

# CORAL CURRENT

The Newsletter of The Coral Reef Alliance



**"Working Together  
to Keep Coral Reefs Alive"**

## UNDERSTANDING THE LANGUAGE OF MARINE PROTECTION

### *The Difference Between Reserves, Protected Areas, and Sanctuaries*

Many of the reefs you visit are protected. What does this mean? Are you allowed to dive or snorkel in a protected area? Can you fish?

Protecting the ocean realm—including coral reefs—is relatively new. The names and functions of the variety of marine protections in use are still evolving. What's more, the definitions may change from country to country.

From reading about CORAL, you are probably aware that our work is focused on preserving coral reefs in protected areas in tourist destinations. We often refer to these collectively as marine protected areas, or coral parks. In truth, CORAL works with communities that are supported by marine protected areas, locally managed marine areas, fully protected marine reserves, national marine parks, and other designations that are locally derived.

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Following are some of the most common designations of marine protection and their definitions, from the most general to the most specific:

#### *Marine Protected Area (MPA)*

Federal law describes MPAs as "Any area of the marine environment that has been reserved by federal, state, territorial, tribal or local laws or regulations to provide lasting protection to part or all of the natural or cultural resources therein." In the United States, MPAs include marine areas in local, state, or national parks, wildlife

*ctd. on page 6*

***Knowing the rules where you are diving and snorkeling is just as important as understanding the rules and regulations of a terrestrial park. Of course, no matter where you are in the water, behaviors such as proper buoyancy control, not disturbing animals, and removing trash (following CORAL's Underwater Cleanup Guidelines) all contribute to a healthier reef.***

## Ask CORAL Dr. Alex Brylske

### DO SHARKS KEEP A REEF HEALTHY?

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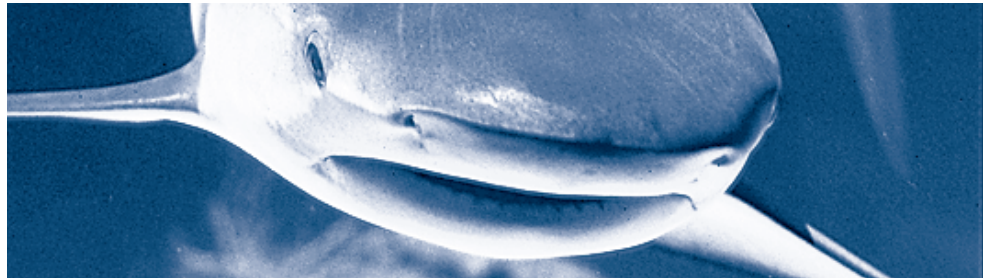
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Have you ever noticed that areas of high coral biodiversity often have high numbers of sharks? As a friend of mine regaled me with stories of schooling hammerheads from his recent trip to Palau, I began to wonder if there might be some correlation, given that Palau is known for having more than 575 types of hard and soft corals.

While at first it may not seem like there's a clear connection between sharks and coral reefs, recent research paints a different picture. We do know that the feeding structure of coral reefs is incredibly complex. But until recently, surprisingly little attention has been given to the specific role of sharks in the feeding structure and the health of coral reefs.

In April, a study was published in the *Proceedings of the National Academy of Sciences* by researchers from Spain and the Scripps Institution of Oceanography at the University of California in San Diego. They looked at the consequences of the decline in shark populations, which are some of the most over fished species in the sea.

Their study involved developing a food web model of a Caribbean reef covering 1,000 square kilometers to a depth of 100 meters, and included some 250 species. It was one of the largest and most detailed investigations ever undertaken, and the first to integrate food web structure, feeding dynamics, and conservation. This extensive model documented more than 3,000 links between species.

**So what were the results?** Of the many interesting findings, the most striking outcome was the effect that human activities—particularly targeted fishing—have had on marine ecosystems. Overfishing of sharks triggers what the researchers termed a "domino effect" where impacts to one species cause impacts up and down the food chain. According to one of the study's lead authors, Dr. Enric Sala, Deputy Director of the Center for Marine Biodiversity and Conservation at Scripps, "It appears that ecosystems such as Caribbean coral reefs need sharks to ensure the stability of the entire system."

In essence, fewer sharks feeding on carnivorous fish, such as grouper, leads to increased pressure on herbivorous species such as parrotfish and surgeonfish. The removal of these important grazers could be the final factor in shifting Caribbean reefs from coral to algae dominated ecosystems. As the report concluded, "The community-wide impacts of fishing are stronger than expected because fishing preferentially targets species whose removal can destabilize the food web." 🐠

*For more information about the study see the full journal article in [Marine and Freshwater Research](#) (volume 55, page 849).*

## Notes from the Field

### EXAMPLES OF MARINE PROTECTION IN CORAL'S PROJECT SITES

#### **HAWAII:**

#### **MARINE LIFE CONSERVATION DISTRICTS**

Hawaiian reef resources have been locally managed for centuries. However, Hawaii's recent history has shown that the state's growing population and growing tourism can have adverse effects on near shore fish populations. In an ideal protection plan, the needs of different user groups are balanced with preserving reef resources for the future. Therefore, Hawaii established a network of protected areas called Marine Life Conservation Districts (MLCDs.).

MLCDs allow only limited fishing and other consumptive uses, or prohibit such uses entirely. The first MLCD created was Hanauma Bay on the island of Oahu in 1967. Convenient to nearby Waikiki, Hanauma Bay MLCD quickly grew to a premier recreation destination for tourists. It became apparent by the late 1980's, however, that throngs of people (upwards of 10,000 per day) within an enclosed, isolated bay could lead to degradation of an area intended for preservation. The modified Hanauma Bay management plan now requires limiting the number of visitors per day and has led to an upgrade of a previously inadequate sewage system. At present there are eleven MLCDs statewide in Hawaii, with additional sites being considered. With a steadily growing tourism economy, effective management of MLCDs will require a continued balance between protection and access.

For more info on Hawaii's MLCDs, visit the State of Hawaii's Department of Land and Natural Resources, Division of Aquatic Resources website at: <http://www.hawaii.gov/dlnr/dar/mlcd/>

#### **CENTRAL AMERICA:**

#### **UNITED NATIONS BIOSPHERE RESERVES**

*The Programme on Man and the Biosphere* of the United Nations Educational, Scientific and Cultural Organization (UNESCO) supports a network of protected areas that balance the conservation and sustainable use of many of the world's richest terrestrial and coastal ecosystems. Since the early 1970's, nearly 500 biosphere reserves have been designated in 102 countries. The reserves are internationally recognized, yet under sovereign jurisdiction of the host country. The primary goal of the reserves is to conserve biodiversity, foster sustainable use of natural resources, and support scientific research, monitoring and education.

The Sian Ka'an Biosphere Reserve exemplifies the social and ecological benefits of the biosphere reserve concept. Located along the Caribbean coast of Mexico's Yucatan peninsula, Sian Ka'an is home to tropical humid forests, wetlands, coastal and coral reef ecosystems. The reserve is divided into core, buffer, and cooperation zones, which lessen the impacts of overfishing and provide increased opportunities for alternative sources of income through tourism activities. A recent socioeconomic assessment of the Punta Allen community in Sian Ka'an illustrates the effectiveness that sustainable activities have had on the local community, and describes how the lobster fishery, for example, has achieved sustainable management and serves as a model management tool for Latin America. 🌊

## FOCUS ON BIODIVERSITY RAJA AMPAT



Papua, an Indonesian province, is the western half of the island of Papua New Guinea. It is also referred to as Irian Jaya.

### **CORAL INVESTIGATES RAJA AMPAT FOR POSSIBLE SITE SELECTION**

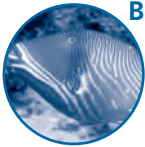
*In recent years, scientists have uncovered the astounding biodiversity in Raja Ampat, an archipelago residing in the heart of the "Coral Triangle." Data gathering expeditions led by Conservation International and The Nature Conservancy show that this area rivals Palau in numbers of species of reef fish and corals, and could be one of the most biodiverse reef areas in the world. Raja Ampat means "four kings," a name dating back to the 15th century when the Sultanate appointed one local "raja" for each of the four main islands in the archipelago: Misool, Salawati, Batanta, and Waigeo.*

## CONSERVATION PROFILE



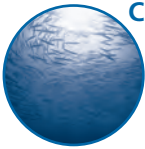
### LOCATION

Raja Ampat is located off the western most tip of the Papua province in Indonesia and covers approximately 6,961 square kilometers.



### BIODIVERSITY

1,074 species coral reef fish, 564 hard and soft corals, 108 types of damselfish.



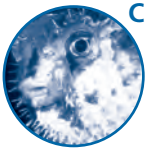
### CHARISMATIC SPECIES

Wobbegong shark, giant clams, sargassum frogfish, mega-schools of barracuda, jacks, bannerfish, surgeonfish, fusiliers, parrotfish, and snapper.



### NOTABLE REEFS

Cape Kri, Mellisa's Garden, Sardines Reef, The Passage, Nudibranch Rock, and Mike's Point.



### CONSERVATION THREATS

Dynamite and cyanide fishing, commercial fishing boats, logging, and mining.



### STRATEGIES

Possible designation as a UNESCO World Heritage Site, community-based protection using Palau as a model. 🌍



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As news of these pristine reefs spurs a budding tourism economy, CORAL will work to ensure that these reefs remain intact for generations to come.

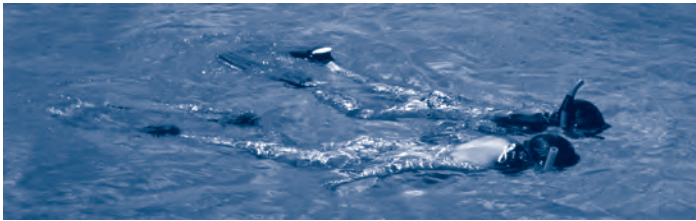
## A STRATEGIC APPROACH TO SELECTING CORAL WORKSITES

CORAL programs currently operate in six geographic worksites—Mexico, Belize, Honduras, Hawaii, Fiji, and Papua New Guinea. How do we arrive at selecting a coral reef destination for our conservation work? While high biodiversity and the presence of marine tourism play a big part in identifying potential worksites, a good deal more is involved in our analysis.

**Site selection is determined by evaluating potential destinations for political stability and safety, types of conservation threats, funding availability, local support for marine protected areas (MPAs), and the presence of potential conservation partner organizations.**

One of CORAL's highest-priority goals in considering worksites is to promote and assist MPA management and effectiveness. Marine protected areas work and are a necessary part of any reef protection plan. Successfully addressing the global threats to coral reefs will require planning and implementing MPAs.

From page 1: Marine Protection



Protected areas often ask snorkelers and shore divers to enter and exit from a certain point. Following these rules prevents damage to coral from trampling.

preserves, Marine Life Conservation Districts (see page 3 for CORAL's work in Hawaiian Marine Life Conservation Districts), or sanctuaries. As is evident, MPA is a broad category that encompasses a variety of protected status.

## Marine Sanctuary

In the US, Marine Sanctuaries, such as Dry Tortugas and the Northwest Hawaiian Islands, are MPAs designed for “multiple use” and only prohibit oil and gas exploration. Conflicts do arise in the management of US sanctuaries, such as where commercial fishing impacts recreational activities. As an example of how definitions vary, however, Philippine sanctuaries prohibit fishing.

## Marine Reserve

Marine reserve is the term often applied to MPAs that prohibit any consumptive use. Here, regulatory restrictions on activities such as fishing and collecting protect the entire ecosystem within the boundary. Most often, recreation is permitted, but some prohibit all entry except for research. Studies have shown marine reserves—sometimes referred to as fully protected marine reserves—are effective tools for increasing both the overall numbers of animals and species diversity relative to that outside the reserve (see page 3 for CORAL's work in Central American reserves.

## Locally Managed Marine Area

Though legislated marine protection has appeared only within the last several decades, traditional cultures have long preserved their waters and reefs through the placement of seasonal or permanent prohibitions (in some locations referred to as tabus). Now termed locally managed marine areas, these protected areas offer a wealth of traditional knowledge to modern marine managers. 🌴



In 2003, CORAL provided a microgrant to this locally managed marine area in Waitabu, Fiji to designate no fishing zones. Since the establishment of these zones, fish stocks have increased in number and size.

**Because the term marine protected area includes most types of marine protection designations, CORAL's publications generally use MPA to describe the areas we work except in cases of formal names.**

For more information, additional resources can be found at:[http://www.coralreefalliance.org/resources/briefs/Effective Marine Protected Areas](http://www.coralreefalliance.org/resources/briefs/Effective%20Marine%20Protected%20Areas)

<http://www.coralreefalliance.org/parks/guidelines.html> (CORAL tourism guidelines)

## Reefs in the News

### THE ROLE OF MARINE PROTECTED AREAS IN PROTECTING AGAINST COASTAL DISASTERS: INTERVIEW WITH TERRY HUGHES

#### *An excerpt from MPA News*

Following the Indian Ocean tsunami in December 2004, experts analyzed how impacts of the disaster were influenced by coastal ecosystem alteration, including degradation of coral reefs and removal of mangrove forests. A primary conclusion was that more natural coastal ecosystems were better able to dissipate the disaster forces, withstand stress, and recover from the event, as well as protect coastal communities. In general, natural systems were more resilient. For more on this, see the UN Environment Programme's Rapid Environmental Assessment Report on the tsunami, available at [http://www.unep.org/tsunami/tsunami\\_rpt.asp](http://www.unep.org/tsunami/tsunami_rpt.asp).

Coral biologist Terry Hughes of James Cook University (Australia) has co-authored recent papers in the journals *Science* and *Trends in Ecology and Evolution* on ways to support resilience of coastal and marine ecosystems to protect against disasters, including tsunamis and hurricanes. Below is an excerpt of the MPA News interview with Hughes about the implications from his research.

**MPA News:** In the context of building ecological resilience, how would you rank the importance of, say, improving water quality versus establishing marine protected areas (MPAs)?

**Hughes:** Generalizing the relative importance of water quality and overfishing is difficult because they invariably go hand-in-hand, and often reinforce each other. No-take areas—one form of MPA—are a useful tool for reducing fishing pressure, but they are effective only in a larger setting. If regions surrounding no-take areas are drastically overfished or if the water is polluted, then their effectiveness is compromised. No-take areas need to be co-managed with surrounding areas that are often heavily used by people.

**MPA News:** Is it possible to build lasting ecological resilience without also building social resilience?

**Hughes:** Sustaining and repairing ecosystems cannot be achieved in a social vacuum. Our recent papers highlight the emergence of an approach that links ecological resilience to governance structures, economics, and society. MPAs and no-take areas work only where there is local participation and support. A narrow focus on fisheries biology simply will

not work unless the social costs and benefits of conservation efforts are addressed simultaneously.

**MPA News:** Your suggestions of ways to build ecological resilience to coastal disasters are similar to ones cited by other experts for building resilience to gradual climate change. That is, we need to restore natural ecosystem function, improve water quality, and decrease overfishing.

**Hughes:** The principles are the same: you must be proactive, anticipate gradual or sudden change, and build resilience beforehand. Of course, the immediate human consequences of sudden violent events makes them a priority for reducing their impact when they occur, and for bolstering the ability of societies and economies to adapt to and recover from them. 🐠

Source: *MPA News* September 2005.

*MPA News* is published monthly by Marine Affairs Research and Education (MARE), a 501(c)(3) not-for-profit corporation, in association with the School of Marine Affairs, Univ. of Washington. For the complete article please see <http://depts.washington.edu/mpanews/>

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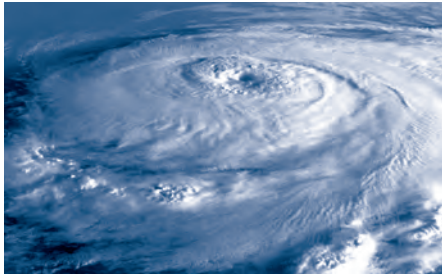


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If you still need to renew your membership and receive your free calendar please visit [www.coralreefalliance.org/support](http://www.coralreefalliance.org/support) or mail your renewal to CORAL, 417 Montgomery Street, Suite 205, San Francisco, CA 94104.

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