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Shh! Will U.S. Navy Turn it Down for Whales and Dolphins?

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Human allies of whales and dolphins have long had difficulty reining in the Navy's use of sonar that harms these animals. But recent developments suggest that may be starting to change.

California's 840 miles of coastline boast an eclectic mix of marine habitats, from swaying kelp forests a hundred feet tall to wave-carved underwater cliffs and archways teeming with intertidal life. More than 285 species of fish are taken both commercially and recreationally here, supporting an industry worth upwards of $600 million each year.

To protect these resources, the state's legislature in 1999 passed the Marine Life Protection Act, the first of its kind in the United States. The law defines three different types of marine protected areas, directs the state to consider them together as a network, and sets up systems for minimizing human impacts within them.

But the act also includes a number of exceptions. Biological research and monitoring are exempt in some areas, as well as licensed fishing and collecting in others. So, too, are matters of national security—the U.S. Navy conducts underwater training exercises in or around several of the preserves established by the law. These exercises can be deadly to marine mammals such as whales, dolphins, and seals.

People who care about such animals have long had difficulty imposing limits on exercises operated by the U.S. Navy. "National security issues often seem to trump environmental issues," says Miyoko Sakashita, oceans director at the Center for Biological Diversity in California.

But several signs suggest that may be changing. On March 8, the California Coastal Commission, a management agency created by state law, rejected a plan proposed by the U.S. Navy for sonar and explosive weapons training off the coast of Southern California, deeming it negligent and dangerous to marine

life. And, while that decision is not binding, 500,000 signatures on an online petition were delivered to the commission requesting the rejection of the proposal.

This seems to show widespread support for the idea that the military needs to be more careful about how its activities affect ocean life.

Sounding off against the sonar plan

The California Coastal Commission's decision is merely advisory, and the National Marine Fisheries Service could still approve the Navy's proposal. If that happens, the plan would permit underwater detonations, ship sinkings, gunnery exercises, and active sonar offshore, all of which are extremely loud and potentially deadly to whales and other marine creatures with sensitive hearing.

The proposal includes conducting activities that produce powerful underwater sound waves repeatedly over a five-year period—up to 9.5 million times in the Hawaii and Southern California training ranges, and 21.8 million times in the Atlantic training range.

This underwater ruckus can wreak havoc on a multitude of organisms, not just whales and dolphins, said Lyndia Storey of Whale and Dolphin Watch. "People are familiar with incidents around the world of cetaceans stranding themselves on beaches after sonar tests," Storey said. "But there's nothing in the [environmental impact statement] that covers plants, fish, algae—all of these things are affected by sound, possibly negatively."

According to Martha McClure, supervisor of the California Coastal Commission, the number of "takes"—jargon for animals potentially injured, maimed, or killed by the tests—estimated in the Navy's environmental impact statement was far too low. "A number of biologists working with us identified many more species that would be affected by these sounds, over quite a large area, and this was a huge stumbling block for us."

A deep-sea cacophony

Underwater, sound waves move five times faster than they do through air, and because they lose less energy in water, they travel farther, too. These waves penetrate living tissue as well as water, and pass through an animal's body like ripples through Jell-O.

At low volumes, sound waves are harmless, and in fact, whales and dolphins generate sounds of their own—clicks, whistles, even songs—to communicate and find food. Higher-frequency sound waves—such as those produced by dolphins—bounce off nearby objects in the water, and the rebounding echo helps the dolphins locate prey. This is called echolocation, nature's precursor to sonar, and it is life-sustaining behavior for numerous marine species. Some of these cetacean sounds are rather loud: the blue whale's call registers a whopping 188 decibels, louder than a jet engine.

But even the blue whale's song can be drowned out by sonar pings, some of which reach 230 decibels or higher. When the calls of whales and dolphins are drowned out, scientists believe they may be unable to find food or communicate with one another. A dolphin incapable of echolocating its prey may starve, and a disoriented whale separated from its pod might wander into an inlet or bay and strand itself in shallow water.

"It's pretty well established that sonar noise affects marine life," says Scott Veirs, a profes-

sor of oceanography at Beam Reach Marine Science and Sustainability School in Seattle. He points out that whales and dolphins hear in the middle range of sound frequencies, which are also the frequencies most likely to be drowned out by Navy sonar. "For an animal that relies on these sounds to hunt, to keep in touch with its group, sonar represents a big obstacle."

Based on studies conducted by the Navy itself, some of these sound waves carry for immense distances—one wave registered 140 decibels, about as loud as a gunshot, 300 miles from its source.

Additionally, these intense bursts of sound can cause bubbles to form in the blood and tissues of marine mammals, leading to embolisms, hemorrhaging, and sometimes stroke. A particular form of sonar test, called the low frequency active signal, rapidly sweeps from low to high frequencies over its one-minute duration. The pulsating sound waves from the signal can resonate in animals' skulls and in airspaces such as lungs and swim bladders, rupturing delicate tissues and sometimes causing disorientation and even death.

"Powerful mid-frequency sounds can temporarily or permanently deafen these animals, leaving them less able to find food, and sometimes leading them to strand themselves on beaches," Veirs said. "What the Navy is requesting with [the consistency determination] is authorization for harassment."

Finding accord in the dissonance

Many of those opposed to the Navy's plan are seeking not to bar sonar tests entirely, but to mitigate the potentially harmful effects as much as possible. Sakashita of the Center for Biological Diversity said that a general acknowledgement of the Navy's need to train is shared among the California Coastal Commission's supporters. The commission, however, outlined "very specific criteria for mitigation," she said, and many felt that the Navy's plan too frequently fell short of them. These measures included limiting Navy testing and traffic within marine protected areas, testing for shorter periods of time, and avoiding tests when migratory species are present.

"We feel that the Navy should be able to do both: protect the country as well as the oceans," Sakashita said.

The Navy, for its part, contends that the environmental impact of its practices has been fairly and adequately considered. "We spend a lot of time and energy developing an accurate assessment of the impacts, and in developing mitigation procedures that work," said Alex Stone, the Navy's project manager for the environmental impact statement. According to Stone, much of the controversy around the Navy's proposal has to do with the difference between proven methods of keeping animals safe and other methods that remain at the conceptual stage.

Stone says that the commission and the Navy agree on many of the "big picture" issues, such as establishing safety zones that would be monitored for wildlife activity; if a pod of whales were detected in such an area, tests would be postponed until they left.

Working with the commission toward a compromise is in the Navy's best interest, Stone said. "It's a complex, difficult-to-understand issue. But we've had a history of working together on this, and I think that, conceptually, we're in agreement."

Strong support for sea mammal protection
Despite its advisory nature, Lynida Storey of Whale and Dolphin Watch says that the commission's decision is an important one, not just for California but also for oceans worldwide. "It's really re-energized awareness in this movement," she said. "Navy sonar is deployed in 70 percent of the world's oceans. Now people are saying, 'You don't have the right to destroy our oceans.'"

"I don't think the Navy had a sense of the size of peoples' response," Storey said. "I had to email the signatures to the courthouse in 10,000-signature increments. That's the largest they'd allow."

And it's not just the whales that are getting attention here—California's Marine Life Protection Act represents pioneering legislation within the United States, and, according to Commissioner McClure, could eventually be replicated by any ocean-bordering nation in the world.

"As a kid, I would look out at the sea and imagine that there were all the fish in the world out there," she said. "But now, of course, we're recognizing that there is a need for protection. We have so many questions about what's out there, how we're affecting those places. So it's important to take into careful consideration everything that we do to the oceans."