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## Short Communication

## A letter of clarification from the authors of “trophy fishing for species threatened with extinction”

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## ABSTRACT

A rejoinder to our recent paper suggests that there has been confusion over our central point. The 85 IUCN Red List Threatened species that the International Game Fish Association issues world records became threatened due to commercial overfishing, not recreational. However, given that they are threatened now, we have concerns about trophy fishing for them, at least in the current form that precludes catch and release. Additionally, while the IGFA claims that an insignificantly low number of record applications for these species have been submitted, many more anglers attempt to catch a large fish than end up submitting record applications. We are grateful for the opportunity to discuss this important issue.

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Based on a rejoinder [1] to our recent paper “*Trophy fishing for species threatened with extinction: a way forward building on a history of conservation*” [2] from International Game Fish Association (IGFA) conservation director Jason Schratwieser we believe that there may have been some confusion over the central point of our paper. It is the goal of this letter to provide clarity and propose a collaborative means of addressing the current data limitations and practical aspects of ensuring the conservation of threatened fishes.

We acknowledge the points raised by Schratwieser [1] and are in agreement with his assertion that commercial fishing is without a doubt a much larger threat for most fish species than recreational fishing and we never claimed otherwise. Indeed, the cause of the Threatened status of the 85 species with IGFA records is almost certainly due to commercial overexploitation. As we stated in our original paper [2], 81 of the 85 species with IGFA records listed as Threatened by the IUCN Red List have a current or historical commercial fishery associated with them. However, it does not matter how and when these fishes became Threatened, it only matters that they are Threatened now.

It is well established in a variety of fish species that the largest individuals are the most fecund [3] and also have the highest re-

productive potential [4], resulting in more offspring and improved offspring health and survival. Our paper's central point was that since trophy fishing targets the largest individuals of a species, removal of a few large individuals from a population can have a disproportionate impact relative to removing the same number of smaller fish (i.e. removing a few bigger fish is not equivalent in terms of population dynamics to removing the same number of smaller fish). Therefore, conservation of the largest individuals is of particular importance, as the potential for population recovery and resilience of these Threatened species may be worsened or hindered if, in addition to commercial fishing pressure, the largest individuals from a population are removed. We do not believe, nor did we claim, that trophy fishing or recreational fishing in general has a disproportionate effect on fish populations relative to commercial fishing, which is in agreement with Schratwieser [1].

Over the past 20 years there have been relatively few world record applications submitted to the IGFA for the 85 species of IUCN Red List Threatened fish we identified in our paper [1]. However, the impact of trophy fishing cannot be measured solely by the number of record applications, as many (admittedly an unquantifiable number) more anglers land large fish with the goal of obtaining a prestigious IGFA all-tackle world record than succeed in obtaining one and thus reporting it. This results in higher fishing pressure on large fish than what would be reflected by the actual number of all-tackle record applications [5].

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One of the largest problems facing fisheries management is the lack of data to better quantify the population sizes of fishes and the effects of all types of fishing on growth and mortality. This creates an opportunity for potential future collaboration between researchers, trophy anglers and conservation-minded institutions like the IGFA. For example, scientists, anglers and the IGFA could work together to further develop and implement non-lethal alternatives to the current all-tackle world record requirements, including length-based records which can estimate weight (e.g. [6]) and high-quality photographs with appropriate scale. The rejoinder [1] acknowledges that more than  $\frac{2}{3}$  of fishes submitted for IGFA all-tackle world records are currently not released alive, and therefore our proposal would allow for the live release of trophy (and potential trophy) fish for Threatened species and the many other species targeted by recreational anglers. This cooperation would also generate valuable data that could help scientists better quantify trends in fish growth and population size. We want to be clear that we are not advocating for strictly catch-and-release for all species; just those that are considered Threatened. There are some excellent examples of where Threatened fish species of interest to anglers have benefitted from a dedicated and passionate group of concerned catch-and-release oriented anglers [7].

We are grateful for the productive discussion about this important topic that our paper has created, and hope that it ultimately fosters

collaborative efforts to help fill gaps in our current knowledge and improve the conservation of Threatened fish species. Indeed, partnerships among the recreational fishing community, scientists, and managers represent the future of sustainable and responsible recreational fisheries.

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