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SAVING THE WHALES -- HOW SCIENTISTS MEASURE SUCCESS

Sex and the single whale?

Whale sex does not immediately come to mind when one pulls up behind a "Save the Whales" bumper sticker.

But since reproduction is one key to preventing extinction, whale behavior is one area scientists are studying to ascertain why some whale populations are growing and others are not.

Certain whales populations are not recovering their numbers and may be on the road to extinction, according to scientists, who point out that the plight of large mammals tends to garner the greatest public attention --

and conservation resources.

"Social dysfunction," failure to find a mate, and to reproduce

successfully may result from the small population size of the western North Atlantic right whales -- which number only 350 or so individuals --

according to the July/August issue of American Scientist. However that idea

is a controversial one, particularly since human threats, or a combination of factors may be the cause.

The article analyzes the status of three whale species in detail.

Lead author Leah Gerber is a wildlife ecologist and post-doctoral fellow at the National Center for Ecological

Analysis and Synthesis (NCEAS) at the University of California, Santa Barbara. She studies subtleties of whale behavior, especially Humpback whales of the North Pacific. Back at

the office -- an international think tank on ecology -- she works on ways to convert that knowledge into conservation decisions.

Her article, "Measuring Success in Conservation," a nine-page analysis with assessments of the status of various whale populations and efforts to protect them, poses many of the key questions of ecologists and those charged with species protection.

"We are becoming more and more aware of the status and decline of biodiversity, but we need novel approaches to understanding this decline and rational decisions about conserving imperiled populations," said Gerber.

"Every year, populations of plants, insects and even microbes reach the brink of extinction, virtually unnoticed," state the authors. "In the meantime, the threat of large-mammal extinctions arouses public passions, attention and, ultimately, money. It is here, at the intersection of

sentimentality and scientific controversy, that conservation biologists typically face their greatest challenge."

They describe the two-fold challenge: "First, biologists need to determine which populations really need recovery action, and just as important, we need to know when a population no longer requires our intervention."

The authors explain that there is very little certainly of determining when a population has recovered. "Recognizing this, we have been working to solve this problem for several populations of endangered whales with the hope that it will move us into a time where rigorous data collection and analysis, and not sentimentality, drive conservation policy," they state.

For example the western North Atlantic right whales, which have been researched extensively, may be falling peril, in part, due to the "Allee" effect, or reproductive failure due to low population density, report the researchers. They explain that biologists are currently debating whether an Allee effect is preventing recovery, or if other threats -- particularly entanglement and ship strikes -- are the cause.

Unfortunately they explain that at this point human efforts at mitigating these threats have not resulted in any substantial growth in that population of whales for two decades.

"The problem is especially challenging, because even if there were perfect information, political will and unlimited resources, it might not be possible to adopt any single action that would immediately increase the population growth rate of the northern right whale," they state.

In analyzing a variety of whales which differ in their recovery status, the authors assert, "It may be that when large whale populations become 'too small' (yet to be defined), they will not recover."

"It is crucial in the future that this lesson not be ignored," they admonish.

In an example of recovery, the authors describe the situation of the eastern North Pacific population of gray whale. Removed from the Endangered Species Act (ESA) List of Endangered and Threatened Wildlife in June 1994, and the only large whale so far "delisted," this whale population is approximately 26,635 individuals, up 2.5 percent each year over the last three decades.

To address the question of how much monitoring is necessary to detect recovery of this whale population, the authors sampled different sets of data from 19 years.

"We then applied a model to determine ESA status for each subset of survey data and found that a quantitative decision to delist is unambiguously supported by 11 years of data, but precariously uncertain with fewer than 10 years of data," said the authors.

Depletion of whale populations is mainly the result of commercial whaling ending sometime between the 30s and 80s. The authors state that "only the eastern North Pacific population of gray whales seems to have fully recovered."

The rest are still classified as endangered under the U.S. Endangered Species Act.

"The lesson here seems to be that at least some large whale populations can recover from overexploitation, but only if their numbers are not reduced to some level, beyond which the "extinction vortex" reaches out and starts pulling them inexorably towards extinction," they state.

They go on to explain that "moratoria on harvest alone are insufficient to guarantee adequate conservation.

Without adequate monitoring, it is not clear to what extent management objectives have been or will be achieved.

Adequate monitoring programs, such as that for the eastern North Pacific gray whale, will not be inexpensive and will not be brief."

The authors conclude with a call for better objective criteria in assessing whale populations, "For several populations of large whales, the current status under the ESA needs to be reconsidered. In developing ESA classification schemes for populations such as the North Atlantic humpback whale and the western Arctic bowhead whale, decision makers will be hard pressed to develop and use an objective set of criteria for all populations of large whales. Yet such objective criteria are exactly what are needed when agencies are faced with an emotionally charged public, a lack of biological data and a clear need to set priorities for allocating limited resources."

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