

Lethal flaws found in Shiffman *et al.* 2021, on science in shark advocacy

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Although written in an authoritative style, Shiffman *et al.*'s paper "*The role and value of science in shark conservation advocacy*" (2021)¹ contains a number of serious errors which call into question its merit. In particular, it claims that the survey on which it is based shows that conservationists favour bans over sustainable shark fishing more than scientists. But in fact, the survey of scientists cited showed that more scientists favour bans than conservationists. The survey also establishes that conservationists do in fact base their published information on scientific papers, rather than public belief or moral considerations, but the authors focus only on the conservationists' attitude to the subjects of the two bills now being considered as future legislation in the USA, revealing an essentially political stance.

The Sustainable Shark Fisheries and Trade Act of 2018 is the shark fishing industry's supposed solution to shark depletion², while *The Shark Fin Sales Elimination Act of 2017*, which would remove the USA from the shark fin trade, is the choice of those who want effective protection for sharks.

The article's slanted presentation suggests that it is political in nature, and written to grant scientific credibility to the erroneous idea that the shark fin trade is sustainable (see their Fig. 5). Indeed, Shiffman's rhetorical arguments tend to echo, often almost word for word, those of the shark fishing industry spokesmen from the Sustainable Shark Alliance^{2,3}.

The only evidence offered to establish the existence of sustainable commercial shark fisheries is Simpfendorfer and Dulvy's 2017 paper *Bright spots of sustainable shark fishing*,⁴ a work that was already in error two years after it was published. It claimed, for example, that the mako shark fisheries in the North and South Atlantic serving the shark fin trade could be sustainable with management. But at the same time, scientists from the International Commission for the Conservation of Atlantic Tunas (ICCAT) found that the status of the mako shark was so dire that even if all fishing was stopped immediately, its numbers would continue to decline for the next fifteen years. There was a probability of only about 50% that the stock would be rebuilt by 2045, and the probability that it would be rebuilt would not exceed 70% until 2070, 50 years from now⁵. Commercial fishing of the blue shark was also promoted by Simpfendorfer and Dulvy as being potentially sustainable in spite of a paucity of data; it too is considered to be overfished in the North Atlantic⁶.

The sharks in the North Atlantic are managed by ICCAT, which represents 48 contracting nations and groups, including the European Union. Member nations provide data of highly variable quality for their fisheries, but there are also several major fishing nations working the North Atlantic that provide no shark catch data to anyone, and are not party to ICCAT. It is estimated that only a

quarter of the sharks killed there are reported, and that illegal finning is rampant⁷. Neither the paper in question, nor indeed any other, provides evidence on how shark fishing could be managed sustainably under such circumstances. The North Atlantic, right in the heart of the ‘civilized’ world, should be the very epitome of excellent fishing management and sustainable shark fishing. The truth clearly is far from that, and the situation is even worse in the Pacific and Indian oceans. Yet Shiffman *et al.* write:

“Results show that in general, the environmental advocates who most strongly supported bans on fisheries and trade were the least familiar with the current state of scientific knowledge on sustainable shark fisheries.”

On the contrary, it appears to be Shiffman *et al.* who are out of touch with the current state of scientific knowledge on sustainable shark fisheries. They also cite Walker⁸ but this paper actually questions whether sustainability in commercial shark fishing can be realized and focuses on the difficulties of accomplishing it. Further, it was published in 1998 before the shocking results of the shark fin trade became evident.

The only other paper which the authors cite as evidence that sustainable shark fisheries exist is Shiffman’s own paper³, which claimed that they exist all over the world, but provided no evidence that they actually do. It was indeed thoroughly rebutted⁹. Contrary to what the authors state, there is much evidence which throws into question the idea that long-term sustainable commercial shark fisheries are possible, particularly in the face of the secretive and largely criminal shark fin trade¹⁰. Traditionally, the shark and skate fisheries that have been managed sustainably were those few, mostly in the USA and Australia, that took the animals for meat¹¹. But this present paper fails to differentiate between those and the current hunt to supply the shark fin trade, which now involves industrial fisheries from nations around the globe.

This paper’s theme of promoting shark fishing while belittling conservationists is a common one in Shiffman’s writings^{12,13,14}. It strongly emphasizes the way scientists surveyed for an earlier paper¹⁴ favoured sustainable shark fisheries over bans, and did so more than the surveyed conservationists. But that same paper stated that 63% of responding scientists strongly agreed or agreed with bans on the sale of shark fins while only 41% of the conservationist respondents support shark fin trade bans. Therefore, shark scientists were more in favour of bans than conservationists to a significant degree, which contradicts what is claimed here. This mismatch between the findings of the two surveys and the claims of these authors invalidates much of what they state.

The claim that the public is concerned about sharks because they “*can be ecologically important*” implies that sharks may or may not be of much ecological importance, and minimizes an important concern with regards to the current and ongoing extent of shark depletion.

All relevant ecological studies have found that, as top and middle predators, sharks are among the most strongly interacting animals in the food chain, with the result that the extreme disruption wrought by more than seven decades of industrial shark removal has caused major, cascading biodiversity shifts throughout the originally complex and diverse aquatic ecosystems which evolved during the previous 500 million years^{15,16,17,18,19,20}.

There is also the claim that the public is concerned about sharks because they “*are a popular encounter for scuba divers and other marine tourists*.” Terming divers “*marine tourists*” disparages a major force behind shark conservation efforts. A large proportion of divers dive locally and regularly, knowing their area well. They have personally witnessed the disappearance of sharks

from the oceans and coasts the way the buffalo vanished from the plains of North America during the 1800s. Therefore, they have always been at the forefront of shark conservation efforts. This statement wholly misrepresents the reasons why so many members of the public are concerned about sharks.

The results of the survey on which this paper is based show that two thirds of NGO employees read scientific papers regularly and more than half have published scientific papers. This was found even though the authors deliberately excluded scientific researchers working in conservation from the survey, an altogether startling bias. The data show that NGOs use scientific and not moral reasons for their arguments for shark protection, so the conclusion should have been that NGO employees working on shark conservation are, with few exceptions, scientifically informed, rather than the contrary.

To anyone who is aware of the actual state of shark depletion and the circumstances around it, it is extremely worrying to see this sort of pseudo-philosophical, pro-shark fishing propaganda neglecting biological facts, yet being published as if it were science.

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