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Shopping list gets longer – not less choosy – in some of world’s largest fisheries

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Tim Essington and a fishing boat crew member remove fish from nets. When fishing boats return with catches of increasingly less-valuable fish, the commonly held notion is that the more valuable species have been fished out. This, however, wasn’t true in two-thirds of the world’s large marine ecosystems selected for study by University of Washington researchers.

Instead, the composition of what was landed changed because fishermen chose to target additional kinds of fish. Landings of the more valuable fish remained the same, or even increased, but that may not be sustainable if managers can’t come up with effective strategies, says Timothy Essington, UW assistant professor of aquatic and fishery sciences. Results of the National Science Foundation-funded project appear this week in the Proceedings of the National Academy of Sciences.

“We shouldn’t remain preoccupied with the model of fishing down the food web that assumes the largest, most valuable fish have disappeared,” Essington says. “That ignores both what’s happening in the majority of cases as well as the need to manage conflicting demands on ecosystems. These multiple impacts may be sustainable during the initial phases of fisheries development but can ultimately lead to collapse of the higher-value stocks if fisheries develop unchecked and without considering these interactions.

“Navigating these conflicts is moving to the forefront of contemporary marine fisheries management and conservation.”

Fishing down the food web emerged as a concern in the late 1990s when Daniel Pauly of the University of British Columbia published findings that global landings of fish were shifting from species higher in the food chain, such as halibut and tuna, to those lower in the food chain, such as herring and anchovies.

Pauly, who reviewed the paper for the authors before it was submitted to editors of the Proceedings of the National Academy, developed the method to compare food-web – or trophic – levels of what is landed. The approach considers only what is brought to shore and does not measure how many fish of various species are actually available.

Using Pauly's method, Essington and UW graduate students Anne Beaudreau and John Wiedenmann, both co-authors on the paper, looked at data between 1950 and 2001. They found the trophic level was shifting downward for landings in 30 of the 48 large marine ecosystems in the world for which they could obtain reliable information. In a little more than two-thirds of those cases – 21 of the 30 ecosystems – the composition of the catch changed to include fish from lower trophic levels, yet the amount of fish from the higher trophic levels remained the same or increased.

Because the research considered only landings, the scientists can't say if the stocks are plentiful or if the amounts were high for some other reason, such as an increase in the number of boats fishing the area.

In either case, Essington says, "We can't ignore the policy implications of this common mechanism of sequentially adding species to what is being fished."

In the other nine of the 30 ecosystems the researchers found that high-trophic-level fish were, indeed, disappearing and forcing fishermen to turn to fish lower on the food web. The most spectacular example is the ecosystem in the North Atlantic where fishery collapses are common.

Link: <http://www.washington.edu/news/2006/02/14/shopping-list-gets-longer-not-less-choosy-in-some-of-worlds-largest-fisheries/>