Loudspeakers make dead coral reefs sound healthy and fish swim to them

By Washington Post, adapted by Newsela staff on 12.13.19
Word Count **853**
Level **1040L**

Whitleys Slender Basslet fish swim between Mushroom Leather Corals and Luzonichthys whitleyi, Great Barrier Reef, Australia. When the scientists played the sounds of healthy coral ecosystems at damaged reefs in the northern part of the Great Barrier Reef, 50 percent more species showed up than at quiet sites. Photo by: Reinhard Dirscherl\ullstein bild via Getty Images

Scientists are searching for ways to help the world's coral reefs. Reefs are underwater land masses made of living coral and skeletal remains. The reefs are a home for fish, plants and other sea life.

The reefs are suffering the devastating effects of climate change. The desperate need for answers has created some wild solutions.

As the Earth has grown warmer, the surface of the ocean has warmed about 1 degree during the last 80 years. Scientists have found that climate change is caused by human's overuse of fossil fuels, such as oil and coal. Burning these fuels releases carbon dioxide and other greenhouse gases. They form a cloud in the Earth's atmosphere that traps heat.

Creating Coral "Nurseries"

In the Caribbean, researchers are creating coral "nurseries." There, they can implant fresh coral on damaged reefs.

In Hawaii, scientists are trying to specially breed corals. They hope the new coral will better survive rising ocean temperatures.

On November 29, British and Australian researchers introduced another unexpected method they say could help restoration efforts: broadcasting the sounds of healthy reefs in dying ones.

In a six-week field experiment, researchers placed underwater loudspeakers in patches of dead coral in Australia's Great Barrier Reef. The speakers played audio recordings taken from healthy reefs. The goal was to see whether they could lure back various communities of fish. The fish are essential to counteracting reef damage.

Promising Results

The results were promising, according to the researchers. The study was published in the journal Nature Communications. Researchers found that twice as many fish flocked to the dead coral patches where healthy reef sounds were played compared with patches where no sound was played.

"Healthy coral reefs are remarkably noisy places — the crackle of snapping shrimps and the whoops and grunts of fish combine to form a dazzling biological soundscape," said Steve Simpson. He's a science professor at the University of Exeter in England. Simpson helped write the study.

"Fish home in on these sounds when they're looking for a place to settle," he said.

According to the study, the number of species present in the reef patches where healthy sounds were played increased by 50 percent over the other patches. The new fish populations included species from all parts of the food web. There were scavengers, herbivores and predators. Importantly, the fish that arrived at the patches tended to stay.

Using Loudspeakers To Restore Lost Soundscape

"Reefs become ghostly quiet when they are degraded, as the shrimp and fish disappear," Simpson said. "Using loudspeakers to restore this lost soundscape, we can attract young fish back again."

The method could offer scientists another tool to revive coral reefs around the world. They need to be able to repeat the process on larger scales. The reefs have been damaged badly by climate change, overfishing and pollution in recent years. Scientists have warned that climate change may already be moving too quickly for some reefs to come back at all and conservation efforts are not keeping pace with the devastation.

Severe coral bleaching killed 50 percent of the Great Barrier Reef in 2016 and 2017. The Great Barrier Reef is the planet's largest coral reef. Bleaching events are usually caused by extreme heat waves. The heat causes the coral to expel algae, a type of sea plant that lives in the coral and provides it with both food and color. This leaves the coral without nutrients, and much more likely to get sick. Bleaching events are occurring four times as frequently as they did in the 1980s.

The researchers worked from October through December 2017 in a lagoon in the northern part of the Great Barrier Reef. It has a large, shallow reef that runs along the coastline.

At the start of the season when fish mate and mature, the team built 33 experimental reef patches out of dead coral on open sand. The experimental reef was about 27 yards from the naturally occurring reef. Researchers then fixed underwater loudspeakers to the center of the patches. The team angled the speakers upward to ensure the sound was distributed in all directions evenly.

Over the course of 40 nights, the team played recordings from a healthy reef in some of the patches. In other patches, they used dummy speakers without sounds and they left a third group of patches untouched.

Fish Attracted More Quickly, Stayed Longer

The researchers call the process "acoustic enrichment." The acoustically healthier reefs attracted fish more quickly and maintained them longer than the reefs without a healthy soundtrack, according to the study.

The researchers said drawing fish back to dead or dying reefs will not reverse the damage by itself. However, depleted reefs have a better shot at becoming healthier if they have large populations of fish. The fish play a variety of roles in keeping the coral healthy.

"Fish are crucial for coral reefs," said Tim Gordon. He's the study's lead author from the University of Exeter. "Boosting fish populations in this way could help to kick-start natural recovery processes, counteracting the damage we're seeing on many coral reefs around the world."