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The Red Sea Star restaurant in Israel is "reconciliation ecology" in practice, says UA's Rosenzweig. Restaurant owners initially wanted to build their underwater facility in the middle of an existing coral reef. When the Israeli government rejected that idea, the restaurateurs adopted an alternative plan: They collected bits of broken coral that littered the sea floor around the existing reef and nursed the portions back to health by dousing the coral with antibiotics. Then they used them to build up a new reef on the barren ground outside of their restaurant. The results are visible outside the windows of the restaurant.

## **Species Protection Must Include 'Reconciliation,' Says UA Ecologist**

**Monday, 25 September 2000**  
**Melanie Lenart**

A massive research initiative to learn how to protect species diversity has been proposed by the National Research Council, with input from a University of Arizona ecologist, in a report released today.

Michael Rosenzweig, professor and founder of the UA department of ecology and evolutionary biology, was a member of the committee selected by the National Research Council to propose research directions for the next several decades. The report was commissioned by the National Science Foundation, which awards millions of dollars in research grants every year. It will be posted on the National Academy of Sciences website, with a link provided below.

Recently, Rosenzweig has been advocating the protection of species diversity through "reconciliation ecology," a concept he presented at a university seminar last week.

"Reconciliation ecology seeks techniques to give more species back their geographic ranges without taking away ours," explained Rosenzweig, who is also editor and publisher of Evolutionary Ecology Research. "If we meet wild species halfway, many will adapt to our world."

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The UA ecologist finds examples of reconciliation ecology anywhere people have taken steps to encourage wild plants and animals to coexist with civilization. He describes the concept more fully in a book called "The Careful Foot: Designing our World to Save Earth's Species." The forthcoming book is now being edited.

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**Contact Information**

Michael Rosenzweig  
520-621-7296 (office)  
520-298-6033 (Home)  
[scarab@u.arizona.edu](mailto:scarab@u.arizona.edu)

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As one example, he points to the work of ecologist Ruven Yosef. After studying the behavior of loggerhead shrikes, a type of bird whose central Florida habitat includes a lot of rangeland, Yosef was able to reverse the local population decline simply by putting up artificial perches in the cattle ranches. A tiny investment in stakes from the lumberyard led to a documented increase of 60 percent in the local loggerhead population in one season.

The concept of reconciliation ecology has given Rosenzweig a glimmer of hope about the future of species preservation. It is a change from how he felt six years ago. After finishing his 1995 book, "Species Diversity in Space and Time," Rosenzweig sank into depression because he could not find a flaw in the data or the math that showed most existing species on Earth were doomed to extinction.

His conclusions came from the species-area curve, in which the number of different species in an area is plotted against the size of the area. In virtually all cases, the number of species increases as the area in question increases

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Rosenzweig and many other ecologists consider this rule as compelling a natural law as the force of gravity. And he sees as equally inescapable the conclusion that as you reduce the area that can be inhabited by wildlife, you reduce species diversity.

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"No ecologist would disagree with the statement that we humans are taking a lot of space. We all know what we're doing -- we're shrinking the Earth," he said.

Referring to some regional examples of species-area curves, he added, "You can see the loss is almost linear. Take away 90 percent of the land and you lose 90 percent of the species. It may take a while, but it takes a long time to fall off a skyscraper,

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too."

Many ecologists advocate setting aside large tracts of undeveloped land to preserve diversity. Ecologist Norman Myers and some colleagues have identified and recommended 25 "hot spots" of diversity for preservation. Together they cover only 1.4 percent of the Earth's surface, yet 35 percent of all vertebrate animal species and 44 percent of all vascular plant species in the world live entirely within these hot spots.

However, Rosenzweig invokes the species-area law to cast doubt upon whether a third of the world's animal species could continue to survive in less than 2 percent of the Earth's area.



UA ecologist Michael Rosenzweig  
(PHOTO: Bert Lippel)

"We must preserve those hot spots. If we lose them, we will surely lose those species. But the logic of that sentence breaks down when its parts get reversed. You can't say you'll save them by protecting the hot spots."

In addition to protecting wilderness areas, humans must encourage wildlife to thrive amid civilization, whether it's in the form of cattle ranches or cities. Even individual choices matter, such as whether to create a "monotonous" lawn of non-native grasses or instead cultivate diverse plants suitable for local wildlife.

In fact, implementing reconciliation ecology will require a shift in thinking for almost everyone, including conservation biologists.

Conservation biology tends to see the issue as "the green forces of nature versus the green forces of money," Rosenzweig noted. However, if reconciliation replaces confrontation, the "two green forces" of nature and economics can exist side by side, the UA professor believes. "You can have your cake and eat it too."

At the same time, saving species diversity will require an investment in time, and therefore money, as researchers learn enough about specific species to be able to predict how they could live with civilization.

So reconciliation programs will depend on public support -- and, to some degree, will be dictated by the public's idea of which species need saving.

"What people want to save may not have to be 'warm and fuzzy,' but if not warm and fuzzy,

then it probably has to be colorful or useful," Rosenzweig said. "But saving the warm, the fuzzy, the colorful and the useful will create a set of new, welcoming habitats in which many other species can find homes."

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