

Shark-Soup Boom Spurs Conservationist DNA Study

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This picture was taken at a port in eastern Taiwan.

Photograph courtesy Shelley Clarke

A burgeoning appetite for shark-fin soup has prompted the development of new genetic tests that will help safeguard the shark for commerce as well as conservation.

In the Far East, shark fin has long been a delicacy. Because the fin is so costly, however, only the wealthiest families could afford to serve it. Now the demand for shark fin has boomed along with Asian economies.

"Anywhere there is a large Chinese population there is a demand for shark-fin soup," said Mahmood Shivji, a conservation geneticist at Nova Southeastern University in Dania Beach, Florida. "In Chinatowns in New York, San Francisco, and Vancouver, for example, you can find packaged shark fin in many stores."

Shivji is co-author of a study describing the new genetic tests in the August issue of *Conservation Biology*.

Broad Medicinal Qualities

"The Chinese consider the shark fin to have medicinal qualities. Everything from curing cancer to just a healthy tonic—the equivalent of chicken soup," said Shelley Clarke, a graduate student at London's Imperial College and a

co-author of the paper. Some believe that the shark fin is an aphrodisiac.

Shark fin is one of the most expensive foods in the world. In the United States, where finning is prohibited, a bowl of shark-fin soup can sell for \$70 to \$150. For trophy species like the whale and basking shark, a single fin can fetch \$10,000 to \$20,000, Shivji said.

In commercial fishing, shark fin is much more in demand than shark flesh. Consequently, many fishing vessels slice off the fin and dump the carcass overboard—a "brutal and wasteful" practice called "finning," said Shivji.

The shark, which cannot swim without its fins, either drowns or dies from starvation. In the United States, the purchasing, landing, or possession of shark fins alone is prohibited under the Shark Finning Prohibition Act, which was enacted on December 27, 2000.

Shark Census

Measuring the shark population, much less the impact of finning, is a challenge. Shivji and Clarke developed their genetic tests to use in the shark markets to identify potentially overfished species and to establish quotas for fisheries. In effect, trade data can act as a shark census.

Shivji and Clarke have developed six tests that tease out a species-specific stretch of shark DNA that serves as a molecular ID tag.

Commercial fisheries that hunt sharks for meat gut them at sea and remove the heads, tails, and fins, leaving just the carcass, or "log," which makes the fish easier to freeze.

The process removes the distinguishing characteristics that make it possible for fishery enforcement officials to identify species in the wholesale markets, said Margo Schultze-Haugen, a biologist and fishery management specialist at the National Marine Fisheries Service, based in Silver Spring, Maryland. Some genetic testing is done but only on a very limited basis.

Shivji and Clarke's new genetic tests are improved versions that allow testing for six species of shark "all in one tube": blue, dusky, porbeagle, silky, and long- and shortfin mako.

"A quick, cheap genetic test that enables us to recognize individual shark species will facilitate good fisheries management," said Schultze-Haugen. "It will also help us enforce fishery closures, quotas, and minimum-size requirements."

Most importantly, the tests can be done using dried or fresh shark body parts. Shivji tested the procedure on dried shark fins from Asian and Mediterranean markets.

Of the 400 species of shark worldwide, about 50 are found in the global markets. But statistics are meager, because most countries don't have the resources for fisheries management. Harvest estimates range from 80 to 150 million sharks per year.

Sharks could be particularly vulnerable to overfishing. They grow slowly, produce few offspring, and take between two and 18 years, depending on the species, to reach sexual maturity.

Shark-Fin Auctions

Hong Kong, the world's shark-fin center, handles about 50 percent of the market, said Clarke. Singapore ranks second.

Clarke investigated the shark-fin trade while living in Hong Kong. Fluent in Mandarin, she was able to operate among the Hong Kong residents, who mainly speak Cantonese.

She visited warehouses where dried fins are sorted, and persuaded the owners to let her take small samples for her and Shivji's genetic studies. She wanted to understand the shark-fin market categories—for example, whether Chinese names correlate with certain species.

For two months Clarke enjoyed open access to shark-fin auctions at the warehouses, where she recorded prices. Then, as it happened, conservationists visited Hong Kong and showed films of finning. A backlash from the shark finning community resulted, and the warehouses blacklisted Clarke.

"Apparently they made a poster of me that said, 'Don't talk to this woman,'" Clarke said. But Clarke had already completed the research for her thesis. She and Shivji continue the work that may help regulate the shark-fin market.
