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Whales' Lower-Pitch Sound Has Experts Guessing

By BINA VENKATARAMAN

The song of the blue whale, one of the eeriest sounds in the ocean, has mysteriously grown deeper.

The calls have been steadily dropping in frequency for seven populations of blue whales around the world over the past 40 years, say researchers at the Scripps Institution of Oceanography, the National Oceanic and Atmospheric Administration and WhaleAcoustics, a private research company. The scientists analyzed data collected with hydrophones and other tools and found that the songs, which they believe are by males advertising for mates, had lowered by as much as 30 percent in certain populations. Much of the song lies at frequencies too low to be detected by the human ear.

The study, though not yet published, has been reviewed by several experts in the field who, in interviews, called the global decline "dramatic," "significant," "convincing" and "unequivocal."

Scientists cannot explain why blue whales from places as disparate as the northern Pacific and the Southern Ocean, which surrounds Antarctica, would drop the pitch of their songs. Each blue whale population has a distinct tempo and tone set to its vocals.

John Hildebrand, professor of oceanography at Scripps and an author of the study, said the drop might signal a rebound in the population of blue whales since commercial whaling bans began to take effect in the 1970s.

Scientists believe that only male blue whales sing. Female blue whales choose their mates based on size, a selection process that has fostered the species' gargantuan proportions. And deeper might signal bigger.

When populations were smaller, whales may have had to be louder to make their calls heard. Now, the males might be competing to make their calls deeper, said Sarah Mesnick, a behavioral ecologist at the NOAA Fisheries Service and one of the study's authors.

"The idea is, as density increases and there are more individuals competing to find mates, that we expect the mating display to change," Dr. Mesnick said. "We may be seeing that in two ways with blue whales: the songs are getting lower and a little less loud."

Typically, lower-frequency sounds travel farther. "But in the blue whale vocal range, which is 10 hertz to 100 hertz," said Mark A. McDonald, the study's lead researcher and a physicist who specializes in underwater acoustics, "there is no practical difference in the sound transmission properties in the deep ocean." And, said Roger Bland, an underwater acoustics expert at San Francisco State University, "It's easier to make a powerful sound at high frequencies."

Blue whale populations could be growing by 5 percent each year, said Trevor Branch, a fisheries scientist at

the University of Washington's School of Aquatic and Fishery Sciences who studies whales. But the numbers are hard to come by and vary in quality depending on the population, because blue whales, unlike humpbacks, are elusive and rarely approach shore. Dr. Branch, who was not associated with the song study, estimates that there are up to 25,000 blue whales, compared with perhaps 300,000 before whaling. The number may have risen from a low of about 10,000 animals.

The population-rebound explanation, while speculative, is compelling to David Mellinger, a professor at the Hatfield Marine Science Center at Oregon State University who has studied blue whales for the past 16 years. Dr. Mellinger, who is not part of the study, said, "It's hard to see anything that would have impacted all of those populations and made them all decrease frequency other than the increase in the population."

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