

CHAPTER 3

Angler Influence on Policy and Legislation

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3.1 INTRODUCTION

Recreational angling is an activity that occurs around the globe and engages diverse participants (Cowx 2002). Participation rates vary widely among jurisdictions but, on aggregate, are estimated to be about 10–11% of the public across the industrialized world (Arlinghaus and Cooke 2009; Arlinghaus et al. 2015). There are numerous socioeconomic benefits associated with angling, which include supporting livelihoods and regional economies, fostering interpersonal relationships, and contributing to psychological well-being (reviewed in Arlinghaus and Cooke 2009; Tufts et al. 2015). The motivations for angling vary widely, ranging from harvest-oriented to simply spending time with friends and family independent of angling catch success (reviewed in Fedler and Ditton 1994). A common theme that has emerged is that anglers are often interested and engaged in various aspects of environmental conservation and fisheries management (Granek et al. 2008).

Recreational anglers connect with aquatic systems and the environment in many ways (Granek et al. 2008). The basis for this engagement undoubtedly relates to individual motivations for angling and the values that they place on natural resources, fish populations, and fisheries, as well as their perceptions of threats facing the resources (Bruskotter and Fulton 2007). There are many examples where anglers have taken leadership roles in restoring degraded fish habitat (Middleton 2001), enhancing fish populations via stocking (Tufts et al. 2015), and supporting and participating in research and stock assessment (Lucy and Davy 2000). Anglers share conservation-oriented messages with the broader public (Cobourn 1994) and other anglers (Bruskotter and Fulton 2008; Guckian et al. 2018), engage in various aspects of policy formulation and refinement, or otherwise directly contribute to recreational fisheries management (reviewed in Granek et al. 2008). Despite top-down regulatory schemes being common in recreational fisheries (whether in the public domain or under various fishing rights schemes), anglers regularly participate in, or otherwise influence, management activities via policy and legislative mechanisms. Bottom-up community-based fisheries management (such as voluntary catch and release, informal bag limits, and sanctuaries) can also serve as the basis for what eventually become formal regulations (Cooke et al. 2013), which provides further opportunities for recreational anglers to influence policy and legislation.

Anglers hold many different roles and affiliations and their influence on decision making can be multifaceted (Figure 3.1). Engagement of recreational anglers may extend beyond the individual, as anglers join and form nongovernmental organizations (NGOs), work as industry or natural resource professionals, and create angling clubs or societies, which may ultimately join together to form associations. These associations may include members of the

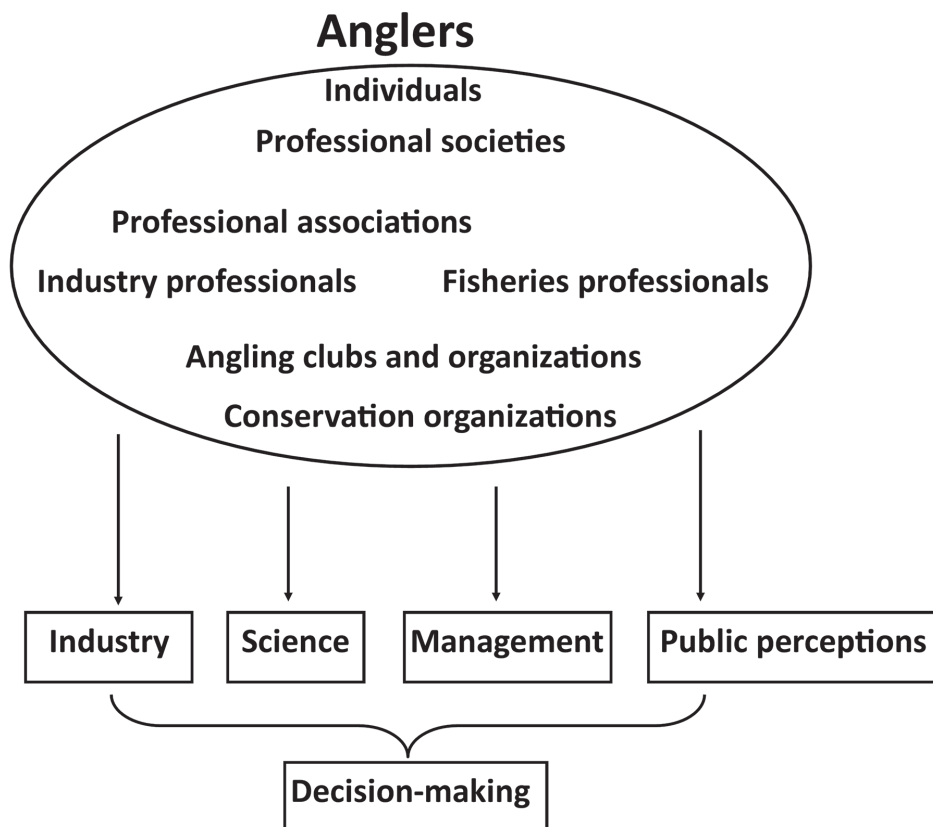


Figure 3.1 Anglers hold many different roles and affiliations that can impart influence on decision making. Anglers may function as individuals, members of the fishing industry, or fisheries professionals (managers, scientists) and form part of professional societies (e.g., American Fisheries Society), associations (e.g., American Sportfishing Association), nongovernmental organizations (e.g., Canadian Wildlife Federation), and angling groups (e.g., Trout Unlimited), noting that none of these roles or groups are mutually exclusive. Whether acting as an individual or as part of an organized entity, anglers can impart significant influence on the recreational fishing industry, science, management, and public perceptions of fish and fisheries, all of which inform decision making.

sportfishing industry (e.g., fishing tackle, equipment, and boat manufacturers, lodges, and fishing guides) who are also highly motivated to maintain healthy environments that support angling opportunities (Danylchuk et al. 2017). Governments and natural resource agencies can incorporate the perspectives of these groups into their decision making in order to provide policy, legislation, and corresponding management approaches that balance recreational, cultural, economic, and conservation goals (Koehn and Todd 2012).

Acknowledging that the recreational fishing community can play a role in contemporary resource management, we consider, review, and discuss opportunities for anglers to influence relevant policy and legislation in North America. Anglers comprise four primary groups, which we consider in this chapter: (1) anglers as individuals, (2) groups of anglers in clubs and organizations, (3) guides and outfitters, and (4) the recreational fishing industry. Specifi-

cally, we summarize the various reasons for, and manners in which, these groups can influence relevant natural resource management decisions, policy, and legislation. We highlight examples of where such activities have been successful and assess the benefits and risks of engaging these groups in different types of activities, from small-scale data-collection efforts to organizations lobbying for regulatory changes. We also recognize that each of these groups may have different motives and operational strategies. Our desire is to provide a template for decision makers to engage with anglers in a manner that is informed, productive, respectful, and balanced, recognizing that anglers and their community (including industry) are but one of the stakeholders considered when developing policy, management, and legislation. We also acknowledge that anglers are present in other groups that influence policy and legislation, such as homeowners and lake associations, property owners, conservation organizations, other recreational clubs, and Indigenous groups, but we do not cover the influence of these groups in this chapter. The case studies that we present may stand as examples of how anglers, angling groups, and the angling industry can effectively contribute to management, policy, and legislation.

3.2 THE MANAGEMENT, POLICY, AND LEGISLATIVE FRAMEWORK

Fisheries policies are designed by governments to outline the methods and principles (e.g., legislation) that will be used to ensure the optimal use of a fisheries resource for a society (Cochrane et al. 2002). Legislation (laws, regulations, and customs) creates a set of rules that every person must follow to maintain the natural resource. Primary legislation serves as an overarching and often general law to facilitate the goals of a fisheries legislation (e.g., Canada's Fisheries Act, the United States' Magnuson–Stevens Fishery Conservation and Management Act, and the United States' Endangered Species Act). This umbrella of legal statutes and precedents (e.g., the United States' Public Trust Doctrine) provides the legal basis for management authorities to create secondary legislation (regulations) to help govern specific fisheries. The ability to create regulations and manage inland recreational fisheries is typically delegated to the province or state. In the United States, state regulations surrounding inland and nearshore marine fisheries is typically deferred by state legislators to state fisheries commissions, though state legislators maintain the ability to make fisheries regulations and may bypass commissions (e.g., legalizing hand fishing in Texas). For marine fisheries, the National Marine Fisheries Service works closely with regional fishery management councils that develop regulations in their region. It is common for anglers or angling groups to engage by serving on various committees associated with such regional fisheries management organizations. Most managers rely on some form of regulation (e.g., licenses, seasons, daily harvest, possession limits, and gear restrictions) for individual anglers, associations, or entire sectors on a trip-by-trip basis (though sometimes annual) to try to restrict harvest (Carter et al. 2015). It is these regulations that may be changed over a short-term period to accommodate for economic, societal, and biological drivers (Arlinghaus et al. 2017), while changes to policies often occur over a longer-term period. Although maintaining sustainable populations and quality fishing opportunities is the general goal of fisheries management, interesting differences may exist across regions that can influence decision making.

In Canada and the United States, water bodies (lakes, reservoirs, rivers, and oceans) and the resources they contain are considered public trust resources, and in most cases, the public may access and fish these areas with the purchase of a single license. Under this open-access

system, effort is not regulated for most water bodies. Therefore, harvest regulations imposed on a trip-by-trip basis can provide some resilience to negative outcomes but cannot restrict total harvest (Arlinghaus et al. 2013). This open-access nature of recreational fisheries can make them susceptible to stock depletion and fishery collapses (Gordon 1954; Post 2013), particularly in the absence of harvest and effort data. In North America, it is common for angling associations to lobby governments (e.g., the Canadian Sportfishing Industry Association [CSIA] and the American Sportfishing Association [ASA]) for specific investments or for (or against) specific management actions. For example, there are extensive efforts in Canada by the CSIA to lobby against management actions that restrict fishing opportunities, such as protected areas (see CSIA 2017). In other parts of North America, such as the Caribbean, there has been limited emphasis on the management of recreational fisheries due to a lack of governance mechanisms and gaps in information needed to implement effective regulations, though some licensing systems exist (e.g., Antigua and Barbuda; Mohammed 2012).

In contrast to North America, European countries operate under a rights-based system, where access and withdrawal rights to the fishery are restricted (Squires et al. 2017). Management authorities therefore designate which individuals, groups, or communities have the right to use the fishery. Managers may restrict access through limited-entry programs where the management authority presents a limited number of licenses to fish, which may be procured by individuals or organizations. Anglers must therefore first purchase an angling license to fish in freshwater and, in most cases, must then purchase a day ticket or longer-term membership to gain access to a water body (Winfield 2016). Angling clubs maintain leased rights to the fishery and may be able to stock desired fish species subject to stocking regulations. The rights-based system has the benefit of identifying key stakeholder groups and then securing them a specified amount of access and harvest, preventing unregulated harvest within a fishery. This may be particularly important for local economies competing for access relative to other fishing sectors but may be exclusive in terms of the people able to participate (Charles 2002).

Regardless of the fishery, the ideal management framework provides ongoing opportunity for “communication and consultation with interested parties” throughout all stages of the management process to achieve a scenario of “co-management” (Cochrane et al. 2002), entailing direct or indirect angler involvement in resource management. This serves as a guiding principle in Canada’s Operational Policy Framework on Recreational Fisheries. As per Guiding Principle 3, “Recreational harvesters have responsibility for shared stewardship for resource conservation and enhancement [...] and will be encouraged to partner with government and to participate in the decision-making process to manage and protect the resource and its habitat” (Fisheries and Oceans Canada 2003). In the United States, there is a requirement for public comment during the decision-making process, and in some cases (e.g., coastal fisheries boards, Great Lakes Fisheries Commissions, and many state agencies) there are requirements for consultation with specific stakeholders. Communication and consultation allow stakeholders, such as anglers, the general public, the fishing industry, conservation organizations, Indigenous peoples, and scientists, to provide input into the regulatory decision-making process (Danylchuk and Cooke 2011; Dedual et al. 2013). Consultations are also an opportunity for fisheries managers to educate and update stakeholders on the information used to guide the decision-making process. Consultation with these groups serves as a form of information gathering that management authorities can then incorporate into proposed regulations. Following implementation of a regulation, the effectiveness of the regulation is

evaluated, which should include consultation with stakeholders as part of the information-gathering process. Ultimately, the success of these consultations will be dependent on effective communication by decision makers.

Co-management is a form of decision-making process that emphasizes collaboration and participation between regulators, user-groups, researchers, and other stakeholders (Jentoft 2003). Co-management can be achieved in fisheries through partnerships between management authorities and other invested groups, from volunteers to conservation organizations and industry. The degree to which these groups are involved can vary. These partnerships can be small in scope, such as stakeholders providing fine-scale data that are often unavailable to the management authority (Shephard et al. 2018). This may include compiling local knowledge accrued by the volunteer or group, while in other cases this may include taking part in or establishing a monitoring program (Danylchuk and Cooke 2011). In larger scope partnerships, partners have a more significant role with greater power in the decision-making process, undertaking actions beyond data collection. Different levels of power sharing can affect co-management, and the context of the fishery may determine what level of power sharing is most appropriate. Regardless of the scale, partnerships can be beneficial for management as they generally facilitate collaborative decision making, conflict resolution, mobilize human resources for data collection and monitoring, increase public awareness, and advance funding opportunities and capacity. Participation can provide a sense of stewardship to partners and the opportunity to contribute to more effective management of valued fisheries resources.

3.3 THE ACTORS AND THEIR ROLE IN MANAGEMENT, POLICY, AND LEGISLATION

Actors refer to individuals or groups in the angling community that have the potential to impart significant influence on policy or legislation. Each section follows a parallel structure wherein we (1) describe the actor, (2) summarize the ways in which they can engage in these activities, and (3) provide a case study of successful engagement.

3.3.1 Individual Anglers

Characteristics of the actor(s).—Recreational anglers comprise a diverse array of individuals from various ethnicities, ages, genders, income levels, and occupations (Burger 2002). Anglers can be part of angling clubs, organizations, industry, conservation organizations, and government, among groups, but in this section, we consider anglers as individuals. Angler motivations and reasons for participation can be disparate, resulting in varied demand for recreational fishing opportunities (Young et al. 2016). For example, anglers have personal tendencies regarding fishing either for food (Cooke et al. 2018) or for pleasure (i.e., catch-and-release fishing; Cooke and Schramm 2007), and managers must be cognizant of these differences when establishing harvest-oriented or catch-and-release-oriented regulations. Regardless of an angler's motivations, having more or larger fish in the fishery is generally considered important (Beardmore et al. 2011), and it should be recognized that anglers have a stake in fishery management outcomes.

Anglers desire healthy fish populations and quality fishing experiences and will support initiatives and management relating to these goals (though in some cases this is impeded by a lack of angler trust in science and management; French et al. 2019). These initiatives often have broader benefits beyond recreational fisheries or the target species(s) of interest. Anglers

can be strong proponents of habitat management and restoration (Copeland et al. 2017), actions that also benefit the entire aquatic ecosystem. While anglers support actions that improve fishing opportunities (Mannheim et al. 2018), they tend to object to management and activities that restrict angling activity (Arlinghaus and Mehner 2005; Nguyen et al. 2016), such as barriers to aquatic habitat connectivity (Laitila and Paulrud 2008), and exploitation in other fisheries sectors (Dorow et al. 2009; Hasler et al. 2011). However, anglers may also object to limits on their own fishing opportunities despite being recommended as a management measure for the purpose of conservation (Arlinghaus and Mehner 2005; Salz and Loomis 2005). Indeed, not all angling-related motivations will yield positive outcomes for broader conservation. Anglers motivated by consumption (or high catch rates) tend to support stocking practices that increase the abundance of targeted fish species (Arlinghaus and Mehner 2005), despite the ecological consequences of these inputs (Hickley and Chare 2004). Further, nontarget species may not receive the same level of management concern from anglers regardless of their conservation status, and in some cases, anglers may contribute to their decline, for example, through purchase and use of nontarget species as live bait (e.g., European River Lamprey *Lampetra fluviatilis*: Foulds and Lucas 2014). Regardless of intent, anglers are a motivated resource user with a potential willingness to engage in management and influence regulations.

Engagement with management, policy, and legislation.—Anglers have often demonstrated a willingness and desire to influence management, policy, and legislation surrounding fish populations. Individual anglers or groups of anglers may participate in small-scope partnerships with management authorities. Given the smaller scope of these partnerships, individual anglers would likely impart the greatest influence at the level of management regulations (through compliance, social enforcement, and data collection), rather than policy or legislation that may be influenced through larger-scale partnerships over a long-term period.

Recreational fisheries management is relatively uniquely positioned to have open collaboration with the public given that license fees from resource users (anglers) are used directly to support management. Anglers have a direct connection with the resource and constitute a potentially large supply of human resources that can provide valuable information for fisheries managers. Anglers can provide data to managers on a small spatial scale (e.g., a specific water body, creel surveys), as well as provide information on elusive species that are difficult to catch via other methods (e.g., Black Marlin *Istiompax indica*; Williams et al. 2015). This information may include local knowledge on long-term fishery trends or the establishment of monitoring programs (Lucy and Davy 2000). Anglers may provide managers with angler diaries (Cooke et al. 2000; Mosindy and Duffy 2007; Skov et al. 2017) or record information via angler smartphone applications that are becoming increasingly widespread in the angling community (Venturelli et al. 2017). The data from these applications can correlate closely with traditional monitoring methods (Jiorle et al. 2016) while providing data on a much broader spatial scale. Further information can be provided by anglers during tournament settings on the sizes and locations of captured fish. In Southern Africa, managers use tournament data to monitor the abundance and growth of nonnative black bass *Micropterus* spp. populations (Hargrove et al. 2015). Anglers may also contribute to citizen-science projects aimed to address key management questions (Cooke et al. 2017a, 2017b). Anglers can help refine research questions, enhance sample collection, and widely communicate results (Lucy and Davy 2010; Cooke et al. 2017b).

Anglers may also get involved in fisheries management through government initiatives aimed at engaging recreational anglers. Programs such as “Fishers for Fish Habitat” run by the New South Wales Department of Primary Industries (Australia), aim to inspire anglers to protect and enhance fish habitat. This program provides anglers the opportunity to help restore degraded fish habitat and can enhance funding for fish-habitat projects (Copeland 2012). Angler assistance can be as easy as picking up garbage along a water body, planting trees in riparian zones, or generally raising awareness about conservation issues. These sorts of activities are also undertaken by the various Friends of [...] River groups and through Adopt-a-River programs in which anglers will often participate. These activities may increase environmental stewardship, which can have an indirect effect on policy, legislation, and management.

Fisheries managers should consult with interested stakeholders during the decision-making process for fisheries regulations (Cochrane et al. 2002). Anglers can be engaged through formal formats, such as public meetings or angler surveys prepared by managers or researchers at the local, regional, or national scale (Waters and McRae 2009; Brownscombe et al. 2014; Lauber et al. 2017). These venues provide opportunity for anglers or groups of anglers to express their perspectives on the impositions of proposed regulations, and help refine regulations to best serve the fishery. Anglers may also share their perspectives through alternative routes of communication with management, such as letters, e-mail, online blogs, forums, phone calls, and social media. The influence of anglers on management may be greater when anglers share their opinions as part of an angling club, society, or association, but the roles of these groups are outlined in section 4.3.3.

Case study in successful engagement.—Engagement of the angling community has been an important and valuable component of the Puget Sound rockfish recovery process. The three rockfish species were listed under the Endangered Species Act (ESA) in 2010 as threatened (Yelloweye Rockfish *Sebastes ruberrimus* and Canary Rockfish *S. pinniger*) and endangered (Bocaccio *S. paucispinis*). These listings were made under the premise that the Puget Sound populations represented distinct population segments (USFWS and NMFS 1996), despite little information collected to evaluate the discreteness criterion for these species (Drake et al. 2010). These listings spurred further research to understand population levels, habitat use, genetics, threats, bycatch, among other factors that inform recovery. Scientists from the National Oceanic and Atmospheric Administration, the Washington Department of Fish and Wildlife, and Fisheries and Oceans Canada worked closely with the angling community to complete a population genetics study on Puget Sound rockfish. Nearly 100 anglers helped collect tissue samples for these fish that were used to evaluate genetic differentiation of Puget Sound rockfish to those of outer coasts of the United States and Canada. Results supported the ESA designation of Yelloweye Rockfish but suggested that the Canary Rockfish is not a discrete population and may not meet the criterion of their ESA listing. As a direct result of this collaboration with anglers, the Canary Rockfish was removed from the endangered species list in 2017 (National Marine Fisheries Service 2017). Efforts were also taken to gain a baseline understanding of angler’s preferences for recovery measures for Puget Sound rockfish (Sawchuk et al. 2015). This outreach and public involvement were considered when designating the rockfish recovery plan in 2017 (National Marine Fisheries Service 2017). Ultimately, the incorporation of anglers into the scientific and decision-making process resulted in more effective management of rockfish in Puget Sound and greater support and buy-in from the angling community.

3.3.2 Angling Clubs and Organizations

Characteristics of the actor(s).—Angling clubs are composed of groups of anglers that share similar motivations for a recreational fishery or fisheries. Various angling clubs across the United States advocate for different species of fish, types of fishing, and water bodies. Angling clubs are generally smaller in spatial scale and have fewer members than angling organizations and societies.

Similar to angling clubs, angling organizations comprise groups of anglers that share an aim of promoting recreational fisheries. However, angling organizations can have large numbers of constituents and thus represent broader interests of anglers. For example, organizations like Trout Unlimited and Bass Anglers Sportsmen Society (B.A.S.S.) are international and have hundreds of thousands of members. Organizations like these are typically divided by a chapter system that ensures members receive pertinent information relevant for their geographic area. Chapter membership has a corresponding fee, which is a primary source of funding for the organization. Funds are used to support restoration projects and education, and to lobby decisions surrounding recreational fisheries. Most of the larger organizations have not-for-profit status with formal governance structures and boards. Communication channels are maintained with anglers to ensure that they are aware of important issues and opportunities to get involved with fishery/conservation issues. Operations are completed by full-time staff with support from volunteers that wish to engage in various opportunities within their watershed.

Angling clubs and organizations represent different interests and hence influence policy and legislation in different ways. The roles and activities of these groups may differ in scale, with clubs generally engaging in activities with smaller scale and scope than that of organizations. The characteristics of organizations considerably increase the scale at which they can influence policy and legislation relative to individual anglers and angling clubs. Regardless, the motivations of these groups consistently include improving recreational fishing opportunities and participation, and the conservation and management of aquatic habitats for this purpose. It is important to recognize, however, that the interests of both angling clubs and organizations may be species-specific, and activities that involve conservation of nontarget species or waters often do not receive the same level of support. Regulations that restrict angler effort (such as closed seasons or restricted areas) as a necessary precursor to effective conservation may not be met with support by angling groups (Arlinghaus and Mehner 2005; Salz and Loomis 2005; French et al. 2019).

Engagement with management, policy, and legislation.—Angling clubs may help solicit additional funding through fishing tournaments and other funding mechanisms to advance the conservation and management of fish and fish habitat that support recreational fisheries. Angling clubs provide a place for individual anglers to engage with management and conservation initiatives, facilitating environmental stewardship within the community. Club members may also aid in the collection of data (angler apps, diaries, surveys), providing small-scale information that is otherwise unavailable to managers. Given the small spatial scale, size, and focus of angling clubs, they are most likely to influence policy at a smaller spatial scale than angling organizations and societies. For example, they may lobby for change of a regulation for a specific water body or species.

Organizations rely on some sort of engagement with their constituencies to raise funds and promote their work regarding policy and legislation. Angling organizations, established as

tax-exempt organizations in the United States, are best suited for fundraising activity through their chapter structure system. Often, these organizations can raise funds through internal match challenges with their board of directors or other leveraging opportunities. These funds can be used to increase education and outreach efforts as well as acquire, maintain access to, and protect public lands—both popular foci of angling organizations. Organizations can work directly with decision makers to inform policy and legislation and may communicate with government to promote legislation that supports the conservation of aquatic environments and maximizes fisheries benefits. In many cases, this can only be achieved by opposing other uses of the resource, including commercial exploitation or land development that would affect aquatic resources. Numerous clubs and organizations play a role in natural resource management (Table 3.1 highlights well-known groups in North America) and are often invited to represent the interests of their members on various government committees.

Case study in successful engagement.—Trout Unlimited is a well-known nonprofit organization that has the mission of conserving, protecting, and restoring North America's coldwater fisheries and their watersheds. The organization has more than 300,000 members and 400 chapters in the United States. Across regions, chapters are organized into councils to facilitate the link between organization staff and local chapters. The influence of Trout Unlimited is greatest at the local and regional scale, as Trout Unlimited works with state agencies to develop legislation and ensure that the interests of recreational fishers are reflected in management of river systems. A positive example of this is the involvement of Trout Unlimited with the Colorado Water Plan. Trout Unlimited supported the development of stream management plans (SMPs) that aim to protect and enhance stream flows to support environmental and recreational use of streams and rivers while maintaining other uses, such as municipal users and agriculture. Now that the Colorado Water Plan calls for SMPs, Trout Unlimited staff are helping to organize these plans across various watersheds within the state, including the Colorado, Uncompahgre, Gunnison, San Miguel, San Juan, and Rio Grande (Trout Unlimited 2018). Management plans are being shaped based on water use priorities within each basin with provisions for recreational fishing opportunities. Organizations like Trout Unlimited can prove to be valuable partners to fisheries managers and provide considerable resources to statewide management initiatives.

Muskies Canada is a nationwide angling club that has a chapter-based system and therefore operates similarly to an angling organization. This club has had substantial influence on Muskellunge *Esox masquinongy* angling regulations at both the local and national scale. In 1992, the Ottawa Chapter of Muskies Canada successfully lobbied Quebec and Ontario resource agencies to change length and possession limits and the closed season for Muskellunge in the area. At a provincial scale, leadership from Muskies Canada worked with the Ontario Ministry of Natural Resources and Forestry to develop responsible guidelines to minimize population-level effects of Muskellunge angling tournaments.

3.3.3 Angling Guides and Outfitters

Characteristics of the actor(s).—Fishing guides (i.e., outfitters) are individuals that are hired by recreational anglers to facilitate the capture of fish. Guides can work as individual service providers through retail stores and outfitters and as part of the staff at fishing lodges. To be successful at their profession, guides need to be skilled at selecting optimum locations to target fish, deciding what tackle and bait to use, and handling and potentially releasing fish their

Table 3.1 Examples of organizations, societies, and associations that influence legislation, policy, and management surrounding fisheries in North America. Purpose statements were identified from the website of each group.

Name	Constituents	Method	Purpose
Coastal Conservation Association	A member-based organization with 17 coastal state chapters spanning the Gulf of Mexico, the Atlantic seaboard, and the Pacific Northwest.	Provides angler support and a legal defense fund to participate in federal fisheries debates.	To advise and educate the public on conservation of marine resources and to conserve, promote, and enhance the present and future availability of those coastal resources for the benefit and enjoyment of the general public.
Ontario Federation of Anglers and Hunters	A grassroots, nonprofit nongovernment, membership-based organization with 100,000 members, subscribers and supporters and 740 member clubs throughout Ontario.	Partners with the provincial natural resource ministry, conservation authorities, nongovernmental organizations, corporations, and landowners, to conduct restoration projects, deliver education programs, and provide student research grants.	To ensure the protection of hunting and fishing heritage and the enhancement of hunting and fishing opportunities and to encourage safe and responsible participation while championing the conservation of Ontario's fish and wildlife resources.
Bonefish & Tarpon Trust (BTT)	The trust is formed by a board of directors and staff responsible primarily for scientific research and marketing.	Partners with universities and institutions to complete research projects proposed by BTT and advocates for regulations to ensure healthy fisheries throughout the Gulf of Mexico, southeastern United States, and Caribbean.	To conserve and restore Bonefish and tarpon and Permit fisheries and habitats through research, stewardship, education, and advocacy.
Trout Unlimited	A member-based organization with 300,000 members and supporters organized into more than 400 chapters and councils from Maine to Montana to Alaska.	Member volunteers carry out conservation activities. Lawyers, policy experts, and scientists promote legal and regulatory frameworks to protect fish and fishing opportunities.	To conserve, protect, and restore North America's coldwater fisheries and their watersheds.

Table 3.1 Continued.

Name	Constituents	Method	Purpose
B.A.S.S.	A member-based organization with more than 500,000 members and more than 20,000 chapters distributed throughout 46 states in the United States and in Canada, Mexico, Italy, Japan, South Africa, and Zimbabwe.	Raises money through the Bassmaster fishing tournament, magazine, and television program, as well as membership fees and donations. B.A.S.S. works with government agencies to promote angling opportunities.	To enhance the sport of bass fishing by advocating for access, conservation, and youth fishing.
Fly Fishers International	A member-based organization with 300 clubs.	Delivers education and conservation programs and partners with other organizations to advocate for policy supporting the goals of Fly Fishers International.	To ensure the legacy of fly-fishing for all fish in all waters continues by focusing on conservation, education, and a sense of community.

clients catch. Guides are also responsible for the overall safety and well-being of their clients and will complete actions that improve the experience of their clients. Fishing guides tend to be recreational anglers themselves and likely offer their services for species and in locations that are very familiar to them. Given that this is a source of income, fishing guides need to live up to the expectations of their clients; otherwise, a negative reputation could impact bookings. Guides also commonly receive monetary tips that are over and above what they charge for their services, and this too can be affected by the quality of the angling experience they provide. As for what defines a quality experience, guides are generally expected to help their clients catch “a lot” of fish and/or fish of large body size, meaning that robust fish populations and healthy aquatic ecosystems are essential. Some guides are proponents of catch-and-release regulations as this allows their product (fish) to be returned to the water body and potentially captured by additional clients in the future. However, this can be highly dependent on the fishery and motivations of the guided angler group. In cases where anglers are primarily motivated to harvest fish, guides are also likely to be proponents of harvest because providing the opportunity to bring fish home is an important aspect of their business. Guides may also disagree on a proposed management strategy, depending on how they perceive its impact will affect their business. For example, targeting spawning aggregations can have cascading negative effects on fish populations, and although some guides may advocate for reducing access to such areas when aggregations are present, others may see this as a threat to their access to the fishery.

Engagement with management, policy, and legislation.—Fishing guides can be strong advocates for conservation actions that promote healthy recreational fisheries. Guides will have strong support for regulations that minimize the short-term consequences to their business (reduced client satisfaction) while ensuring the long-term sustainability of the fishery and correspond-

ingly their business. As guiding businesses can be directly impacted by regulations, they will often form coalitions to increase awareness of environmental concerns and lobby for regulatory changes that reduce threats to recreational fisheries as well as their livelihoods. A prime example is Captains for Clean Water (<https://captainsforcleanwater.org>)—a group founded by guides that advocates for change in water management in Florida, particularly with regards to restoring water flow through the Everglades. Such movements rally guides, as well as anglers and the angling industry, to create political pressure aimed at reducing risks to recreational fisheries.

Guides are well positioned to provide data to fisheries managers given that they spend their working days on the water interacting with the resource(s) and resource users. For example, steelhead guides on the Bulkley River worked with researchers and the provincial resource ministry to capture and tag steelhead *Oncorhynchus mykiss* along with their clients (Twardek et al. 2018). This research provided catch-and-release survival estimates for the recreational fishery that are used to monitor fisheries mortality for the population. Guides can also share positive environmental messages to their clients that are often affluent and in positions of influence. Guides may therefore positively shape the environmental beliefs of others, which can have indirect impacts on their support for fisheries regulations and policy. Guides can be effective lobbyists of legislators as well, given the time they spend on the water coupled with the fact that it is their livelihood. The outcome of successful lobbying attempts will not necessarily have positive conservation outcomes if the guide's beliefs are not representative of the fishery or if blame is wrongly directed towards agencies and policies for shortcomings in the fishery.

Case study in successful engagement.—Saltwater flats fisheries for species such as Permit *Trachinotus falcatus* have become valuable industries (Fedler 2011), despite continual threats to flats ecosystems from coastal development and environmental change (Murray et al. 2014). Management of these stocks has been difficult, as basic information related to population size, demographics, and spatial ecology is often lacking. To address some of these shortcomings, management authorities have developed close partnerships with anglers, industry, conservation organizations, and academics (Adams and Cooke 2015). Angler- and industry-based contributions to science and management of flats fisheries have been ongoing and further supported by establishment of nonprofit conservation groups such as the Bonefish & Tarpon Trust—a group originally founded by guides, anglers, and other members of the recreational fishing industry. The large-scale acoustic telemetry study supported by Bonefish & Tarpon Trust throughout Florida waters provides an example of the involvement that angling guides can have in citizen science, which can then directly inform management (Brownscombe et al. 2019).

This research program has sought to gain insight on Permit spatial ecology throughout Florida waters. Capturing Permit for scientific purposes is only feasible by angling, though capturing these fish by angling remains a difficult, specialized task. The knowledge and experience held by Permit angling guides is therefore critical to efficiently capture these fish for scientific research. Over the past few years, angling guides from Florida have worked with scientists to help capture Permit for tagging. Guides either took scientists out on the water or immediately informed scientists if a Permit was captured so that it could be tagged with an acoustic transmitter. This work showed that spawning Permit are vulnerable at aggregation sites for longer than previously considered and that they were not being fully protected by the current spawning season closure for Permit in the Special Permit Zone of the Florida Keys and Biscayne Bay. Further, public input to Florida Fish and Wildlife Conservation Commission

staff indicated that guides and anglers were concerned that fishing targeting these spawning aggregations was having a negative impact on the Permit population (Walthall et al. 2018). An amendment to the Florida Fish and Wildlife Conservation Commission's current closure from May to July to include April was set on February of 2018 to protect Permit during the entirety of their spawning period (Walthall et al. 2018). This work provides just one example of the greater collaborative scheme in place to protect and manage Permit fisheries and tropical and subtropical flats habitats. This scheme could be implemented across other sport fisheries and would be particularly valuable for fisheries where angling is the most effective means to gather information (sample) on the target species.

3.3.4 The Angling Industry

Characteristics of the actor(s).—The recreational angling industry is a fundamental segment of the broad angling community given that it provides the means for individuals to actually encounter and capture fish. The recreational angling industry comprises the companies that produce fishing equipment, related accessories, and apparel, dealers, and retail outlets (physical and online) where anglers can purchase these items, as well as the media (magazine and television). The industry also includes guides, lodges, and travel companies (covered in section 4.3.3) that help facilitate recreational angling, ranging from local waters to remote and exotic destinations around the world. These groups were discussed separately above as the scale of their influence is much smaller than that of large corporations or associations.

Given the scale and scope of recreational angling, consumer spending and overall commerce related to the sport is considerable. Recreational anglers in the United States generated more than US\$46 billion in retail sales and \$115 billion in economic impact in 2016 (U.S. Fish and Wildlife Service and U.S. Census Bureau 2017). Even fly-fishing, which only represents approximately 13% of angling participation, generates nearly \$900 million annually in the United States (Southwick Associates 2016). In some regions, recreational angling can account for a considerable proportion of the overall economy. For instance, flats fishing, discussed, above was estimated to contribute \$465 million annually to the Florida Keys (Fedler 2013), \$141 million annually to the Bahamas (Fedler 2010), and \$50 million annually to Belize (Fedler 2014). Related to this commerce generated by the angling industry are the jobs that contribute to local and regional employment. In the United States, recreational angling creates and supports more than 400,000 jobs (National Oceanic and Atmospheric Administration 2017) while in some local communities, recreational angling-related jobs can be one of only a few sources of employment (Barnett et al. 2016).

Although companies in the angling industry are driven fundamentally by profits, environmental branding can tie conservation to profitability. Advocating for the effective management of recreational fish stocks and the environments that support them can help ensure market longevity and build brand recognition. Engaging in environmental stewardship activities often results in greater business benefits (Guimaraes and Liska 1995), which creates a win-win scenario where both the environment and the industry actor benefit (e.g., Patagonia, Orvis). Some entities in the recreational fishing industry are nonprofit benefit corporations certified in the United States (e.g., Fishpond, Patagonia.), which have a mandate to help solve social and environmental problems through their commerce.

With strong ties to commerce and economic prosperity, some individuals and companies in the recreational angling industry have become advocates for natural resource management,

policy, and legislation and associated actions that help maintain and even improve the status of recreationally targeted fish species. Topics such as harvest regulations, restoration of essential fish habitat, boating, and fishing access; removing barriers to fish migration; and best practices for catch-and-release angling are examples of focal areas often addressed by the angling industry. Given that the angling industry promotes fishing by marketing their goods and services, they may indeed serve as an important channel for communications regarding management, policy, and legislative actions that either support or prevent access to recreationally targeted species. Recreational fishing media sources such as *In-Fisherman* and *Pond Boss* magazine and television programs such as *Fish'n Canada* can reach a wide number of anglers. Major trade shows such as the International Sportsmen's Expo also provide an opportunity for the industry to communicate with the angling community. As a result, the recreational angling industry can be a powerful segment of the overall angling community when it comes to lobbying for policy and legislation that ensures both the effective management of recreational fish stocks and their essential habitats and the maintenance of a consumer base to purchase goods and services.

Engagement with management, policy, and legislation.—Most companies do not have the capacity to invest in staff specifically charged with monitoring and lobbying for management, policy, and legislation that, in turn, support healthy fish populations and quality angling opportunities essential to their business. As such, member-based angling trade associations act as unifying entities that can represent individual companies to ensure sportfishing interests are presented and considered in governmental policy and legislative decisions. Note that the boating industry is similarly motivated to support angling opportunities given that anglers spend more than \$4.5 billion on boating costs each year (U.S. Department of the Interior 2017).

Major angling trade associations include the ASA and American Fly Fishing Trade Association (AFFTA) in the United States, the Angling Trades Association (ATA) in the UK, and the CSIA in Canada. Common to each of these associations is the mandate to promote growth in the fishing industry and support the protection, enhancement, and restoration of waters used by recreational anglers. Some are charged to keep watch on existing and emerging laws and policies that could affect association members, the broader recreational angling industry, and fish and essential habitats. In the United States, both the ASA and AFFTA have committees specifically geared toward government affairs that build relationships with members of Congress and key government officials to ensure that the interests of the recreational angling industry and community are included in legislative decisions. In Canada, the CSIA was fundamental to establishing the Parliamentary Outdoor Caucus. Angling trade organizations can also have specific charges related to recreational fisheries management, such as preventing overfishing, advocating against no-fishing zones, promoting better catch-and-release angling techniques, and stopping the spread of invasive species. Angling trade associations commonly collaborate with NGOs to build greater capacity for ensuring the sustainability of recreational angling and the related industry.

Case study in successful engagement.—The ASA is a trade association that was originally created to represent the interests of the tackle industry in the United States. The association has developed since its creation to reflect the interests of the broader sportfishing community, including equipment manufacturers, retail stores, fish and wildlife agencies, conservation organizations, and angling clubs (ASA 2018). The ASA has government affairs staff members

who monitor emerging policies and maintain close relationships with members of Congress and other conservation and recreation agencies to ensure that recreational fishing interests are considered when legislation is revised. These may include lobbying for funding for fisheries conservation programs, ensuring that fisheries are not overfished, developing new and improved catch-and-release techniques, advocating against no-fishing zones, working to stop the spread of invasive species, promoting the use of science during policy and regulatory decisions, and opposing costly restrictions on lead fishing tackle. The ASA also supports legislation that would benefit fish populations, such as the National Fish Habitat Conservation Act (S. 1436; under the 115th Congress).

In the United States, the National Fish Habitat Partnership (NFHP) has the aim of providing a national framework for maintaining and restoring fish habitat by supporting partnerships among conservation groups. Conservation projects are supported by leveraging funds from government, private, and tribal sources. The NFHP has benefited more than 800 projects across the United States (Association of Fish and Wildlife Agencies 2018). An example of one of these initiatives is the Weber River drainage project, which reconnected fragmented habitat used by Coastal Cutthroat Trout *Oncorhynchus clarkii* and Bluehead Sucker *Catostomus discobolus*. The ASA was involved in the original development of the NFHP in 2001, has a seat on the NFHP board, and has continued meetings with congressional staff over the past 10 years. In 2006, this plan was formalized and The National Fish Habitat Conservation Act was passed through the U.S. Senate and House as an amendment (#3234) of the Energy Policy Modernization Act (S. 2012), authorizing the NFHP program. In 2019, the National Fish Habitat Conservation Through Partnership Act (H.R. 1747) was passed, providing critical legislation to fund on-the-ground habitat restoration projects as part of the National Fish Habitat Partnership.

3.4 BENEFITS OF ENGAGING ANGLERS

Engagement of anglers, angling groups, guides/outfitters, and other industry players in contemporary resource management, policy, and legislation can have multiple benefits (Figure 3.2). Engagement of anglers results in collaborative decisions that support angling opportunities while effectively managing and conserving the fishery. Ongoing engagement provides managers opportunities to communicate with stakeholders and resolve conflicts while increasing public awareness of fisheries management. Managers are tasked with making technical choices and explaining the science and rationale behind alternative regulatory options so that citizens understand the implications of regulatory action. Anglers are tasked with communicating their interest and goals for the resource to managers. This results in the proposal of a regulation or policy that incorporates both values and technical aspects of fisheries management (McMullin and Pert 2010). Workshops and other multi-stakeholder meetings provide opportunities to share perspectives, address common misunderstandings, and resolve conflicts (e.g., Bower et al. 2017). These collaborative actions can build trust in and support for regulations and other management decisions. When conflicts cannot be resolved, compromises may be identified to balance sacrifices and benefits among stakeholder groups (e.g., Gregory and Long 2009).

Engaging recreational anglers and angling associations in decision-making processes can increase participation in management and outreach to the broader community. Participants are more likely to understand the rationale for and support management decisions. They can then serve as ambassadors to their broader communities to encourage acceptance of and ad-

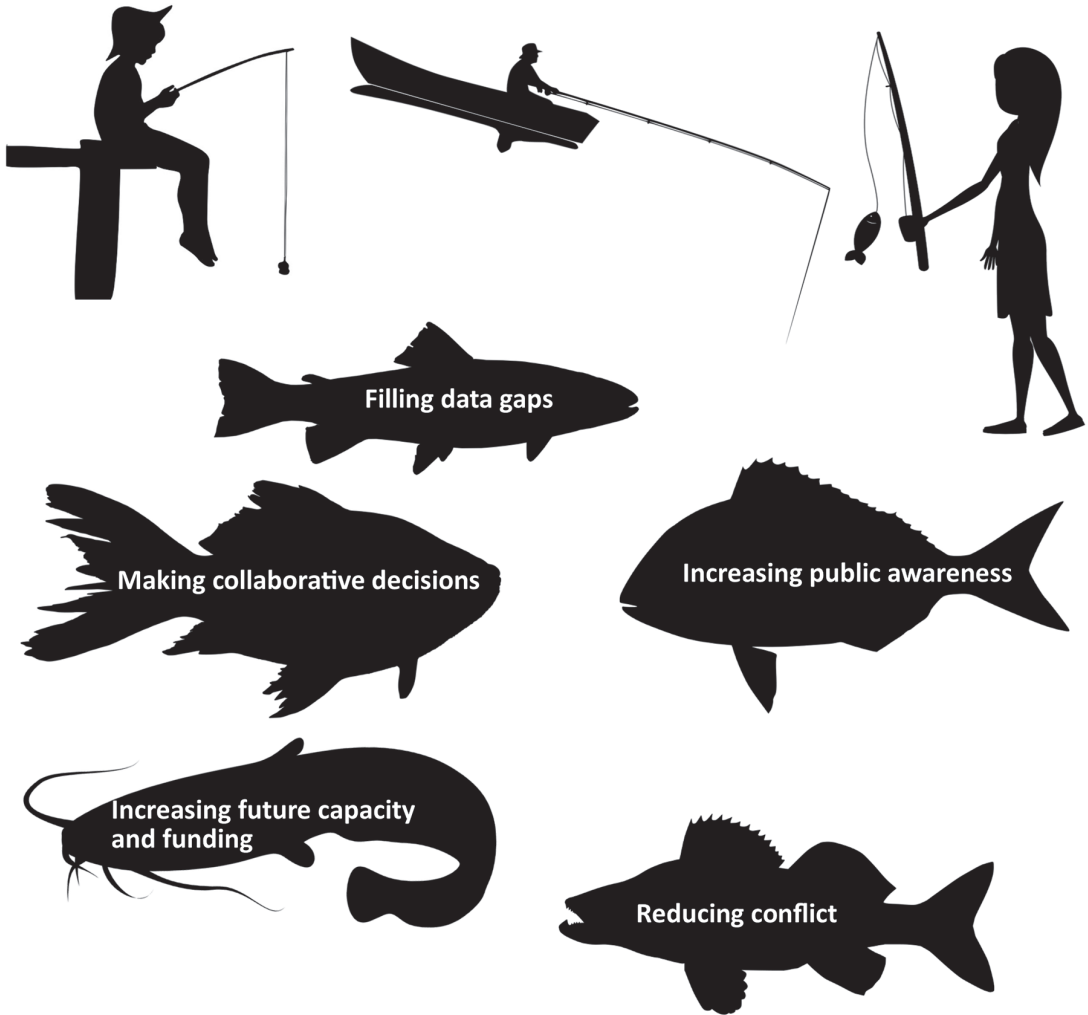


Figure 3.2 Advantages of engaging anglers and other stakeholders in management and decision-making processes.

herence to new regulations. Anglers that participated in an adaptive management stocking experiment in Germany expressed greater ecological knowledge retention and increased pro-environmental behavior relative to control participants (Fujitani et al. 2017). Stakeholders that participate in decision making may also be more likely to engage in conservation activities—such as habitat management and restoration—and citizen science and to recruit other members of their communities to participate.

3.5 RISKS OF ENGAGING IN ANGLERS

The engagement of all primary groups in recreational fisheries management, policy, and legislation results in greater complexity for decision makers and requires increased resources and effort. Undoubtedly, groups that stand to be most affected by management decisions should

be involved in decision-making processes (Leach et al. 2002). Ensuring representation by all interested, including nontraditional stakeholders, requires further time and resources. Managers should balance feedback from industry and organized groups such as angling clubs, societies, and associations that have the resources to participate, with input from significant user groups that lack formal representation (e.g., fishing storeowners, recent immigrant anglers—especially those that do not speak the local language). Such stakeholders may require additional support and resources to fully engage, but the responsibility lies with these actors to get involved in decision making.

Limited resources, legal restrictions, and competing interests among groups have the potential to provoke conflict and dissatisfaction, especially if participants have valid but unreasonable expectations. Decision making may therefore be delayed or inadequately address issues, ultimately to the detriment of the fishery. This is particularly the case for areas where—or during periods when—fish and game management budgets have been cut. Engaged stakeholders may be discouraged when otherwise good suggestions are deemed impossible because of insufficient resources. The regulatory options available to managers are often limited by higher-level policies and regulations. When anglers are given a voice, they may suggest alternative management approaches that are known to be ineffective or are beyond the discretion of a given regulatory review process. Recommendations for ineffective practices can be addressed by sharing evidence of previous implementation failures. In contrast, if novel suggestions are declined because they are incompatible with broader regulatory frameworks, participants can become disillusioned with the process. Though multi-stakeholder engagement processes provide opportunities to resolve conflicts, some conflicts may be intractable. Decisions that necessarily favor one interest over another can lead to resentment and opposition to management efforts.

By engaging recreational anglers, management and policy may be shifted to serve the primary motivations of anglers, which may not always align with the sustainability of the fishery or broader management objectives (e.g., conservation of biodiversity, recovery of imperiled species that are not targeted by anglers). In recent decades, natural resource management has shifted away from single-species management and harvest enhancement and toward ecosystem-based management and biodiversity protection. Anglers advocate for species that are targets of recreational angling (game fish). As a result, agency funding could be shifted away from nongame species that are in need of protection. Anglers are often less supportive of regulation changes that may require personal sacrifice, such as harvest reductions (e.g., Murphy et al. 2015), even if evidence indicates that such regulations will increase a desirable fishery attribute, such as sustainability, abundance, or size. Anglers also typically overvalue the effectiveness of stocking, viewing it as a panacea rather than a management solution for specific contexts. Recreational fisheries managers need to consult with and listen to anglers, but fisheries managers also have to wear multiple hats and are often the voice of nongame fish (see Cooke and Young 2004).

3.6 MITIGATING RISKS OF ENGAGING ANGLERS

Many risks can be mitigated by specifying scope and objectives early in the engagement process. Participants should understand the range of options under consideration, the resources available, and important decision-making boundaries (i.e., overarching legislation). Alternative options should be clearly presented as compensatory rather than complementary, to avoid creating unrealistic expectations. It may be possible to manage a fish population to produce

trophy-sized fish or an abundant population but rarely both. Anglers may also be unfamiliar with the level of resources needed to conduct stock assessment in a given fishery, such that there is a need to educate them about the need to manage some fisheries on a landscape scale (e.g., Lester et al. 2003). Oftentimes, anglers will lobby for assessment on their lake, which may not always be possible or prudent.

A first step in any recreational fisheries decision-making process is to gather information. Stakeholders should be engaged early to better understand their perceptions and preferences, allowing the identification of opportunities and obstacles. Surveys, public meetings, and workshops can be used to gather input from a variety of interest groups, including those that have not traditionally been represented in decision-making processes. For example, anglers were interviewed in California regarding their perspectives on marine protected areas by conducting in-person interviews on fishing piers (Scholz et al. 2004). Variation in preferences within broad interest groups, such as recreational anglers, should also be assessed. For instance, Blue Catfish *Ictalurus furcatus* tournament anglers more strongly supported regulatory reforms, such as banning setlines and decreasing creel limits, compared to harvest-oriented anglers (Hyman et al. 2017). In addition to sharing perspectives, stakeholders can contribute to the compilation of the best-available science germane to a given management decision by providing local knowledge (Sullivan et al. 2006) and participating in citizen-science initiatives. Managers should aim to identify and include all considerations in the decision-making process, not merely those highlighted by particular interest groups even if they are the most vocal (e.g., May 2015). At the end of the day, the fisheries manager is also a steward of the resource and the one responsible for considering what anglers desire and thinking about biodiversity and nongame fish, even when these are not complementary.

Although there have been many papers on the topic, the literature review by Reed (2008) on stakeholder participation in environmental management (not just recreational fisheries) is particularly informative. Reed (2008) outlines eight key tenets for stakeholder engagement that are relevant to recreational fisheries management (Table 3.2). Active stakeholder participation is regarded as the hallmark for effective environmental management, particularly where there are diverse stakeholder groups with vested interests (such as anglers). That is not to say that stakeholder participation is always effective or without its challenges. However, a well-designed, well-structured, well-intentioned, and well-implemented stakeholder participation program will almost always be of great value to natural resource management agencies. A recent article suggested that co-production (when stakeholders are inherently involved in an activity to the point where they take ownership) done well generates outcomes that extend well beyond the tangible (e.g., scientific publication) to include many things that are intangible (e.g., decreases mistrust in the science, improves cooperation, and increases dissemination of findings; see Willyard et al. 2018). Engaging with anglers early and often is key to effective co-production and increasing resource stewardship.

3.7 CONCLUSION

Recreational fisheries are dynamic socioecological systems with many invested stakeholders (Arlinghaus and Cooke 2009), including anglers, angling clubs, organizations, guides and outfitters, and industry. Although there are often competing motivations among these groups, the success and productivity of the entire sector often revolves around the integrity of aquatic ecosystems that support game fish populations (Rosenberg et al. 2000).

In North America, decision-making authorities (i.e., elected officials or their designees) are responsible for developing the policy and regulations that support recreational fishing opportunities, economic growth, and conservation. Successful management is best achieved when there is strong communication among anglers, industry, angling groups, scientists, and decision makers (Dedual et al. 2013). Anglers themselves may support management by participating in data collection (angler apps, diaries, and surveys), while groups of anglers may form clubs and associations that can impart significant influence on regulations governing recreational fisheries. These policies may also be shaped by the recreational fishing industry, which advocates for policy and management to support economic opportunities within the sector. Ultimately, incorporating these perspectives into the governance of recreational fisheries can help resolve conflict, engage stakeholders, and increase understanding of policy and management decisions.

Engaging in collaborative decision-making processes is not without its risks. Expectations of these groups can be unrealistic given competing interests and limited resources available for management. The inclusion of multiple stakeholder groups can also increase complexity and slow down decision making. The negative consequences of engaging stakeholder groups can be minimized through proactive consideration of the scope and objectives of these engagements. Many natural resource agencies employ outreach agents and stakeholder engagement staff as well as individuals with expertise in human dimensions to assist in stakeholder engagement, given that not all fisheries scientists will have appropriate training to do so effectively. Furthermore, the entirety of the recreational angling community must understand that they are just one of the many important sectors and voices considered in the governance of aquatic resources. Nonetheless, for all the reasons discussed in this chapter, anglers and angling organizations play an important role in the management of our shared resources and it is critical that a base of our population continues to participate in angling. As angling participation declines, so do the benefits brought to fisheries, management, and conservation. We hope that the descriptions, case studies, and strategies we have provided for fisheries managers will enable them to engage anglers in a manner that is informed, productive, respectful, and balanced, recognizing that anglers are a significant stakeholder to be considered in the complex management and policy arena.

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