



Full length article

Fishing practices and representations of shark conservation issues among users of a land-based shark angling online forum



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ARTICLE INFO

Handled by Prof. George A. Rose

Keywords:

Recreational angling

Human dimensions

Stakeholder knowledge and attitudes

Shark fishing

Shark conservation

ABSTRACT

Recreational fisheries can play a significant role in the population dynamics of threatened fish species, but have received much less research and management attention than commercial fisheries. Land-based anglers are a group of recreational fishers that fish from beaches or piers; however, comparatively little is known about the practices and perceptions of this stakeholder group. In order to gather data for an initial assessment of the fishing practices of land-based anglers and their perspectives on shark conservation issues, we performed a content and discourse analysis of an online discussion forum used by the largest land-based shark fishing club in Florida. Discussion board content analysis can identify evidence that certain perceptions or practices exist within a studied sample, but cannot be used to estimate how common those perceptions and practices are among the wider population. We found evidence that forum users are demographically distinct from other recreational anglers in Florida, and are mostly young males. Some forum users perceive themselves as relatively low-income compared with other fishing stakeholder groups. There was no evidence in forum discussions that patterns of reported landing and release of hammerhead and tiger sharks changed following the introduction of new legal protections for these species in 2012. This study identified a minimum of dozens of cases of illegal shark fishing practices among forum users, and found evidence that some users are aware that these practices are illegal. There was evidence that some users believe that their own practices have no effect on shark populations and should not be regulated. Additionally, this study found the existence of mixed attitudes and levels of trust towards scientific researchers and environmentalists.

1. Introduction

Populations of many shark species have declined, and approximately 24% of all known species of sharks and their relatives are listed as Threatened with extinction by the International Union for the Conservation of nature (IUCN) Red List (Dulvy et al., 2014). While these population declines are mostly attributable to commercial overfishing, recreational fisheries can have a significant impact on fish population dynamics (Coleman et al., 2004; Cooke and Cowx, 2004; Lewin et al., 2006) including shark populations (Gallagher et al., 2016). McClellan Press et al. (2015) noted that recreational shark fishing occurs throughout the coastal United States, and 93% of surveyed recreational anglers had caught a shark at least once. In 2013, 2014, and 2015 more non-dogfish sharks were killed in the United States by

recreational anglers than by commercial fishers, which can be attributed to both increasing numbers of sharks caught by recreational anglers and declining U.S. commercial shark fisheries (State of U.S. Fisheries, 2013, 2014, 2015).

Anglers have a variety of different motivations for fishing, ranging from catching fish to eat to simply enjoying a day outdoors (Holland and Ditton, 1992). A detailed understanding of stakeholder motivations can improve communications between policymakers and stakeholders, potentially increasing stakeholder buy-in to new regulations (Lundquist and Granek, 2005). For example, boat-based charter recreational anglers in Florida enjoy catching sharks for the sport and challenge of catching a big fish, but are concerned about global shark population declines and therefore generally release what they catch (Shiffman and Hammerschlag, 2014). Moreover, Florida's shark anglers generally

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exhibit a strong overall conservation ethic towards sharks, and many value healthy shark populations (Shiffman and Hammerschlag, 2014; Gallagher et al., 2015b), as do recreational shark anglers in Australia (Lynch et al., 2010). Gallagher et al. (2015b) noted that half of surveyed Florida boat-based anglers identified themselves as members of a conservation-focused angling group or club. These motivations and their implications for management are comparatively understudied for anglers who fish for sharks from beaches, bridges, and piers, referred to herein as “land-based shark anglers.” These anglers may have different motivations, values, and fishing practices compared with anglers who fish from boats, and should be studied separately.

Large sharks are a popular target of Florida’s recreational anglers (Fisher and Ditton, 1993; Shiffman and Hammerschlag, 2014; Gallagher et al., 2015b). Gallagher et al. (2015a,b) noted that nearly half of surveyed anglers intentionally targeted sharks. Though catch and release is commonly practiced by recreational anglers targeting sharks (Babcock, 2008; Shiffman and Hammerschlag, 2014), certain species like hammerheads (*Sphyrna sp.*) can be highly susceptible to lethal and sublethal capture effects and post-release mortality due to a strong physiological stress response (Gallagher et al., 2014). The physiological stress effects associated with boat-based shark fishing practices have been assessed for several shark species (Skomal, 2007; Brill et al., 2009; Skomal and Bernal, 2010; Marshall et al., 2012; Gallagher et al., 2012, 2014). However, the physiological stress effects of land-based shark fishing are not as well studied (Gallagher et al., 2016), though a recent study (Ajemian et al., 2016) looked at catch trends among Texas land-based shark anglers.

Successfully implementing conservation and management regulations requires effectively communicating with stakeholders, understanding their perspectives, and understanding the social context in which their attitudes are formed (Lundquist and Granek, 2005). Stakeholders who accept the legitimacy of scientific research and believe in the fairness of regulations governing their actions may be more likely to willingly follow those regulations, and may help to enforce those regulations through compliance pressure on their peers (Kennedy, 2010). In contrast, stakeholders who do not accept the legitimacy of scientific research or the fairness or the regulatory process may be less likely to willingly follow regulations (e.g., Suman et al., 1999). The perspectives of land-based recreational shark anglers are comparatively understudied.

An increasing number of social interactions occur online, and studying these interactions through the use of content and discourse analysis can help researchers to more fully understand a particular community (Dalsgaard, 2016). Recreational anglers are known to use online discussion forums to communicate with each other about fishing practices and the regulations governing their sport (Ridings and Gefen, 2004). Joining and participating in these “virtual communities” allows anglers to learn from more experienced community members, and to find partners for future fishing trips (Martin et al., 2014). Anglers often share stories and photos of their catches in these forums, which allows other anglers to experience their fishing successes vicariously (Ridings and Gefen, 2004). Although this method has significant limitations (see discussion), content and discourse analysis of posts made to online discussion forums used by anglers can provide a cost-effective, unobtrusive, and effective method of obtaining first approximation data on land-based angling.

Data gathered from discussion boards is limited compared with targeted surveys or interviews, because it relies on members of the studied population voluntarily posting information without any prompting from the researcher. However, gathering information from online forums can be a low-cost, logistically simple way of gathering first approximation data on an otherwise poorly studied population (Martin et al., 2014). Discussion board postings can reveal whether or not certain attitudes or behaviors are present within the studied sample, but this data cannot be extrapolated to determine the how common these attitudes or behaviors within the larger population (Steinmetz, 2012).

Because of its status as a hotspot for recreational shark fishing (Shiffman and Hammerschlag, 2014; Gallagher et al., 2015b), Florida is an ideal location to study land-based shark fishing. Accordingly, to provide an initial characterization of south Florida’s land-based shark fishery, we conducted a content analysis of posts made by members of the South Florida Shark Club (the largest land-based shark fishing club in Florida) on their online discussion board. The South Florida Shark Club (SFSC) is an organization whose stated goal is to “promote and protect [the] sport of land-based shark fishing.” The SFSC’s discussion forums are an active place of discussion, with 1183 registered members of the South Florida Shark Club writing 48,334 posts on 7074 topics (as of January 31, 2014). Some discussion board posts report the results of shark fishing trips, while others focus on a variety of related topics, including proposed shark fishing regulations, perceptions of other stakeholder groups, and other shark conservation issues.

Scientific analysis of information posted in online discussion forums requires a hybrid of content and discourse analysis with descriptive methodologies from the discipline of ethnography, and has been referred to as “virtual ethnography” (Steinmetz, 2012). Online discussion forum posts are typically archived and searchable, allowing researchers to analyze months or years of conversations without needing to observe them in real time (Steinmetz, 2012). Discussion board analysis can be considered to be the virtual equivalent of reading diaries or autobiographies, already an established component of ethnography research (Nardi, 2015; Dalsgaard, 2016).

In this study, SFSC discussion board posts were analyzed to address the following research questions with the goal of providing initial information on this understudied system with potential conservation implications: 1) What are the reported demographics of forum users? 2) Which shark species do forum users report catching? 3) What fishing practices do forum users report utilizing to catch sharks (with specific focus on whether or not sharks are brought completely out of the water, and whether or not sharks are released)? 4) Is there evidence that reported fishing practices vary between species (especially with respect to protected species where landing is prohibited and release is required)? 5) Is there evidence that reported fishing practices change once a shark species gains new legal protections (which prohibit landing and require release)? 6) Is there evidence of SFSC forum user knowledge of and perspectives towards any shark conservation and management policies (including specific types of policies that users support or oppose and reasons for that support or opposition, as well as willingness to follow regulations governing their own actions)? and 7) Is there evidence of forum user perceptions of other stakeholder groups involved in shark conservation and management (with specific focus on scientific researchers and environmental advocates)?

2. Methods

2.1. Content analysis of SFSC discussion board posts

Content analysis was carried out on posts from the South Florida Shark Club online forum homepage (<http://www.southfloridasharkclub.com/foro/>, accessed January 31, 2014). This method is a form of unobtrusive research (Babbie, 2013), which allows researchers to study stakeholder preferences without influencing the stakeholders. This is useful for studying controversial topics that stakeholders may be uncomfortable discussing with a researcher (Babbie, 2013). When analyzing discussion board content, passive observation is an established best practice, because when forum users are aware that they are being studied, they may alter their behavior, or even express hostility to the researchers (Nardi, 2015).

Researchers have an obligation to protect the individual privacy of those who are unaware that they are being studied, which can be done by anonymizing all posts before analysis (Steinmetz, 2012). This obligation to protect individual privacy exists even when analyzing posts made by pseudonymous users, those who have a consistent online

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