

Supreme Court wrestles with whales vs. sonar

Research offers best way to balance needs of marine mammals and the Navy

Arguments about the impact of Navy sonar on marine mammals rose to the highest court in the land last fall. But not every issue is best settled in court. Those who may be the best judges of sonar impacts—scientists—say they were essentially left out of the debate.

The U.S. Supreme Court weighed competing interests—“a balance of harms,” in legal terms. On one hand is the potential threat to whales from sonar; on the other, the military threat posed by naval forces that are inadequately trained to use sonar to detect enemy submarines.

In November 2008, the justices cited the public’s overriding national security interests and ruled that, in the absence of direct evidence of sonar-related whale deaths in waters off California, the Navy could continue sonar training exercises there. However, the justices also upheld arguments by the National Resources Defense Council (NRDC) and other environmental groups that the Navy should continue “monitoring and mitigation measures” to prevent harm to marine mammals.

“The ruling was procedural; the case did not hinge on science,” said Darlene Ketten, a biologist at Woods Hole Oceanographic Institution (WHOI) who specializes in marine mammal hearing.

“Neither side wanted to discuss research

that has developed new methods to better protect whales that will still meet the Navy’s training requirements, and I’m not quite sure why,” said Peter Tyack, director of the Marine Mammal Center at WHOI, which has a mission to provide research in support of marine mammal conservation.

Heat, but no light

Richard Kendall, the lawyer representing the environmental groups, made claims about harm to whales caused by sonar, but in its decision, the court did not address whether those claims were valid. The Supreme Court justices seemed frustrated by the lack of concrete information about sonar and whales. At one point in the proceedings, Justice Stephen Breyer asked: “Why couldn’t you work this thing out? ... You are asking us, who know nothing about whales and less about the military ... to try to figure out who’s right in the case, where the other side says the other side is totally unreasonable.”

As a result, Tyack said, “The court cases are generating a lot of heat, but I don’t think the ruling moves us toward a better solution, where the animals are less at risk and the Navy is less encumbered.”

For example, he said, there was disagreement between the Navy, which turns off sonar when whales or dolphins are seen within

1,000 meters of a vessel, and the environmental groups, which argued that the shutdown range should be increased to 2,000 meters. But the whales that have most often beached and died during sonar exercises are beaked whales, which are elusive and difficult to see at the surface.

“The odds of sighting a beaked whale at the surface are close to zero, so visible monitoring is ineffective at either distance,” Tyack said. “We have new techniques to listen for the sounds beaked whales make when they are out of sight, foraging at great depth. Yet the inadequacy of the current observation methods and the existence of better ones never came up in the court arguments.”

Research can help ‘balance the harms’

Environmental groups sometimes exaggerate sonar risks with emotional arguments that attract public attention but are scientifically inaccurate, Ketten and Tyack say. For example, Kendall asserted that marine mammals near a sonar source experience a sound equivalent to 2,000 jet engines, causing them to get decompression sickness, or “the bends,” if they surface too rapidly.

“What he did not mention is that whales are almost never going to be next to the sonar, but rather will experience much lower levels of sound at a distance,” Tyack said.



Tom Kleindinst, WHOI

Peter Tyack, director of the WHOI Marine Mammal Center, studies social behavior and acoustic communication in whales and dolphins, and the ways human-caused noise affects them. He uses digital tags to record both the behavior of whales and the underwater sounds they are exposed to, including sonar.



Tom Kleindinst, WHOI

Darlene Ketten, director of the Computer Scanning and Imaging facility at WHOI, uses forensic techniques, biomedical images generated from CT (computerized tomography) scans, and biophysical models to study the adaptations of aquatic vertebrates for hearing under water.

“Comparing loudness for different species in air and in water is very controversial.”

Concerning decompression sickness in whales, Ketten said, “There has been a lot of speculation, but so far there is no proof it has occurred.” Tyack added that “beaked whales that stranded during sonar exercises have been reported to have gas bubbles in their tissues that are consistent with decompression, but there is great scientific uncertainty about whether beaked whales could get the bends from one rapid surfacing.”

On the other side, analyses by federal regulators and the U.S. Navy may not fully account for all sonar risks, Tyack said. The Navy has agreed that sonar in some situations may cause beaked whales to strand on beaches and die. In environmental impact statements, the U.S. Navy notes a link between sonar and 37 whale deaths in five stranding events worldwide since 1996. However, given how little information is available, the problem may well extend beyond these 37 whales. Sonar may have a host of other effects on marine mammals, such as stress, disorientation, hearing loss, and disruption of feeding, that may have important impacts but would not be evident in the stranding record, he said.

Technology offers solutions

Ironically, most scientists and U.S. fisheries managers agree that far more marine mammals are killed in fishing gear than by sonar. A study by Andrew Read of Duke University and colleagues, presented to the Scientific Committee of the International Whaling Commission in 2003, estimated that 300,000 whales and dolphins are killed in fishing operations *per year* worldwide. By contrast, Barbara Taylor of the U.S. National Marine Fisheries Service and colleagues informed the same committee in 2004 that fewer than 200 whales stranded coincident with naval maneuvers in the past 40 years.

“When the courts and the public do not get an accurate picture of the threats posed by different human activities to marine mammals and other wildlife, it distorts conservation priorities and does not serve the interests of the animals,” Tyack said.

A recent technological invention—digital tags that can record whales’ behavior and the sounds in their environment—has vastly increased scientists’ ability to learn how



In May 1996, 13 Cuviers’ beaked whales stranded in Kyparisiassis Gulf in Greece after the use of naval sonar in the area. Research by Alexandros Frantzis of the Pelagos Cetacean Research Institute first brought attention to the links between sonar and strandings.

whales respond to sonar, he said. The Navy funds much of this research (see Page 38).

“I am an optimist,” Tyack said, “but I believe it’s absolutely likely that in five years, researchers will know enough about beaked whale behavior in response to sonar to allow the Navy to plan missions that have minimum impact on whales.”

“We could solve the sonar problem,” Ketten agreed. “We are very close to answers on what animals like beaked whales hear and how they respond to sound. If all sides devoted more resources to research than to lawsuits, we could get solid answers, but

without them, the lawsuits will continue.”

Joel Reynolds of the NRDC replied that lawsuits compelled new Navy research funding. “Without this advocacy, the Navy would almost certainly still be training illegally with sonar around the world, with too little regard for marine impacts—just as it had for decades before environmental advocates forced them to respond.”

Still, Tyack said, “It’s ironic to think it’s the human squabbling that is preventing the science from informing the policy.”

—Kate Madin