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Sharks and Turtles

by

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My compliments to your environmental writer, Mindy Foster, for reporting factual instead of fantasy information regarding sea turtles and tiger sharks ("The Shark Factor" 2/93). Few people in the news media seem to be doing so these days. Mindy rightfully pointed out that "There is no hard evidence that the increased turtle population is the cause of increased (shark) sightings and attacks". I agree. There is no evidence whatsoever, beyond idle speculation. And, strangely enough, in some cases the speculators are persons interested in "solving" the shark problem by hunting and killing sea turtles.

In the first place, while more turtles are indeed being seen now, compared to say 15 years ago, the increase is not anywhere near as great as some would like us to believe. In addition, such sightings need to be viewed in their proper perspective. That is, turtles are highly visible creatures that must come to the surface every so often to breathe. Once there, they are easy to spot, even when you're not looking for them. A dozen turtles in an area, breathing once every 5 to 15 minutes, can give the deceptive impression of abundance well beyond the numbers actually present. In contrast, a dozen fish, crabs, or octopus spread out over the same area won't even be noticed unless you're intentionally searching underwater for them. You don't have to search hard to spot a sea turtle, even if there are only a few in the area where you're surfing.

Some people have also gotten the flawed impression that turtles are the overwhelming, if not exclusive, food item in the tiger shark's diet. But that's simply not the case. It is a biological fact that tiger sharks eat a wide variety of prey, more so than any other species of shark. For example, in a 2-year study conducted by the University of Hawaii, tiger sharks in Hawaiian waters were found to prey upon the following items (in descending order of percent sharks containing these items): fish; crabs and lobsters; garbage (often floating garbage); birds; sharks and rays; squid and octopus; turtles; porpoise and whales; and humans.

Even though the tiger shark preys on numerous items, turtles are nevertheless frequently overestimated in their diet by people (even some scientists) cutting them open to see what they eat. This happens because the tiger shark's digestive tract functions in such a way that only mushy material-- that is, the broken-down

remains of prey items subjected to strong stomach acid-- can pass out of the stomach into the intestines. Objects of any size that can't be decomposed in the stomach are retained there for an unknown but likely long period of time before being regurgitated. The outer surfaces of a sea turtle, especially the plates of the shell, are made of a tough keratin-like substance that is totally resistant to decomposition in the stomach. Consequently these large and clearly recognizable items from a turtle are held in the stomach, while the rest of the animal including meat, bones and all else is digested. The protective plates and scales covering the turtle also lengthen the total amount of time needed to digest the rest of the body, since turtles up to 50 lbs can be swallowed whole. In sharp contrast, soft bodied prey items, with far fewer and smaller indigestible parts, digest faster and can be easily overlooked and underestimated in stomach contents. These factor working together give an erroneous and biased picture of the dietary makeup of the tiger shark when viewed by persons who are unaware of the biological facts I have just described. Yes, of course, turtles are a part of the tiger shark's diet. But a very complex situation exists whereby many sorts of things are eaten under varying feeding rates, and then digested over different periods of time. No one really knows how often tiger shark's feed, how long it takes to digest each of their prey items, and how often they regurgitate items like turtle parts that can't be digested.

Some people have also speculated that attacks on surfers by tiger sharks are the result of "mistaken identity" for sea turtles. Again, there is no credible information to support such an idea. The theory by some scientists that great white sharks mistake surfers for seals off California simply can't be logically transposed to tiger sharks and turtles in Hawaii. In California a surfer is suppose to look like a seal floating at the surface. Copying that same theme, in Hawaii a surfer is purported by the news media to look like a turtle floating at the surface. Obviously both cases can't be correct, since a sea turtle bears no resemblance to a seal. Does a surfer on a 6-to-8 foot long narrow surfboard look like your average 2-foot oval sea turtle? Of course not. But maybe this is like looking at an inkblot. If you stare at it long enough you can start to see all sorts of things. And maybe that's what some people are doing when they make such faulty comparisons.

The fact is that tiger sharks don't have to "mistake" anything floating at the surface in order to strike, bite, or eat it. Taking things at the surface is a natural part of the tiger shark's known feeding strategy. Jean-Michel Cousteau summarized this situation correctly when interviewed a year ago, following the death of a swimmer attacked and devoured by a large shark off Olowalu on Maui. Cousteau said, "Tiger sharks are particularly dangerous to swimmers. Some sharks are more fussy than others about what they eat. Tiger sharks are known to eat almost anything and everything, and ..are more likely to attack anything

on the surface whether it's a piece of wood, a surfboard, a boat, or a bird".

Recent attacks in Hawaii on surfers have taken place during daylight hours in reasonably clean, clear water. It's hard to imagine that the sharks involved mistook their victims for anything else than an object at the surface that was potentially edible. A few months ago there was even an eye-witness account (with photos) of a 2000 lb bull swimming in waters off Maui being attacked by tiger sharks (see Hawaii Fishing News, 12/92). Did the sharks "mistake" this bull for a sea turtle? Perhaps, but only if they had been staring at inkblots for too long!

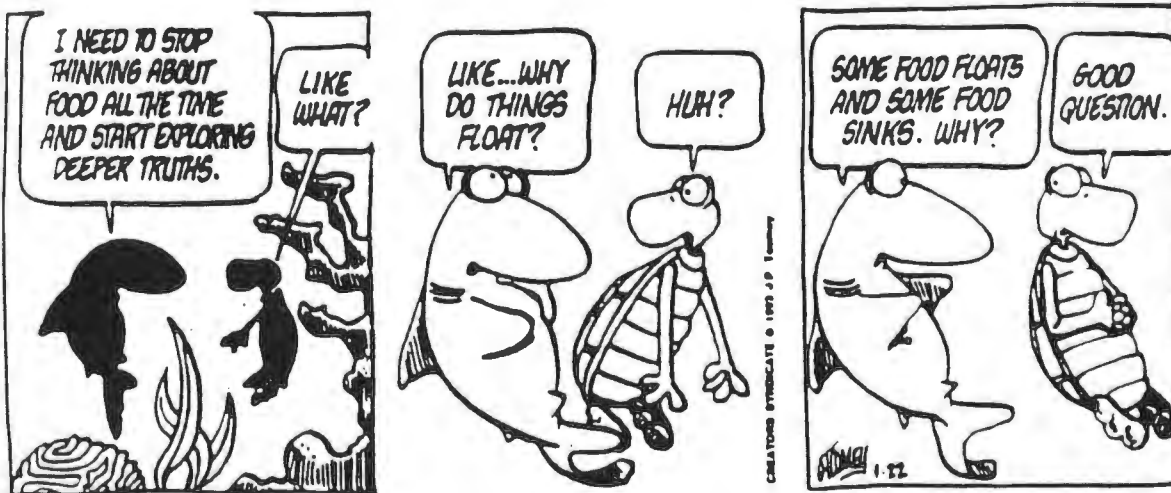
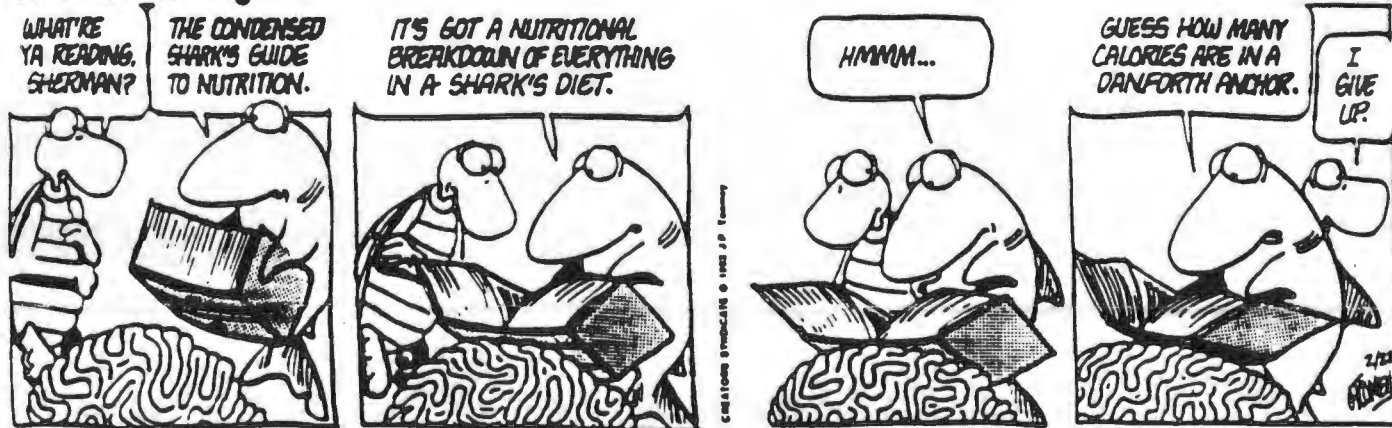
Interestingly, the "mistaken identity" idea fits quite comfortably with those people who, due to their sincere convictions, for one reason or another are opposed to fishing for tiger sharks in Hawaiian waters. The logic would be as follows: If a shark really didn't mean to bite a human, -- that is, it was "just a big mistake", -- then the news media and public at large might be more inclined to have greater understanding and tolerance of attacks in Hawaii.

It is my responsibility, as a member of the IUCN Marine Turtle Specialist Group, to make sure that turtles don't get a bum rap as the result of groundless speculation, intentional bias, or flawed scientific reasoning. I've spent 20 years in the Hawaiian Islands dedicated to studying Hawaiian sea turtles. There's a lot known, but still much to be learned. Factual information, not emotions, must prevail. Some people are very emotional over the issue of fishing for sharks. Others may be overly concerned with the risk of shark attack in Hawaii. One thing for certain is that the current status of sharks here in Hawaii is very different from the east coast of the United States, where some populations are seriously depleted from commercial fishing.

Hawaii's sea turtles have long been considered the surfer's friend--rugged and skilled ocean animals that eat marine vegetation and pose no threat to humans. Tiger sharks, not turtles, have been attacking surfers. Recently an authority on Hawaiian sharks was quoted in Surfing Magazine saying, "In the sixties and seventies the state (of Hawaii) had a shark eradication program to control the population of potentially dangerous sharks. But there's been nothing done in the last twenty years, so the tiger population right now should really be at a peak". This statement certainly makes sense, considering that tiger sharks are apex predators that have no natural enemies of their own, except for other larger sharks. As a nearshore species roaming the reef edge in search of food, it would seem perfectly reasonable to expect a "peak" in the tiger shark population after 20 years of virtually no fishing. And that would even hold true for places where there are no turtles at all for tiger shark s to include in their diet.

Yes, sea turtles can still be considered the surfer's friend. Because if the turtles weren't out there now making themselves available as a food item, that "peak" population of sharks would simply turn to something else to eat. And that "something else" might be greater numbers of "someone else" out there surfing or swimming.

Sherman's Lagoon





A distinctively-patterned tiger shark.

THE CURIOUS EATING HABITS OF TIGER SHARKS

The tiger shark is one of three species most frequently named as being responsible for attacks on humans. Voracious eaters, they will swallow almost anything they encounter in the sea. At various times the stomachs of captured specimens have been found to contain an astonishing variety of objects including: a coil of copper wire, nuts, bolts, lumps of coal, boat cushions, clothing, a tom-tom, an unopened can of salmon, driftwood, birds, other sharks, seals and the head of a crocodile.

Sharks can regurgitate the contents of their stomachs at will, and some can apparently store food undigested. Sir Edward Hallstrom, honorary director of Sydney's Taronga Park Zoo, once observed this phenomenon in a tiger shark that lived for a month at the zoo in 1950. On two occasions during its captivity the shark was fed on horse meat which it regurgitated. After it died the shark's stomach was cut open and was found to contain two undigested dolphins, eaten before its capture.