

Scientists shed new light on behavior of shark 'tweens' and 'teenagers'

August 24 2009



This is a lemon shark sighted in the Bahamas. New research by the Institute for Ocean Conservation Science, University of Miami, Field Museum of Chicago and others finds that young lemon sharks born at the Bimini islands, Bahamas, tend to stay near their coastal birthplace for many years. Tropical island-nations that sacrifice their nursery habitats to coastal development are therefore likely to lose not only babies but also much older sharks from their local areas, with potentially dire effects on the surrounding ecosystem. The study, conducted over a 14-year period at the Bimini Biological Field Station, is the cover article in the August 2009 issue of *Molecular Ecology*, a leading international scientific journal. Credit: Sarah Lardizabal/MarinePhotobank

(PhysOrg.com) -- A long-term field and DNA study by the Institute for Ocean Conservation Science at Stony Brook University, University of Miami, Field Museum of Chicago and others has shown that young lemon sharks born at the Bimini islands, Bahamas, tend to stay near their

coastal birthplace for many years. While shark research and conservation typically focuses on baby sharks confined to shallow habitats, or ocean-roaming adults, less is known about these intermediate-aged animals, which are the breeders of tomorrow and are roughly similar in development to human 'tweens' and teenagers.

Tropical island-nations that sacrifice their nursery habitats to coastal development are therefore likely to lose not only babies but also much older sharks from their local areas, with potentially dire effects on the surrounding ecosystem. The study, conducted over a 14-year period at the Bimini Biological Field Station, is the cover article in the August issue of [Molecular Ecology](#).

"It takes some sharks more than a decade to reach reproductive age, so we set out to better understand the phase of their development from when they are a couple of years old until they are on the verge of sexual maturity," said lead author Dr. Demian Chapman, shark scientist with the Institute for Ocean Conservation Science at Stony Brook University (SBU) in New York, and an assistant professor at SBU. "We were very surprised to see that many lemon sharks lingered for years around the island where they were born -- often more than half of their development to adulthood."

Fear of deep water--and the bigger predators that live there-- combined with abundant prey in the mangroves around Bimini probably keeps these island-born sharks in safer waters near home for several years after their birth. "This means that using marine reserves and other local conservation measures may help protect sharks born around tropical islands for much longer than we thought," Dr. Chapman explained. He suspects that future research could show that these stay-at-home behavior patterns are common among many shark species that live and breed around tropical islands. "If island communities develop all of their shark nursery habitats, like mangroves, or overfish baby sharks in local

waters, then they will subsequently lose a big chunk of the older sharks as well," he said.

Love them or not, sharks are essential to healthy oceans. Removing these top-level ocean predators will disrupt the local food web and cause negative consequences for other species and the ecosystem at large. Moreover, many tropical islands generate substantial revenue from shark-dive tourism, which this new research suggests will be heavily reliant on sharks born in local nursery areas.

During the course of the Bimini study, from 1995 to 2007, over 1,700 immature lemon sharks were caught, tagged and released. The implanted tags, plus subsequent recaptures and [DNA](#) analysis, showed that more than half of the 3- to 7-year-old sharks caught off Bimini were born locally and had lingered near their birthplace for years. Full results are described in the study, entitled, *Long-term natal site-fidelity by immature lemon sharks (*Negaprion brevirostris*) at a subtropical island*.

"In general, the survival of these intermediate-aged sharks is critical for sustaining shark populations," said study co-author Dr. Samuel Gruber, Professor at the University of Miami's Rosenstiel School of Marine and Atmospheric Science and Director of the Bimini Biological Field Station, who has been leading the overall lemon shark research program at Bimini since 1978. "Our study suggests that local conservation efforts can help many lemon sharks born at islands like Bimini survive through roughly half of their development to adulthood. Broader scale, sometimes international, management is needed to protect them after they've left their birthplace as adolescents and adults."

Detailed information on how sharks disperse from their birthplace could be very useful for conservation efforts throughout the tropics, given that many tropical shark species are threatened by overexploitation to supply the trade for shark fin soup, for which demand is especially high in Asia.

Between 22 and 73 million sharks are killed each year to supply the fin trade, and international management agencies are scrambling for solutions to stem severe shark population declines.

"Our study suggests that many tropical island nations may not have to wait for complex international shark regulations to be established in order to act," said Dr. Chapman. "Their local management efforts could give immature sharks a chance to grow up in relative safety until they are big and 'bad' enough to roam deeper habitats far from home, where broader scale protection becomes more important."

The research team is now extending its study to answer one of the great mysteries of shark biology: do sharks home back to their birthplace as adults? Co-author Dr. Kevin Feldheim of the Field Museum in Chicago, who led the genetics part of the study, said: "This research showed that most of the young [sharks](#) left the island by the time they were mature. Now we want to find out if they end up coming back to the place where they were born to breed, much like salmon and sea turtles do."

Source: Stony Brook University ([news](#) : [web](#))

Citation: Scientists shed new light on behavior of shark 'tweens' and 'teenagers' (2009, August 24) retrieved 28 July 2024 from <https://phys.org/news/2009-08-scientists-behavior-shark-tweens-teenagers.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.