Killed pilot whales on Hvalba, Faroe Islands (Wikipedia)

Competition with Whales: A Myth

BIOLOGY 420: OCEAN CONSERVATION & SUSTAINABILITY

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JOSEPHINE LING

EXECUTIVE SUMMARY

Rapidly decreasing fish stocks are a major concern, both in terms of fisheries and ecosystem conservation.

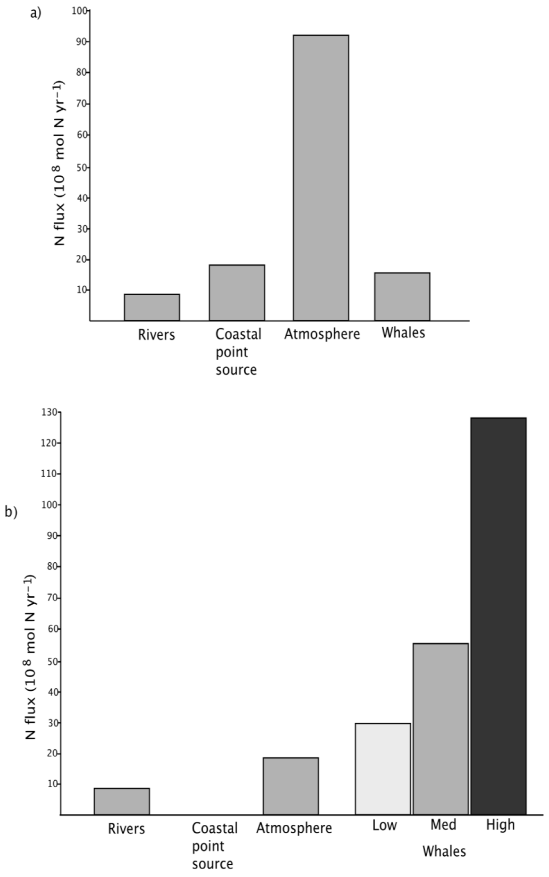
Many countries heavily dependent on these fisheries have argued for the culling of whales, on the claim to be reducing competition for fish, despite an 1986 international moratorium on commercial whaling.

There is, however, little evidence to support this view; in fact, research points to the role of whales in enhancing primary productivity and helping to support ecosystems, which in turn benefit fisheries.

Introduction

In 1986, the International Whaling Commission (IWC) introduced a moratorium of commercial whaling. Certain countries, still hunt whales, claiming scientific research or under reservation. These countries also often rely heavily on their fisheries, and the growing perspective of whales as pests, competing with human efforts for food sources. Most notably, Japan's Institute of Cetacean Research (ICR) published a paper in 1999 claiming that cetaceans eat 2-6 times what humans caught from marine fisheries at the time. Based on this, they advocate for the culling of whales to "achieve sustainable utilization of fish", since whales were eating fish to depletion.

This policy briefing examines the claim that whales compete with humans for fishery resources and the argument for culling them.



Current (a) and historical (b) estimated contributions of nitrogen to the marine ecosystem by whales (Roman & McCarthy 2010).

Ecosystem Services

Whales have been known to provide carbon and nutrients to the deep ocean, most often through the sinking of whale carcasses. More recently, studies in the Southern Ocean and Gulf of Maine have elucidated the role of whales in photic ecosystems. In nutrient-limited environments, whales are especially important in recycling nutrients back to the surface waters, through excretion at the surface. In the Southern Ocean, it has been determined that the iron available insufficient to support krill populations, and in the Gulf of Maine, deep and adjacent waters cannot supply the nitrogen necessary to explain the primary productivity here; in both these regions, whales have been cited as the supplier of limited nutrients.

Overall, whales have important ecosystem functions.

Debunking the Myth

In their report, the ICR quoted the total consumption of cetaceans as somewhere between 280-500 million tons of seafood. This is misleading. For example, krill, while not an appreciable part of the human diet, are a staple food for many baleen whales. The report lists all cetacean prey as seafood, even if it is not of the human diet. In addition, the ICR culls whales to further their "scientific research", citing the need to determine their diets and therefore their impacts on fish stocks. However, a number of previous studies have already been carried out with stomach analyses to determine diet. This has caused some Japan's fisheries sciences to be viewed with some suspicion.

Evidence points to a negligible effect of marine mammals on fisheries in the North Atlantic. Further, simulations in the Caribbean in which whale populations were reduced did not result in any appreciable increase in fishable biomass. In fact, the removal of whale species may actually cause decreases in fish stock abundance, as some whales prey on predators, such as sea otters, which in turn eat sea urchins. Sea urchins are grazers of kelp, which are important nurseries of many commercially important fish larvae. Remove whales, and the food web shifts so that sea urchin populations explode, decimating kelp forests and destroying larval fish habitat. Claims that whale populations are rebounding after historical whaling is also deceptive, as the overwhelming majority of whale species have not.

Overall, the cost to the ecosystem from removing whales outweigh any benefits to the fisheries, as they may actually be negatively impacted.

Bowhead whales (Getty Images)

Recommendations & Implications

1. Uphold and enforce the IWC moratorium on commercial whaling for all countries.
2. Scrutinize the culling of whales for "scientific purposes".
3. Continue efforts to restore and protect whale populations and habitats.
4. Increases public awareness about the role of whales in the ecosystem.

Efforts that work toward restoring whale populations and reducing whaling can enhance primary productivity through the return of nutrients to the surface waters from depth. This can initiate a feedback loop, as increased primary production can support larger food webs, which may actually benefit important commercial fisheries. Culling them will almost certainly have adverse effects on the ecosystem, especially nutrient cycling and trophic cascades.

References

Hirata, K. (2005). Why Japan Supports Whaling. *Journal of International Wildlife Law and Policy, 8,* 129-149. doi: 10.1080/13880290590965276

Roman, J., & McCarthy, J. J, (2010). The Whale Pump: Marine Mammals Enhance Primary Productivity in a Coastal Basin. *PLoS ONE, 5*(10), e13255. doi:10.1371/journal.pone.0013255

Nicol, S., Bowie, A., Jarman, S., Lannuzel, D., Meiners, K., & van der Merwe, P. (2010). Southern Ocean iron fertilization by baleen whales and Antarctic krill. *Fish and Fisheries, 11*(2), 203-209. doi: 10.1111/j.1467-2979.2010.00356.x

SeaWeb. (2014). Culling Whales to Boost Commercial Fisheries. http://www.seaweb.org/resources/briefings/cullingwhales.php [Retrieved 28 Nov 2014].