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MONITORING CORAL REEF MARINE PROTECTED AREAS

CLIVE WILKINSON, ALISON GREEN, JEANINE ALMANY AND SHANNON DIONNE

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A PRACTICAL GUIDE ON HOW MONITORING CAN SUPPORT EFFECTIVE MANAGEMENT OF MPAS

REEFBASE

REEF CHECK

IMPAC

Reef Foundation

ICRAN
International Coral Reef Action Network

UNEP

Ministry of the Environment, Japan

United States Coral Reef Task Force

The research reported herein is based on early analyses of complex data sets and should not be considered definitive in all cases. Institutions or individuals interested in all consequences or applications of this research are invited to contact the authors.

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Australian Institute of Marine Science
PMB No 3, Townsville MC Qld 4810
Australia
Telephone +61 7 4753 4444
Facsimile +61 7 4772 5852
bookshop@aims.gov.au
www.aims.gov.au

IUCN Global Marine Program
Rue Mauverney 28
Gland 1196, Switzerland
Telephone +41 22 999 0204
Facsimile + 41 22 999 0020
email: info@books.iucn.org
www.iucn.org

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Cover Photographs from right to left, top to bottom from the front: Pulau Redang fishing village, Malaysia (Chou Loke Ming); flourishing table *Acropora* corals on Great Barrier Reef (Lyndon Devantier); *Eleutherobia aurea*, endemic soft coral, St Lucia MPA, South Africa (Michael Schleyer); coral reef shells for sale, Tanzania (David Obura); flourishing branching *Acropora* corals on GBR (Lyndon Devantier); children in dugout canoe, Toliana Madagascar (Pierre Vasseur); shipwreck on Rose Atoll, American Samoa (James Maragos); scientists monitoring the GBR (AIMS); Carrie Bow Cay research station, Belize (Clive Wilkinson); beach on Ant Atoll, Federated States of Micronesia (Clive Wilkinson); repairing fine mesh fishing nets, Kenya (David Obura); women and children gleaning on coral reef flats in Toliana, Madagascar (Pierre Vasseur); monitoring deep reefs in the Bahamas (Clive Wilkinson); plague of crown-of-thorns starfish on the GBR (Peter Moran); spearfishing on coral reef flats East Africa (Bernard Salvat); Buginese (sea gypsy) fishing boat in Indonesia (Sue English).

CaseStudy 13

American Samoa Bans Destructive Scuba Fishery: The Role of Monitoring in Management

Alison Green

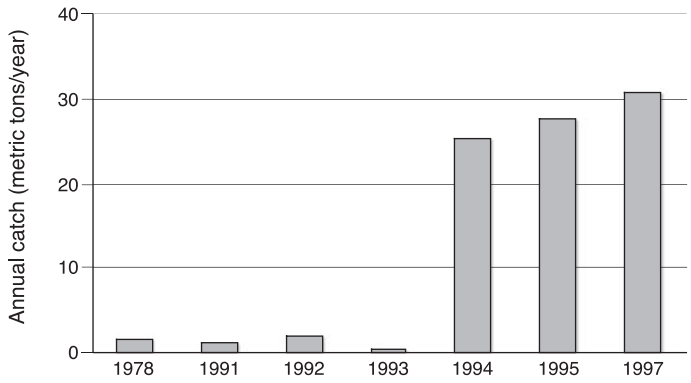
The challenge

It was important to act decisively when a new, high technology commercial fishery became established (the night-time scuba fishery) in the mid 1990s on the main island of Tutuila, American Samoa. This island is heavily populated and fished by artisanal and subsistence fishermen. The new fishery, which dramatically increased the catch of reef fishes on the island, posed a new threat to both fish populations and local fisheries. Urgent action was required to stop this fishery, but there was not enough time for a detailed assessment to be done. Local managers and scientists acted with the best available information, based on long-term monitoring of the fishery and fish populations.

What was done?

American Samoa has three long-term monitoring programs: two programs in Pago Pago Harbor and Fagatele Bay National Marine Sanctuary (since 1917 and 1985 respectively); and broad-scale surveys of the reefs throughout the Territory since 1996. These surveys have been conducted by visiting scientists (C. Birkeland and A. Green) since 1985 and 1994 respectively.

The government Department of Marine and Wildlife Resources has also monitored the coral reef fisheries intermittently for many years, and was the first to show that there was a problem with the scuba fishery.



There has been a dramatic (15 times) increase in catch of reef fish, especially parrotfishes, since the scuba fishery started operating. Parrotfishes are heavily targeted by this fishery.

This information led local managers to hold public meetings to discuss banning this fishery, and they invited the visiting scientists to present their survey results. The scientists observed that there was an alarming decline in the reef fish populations on Tutuila since the scuba fishery had commenced. The scientists, however, reported that it would be more than a year before quantitative data would be available to support their observations. They agreed that the situation was too severe to wait for more information, and supported banning the scuba fishery immediately. The local community also reported that subsistence fishing had become more difficult in recent years since the scuba fishery commenced. The perception was that teams of night-time scuba fishermen were working their way around the island, systematically wiping out reef fish populations.

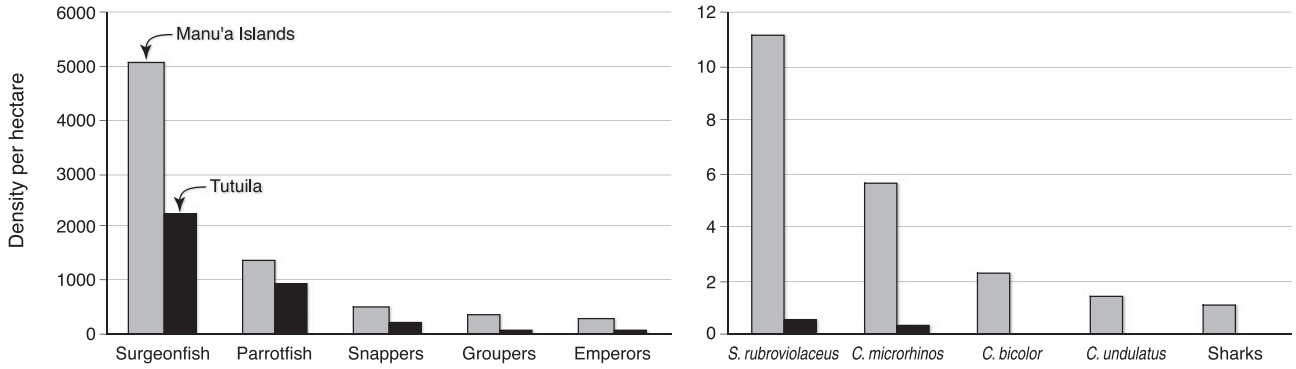
The scuba fishery was banned by Executive Order by the Governor of American Samoa in April 2001 (and subsequently banned by regulation in January 2002) due to concerns that this greatly increased catch rate would lead to overfishing of the reef fish populations. A recent survey confirmed that the reef fish populations on Tutuila are more heavily affected by fishing than those on the adjacent Manu'a Islands (where this fishery did not become established, and fishing pressure is lower), and that the local government did the right thing in banning this highly efficient fishery.

For example:

- Densities of the five major fisheries families (including parrotfishes) are lower on Tutuila than in the Manu'a Islands; and
- Large reef fishes that are particularly vulnerable to overfishing, such as large parrotfish (*Cetoscarus bicolor, Chlorurus microrhinus*, and *Scarus rubroviolaceus*), maori wrasse (*Cheilinus undulatus*) and sharks are now absent or rare on Tutuila, but are still present in Manu'a.

How successful has it been?

The coral reef and fisheries monitoring programs have been very successful in assisting the local government in banning this destructive fishery. Recent monitoring data show that local managers did the right thing in banning this highly efficient fishery before fish stocks were seriously overfished on Tutuila. If they had waited another 18 months for more rigorous scientific evidence before they acted, the fishery would have continued and probably resulted in more serious impacts on the fish populations.



Left: This shows that the density of the five major fisheries families are very different on Manu'a Islands compared to Tutuila where fishing pressure is higher (see Green 2002).

Right: The density of large reef fish species is also lower on Tutuila than in the Manu'a Islands (see Green 2002).

Local enforcement officers report that there has been little or no scuba fishing around Tutuila since the ban. However, this fishery has not stopped it merely displaced to neighbouring Samoa, which has subsequently banned the fishery (through traditional bans and new fisheries legislation). It is likely that this fishery will move to other Pacific countries.

Lessons learned and recommendations

- The night-time scuba fishery is highly efficient, and poses a major threat to coral reef fishes (particularly parrotfishes). This fishery should not be allowed to operate in an uncontrolled manner, because scuba fishing will quickly overfish local fisheries resources, and recovery may take decades (if at all);
- Monitoring can play an important role in fisheries management. On Tutuila, two types of monitoring programs contributed to banning a destructive fishery: monitoring both the fisheries catches; and the reef fish populations;
- Scientists and managers should not wait until more information is available, but should take the precautionary approach and act decisively to protect their resources if there is reasonable justification;
- Management actions can be most effective when supported by relevant stakeholders, including managers, scientists and the local community.

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Contact

Alison Green, The Nature Conservancy, PO Box 772, Townsville 4810 Australia; agreen@tnc.org