

Stakeholder engagement is essential to marine fisheries research, conservation, education, and advocacy

La participación de las partes interesadas es esencial para la investigación pesquera marina, conservación, educación y promoción

L'engagement des parties prenantes est essentiel à la recherche sur les pêches marines, conservation, éducation et plaidoyer

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EXTENDED ABSTRACT

Modern resource management and conservation require public input and support in formulating regulatory and conservation strategies, and to achieve compliance with regulations. Historically, most guidance on science-society interaction has focused on how research findings were applied to policy, and did not include stakeholder collaboration in identifying issues of concern or research design and execution (Jolibert and Wesselink 2012). This approach follows a long tradition of linear transfer of knowledge from research to policy, and dissemination via peer-reviewed publications, which often omits or is unaware of stakeholder perceptions.

When stakeholders have been included in the research and management process, they are frequently not engaged throughout the process, but instead are only engaged during the dissemination stage (Jolibert and Wesselink 2012), such as reviewing draft management strategies that have already been formulated. Thus, incorporating stakeholders throughout the process (problem identification, resource assessment, research, application of findings to management) remains a challenge. This may be in part because the engagement of stakeholders in identifying issues of concern and participating in the design and collection of data for research projects can reduce the credibility of the research in the eyes of policymakers, and in scientific peer review (Jolibert and Wesselink 2012), though this negative perception is shifting.

The challenge is even greater in many developing nations, where the need to manage fisheries as part of a complex system that includes natural, human, and management components has not been adequately addressed, in large part because of a top-down management approach (e.g., in Belize, Gillet 2003). Moreover, there is often no regular interaction between science and policy, in part because many management agencies don't have a research division. Moreover, when science that informs policy is conducted, it mainly addresses commercial fisheries. Thus, most fisheries management does not include stakeholders, and recreational fisheries has the added challenge of an overall lack of management attention.

When collaborating with stakeholders to address conservation and management challenges, it is essential to partner with stakeholders early on, and to foster long term, trusting relationships based on mutual respect. In contrast to engaging stakeholders on a per-project basis, often as a one-time occurrence (i.e., "parachute science/conservation"), time invested into long-term, collaborative relationships is more likely to result in a positive feedback loop of trust and productive results and better understanding of collaborator perspectives. Measures of trust and understanding are one of the better predictors of successful collaborations, which in turn have positive effects on research and conservation outcomes (Jolibert and Wesselink 2012).

Boundary organizations are organizations that enable or enhance communication and information transfer between disparate groups (e.g., scientists and non-scientists (Safford et al. 2017), and are the types of organizations needed to address the stakeholder engagement challenge by not only facilitating communication between scientists and resource managers and policy makers, but also including stakeholders. In recent years, stakeholder-focused, non-governmental conservation organizations that focus on broad-scale conservation needs have been applying an integrated stakeholder approach more frequently and effectively, which also has provided a model for scientific researchers and resource managers. One example of such organizations is Habitat-Dependent Outdoor Recreationist Organizations (HDORCO), which are

“organizations that engage habitat-dependent outdoor recreationists in ecosystem-scale conservation and help to set and/or achieve conservation goals” (Raynal et al. 2020). This requires a long-term, interactive relationship. Thus, HDORCOs engage in exactly the type of relationships that are required for stakeholder inclusion, and address the shortcomings previously described. Habitat-dependent outdoor recreation is “recreation that depends upon relatively intact and functional natural ecosystems to support the core aims of the activity (as opposed to many outdoor team sports, motorsports, etc.) and, therefore, potentially provides incentives for participants to engage in conservation” (Raynal et al. 2020). Thus, stakeholders engaged in such activities are invested in maintaining healthy ecosystems, and thus are more likely to participate in collaborations with researchers and resource managers.

Here we present a model of a boundary organization, Bonefish & Tarpon Trust, that as part of its structure incorporates marine recreational fishery stakeholders, scientists, and resource managers in the process of threat assessment, research, education, advocacy, and conservation. Bonefish & Tarpon Trust was founded as a non-profit, non-governmental organization in 1998 (originally called Bonefish Tarpon Unlimited) by recreational fishers and fishing guides concerned about declines in populations of Bonefish (*Albula vulpes*) and Atlantic Tarpon (*Megalops atlanticus*) in the Florida Keys (USA). The organization has matured into a fisher-integrated, science-based, conservation organization that focuses on conservation of the recreational flats fishery for Bonefish, Tarpon, Permit (*Trachinotus falcatus*), and common Snook (*Centropomus undecimalis*), and more broadly the ecosystem that supports these and similar fishery species. Conceptually, BTT strategically connects with fishers/the fishing community, fisheries and resource managers, and scientific researchers, and acts as both a collaborator with, and intermediary between, these sectors that traditionally have not experienced sufficient or consistent communication to drive conservation success. Collaboration with the scientific community ensures that high standards are maintained for research, applying the most advanced methods. Frequent interaction with resource management agencies ensures that any research is addressing management needs or knowledge gaps, and enhances communication channels between the agencies and fishers. BTT integrates fishers throughout the process. For example, the integration with fishers is often structured as either an informed nested or parallel mixed-methods approach (Kinnebrew et al. 2021), whereby fishers are queried about perceptions of the fishery to help guide research efforts, are consulted about projects as the projects are designed, participate in data collection, and advocate for application of research findings to management and conservation. This approach is being increasingly applied by conservation and outdoor recreation organizations (Raynal et al. 2020). In all cases, communication is based on an extended period of building relationships rather than a project-specific interaction. Although the model used by BTT focuses on the recreational flats fishery, this same approach can be

applied to other fisheries.

KEYWORDS: Marine conservation, recreational fisheries, coproduction, stakeholder engagement

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