

## Silent stalkers of dark ocean waters

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The mating roar of a male harbor seal is supposed to attract a partner, not a predator. Unfortunately for the seals, scientists have found evidence that marine-mammal-eating killer whales eavesdrop on their prey. The researchers will present their work at the 166th Meeting of the Acoustical Society of America (ASA), held Dec. 2 – 6 in San Francisco, Calif.

Previous research had shown mammal-eating killer whales are nearly silent before making a kill, neither vocalizing nor using their echolocation. The likely reason, says Volker Deecke, a researcher at the Centre for Wildlife Conservation at the University of Cumbria in the U.K., is the excellent hearing of the seals, porpoises, and other animals

the whales stalk.

"If the mammal hunters just swam around clicking all the time, then all the prey would be warned," he said. "It looks like the whales are using a stealth approach instead."

While biologists had evidence that the whales do not echolocate while hunting, they were still unsure exactly how the animals do find their prey in the murky northern waters off the west coast of North America. To help answer that question Deecke and his colleagues traveled to Alaska and placed acoustic recording tags on 13 killer whales over the course of a two-year study.

The tags, which are about the size of a cell phone, were attached to the whales with four suction cups and could stay on for up to 16 hours. The tags' accelerometers, compass, depth sensor, and hydrophone recorded data on the animals' movements and any sounds it heard or made. Deecke and his colleagues were able to identify predation events by the characteristic sound of a whale dispatching its prey with a hit from its tail fluke.

After analyzing many hours of data, Deecke and his team found that killer whales were successfully locating prey even in near-complete darkness. Deecke notes that this new evidence of nighttime hunting rules out visual cues as the only means of prey detection.

"We now suspect that mammal-eating killer whales are primarily eavesdropping on sounds generated by their prey to find food," he said. Deecke recounted one unfortunate seal whose demise was captured by the sensors in an acoustic story of life and death.

"As soon as we put one of the tags on, it started to record seal roars, which are part of the display that male harbor seals use to attract

females. Over the next half-hour the roars got louder and louder, then there are a sequence of three quite loud roars that suggest the seal is within a few hundred meters of the [killer whale](#). Twenty-seven seconds later there are the sounds of a predation event, and then no more roars."

Deecke notes that such a story is compelling but does not provide direct evidence that killer whales are tuning in to the sounds of their [prey](#). Going forward, he hopes to use playback experiments to test killer whales' responses to recorded seal roars and porpoise echolocation clicks.

Finding out how much killer whales rely on acoustic cues to hunt could help scientists better understand the potential ecological impact of shipping noise and other activities that generate underwater sound. "We need to understand how the foraging process works so that we, as humans, can know how our behavior might impact the animals negatively and what we can do to minimize our impact," Deecke said.

**More information:** Presentation 2aAB10, "Killers in the dark – acoustic evidence for night-time predation by mammal-eating killer whales in Alaska," will take place on Tuesday, Dec. 3, 2013, at 11 a.m. PST. The abstract describing this work can be found here: [asa2013.abstractcentral.com/planner.jsp](http://asa2013.abstractcentral.com/planner.jsp)

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