Assessing levies for by-catch could fund conservation measures

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That money, the researchers suggest in the August issue of *Frontiers in Ecology and the Environment*, could be used to address other causes of species decline, such as pollution and invasive predators.

This dual approach, they say, would give fishermen financial incentives to find creative ways to avoid catching noncommercial species, known as by-catch, while providing funds to address more hazardous threats to seabirds and turtles. For example, while almost half of all seabirds listed by the World Conservation Union are directly or indirectly threatened by fishing, as many as three-quarters of those species are also threatened by such invasive species as cats and rats at breeding colonies.

"Fisheries are complex, revenue-generating industries, and large majorities are unregulated," said Josh Donlan, a co-author of the paper and a graduate student in ecology and evolutionary biology at Cornell. "Once you add in the cost of doing conservation, this is a win-win

situation for a lot of endangered seabirds and sea turtles that are impacted by fisheries' by-catch."

Donlan and co-author Chris Wilcox, a senior research scientist at Australia's Commonwealth Scientific and Industrial Research Organization, used Australia's Eastern Tuna and Billfish Fishery as a case study to test the benefits and costs of their approach, called compensatory mitigation. The fishery extends from Cape York, Queensland, to the South Australia/Victoria border and targets albacore, yellowfin and bigeye tuna and billfish. However, each year the fishery unintentionally kills 1,800 to 4,500 flesh-footed shearwaters (Puffinus carneipus), a seabird whose entire eastern Australian population breeds on Lord Howe Island, which is within the fishery.

The researchers compared the expected costs and conservation benefits of closing down fishing areas that suffer from other causes of population decline, such as rats eating eggs, chicks and adult birds on the island. Their analysis showed that closing the fishery around Lord Howe Island would cost about $3 million U.S. and increase the growth rate of the shearwater population by about 6 percent. But killing the rats would cost only about $500,000, yet yield a 32 percent increase in shearwater population growth.

In other words, killing the rats would increase the shearwater population per dollar invested 23 times more than closing the fishery.

The researchers say that levies, with higher fees imposed for more endangered species, would make users who earn a profit from common-pool resources pay for the impacts they have on the system. At the same time, they argue, if levy money were given to conservationists to address other threats to seabird or turtle populations, then these conservationists would in turn be made more accountable for producing and quantifying results.

"This idea moves away from strictly charity models of doing conservation [where money is donated to conservationists], to a noncharity model [where those involved are held accountable]," said Donlan.

While compensatory mitigation may not work for all seabirds or threatened species, there remain many species that face multiple threats and could benefit significantly from this approach, he said.

Source: Cornell University News Service