents, especially ephemera ("grey literature"); evaluation, repackaging and dissemination of information; provision of literature searches, question-and-answer services and bibliographic support; and assistance with the development of in-country reference collections and databases on marine resources.