

## Madagascar Reefs May Hold Keys to Rebirth, Despite Bleaching

James Owen

for [National Geographic News](#)

October 17, 2006

Though blighted, coral reefs discovered off Madagascar may provide the seeds of recovery for marine life devastated by rising sea temperatures, researchers say.

A survey of coral reefs along the African island nation's remote southwest coast has revealed massive damage from coral bleaching—the loss of algae that live within corals and provide them with both food and color.

Some areas were found to have lost up to 99 percent of their coral cover. But researchers also discovered pockets of bleaching-resistant corals. The scientists say these animals could help revitalize dying reefs "To find these little foci of resistance is extremely rare and is of massive conservation importance," zoologist Alasdair Harris said.

### Global Warming

Harris is research director for the London-based marine conservation group Blue Ventures. The organization led the survey in partnership with the Bronx, New York-based Wildlife Conservation Society.

He says the survey shows the importance of locating and protecting healthy coral ecosystems.

"As climate change poses an increasing threat to our marine habitats, these resilient areas could hold the key to ensuring the continued existence of coral reefs around the world and the marine species that rely on them for survival," he added.

The team found that, as in other regions of the Indian Ocean, coral reefs are dying off southwest Madagascar.

Bleaching—so called because the corals turn white—affected 75 percent of coral reefs around the world in 1998, according to the United Nations Environment Programme. The Indian Ocean was badly hit in 2000 too.

"There has been mass mortality relating to hot sea surface water," Harris said.

Madagascar, the world's fourth largest island, is renowned for its wealth of unique plants and land animals, including lemurs, fossas, and giant jumping rats. Less known is the diversity of marine life around its shores.

The new survey focused on reefs in the remote Andavadoaka region.

There a team of experts documented 386 species of fish. Their finds included rare species known only from Madagascar and a type of wrasse that may be new to science. (See a photo of a "flasher" wrasse from Indonesia.)

### New Corals

Some 165 coral species were also identified. Four may be new species, according to coral expert Douglas Fenner of the Department of Marine and Wildlife Resources in Pago Pago, American Samoa.

"Most of the reefs had been devastated by mass coral bleaching," Fenner said. But "patch reefs"—away from the main reef network—in deeper water were in "very good shape," he added.

These reefs have survived previous mass bleachings in 1998 and 2000, so they may also be resilient in the future, Fenner says.

Why these reefs have survived remains unclear, according to Harris of Blue Ventures. The reefs' remote locations, however, may be significant.

"Most of the mortality we see happens on the shallower reefs round the coast and islands," Harris said. "The patch reefs are further from shore. Their tops are quite deep, so [the reefs] can't really be seen by the fishers who might have targeted them otherwise."

Harris says plant-eating fish are crucial to the health of corals, which compete with plants such as seaweeds for space on the reefs.

The new survey suggests plant-eating fish populations have declined in the region. He adds that patch reefs have a higher abundance and diversity of corals than the degraded coastal reefs and that some of these species may be more tolerant to warmer waters.

"They're showing interesting traits we're not seeing in other reefs," Harris said. "Enabling them to reproduce and grow is a priority."

The team says the patch reefs are a source of tiny coral larvae that travel on sea currents and could potentially colonize and revitalize bleached reefs.

Artificial reefs are now being built to monitor this process.

"We're going to be studying the growth of juvenile corals on these sites," Harris said. "And that will give us a good indication of their effectiveness for reseeded degraded coral reefs."

Studies suggest mass coral bleaching events will become more frequent as sea temperatures continue to rise.

"It's likely that these communities will be experiencing stress on an almost annual basis," Harris said.

### **Protected Areas**

Despite that gloomy outlook, the discovery of these resilient coral reefs offers hope, the team says—provided the reefs are incorporated into protected areas.

Government protection could help safeguard the reefs from human impacts, such as fishing and runoff from coastal villages and resorts.

Officials could establish "no take" fishing zones and, elsewhere, promote fishing practices that wouldn't harm coral ecosystems, the researchers add.

A number of aquaculture programs aim to provide local communities with alternatives to fishing. One project encourages seaweed farming, while another touts the cultivation of sea cucumbers—edible sluglike animals.

Nicholas Graham is a tropical marine biologist at Newcastle University in the United Kingdom.

"Shifting reefs back to a coral-dominated state is not a simple matter," he said. "And no one seems to have the answer of how that's done at the moment."

But Graham says the theory behind the Madagascan project is a good one.

"If you have areas of reef which seem resistant to increased water temperatures, then at least you have the source population to reseed degraded areas if conditions in those areas are suitable," he said.

Graham says that historically "the amount of reef science coming out of Madagascar is very limited."

"In Madagascar and lots of other areas around the world that are understudied," he added, "there are likely to be various undescribed species."