

CHAPTER 6

Beyond the Catch: Fostering Stewardship among Recreational Anglers through the Development of a Water Ethic

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6.1 INTRODUCTION

In his seminal essay, “The Land Ethic,” Aldo Leopold (1970) laid groundwork for an ethical paradigm that recasts the relationship between humans and nature. This ethic “enlarges the boundaries of the community to include soils, waters, plants, and animals, or collectively: the land... [and] changes the role of *Homo sapiens* from conqueror of the land community to plain member and citizen of it.” Leopold’s vision of a society that encourages its members to act as stewards of the land has permeated the environmental sciences over the past 60 years (Mathevet et al. 2018). Although the spirit of his thesis applies to multiple ecosystems, aquatic resources warrant explicit attention because they are intrinsically valuable and generate flows of ecosystem services that enhance human well-being. Moreover, these environments face specific challenges due to connectivity among waterways, difficulties surrounding effective governance of common pool resources, and competing stakeholder interests that can impede the process of achieving environmental sustainability (Lebel et al. 2006; Armitage et al. 2009; Cooke et al. 2013a; Lechner et al. 2015; Flint et al. 2017). Consequently, there is a strong need to better understand the factors that motivate people to act as environmental stewards, particularly within recreational angling communities that play a direct role in shaping aquatic ecosystems.

Previous research has provided insight into the factors that drive stewardship behaviors, defined as actions that are voluntarily performed with the intention of benefiting the long-term interests of ecosystems (Chapin et al. 2009; Colwell et al. 2012). On one hand, internal factors ranging from self-interest to altruism are fundamentally important for energizing behavior, particularly the sense of duty that people feel to go beyond formal regulations and do what is morally right regardless of personal costs or benefits (Stern 2000). On the other hand, a host of external factors such as historical contexts and environmental governance structures are instrumental in establishing codes of conduct that sustain human and biological communities. The entities deemed responsible for overseeing environments and identifying the collective interests of a group require careful consideration given their role in determining how and why standards for action are established. Although the range of factors that influence stewardship behavior can be understood through multiple paradigms that explain different ethical points of view concerning nature conservation (van Riper et al. 2018), many converge on the notion that stewardship emerges from reciprocal relationships

between people and the environments they experience (Naeem et al. 2016; Rochester et al. 2016; Manfredo et al. 2017).

This chapter explores the tenets of a water ethic among recreational anglers, borne from Leopold and other scholars who have advocated for a shift in values toward a more caring, knowledgeable, and reflexive society that recognizes the interdependence between people and aquatic environments. We focus particular attention on recreational anglers because of their identification with fishing and, therefore, inherent interest in stewarding natural resources over time (Landon et al. 2018). Anglers also play a substantive role in supporting human and economic well-being (U.S. Fish and Wildlife Service and U.S. Census Bureau 2016), as well as minimizing impacts on the environment (Worm et al. 2006; Halpern et al. 2008; Díaz et al. 2019). As a corollary, previous research has indicated that participation in recreational angling has been steady or declining since the 1980s and further decreases are projected for the future, especially in urbanized environments (Arlinghaus et al. 2015). Exacerbating these trends are rises in technology that detach people from nature-based settings (Pergams and Zaradic 2006; Martin et al. 2012), ethical questions about the sentience of fish and animal welfare that may deter people from angling (Arlinghaus and Schwab 2011), and potential distrust toward resource management agencies (Kendal and Raymond 2019). These trends reinforce the importance of understanding how stewardship can be maintained and expanded, especially in light of the need for recruitment, retention, and reactivation (R3) of new anglers (Decker et al. 1991; Burkett and Winkler 2019).

In the sections that follow, we provide an overview of stewardship as the basis for sustaining positive relationships between recreational anglers and the fishery resources on which they rely. Specifically, we review literature that has underscored the importance of angler behavior due to its potential to catalyze social-ecological change, as well as discuss the social psychological factors that compel voluntary action. We also present three principles from the perspective of the environmental social sciences as a guiding framework for resource management agencies to shape individual and group decisions that influence environmental sustainability. This chapter draws on our collective research programs and aims to provide guidance on how best to enhance a stewardship ethic among recreational anglers.

6.2 ANGLER BEHAVIORS INFLUENCE FISHERY RESOURCES

Angler behaviors encompass a variety of everyday actions that are not often governed by fishery management agencies but that influence the environment (Cooke and Cowx 2004; Lewin et al. 2006). Several examples of angler behavior are avoiding or remediating litter and pollution, participating in fish habitat enhancement, and adhering to fish welfare protocols when engaging in catch and release (FAO 2012). Recreational anglers can also decrease fish stocks (Coleman et al. 2004) and reduce the population of larger size-classes (Post et al. 2002). On an indirect basis, recreational angling causes long-term genetic changes known as “fisheries-induced evolution,” which selects for earlier maturation (Heino et al. 2015) and decreased fecundity (Kuparinen and Merilä 2007). Anglers may also contribute to the spread of invasive species, either inadvertently, by neglecting to clean their boat or equipment between uses in different water bodies (Ludwig and Leitch 1996; Gates et al. 2009; Rothlisberger et al. 2010; Kemp et al. 2017; Cole et al. 2019), or intentionally, by engaging in unauthorized stocking of nonnative target species (Johnson et al. 2009). In other words, recreational anglers change environments in both positive and negative ways. It is therefore fundamentally important that

voluntary engagement in stewardship behaviors be enhanced by building a sense of moral obligation to act in a manner consistent with beliefs about care for a land (or water) community.

Establishing moral grounds for resource protection among recreational anglers is challenging because there are numerous factors that work in tandem with morality to shape angler decisions. Previous research has provided insight on how to boost voluntary engagement in activities that sustain fishery resources over time (Lucy and Davy 2000; Granek et al. 2008; Arlinghaus et al. 2017). Results from a statewide survey in Texas suggested that nearly one-quarter of license-holding anglers elected to become members of fishing or conservation organizations (Schuett et al. 2014). Of these respondents, the strongest motivation was benefiting the environment, which was more important to anglers than the prospect of gaining influence over policy. In addition to examining involvement in fishing organizations as a predictor of angler stewardship behaviors, studies have indicated that participation in citizen science activities can provide a platform for enhancing stewardship by creating opportunities for the public to assist with data collection and monitoring (Kyle et al. 2016). These programs not only enable people to observe and become inspired by nature (Kaplan and McCay 2004), but also increase knowledge, beliefs, and intentions to engage in behaviors that benefit the environment (Arlinghaus et al. 2017). In other words, given the constraints to engaging in fishing activities (Sutton 2007; Yoon et al. 2013), citizen science programs have the potential to increase interest in nature and ultimately participation in angling, thereby facilitating R3 among groups of people with a strong stewardship ethic.

6.3 KEY STEWARDSHIP PRINCIPLES FOR RESOURCE MANAGEMENT AGENCIES

Promoting stewardship behaviors in aquatic ecosystems requires a working knowledge of how to examine and understand why individuals and groups may behave in certain ways. Yet, behavior change is a difficult task that continues to be prioritized by resource management agencies. Behavior change initiatives are replete with challenges, in part because social science research tends to rely on self-reported data and people can be uncertain about their own decisions (Garner 1962), fickle in what they report over time (Vygotsky 1980), sensitive to social judgment (Sherif 1998; van de Mortel 2008), and biased by heuristics and framing (Tversky and Kahneman 1974). Moreover, many of the factors that influence angler behaviors are not directly observable, even to anglers themselves. It is worth noting, however, that some have questioned the ethics of behavior change techniques in the hands of state actors like fisheries managers (Sunstein 2015). Public agencies should take care to ensure that outreach activities connect all constituents to the resources they are entrusted to manage, not simply reify existing social and economic discrepancies reflected in the makeup of the majority of angler communities. In the section that follows, we share three principles informed by previous research to aid in this quest for advancing the design and implementation of behavior change programs.

6.3.1 Principle #1: Activate Norms

Norms are one of the strongest predictors of behavior and are learned through interactions that exist on both personal and social levels (Heberlein 2012). The land ethic, itself, rests on norms and sanctions for antisocial behavior (Leopold 1970). There are two types of norms we would like to highlight. First, “personal norms” are defined as feelings of moral obligation,

such as pride, guilt, and worry (Schwartz 1977). In the context of fishery management, people who identify as recreational anglers can feel compelled to engage in stewardship activities due to a sense of responsibility to preserve the resource in perpetuity. This sense of responsibility can create a standard for action that is bolstered by perceived benefits or repercussions (i.e., sanctions) for a given behavior (Schwartz 1977; Bruskotter and Fulton 2008). For example, anglers may be proud of themselves for cleaning their boats to prevent the spread of invasive species, or feel guilty if a species is spread due to their behavior. In this sense, personal norms can catalyze a behavioral response from an individual in response to the expectation from a broader collective.

In addition to personal norms, a second norm-related concept is “social norms,” defined as perceived social pressures that are felt internally and reinforced by other people (Landon et al. 2017; Nolan 2017). Social norms are central to establishing a water ethic because they indicate broader, societal level transformations that recognize whether behaviors are deemed appropriate or inappropriate for particular interest groups. Communities can emerge from coalitions of anglers who fish at the same site, are members of the same fishing club that advocates for a species (either native or nonnative), or participate in online forums to advance causes such as fisheries conservation. Through sustained interaction among these communities, a sense of moral obligation and sanctions are more likely to ensue. These responses become more pronounced if the angler interacts with peers who value aquatic ecosystems and can be sustained by society’s willingness to impose external pressures (e.g., regulations, policy) on the individual, which in turn will indicate that stewardship has become a normative component of angler conduct. However, as many different types of fishing organizations have emerged since the 1970s, so have the goals and values of the people who are (or are not) affiliated, which can complicate management outcomes (Krueger and Decker 1999). In other words, a fishing group’s social pressures may or may not be in line with the goals of fisheries management. Thus, the variety of environmental worldviews held by anglers (see van Riper et al. 2019) are important to keep in mind when negotiating policies and communicating with the public because these underlying orientations work in tandem with responses to normative pressure that influences behavior.

To encourage engagement in stewardship activities, fishery management agencies can adopt practices that leverage both personal and social norms. An example management response is to frame stewardship as common and widespread by pointing to diverse coalitions of anglers that support fisheries conservation. This framing will create a prototype that individuals can emulate and, over time, establish more sustainable outcomes through formal and informal sanctions while respecting the importance of maintaining freedom in leisure experiences (Kleiber et al. 2011). In other words, crystallizing what is normative may result in anglers modifying their behavior to better match those of their respected peers (Cialdini et al. 1991). Another approach that can be adopted by resource management agencies is to use persuasive communication that emphasizes feelings of pride and ownership over conservation successes and therefore incentivizes action (Harth et al. 2013). Anglers who believe they can enact change and recognize the importance of minimizing human impacts on the environment may begin to view their interactions with aquatic resources through a moral lens—that is, their personal norms will be activated and applied in a recreational context (Schwartz 1977). Indicating that communities have the foresight to sustain fishery resources while incremental improvements are being made can facilitate the evolution of a water ethic among recreational anglers.

6.3.2 Principle #2: Work within Existing Value Structures

Values are the fundamental basis for individual decisions (Schwartz 1994) and can facilitate the development of a water ethic because value shifts (van Riper et al. 2018) coupled with the activation of norms (Heberlein 2012) can bring about lasting behavior change (Kenter et al. 2015, 2019; Manfredi et al. 2017). Although many anglers are aware of the threats facing aquatic ecosystems and local economies, research suggests that many people do not act to mitigate these threats. Specifically, past work in this area has indicated that awareness, knowledge, and concern are generally high among recreational anglers and continue to rise (Sharp et al. 2011; Connelly et al. 2016; Kemp et al. 2017), while the frequency of behaviors causing environmental degradation has remained relatively constant (Burgess et al. 1998; O'Brien 2013). This phenomenon, termed the “value-action gap,” occurs when individuals who receive environmental education and are aware of anthropogenic impacts do not act in a way consistent with their values (Kollmuss and Agyeman 2002; Schultz 2011). Closing this gap is exceedingly complex due to the diversity of psychological processes and institutional factors that influence angler behavior.

To promote a water ethic among recreational anglers, both cultural and individual values should be considered (Figure 6.1). Cultural values are worldviews—or ways of life—that define a society (Douglas and Wildavsky 1983). For example, a *communitarian* cultural value (i.e., the opposite of *individualist* values) could be ascribed to a group of people that believe interpersonal relationships and group identity define its members (Kahan 2012). People with pronounced communitarian cultural values may respond well to messages that emphasize the importance of grassroots movements in the management of aquatic ecosystems, rather than rationales based on authority or the expertise of individual stakeholders. Value orientations also exist at the individual level and are defined as guiding principles in life (Rokeach 1973). *Self-transcendence* is an example of an individual value that indicates concern for other organisms and society. In principle, anglers who are primarily guided by the core beliefs of self-

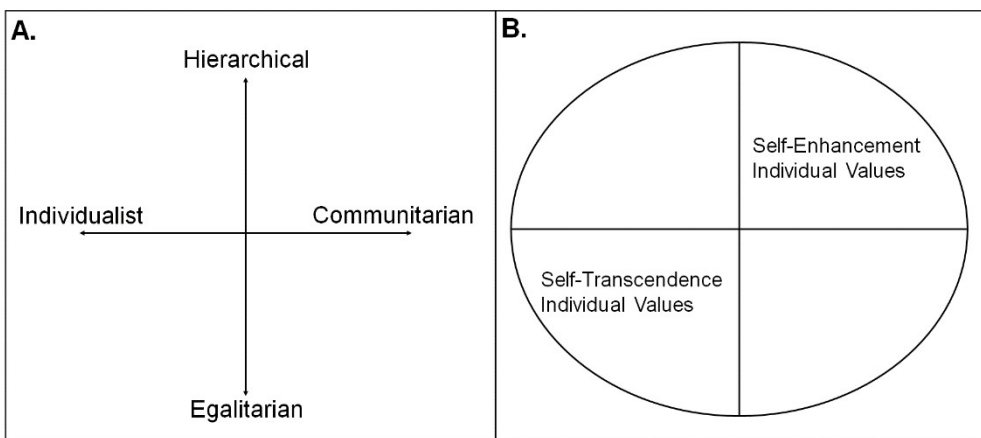


Figure 6.1 (A) Individuals can identify with two types of cultural values, which are situated on poles that range from hierarchical to egalitarian and individualist to communitarian. (B) Two types of individual values are situated on a value wheel as polar opposites ranging from self-transcendence to self-enhancement. Adapted from Kahan (2012) and Schwartz (1994).

transcendence may respond well to messages about resource protection for the sake of the environment and society rather than the importance of factors such as achievement and goal setting as motivators for conservation. A better understanding of where a constituency falls in relation to their cultural and individual value orientations provides insights that agencies can use to communicate and navigate value differences (Lakoff 2010), keeping in mind that the contexts anglers work within also play a substantive role in shaping angler preferences and behavior.

The relationships among multiple types of values (e.g., cultural, individual) must be considered to close the value-action gap (Kollmuss and Agyeman 2002). Values among recreational anglers are a critical area of inquiry that could guide how fishery managers frame their communications and discuss concerns with subgroups of a constituency, especially given that limited previous research has investigated those psychological processes that are unlikely to change over time. For example, if an ecosystem is at high risk of human-induced biological invasions and the angling community that frequents the area holds strong *egalitarian* cultural values that support equality across social roles in society, managers could adopt a narrative that de-emphasizes government intervention to align with these values. Instead, highlighting how individual anglers are equally capable of paving the way toward collective well-being that minimizes the spread of invasive species would be more likely to stimulate a behavioral response for anglers who are primarily guided by this kind of cultural value. Accordingly, messages about the environment will be most likely to resonate when they are tailored to align with the values of a stakeholder group, rather than attempts to alter existing viewpoints (Manfredo et al. 2017; van Ripper et al. 2018).

6.3.3 Principle #3: Leverage Institutional Factors to Encourage Stewardship

Angler behaviors are shaped by multiple psychological processes that work in tandem with institutional factors that govern fishing practices in the context of a social-ecological system. These factors can be considered formal or informal (Ostrom 2005). Formal institutions refer to rules that are codified by an official governing body to limit angler behaviors in relation to resource use (i.e., fishing permits). Informal institutions, on the other hand, refer to socially shared rules (e.g., taboos, customs, traditions, and social norms) of angler behavior that are not prescribed, but rather enforced by a community through socialization (North 1991; Cooke et al. 2013b). Collectively, these institutional factors bound the choice set available to anglers in a fisheries context. For example, in some states, it is legal to keep a large Muskellunge *Esox masquinongy*, but doing so is greatly frowned upon by the Muskellunge angling community. In this sense, the decision of whether to keep a fish is influenced by the official rules of an agency with jurisdiction over the resource in addition to the perceived appropriateness of an action within a broader social context. However, contradictions may arise; thus, formal and informal institutions, alongside angler values and norms, should be carefully considered to identify appropriate strategies for enhancing stewardship.

A self-regulating fishery is comprised of anglers who identify as stewards of an aquatic ecosystem and engage in behaviors to reflect this orientation, thereby contributing to the evolution of social norms that reinforce appropriate modes of conduct. However, not all anglers who identify as stewards benefit the environment. It could be that anglers have misinformation or a limited understanding of the ecological dynamics of fisheries stocks, habitats, and harvest (Gray et al. 2015). Consequently, functional governance regimes, including both for-

mal and informal institutions supported by scientific expertise, are essential for sustaining aquatic ecosystems (Jordan et al. 2005; van Riper et al. 2016). Moral beliefs about appropriate levels of management interventions to sustain fishery resources and habitats, trust in natural resource management agencies, and values are also drivers of behavior when knowledge is low (Bruskotter and Fulton 2008; Gray et al. 2012, 2015).

Institutional factors are instrumental for behavior change, in part because stable psychological factors such as values are unlikely to change over short time periods. Therefore, while a person's values and attitudes adjust over the long term, an agency can compel desired behavior more immediately with a rule or regulation. In support of this proposition, Heberlein (2012) asserted that behavior change would require attention to the social, cognitive, and structural components of decisions. Structural, in this sense, refers to both physical and institutional factors that play a role in behavior change. Although values can be leveraged to develop positive attitudes toward sustainability (Kenter et al. 2015), changing the structural context of a decision will also increase responses to a given policy change or management initiative.

Combining institutional factors and social norms has led to success stories such as the development of catch-and-release angling for black bass (Long et al. 2015). As black bass angling became popular in the United States, anglers grew concerned that the vast quantities of harvest were unsustainable. Grassroots organizations, in particular the Izaak Walton League and the Bass Anglers Sportsman Society (B.A.S.S.), emerged in the mid-20th century to promote the sustainability of bass fisheries. In response to pressures from these groups, many state agencies banned the sale of black bass for commercial consumption, implemented size and harvest limits for recreational fishing, and began taxing fishing and boating supplies to provide funding for stocking and managing bass fisheries. These actions were successful but amplified by actions the angling societies took themselves: advertising the benefits of catch-and-release angling. The heavy promotion of catch and release through television advertisements by professional anglers and promotional materials distributed by B.A.S.S.—one of the largest angling societies in existence—effectively changed personal and social norms such that bass anglers expected themselves and others to release the fish they catch. More recently, B.A.S.S. has promoted catching a variety of bass species by implementing tournament prizes for individual species, in addition to continuing the catch-and-release ethic by using photographs to judge the catch size (Taylor et al. 2019). These messages may lead to support for policies and further normative reinforcements around behavior change.

6.4 NEED FOR WIDER ADOPTION OF A WATER ETHIC

Calling for a water ethic among recreational anglers in the tradition of Leopold (1970) will sustain fishery resources over time and facilitate R3. This paradigm shift will require large-scale cooperation among individual users and multiple institutions (Merchant 2010). Governance regimes in support of bottom-up policies that emerge from stakeholder coalitions are paramount for sustaining resources and complementing the rules and regulations introduced by governments (Berkes 2002). A variety of fisheries management approaches have emerged in response to this need (Arlinghaus 2006). Fisheries may be publicly owned, as is common in North America, and managed by government agencies in the public trust. They may also be privately owned, as is common in Europe, with management more directly informed by resource users. Across all contexts, individuals need to be empowered to steward natural resources outside of formal regulations and, in turn, help address a host of

challenges specific to aquatic ecosystems, including the navigation of less discernable political boundaries, difficulties in enforcement, and species migration across regional land and seascapes.

When formal management arrangements are in place, public engagement should be prioritized to sustain support for conservation activities, establish normative practices, and facilitate the development of new social norms. Open discussions about social-ecological change can yield benefits, such as increased compliance with regulations (McCook et al. 2010) and satisfaction with policy outcomes, so long as changes are seen as necessary, important for conservation, equitable, and adequately executed (Sutton and Tobin 2009; Danylchuk and Cooke 2011). There are many ways anglers can be involved throughout the decision-making process, including monitoring, research, enforcement, conservation, management design, advocacy, and education (Krueger and Decker 1999; Granek et al. 2008). Greater involvement can reduce tensions in the relationships between anglers and management agencies, as well as increase accountability of authority figures (Kaplan and McCay 2004). In addition, increases in awareness and support for conservation initiatives can contribute to angler decisions to engage in behaviors that benefit the environment (Stern 2000).

6.5 OVERCOMING CHALLENGES TO MANAGEMENT OF AQUATIC ECOSYSTEMS

There are numerous challenges facing the sustainability of aquatic ecosystems, particularly related to public involvement in decisions. Although resource management agencies increasingly view the process of building trust and rapport with angling communities as a priority (Gray and Jordan 2010; Stern and Coleman 2015), this requires regular engagement with collectives that influence and reflect angler viewpoints. Indeed, stewardship becomes more prevalent when supported by a collective, rather than mandated by the government due to commitment, loyalty, and the perceived importance of informal groups for maintaining individual identity (Kyle and Mowen 2005; Beardmore et al. 2014). Given that people in positions of power and social influence over these collectives are instrumental in establishing standards for action within a group, managers should seek out leaders to facilitate communication and provide access to its members. This remains an ongoing challenge because some influential opinion leaders are not part of formal organizations and may not believe in the importance of public involvement in decisions.

The social sciences play an important role in building positive relationships between resource management agencies and stakeholder groups by generating information on public viewpoints that can then be translated to practice. Decision makers should prioritize making evidence-based decisions about their constituents and harnessing different disciplines to solve resource management problems in aquatic ecosystems. Recent studies conducted by Heck et al. (2014, 2015, 2016) investigated managers' understanding of the social sciences and, perhaps more importantly, their incorporation of information stemming from social science research into decisions. These authors found that formal training in social science disciplines was not common among fisheries professionals and that greater capacity to conduct and consider social science research could lead to a better understanding of constituent needs and ultimately satisfaction. This finding has long-term implications for the retention of anglers. Furthermore, the design of communication and outreach strategies to leverage stewardship can be informed by knowledge of the values, beliefs, and norms of anglers.

Generating this knowledge requires some familiarity with various theories and methods from the social sciences. In response to the need for broader and deeper social science research (Bennett et al. 2017), this chapter offers insights on the multiple factors that influence the perspectives of individual anglers, managers, and broader collectives that rely on aquatic ecosystems for human well-being and quality of life.

6.6 CONCLUSION

How do we promote a water ethic among recreational anglers that inspires and sustains environmental stewardship? This question warrants attention from management agencies that aim to enhance the provision of recreational opportunities in pursuit of R3 while encouraging anglers to *move beyond the catch*. Drawing from Leopold (1970), who advocated for stronger environmental values that would compel individuals to act as responsible members of a land community, this chapter establishes three principles for enabling resource management agencies to more effectively encourage stewardship. Specifically, building on previous research that has developed guiding frameworks for management of aquatic ecosystems (Olver et al. 1995; Elmer et al. 2017), we highlight the importance of activating moral responses to environmental sustainability, working within the existing value structures of anglers, and relying on broad institutional factors to reinforce environmentally sustainable practices. These principles should be grounded in social-ecological knowledge and used as a guide for practitioners to engage individuals and groups in governance that supports and sustains recreational angling.

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