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Combining fishing regulations and trade data reveals the complex global market for shark products

Much like caviar, shark fins are a luxury product and delicacy in parts of the world. And like wild caviar, the demand for shark fins has placed an incredible threat on species that can't reproduce quickly enough to keep up.

Understanding the intricacies of the market for shark products calls for more than merely an account of fishery landings and life histories. It requires understanding how these interact with societal, economic and regulatory trends.

These data are finally available together in a new database, providing an opportunity for an interdisciplinary team led by researchers at UC Santa Barbara, The Nature Conservancy and Renmin University of China. After poring over the data, the authors found that shark-finning regulations did not have a significant impact on trade volumes or trade partnerships.

"We evaluated a lot of different things and found that there's really no clear-cut answer to our research question," said co-lead author [Echelle Burns](#), a project scientist at UC Santa Barbara's Environmental Markets Lab (emLab).

The [paper](#), published in Nature Communications, found that shark finning regulations have no statistically significant effect on global trade flows — namely exports, imports, domestic consumption, or number of trade partners. Despite the insignificant results, this study is the first to explore the relationship between finning regulations and trade.

“This research highlights the complex dynamics between fishing practices and trade,” explained co-lead author Sara Orofino, an ocean scientist at The Nature Conservancy. These have traditionally been studied as separate systems, without a way to connect them. A new dataset bridges that divide, enabling researchers to connect what is caught with what is traded, and begin to untangle the influence each exerts on the other.

From catch to commerce

Sharks have been hit hard by modern fishing. As a whole, these animals grow slowly, mature late and reproduce in small numbers. “Many shark species face extinction because they’re frequently caught by fisheries — sometimes on purpose and sometimes [by] accident,” said Burns. The resulting shark products — like fins, meat, oil and liver — are traded through complex but distinct global supply chains.

Because sharks are so vulnerable, there has been a massive push for regulations to protect them, resulting in a complicated patchwork of national, regional and international regulations. These regulations generally target fishing behavior or trade. One variety is shark-finning regulations, which try to prevent fishermen from catching sharks, cutting off their valuable fins and throwing the carcass back into the water — an incredibly wasteful practice.

Shark carcasses aren’t attractive to keep on board: They take up room and are not as valuable by weight as just the fins. Shark-finning regulations require keeping shark fins and carcasses together, either attached or in prescribed ratios. This affects if and how sharks are processed and retained and ultimately what shark products enter the supply chain. “One idea is that if we prevent shark finning, and fishers decide to stop targeting sharks, then maybe the market for shark products will shrink,” Burns explained.

A glimpse into a complex market

Demand, regulations and fishing all influence each other in many ways, leading to concerns that shark-finning regulations could have unintended consequences. “For example, if a country requires that fishing vessels must land sharks with their fins still attached, the influx of shark meat supply could stimulate a market expansion for shark products,” said co-lead author Kaiwen Wang, an economist at Renmin University of China.

The team sought to investigate the dynamics between policy and the resulting impact on global trade. “Until very recently, answering that sort of question really wasn’t possible,” Burns explained. “The data simply didn’t exist.” Trade data and fishery data live in different places and come in different units. That makes it incredibly challenging to follow landings beyond the pier, or retrace fillets back to the ocean.

But a new dataset maintained from the University of Washington bridges this gap. Released in 2024, the Aquatic Resource Trade in Species dataset (ARTIS) tracks fishery products across trade networks and supply chains. Combining ARTIS data with tools from econometrics enabled the authors to explore the relationship between finning regulations and international trade of shark products.

Regulations vary across countries, as do their adoption dates. So the authors compared a country’s trade data and domestic consumption with itself before and after adopting a regulation. They then compared this difference across countries; those with no-regulations served as the control group.

The importance of null results

After a thorough analysis, the team found no statistically significant relationship between shark-finning regulations and the consumption or trade of shark products. In other words, shark-finning regulations have not dramatically changed the global trade of shark products.

“This sort of null result can initially be disappointing for us as researchers,” said senior author [Gavin McDonald](#), a senior project scientist at UCSB’s emLab. “But it is

still incredibly important to share these types of findings. All too often, analyses with null results are abandoned and not shared or published, which can be a huge missed opportunity for advancing science and policy.”

“Our findings are an important warning that real-world changes along the supply chain of shark products are much more complicated than we would have thought,” Wang added. The results open up new questions, such as how well regulations are enforced and the details of how the supply chain actually behaves.

How a shark fares after a run-in with fishing gear varies dramatically across different species, as the authors discovered in a [previous paper](#). These differences are partly why there’s no clear-cut solution to address shark mortality, and contribute to the complexity of the regulatory landscape. In addition to finning bans, there are also retention and import bans, gear restrictions and international trade regulations which all interact with each other.

“The ability to evaluate these dynamics between regulation and trade outcomes is critical for understanding their impact,” Orofino said.

Tags

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