

OUTSIDE JEB

How many old-growth fish are out there?



Species diversity has long been recognized as an important component for a stable and healthy ecosystem. Yet, diversity within populations is an equally important, but largely overlooked, aspect of many populations. Although it is unclear whether wild animal populations are able to maintain their diversity when hunted by humans, wild commercial fishery populations may hold the answer to this question. They are one of the few wild populations that is routinely hunted for human consumption, as old-growth, ecologically valuable fishes tend to make the most delicious dishes. Wondering how many of them are left in the ocean, Lewis Barnett and colleagues from the University of Washington and the National Oceanic and Atmospheric Administration, USA, and Anthony Ranasinghe, from Virginia Tech, USA, analysed the fisheries databases from five regions.

The authors compared the status of current fish stocks with two baselines. The first was the age distribution in the records that accounted for the effects of fisheries. The second was a simulated age distribution that assumed that there had been no fishing. Barnett and his colleagues then compared the present age distribution with the two baselines among the 63 commercial fishery stocks along both US coasts and around Europe spanning 24–140 years.

Alarmingly, the two approaches reached the same conclusion that either the proportion or number of older fishes in the population has declined dramatically (79–97%). The extent of the reduction was greater than 90% in 32–41% of populations. However, the extent of the loss of older fish from the population was different across the regions. While the US southeast and west coasts had the most pronounced and consistent reduction in the abundance of old-growth fishes, the population in Alaska seemed to be in a better condition, where 6–29% of the populations had not lost a disproportionately high number of their older fishes, presumably because the fisheries recovery policy leads to a favourable environment for juvenile survival in the Alaska region.

This drastic decline of older fish in commercial fish stocks is worrisome. First, older fish are the most fertile and hence have a greater influence on the

number of offspring produced in a population. Second, female fish of different ages often stagger their migration times and spawn at different locations, reducing competition between their hatchlings for resources. In addition, populations with a broad age span tend to be more resilient to environmental change, placing fish stocks at risk when they lose the elders from their population.

In contrast to the famous quotation from Jurassic Park that ‘Life finds a way’, it seems that wild fishes may not stand a chance when facing our effective fishing fleets if we do not give them space and time to roam freely. The fact that fish populations in Alaska have a more balanced age structure provides some hope that measures such as the establishment of marine reserves and rotational harvesting can protect wild fish populations, providing them with the opportunity to flourish. Other measures, such as imposing both minimum and maximum size limits on the catch, could provide effective protection for the largest and oldest members of the population.

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