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Fish evolve quickly to take advantage of marine protected areas: UBC study

RANDY SHORE (Vancouver Sun)
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Fish can quickly evolve to get more benefit from the protection offered by marine protected areas, according to research from the University of B.C.

Variation in the natural range of large fish species means that some fish will spend much of their lives in or near areas protected from fishing, while others will range farther and face capture. Because they are less likely to be harvested, less mobile fish are more likely to survive and pass that trait on to their offspring.

“Evolution can be very fast and we’ve seen that many times, when organisms are dying, selection pressure is high,” said co-author Jonathan Mee.

Researchers modelled the ocean movements of species including skipjack and bluefin tuna and great white sharks in a collaboration between UBC’s Biodiversity Research Centre and the Sea Around Us project at the Institute for the Oceans and Fisheries.

“It’s safe to assume that a trait like how much fish move has some genetic basis. In fact, it would be weird if that wasn’t the case,” said Mee.

They found that the movement patterns of tuna could change within 10 years of the creation of a new marine protected area (MPA). The longer-lived Great Whites showed change after 50 years.

MPAs are parks and conservancies managed under federal and provincial law to protect sensitive ecosystems and species.

Based on the idea of “fisheries-induced evolution,” co-author Daniel Pauly said that expanded “no-take” zones could balance the negative impacts of overfishing outside protected areas, where commercially desirable fish have no place to hide.

“The boats got bigger and now we can cover the entire range of the tuna,” said Pauly. “The distance doesn’t protect them, depth doesn’t protect them, nothing protects them except our decision to remove ourselves from certain areas in the form of marine reserves.”

While pioneering biologist Charles Darwin had conceived of evolution as a slow, imperceptible process almost immune to the impacts of human activity, we now know that human beings and their activities are an important source of selection pressure, said Mee.

Areas of refuge that protect fish from harvest could strengthen fish populations and even protect some species from extinction, the authors say.

Late in 2016, then-U.S. president Barack Obama protected 13,000 square kilometres of deep water habitat in the Atlantic Ocean and expanded protected areas off the coast of California.

“Critics said the fish would just swim out and be killed, but we are finding that reserves are a good conservation strategy,” said Mee.

B.C.’s coastal waters are home to more than 200 MPAs, including one newly created to protect glass sponge reefs in Hecate Strait and Queen Charlotte Sound totalling 2,410 square kilometres. Roughly 3.2 per cent of coastal areas are covered by MPAs.

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