

# Data backs limits on deep-sea fishing by depth

August 27 2015

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A photo of the Roundnose Grenadier, a deep water fish. Credit: Marine Scotland Science

Researchers reporting in the Cell Press journal *Current Biology* on August 27 have evidence in support of a clearly defined depth limit for deep-sea fishing in Europe. The findings come just as the European Union considers controversial new legislation to manage deep-sea fisheries, including a ban on trawling below 600 meters.

"The most notable thing to consider about our findings is that the trend in catch composition over the depth range of 600 to 800 meters shows that collateral ecological impacts are significantly increasing while the commercial gain per unit effort is decreasing," says Joanne Clarke of the University of Glasgow.

In other words, "going deeper causes greater and greater damage for a reducing benefit to fishermen."

Studies have already shown that deep-sea fish species are more vulnerable, due to the fact that individuals tend to live for a long time while having relatively few offspring in comparison to shallow-water species. Evidence has also shown that deep-sea bottom trawling has taken its toll, with implications for the deep-sea ecosystem and for the climate. Deep-sea fish sequester large amounts of carbon per year.

The question, Clarke says, was: "Why a depth limit, and what depth?"

Study authors David Bailey of the University of Glasgow and Francis Neat of Marine Scotland Science came up with a way to find out by looking at changes in catch composition trends with depth. The researchers collected data from trawl surveys between the depths of 240 and 1,500 meters in the northeast Atlantic. Those surveys used different gear types at various locations between 1978 and 2013.

An analysis of those data revealed a clear transition in catches at depths of 600 to 800 meters, including a significant increase in biodiversity, the ratio of discarded to commercial biomass, and the ratio of sharks and rays to commercial biomass. As the ecological impacts increased, the commercial value per unit of effort decreased.

"Depth limitations are often labelled as a 'blanket' measure, unsophisticated and poorly thought out," Clarke says. "In this case,

however, it appears that there would be some very specific conservation benefits to a depth limit at around 600 meters."

The discovery that their evidence backed the latest depth-limit proposal came as a surprise to the researchers.

"We had no prior reason to expect that our findings would suggest that this was in fact an appropriate depth," Clarke says. "We went into this analysis purely to test whether any depth appeared particularly suitable for a depth limit, but with no expectation that this would be the case."

European Council discussions on the matter are expected to begin again in September and, while there are many other factors at play, the researchers say they are "very confident that the work will be brought to the attention of the relevant people and at a critical time."

**More information:** *Current Biology*, Clarke et al.: "A Scientific Basis for Regulating Deep-Sea Fishing by Depth"

[dx.doi.org/10.1016/j.cub.2015.07.070](https://doi.org/10.1016/j.cub.2015.07.070)

Provided by Cell Press

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