

• Sustainable solutions to fishing-marine megafauna conflicts

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Background

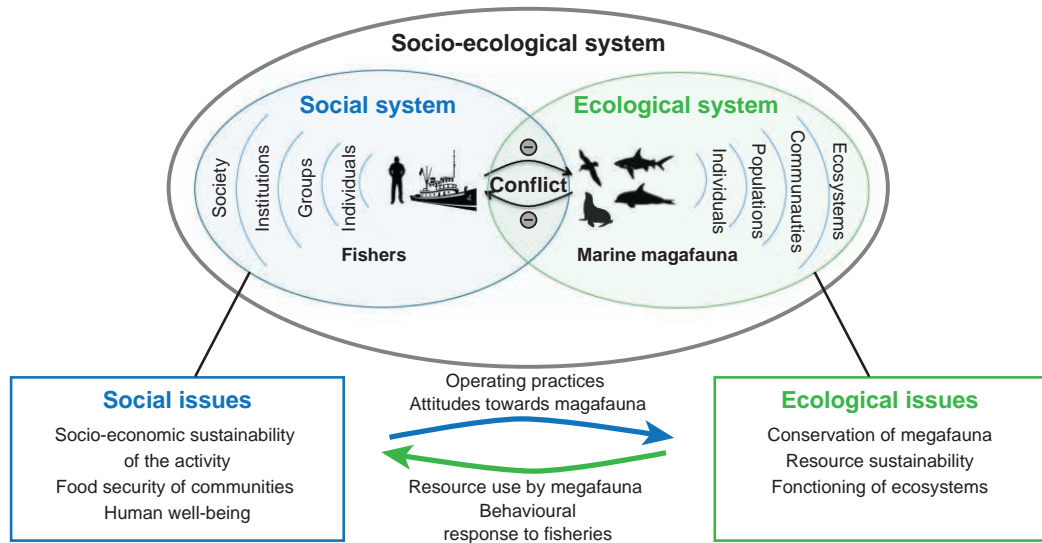
Conflicts of use between fisheries and marine megafauna (sharks, turtles, mammals and seabirds) now extend around the globe and are exacerbated by the intensification of fishing, the decline in fish stocks and significant conservation issues. Although the end of the 20th century saw a shift from an approach of eradicating megafauna to one of human-wildlife coexistence, there are still only limited sustainable solutions. To tackle the major societal and environmental challenge posed by this coexistence and to provide integrated decision-making tools, it would seem appropriate to develop transdisciplinary and trans-sectoral research at the socio-ecological system level, following the approaches adopted by sustainability science.

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Further reading

NYHUS P. J., 2016 – Human–wildlife conflict and coexistence. *Annual Review of Environment and Resources*, 41 : 143-171.



Socio-ecological system and issues associated with the fishing-marine megafauna conflict.

Socio-ecological complexity of the conflict

The fishing-marine megafauna conflict is a typical environmental problem at the interface between societal and ecological issues, with impacts that disrupt multiple compartments of marine socio-ecosystems, threatening their balance, their functioning and, consequently, their long-term sustainability. For example, the behaviour of sharks and marine mammals, which feed on fish catches from fishing equipment, has socioeconomic costs for fishers (loss of yields, material damage and extra effort) and

negatively impacts the predators themselves (by catch mortality and/or fisher response), fish stocks (skewed assessments) and associated ecosystems (changes in trophic interactions). This type of conflict affects coastal and offshore fisheries in all sectors (industrial, artisanal, subsistence and recreational) worldwide, but the various effects produced vary from region to region and can, in some areas of the Global South, threaten the food security of communities.

Transition towards transdisciplinarity

The majority of scientific studies have, until now, examined conflicts through piecemeal approaches, focusing on a limited number of socio-ecosystem components or on a single type of issue (social, economic or conservation) and separating human activity from other functional groups. These studies, generally used as an aid to decision-making in fisheries management, result in single-track measures pitting the socioeconomic viability of fisheries, the sustainability of fish stocks and the maintenance of marine megafauna populations against each other, creating contradictions within the governance systems themselves.

Generic research recommends interdisciplinary approaches for effective coexistence, but their implementation may be hampered by the complexity of socio-ecosystems and the lack of cross-sectoral expertise needed to catalyse knowledge in an integrated manner. In addition to the transition that has already begun at the individual (researchers broadening their disciplinary field) and collective (mobilisation of a range of expertise in research programmes) levels, particularly at IRD, a transition from interdisciplinarity to transdisciplinarity is also needed. This involves developing and deploying integrative scientific tools to identify, by taking into account social, economic and ecological interactions, the conditions for maintaining an entire socio-ecosystem that is stressed by the conflict. Such tools already exist – for example,

ecosystem models with human components or bioeconomic coviability models – but their application is still limited.

The importance of social sciences and humanities (SSH)

While studies on the ecological mechanisms and impacts of conflicts dominate the literature and provide the first clues to mitigation, they must be complemented by SSH studies to identify the barriers to coexistence related to fishing activities and their modes of governance. At the level of fishers, this involves understanding social and economic constraints, along with attitudes and perceptions towards megafauna. For example, the analysis of perceptions – which are linked to individuals' culture and life history and often determine how a conflict arises – can be used to direct eco-awareness efforts towards increased acceptance of megafauna. On a broader scale, SSH, and in particular research in environmental humanities, are essential for understanding how stakeholders organise themselves around the conflict, the power games played and how knowledge (local, scientific, expert opinion, etc.) is put into practice in the decision-making process. Together, as part of a process of transforming existing governance methods, these studies can activate the levers needed to remove the obstacles to fisheries and marine megafauna coexisting by bringing together stakeholders (fishers, fishing industry, managers, scientists, environmentalists, economists, policymakers and the general public) with often divergent interests.

Adaptive co-management as a lever for transformation

One of the transformation levers is adaptive co-management. It combines different knowledge systems and different types of knowledge by promoting information flows and cross-sectoral collaboration, proactively engages all stakeholders, and has been put forward as a management method suitable for mitigating human-wildlife species conflicts. However, adaptive co-management is still only rarely used in fishing/marine megafauna conflicts because the benefits only become apparent in the medium and long term. Actions with

immediate effects, such as financial compensation or the use of technological systems to keep megafauna away, are therefore often preferred. These approaches can be effective at the local level, but must be integrated into an adaptive co-management process and accompanied by more radical transformations to guarantee long-term coexistence. By developing a more holistic understanding of the issues, processes and impacts of the conflict, significant changes in fishing practices or techniques can be tested, assessed and adjusted in an iterative manner until socioeconomic and ecological compromises are found that can maintain the entire system.

KEY POINTS

While fishing-marine megafauna conflicts cannot be eliminated, sustainable solutions for coexistence are possible. This coexistence requires innovations in fishing practices, based on knowledge acquired in all compartments of the socio-ecological systems associated with the conflicts. This knowledge is acquired through developing integrative transdisciplinary research that identifies the balance points that allow the social and biological components to work within sustainable margins. It is also essential to re-examine how the various stakeholders could mobilise and organise themselves around this objective of coexistence. Sustainability science, as a “problem-based” research field, advocating the socio-ecological approach and building on the pillars of understand, co-construct and transform, can act as a catalyst for transitioning to adaptive co-management methods and shifting from conflict to coexistence between fisheries and marine megafauna.

SUSTAINABILITY SCIENCE

UNDERSTAND, CO-CONSTRUCT, TRANSFORM

Collective thinking coordinated
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