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## One-third of world fish catch used for animal feed

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By Deborah Zabarenko, Environment Correspondent

WASHINGTON (Reuters) - One-third of the world's ocean fish catch is ground up for animal feed, a potential problem for marine ecosystems and a waste of a resource that could directly nourish humans, scientists said on Wednesday.

The fish being used to feed pigs, chickens and farm-raised fish are often thought of as bait, including anchovies, sardines, menhaden and other small-to medium-sized species, researchers wrote in a study to be published in November in the Annual Review of Environment and Resources.

These so-called forage fish account for 37 percent, or 31.5 million tons, of all fish taken from the world's oceans each year, the study said. Ninety percent of that catch is turned into fish meal or fish oil, most of which is used as agricultural and aquacultural feed.

Ellen Pikitch, executive director of the Institute for Ocean Conservation Science and a professor at Stony Brook University in New York, called these numbers "staggering."

"The reason I find that so alarming is that it's an enormous percentage of the world fish catch," Pikitch said by telephone. "And fish are fundamentally important to the health of the ocean overall."

Forage fish are near the base of the marine food web, nourishing larger fish, ocean-dwelling marine mammals and sea birds, especially puffins and gulls, the study said.

### ECOLOGICAL CONSEQUENCES

Unlike such dinner-plate fish as tuna, swordfish and cod, the extraction of forage fish is largely unregulated, Pikitch said. Excessive removal of these small fish from the ocean environment could hurt the species that feed on them.

Aside from the potential ecological consequences, the taking of these large numbers of forage fish interferes with food security for humans, she said.

On average, it takes three to five pounds (1.36 to 2.27 kg) of fishmeal to produce one pound (0.45 kg) of farm-raised fish, Pikitch said.

"If you're creating protein for humans to consume, does it make sense to take three to five pounds of perfectly good food and convert it into only one pound of food?" she said.

Most forage fish are high in omega 3 fatty acids associated with heart health, she said, adding that it makes sense for humans to consume these fish directly rather than to feed them to livestock and farmed fish.

But human consumption of these fish needs to be monitored, said Joshua Reichert of the Pew Environment Group.

"Whatever people take out of the sea needs to be carefully calibrated to ensure that sufficient fish are left to sustain populations of other fish, seabirds and marine mammals, which all play a major role in the healthy functioning of the world's oceans," Reichert said in a statement.

The study is the product of a nine-year partnership between the University of British Columbia in Vancouver and the Pew Charitable Trusts, funded by

the Pew Institute for Ocean Science, which is transitioning to become the Institute for Ocean Conservation Science at Stony Brook.

(Editing by John O'Callaghan)

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