

## Researchers seek to preserve where the wild things are

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Palmyra Atoll is one of the most remote sites in the United States and serves as an excellent example of how less-disturbed reef ecosystems function. Palmyra was directly purchased to conserve the biodiversity that it harbors. Credit: Kydd Pollock

It was August 1941, four months before the attack on Pearl Harbor.

In search of a strategic Pacific Ocean base, American sailors landed on the shores of Palmyra Atoll, a flyspeck on the map about 1,000 miles southwest of Hawaii. They found a paradise of Technicolor corals, crystalline lagoons and lush <u>native forests</u>.



Isolated wildernesses such as Palmyra, which is now a National Wildlife Refuge, provide precious natural laboratories and hold a powerful allure in the popular consciousness. However, few scientists or policymakers have considered how to tailor conservation approaches to the unique challenges of these places which, until recently, were protected by their own remoteness.

A new Stanford paper called "Conservation at the edges of the world" in the September issue of *Biological Conservation*, which is online now, examines different conservation methods for remote areas. Palmyra is one of the "model remote sites" described in depth in the article.

The researchers assert that globalization is rapidly eroding isolation, and now is the time to protect scientifically valuable far-flung ecosystems. They suggest that some of the logistical, cultural and economic challenges of conserving remote places can be turned into opportunities for biodiversity management.

Palmyra is one of the Northern Line Islands, atolls once only accessible by rare <u>ship traffic</u>. Now, passenger airlines and <u>cruise ships</u> make regular stops in the area. Commercial fishing boats ply the waters of even the most isolated atolls and sea-tossed trash litters shorelines.

Still, the atoll remains a natural wonderland. It has one of the world's most intact coral <u>reef ecosystems</u>, a place where divers can expect to see more than 50 reef sharks at a time.

"Preserving the last remaining undisturbed ecosystems is the only way to avoid losing intact biodiversity reservoirs," said study co-author Fiorenza Micheli, a biology professor affiliated with the Stanford Woods Institute for the Environment and the Hopkins Marine Station. Like preventive medicine, Micheli said, "It is a relatively small investment we can make to prepare for the highly uncertain future ahead of us."



## Why do remote areas matter?

Biodiversity, the variety of living things in an area, plays an essential role in providing oxygen, food and other necessities. Because they are largely undisturbed, remote wildernesses are "our last good banks of biodiversity, libraries of evolutionary information and living museums showcasing how ecosystems develop and function when they are not dominated by humans," the study's authors write.

In this way, the world's most remote sites serve as globally unique controls, baselines of near-pristine nature to compare to less remote places with more human impact, according to study lead author Douglas McCauley, a former graduate student at Hopkins Marine Station.

"Beyond their instructive worth to scientists, many of us can and should take satisfaction in simply knowing that there still remain spots of our planet out there where life advances, for the moment, in ways that it has for millennia," McCauley said. "As remoteness degrades across our planet, the value and importance of these sites to science and society will only increase."

## Why focus on remote areas now?

More than 90 percent of remote places, a total land area six times larger than the United States, remains without formal protection, according to the study's calculations.

In an era of rapidly expanding transportation networks, ever-growing urban areas and development-hungry economies, remote doesn't mean what it once did. Even places without human footprints are affected by the long arm of human influence through factors such as climate change, which has led to more acidic ocean water, heat waves and coral die-offs,



among other impacts.

"Up until now we have had the luxury of thinking very little about conserving these sites because their insulation has provided de facto protection," McCauley said.

Factors such as the expense of monitoring and local communities' dependence on nature make managing biodiversity in far-off places very different from managing well-trod parks or urban green spaces.

The researchers say community planning is an essential ingredient to effective management regardless of the specific approach taken to conservation of remote areas.

Policies related to immigration and settlement establishment, for example, can have dramatic effects. Local conservationists can help leaders understand how related decisions affect biodiversity.

The study's observations and evaluations of conservation approaches are not meant to serve as specific guidelines, the authors say. Rather, the findings are intended to help start a broader discussion about how to save the last few remote places on Earth.

More information: <u>www.sciencedirect.com/science/ ...</u> <u>ii/S0006320713001766</u>

Provided by Stanford University

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