



Participant perceptions of consensus-based, marine mammal take reduction planning



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ABSTRACT

This study employs Structural Equation Models (SEMs) to systematically analyze the components of a multi-stakeholder negotiation in an applied setting. It characterizes participant perceptions of a multi-stakeholder, consensus-based negotiation process used to reduce harmful interactions between marine mammals and fishing gear in U.S. waters (marine mammal Take Reduction Teams). From April to July 2013, 234 current and former participants of eight Take Reduction Teams received a survey with 15 questions about the negotiation process, outputs (Take Reduction Plans), and outcomes. The SEMs depict relationships among the latent variables of social capital and shared learning, fairness, stakeholder satisfaction with the Take Reduction Plans, and their perceived outcomes. The SEMs also explain the influence of independent predictors of team identity and age, geographic region, and stakeholder affiliation on the latent variables. Results indicate that stakeholder views of fairness significantly influenced their satisfaction with the Take Reduction Plans, which in turn, significantly affected their opinions of the outcomes. While the majority of participants believed the plans were at least slightly successful at reducing marine mammal bycatch, this varied among teams and was significantly influenced by stakeholder affiliation, region, and Take Reduction Team age.

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1. Introduction

The unintentional capture or entanglement of marine life in fishing gear (bycatch) kills thousands of marine mammals in U.S. waters annually [1,2]. The National Marine Fisheries Service (NMFS), one of three agencies charged with protecting marine mammals in the U.S., creates and implements regulations subject to the Marine Mammal Protection Act of 1972 (MMPA, 16 U.S.C. 1361 *et seq.*). As a consequence of the 1994 amendments to the statute, NMFS quantitatively evaluates fisheries impacts on marine mammal stocks and when bycatch exceeds statutory thresholds, NMFS convenes a team of stakeholders (Take Reduction Team) to develop consensus-based regulations to minimize marine mammal-fisheries interactions. These stakeholders include representatives from the fishing industry (fishermen, lobbyists, and fishing industry association representatives), environmental groups, scientific researchers, members of Regional Fisheries Management Councils and commissions, and state and federal environmental managers. NMFS has convened nine Take Reduction Teams since 1994, several of which have been active for over 15 years. Two teams merged while another team disbanded in the

early 2000s, leaving seven active teams (Table 1). A 2008 review of the marine mammal take reduction planning process by the Government Accountability Office explicitly identified the need for “a comprehensive strategy for assessing the effectiveness of Take Reduction Plans and ... regulations that have been implemented” [44, p. 37]. This research aims to quantitatively evaluate stakeholder opinions of the take reduction negotiation process, outputs, and outcomes using Structural Equation Models (SEMs), and identify the covariates that significantly influenced the model results. It addresses the following questions: 1) Do marine mammal Take Reduction Teams in practice comprise the necessary components (representative participation, repeated interactions, shared learning, facilitation, and consensus goal) for successful multiparty negotiations? 2) Are there differences between existing teams? and 3) How and why do views of social capital, fairness, and satisfaction with outputs and outcomes vary across stakeholder groups within teams and across teams themselves?

2. Marine mammal take reduction planning

2.1. Marine mammal bycatch and multi-stakeholder negotiations

The MMPA directs each Take Reduction Team to generate a consensus-based Take Reduction Plan within six months of the

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Table 1

Survey responses by stakeholder affiliation, including the number and proportion of individuals who are members of more than one team and total number of responses per stakeholder group, and survey responses by Take Reduction Team, includes responses by individuals on more than one team.

	No. Respondents	No. Respondents on > 1 team	% Respondents on > 1 team	Total No. Responses (records in database)
Stakeholder Affiliation				
Researcher	30	10	33%	51
Fishing industry	41	14	34%	62
Environmental group	8	6	75%	24
State manager	21	11	52%	37
Federal employee	30	17	57%	75
Fisheries Management Council	4	2	50%	10
Facilitator	5	1	20%	9
TOTAL	139	61	44%	268
Take Reduction Team				
Atlantic Large Whale	65	43	66%	65
Atlantic Offshore Cetaceans*	14	11	79%	14
Atlantic Trawl Gear	23	20	87%	23
Bottlenose Dolphin	53	37	70%	53
False Killer Whale	19	7	37%	19
Harbor Porpoise	54	48	89%	54
Pelagic Longline	29	21	72%	29
Pacific Offshore Cetaceans	11	4	36%	11
TOTAL	268			268
*Disbanded				

team's formation (16 U.S.C. 1387(f)(7)(A)(ii)). This multi-stakeholder negotiation process requires a substantial time commitment by stakeholders. The plans are modified and amended based on updated information about marine mammal bycatch rates, results from research about bycatch reduction measures, and changes in fisheries management practices (e.g., new fishing regulations). Although NMFS must implement legally valid, consensus-based regulations, if stakeholders are unable to come to consensus, the agency will generate its own regulations that meet statutory mandates (16 U.S.C. 1387(f)(7)(A)(ii)). This can act as an incentive for stakeholders to reach consensus. The negotiations are professionally facilitated, which encourages communication among team members.

2.2. Early challenges of take reduction planning

While learning how to implement the take reduction planning requirements of the MMPA, NMFS engaged in limited coordination with other agency offices responsible for implementing fisheries management policies [3]. In addition, NMFS missed statutory deadlines for adopting and implementing final Take Reduction Plans, which created mistrust and frustration among team members, decreased the credibility of the agency, and undermined the negotiation process [4,5]. In response, members of environmental groups filed suit to compel NMFS to adopt the plans [4]. This defection of the environmental groups engendered mistrust among other stakeholders, who suspected that the settlement agreement contained additional language that was not agreed upon by the team [4]. Data deficiencies also hindered the early creation of effective Take Reduction Plans and participant buy-in. According to RESOLVE [5], nearly 70% of the team members surveyed felt the data were insufficient.

3. Public participatory processes

Involving affected parties in creating solutions to complex natural resource conflicts, such as marine mammal-fisheries interactions, can decrease hostility among people with opposing viewpoints and improve the quality and legitimacy of regulations put in place to protect resources [6–12]. Participatory processes have been described by a variety of applied and theoretical

frameworks and disciplines [12–30], which share the following recommendations for successful negotiations: 1) inviting certain parties and excluding others influences the likelihood of achieving agreement on and compliance with outputs; 2) focusing on shared learning increases the chances of agreement and improves relationships and social capital; 3) increasing the number of interactions among participants fosters cooperation; 4) using a neutral, third party improves fairness; and 5) focusing on achieving consensus bolsters buy-in and decreases the probability of defection.

3.1. Representative participation

Participatory processes bring together a variety of stakeholders with a range of experiences to incorporate citizen values and generate more realistic policies [12,25,26]. Limited institutional resources, time constraints of stakeholders, and the practicality of implementation restrict who sits at the table and can lead to turnover among the participants. Intensive participatory processes may exclude members of the general public, many of whom will be directly affected by policies created during stakeholder negotiations [26,27,31]. For practical reasons, regulatory agencies may choose interest group representatives who can relay information to their respective constituencies. Agencies may invite representatives with whom they have an established relationship, which could limit the breadth of representation and thus inhibit the 'ideal' deliberative process [7]. Nonetheless, agencies must balance the number of participants with the practicality of generating consensus-based decisions [12].

3.2. Shared learning

Differences between regulatory science (generated by the agency), research science (generated by the academic community), and lay knowledge (generated outside of the government or academia) can engender conflict [32–35]. Sharing citizen knowledge and technical information can address such conflicts. Shared learning occurs when participants collectively learn about an issue, exchange data, question existing information, and identify agreed-upon facts and data needs. This increased understanding of issues facilitates creative problem solving and improves decisions and outcomes [24,36,37]. Shared learning also helps participants search for common values, which can decrease conflict while

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