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Point-Counterpoint

Individual outcomes matter in the context of responsible and sustainable catch-and-release practices in recreational fisheries and their management

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ABSTRACT

Recreational anglers often engage in catch-and-release (C&R) whereby some of their catch is returned to the water (either to comply with harvest regulations or voluntarily) with the assumption that fish will survive and experience negligible impacts. Despite the assumption that C&R is usually harmless to fish and, thus, helps reduce overall fishing mortality, a large evidence base shows a proportion of released fish will not survive. Even if the event is not lethal, each individual fish will experience some sublethal impact (e.g., injury and stress). There is some debate within the recreational fisheries science and management community regarding the extent to which sublethal impacts or even mortality of individual fish matter, given that fisheries management efforts often focus on whether excessive overall mortality affects population size or quality of angling. Here, we embrace the perspective that individual-level outcomes matter in the context of responsible and sustainable C&R in recreational fisheries and their management. We outline 10 reasons why there is a need to account for individual outcomes of C&R fish to generate resilient fisheries under a changing climate and in the face of other ongoing, increasing, and future threats and stressors. Fostering better handling practices and responsible behaviors within the angling community through education will improve interactions between fish and people while ensuring more successful releases and ecological benefits across fisheries. We acknowledge that cultural norms and values underpin ethical perspectives, which vary among individuals, regions (e.g., rural vs. urban), and geopolitical jurisdictions, and that these can dictate angler behavior and management objectives as well as how individual-level C&R impacts are perceived. Our perspective complements a parallel paper (see Corsi et al., 2025) that argues that individual fish outcomes do not matter unless they create population-level impacts. Creating a forum for discussing and reflecting on alternative viewpoints is intended to help identify common ground where there is opportunity to work collectively to ensure recreational fisheries are managed responsibly and sustainably.

CONTEXT

Recreational angling is a popular activity in both marine and inland waters that engages ~10.6% of the world's population (Arlinghaus et al., 2015) equating to more than 220 million anglers (Arlinghaus et al., 2021; World Bank, 2012). The activity generates socioeconomic benefits (Arlinghaus

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& Cooke, 2009; Tufts et al., 2015) and is of high importance to the lifestyle and leisure of many people. Although a large portion of fish caught by recreational anglers are harvested for food (Cooke et al., 2018; Embke et al., 2020), many fish are also released (i.e., catch-and-release). Catch-and-release (hereafter, "C&R") can be mandated by fishing regulations (e.g., size or bag limits) or be a product of the personal choices of individual anglers (Arlinghaus et al., 2007). Release rates vary greatly among fisheries, fish species, and countries (ranging from near total harvest to near complete release) but rough estimates suggest that there may be as many as 30 + billion fish released by recreational fishers each year globally (Cooke & Cowx, 2004). The basic premise of C&R is that released fish will survive and experience negligible sublethal impacts that do not affect fitness (e.g., growth or reproduction; see Cooke & Schramm, 2007; Wydoski, 1977). Several major syntheses (e.g., Arlinghaus et al., 2007; Bartholomew & Bohnsack, 2005; Hühn & Arlinghaus, 2011; Muoneke & Childress, 1994) reveal that mortality rates are highly variable across species, environments, and angling styles (ranging from negligible to near total mortality) and that some form of sublethal impact (e.g., injury, stress, behavioral changes) is inevitable, even if many are reversible and do not lead to fitness concerns (reviewed in Arlinghaus et al., 2007; Cooke & Suski, 2005). What is clear is that the outcome of C&R events is largely determined by angler behavior and decisions, including gear choices, the target species, handling practices (e.g., duration of fight, net type, air exposure), and the capture environment (e.g., capture depth, water temperature; reviewed in Brownscombe et al., 2017). Therefore, it is largely in the hands of the angler to make decisions that are more or less harmful to the individual fish to be released.

Efforts by managers, fishers, and other parties to reduce mortality and sublethal impacts of C&R have occurred for decades, guided by a desire for responsible and sustainable fisheries (Cooke et al., 2019). Yet, a perspective held by some is that fisheries management should solely be concerned with impacts of C&R on fishery quality and population dynamics/status where fishing effort, fishing mortality (of all sources, including release mortality), and vital rates determine whether a given impact will have population-level effects and thus necessitate management action (Kerns et al., 2012). For example, C&R mortality rates up to 25% may not be problematic if other sources of mortality are low, compensatory natural mortality is present, fishing effort and catch rates are low, and the vital rates/life history of the population can generally support such mortality (Coggins et al., 2007; Johnston et al., 2015; Pine et al., 2008). Conversely, another perspective (held by the authors of this paper) is that all individual-level outcomes matter in the context of responsible and sustainable C&R in recreational fisheries, regardless of whether they have population-level consequences. Here, we elaborate on that perspective. Our perspective serves as an alternative to the arguments outlined in Corsi et al. (2025). These papers should be read together to understand the range of views on this topic and how individual and population-level perspectives complement one another.

TEN REASONS WHY INDIVIDUAL OUTCOMES OF FISH MATTER

Below, we identify 10 reasons why there is merit in focusing on individual fish when attempting to achieve responsible and sustainable recreational fisheries. In an increasingly multi-stressor world, minimizing C&R impacts on fishes should universally lead to better conservation outcomes and is a valuable goal, not the least from a precautionary perspective (Figure 1). We preface this by noting that there are presumably differences in angler motivation, ethic, and behavior for anglers and fisheries where one engages in voluntary release (i.e., where fish could be legally harvested) vs. mandatory release (i.e., where fisheries regulations require it). It is unclear how those factors influence angler interactions with individual fish.

Because animal welfare is an individual-level concept

A variety of ethical perspectives can be used to frame fisheries management and judge its practices; they can be broadly differentiated into those that focus on the well-being of individual fish (e.g., animal welfare), on the well-being of individual humans (anthropocentrism, virtue ethics), and on aggregated biological entities, such as the status of populations or natural environments (summarized in Arlinghaus & Schwab, 2011). Ethics that focus on animal welfare are clearly and exclusively individual-level concepts. These ethical standpoints come in three variants—animal welfare, liberation, and rights. We do not consider the latter two because with those perspectives, there is no recreational fishing that is considered appropriate, as the benefits to humans in catching sentient fish conflict with the interests/rights of those fish because the fish's interest/right is to not be harmed by humans (Arlinghaus et al., 2009; Arlinghaus & Schwab, 2011). Welfare, by contrast, is a concept that does not oppose the use of animals, even if they are sentient, and strives to minimize any form of impacts on individual fish that are affected by human activity, including recreational fishing (Arlinghaus et al., 2009). Catch-and-release events harm the well-being of individual fish as injury is unavoidable, even when it is mild (e.g., a puncture wound from a hook). Also, during angling (and handling), the fish will experience physiological stress, which, again, is unavoidable even if reversible in the short term (for which there is abundant evidence in many cases). From the perspective of an individual fish, hooking and other C&R related stressors (e.g., air exposure, handling) are unnatural; thus, human-mediated impacts that are part of the angling process should be minimized to improve the well-being of fish from a welfare view (Ferter et al., 2020). We reiterate that considering welfare is not an anti-angling perspective (Arlinghaus et al., 2009), it is simply one that calls upon anglers to reduce impacts on the fish whenever they can. Even if animal welfare is not a motivating factor, releasing each fish in the best conditions is also the core goal of all responsible C&R anglers (Cooke et al., 2019; Shephard et al., 2023). It is in the self-interest of each individual angler to release fish in the best condition and as unharmed as possible as this facilitates rapid recovery and better chance of return to the catchable pool of fishes (Cooke & Sneddon, 2007). Note that we purposely did not discuss fish pain or suffering as components of sentience typical of the animal liberation and rights

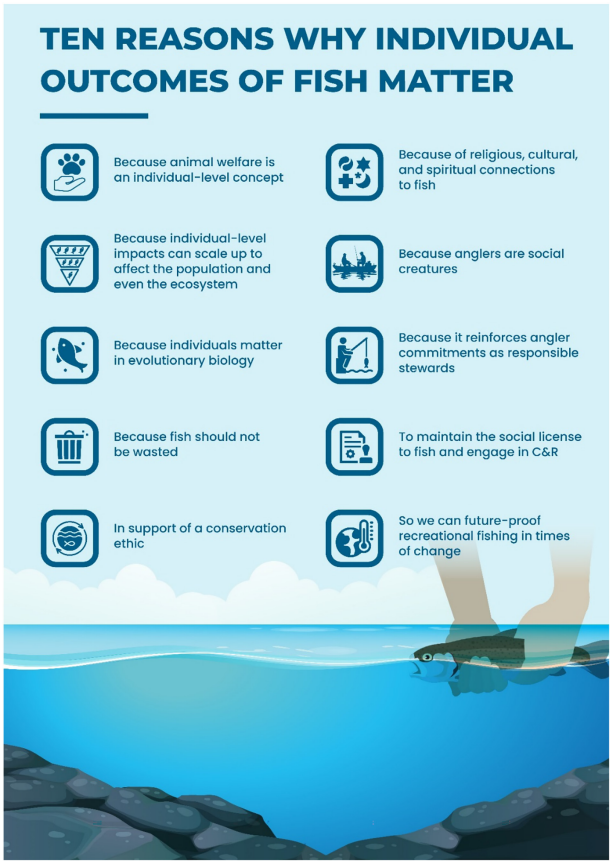

Figure 1. Visualization of the ten reasons our team identified in terms of why individuals matter in the context of responsible and sustainable catch-and-release recreational fisheries.

frameworks because a pragmatic approach to fish welfare focuses on objectively quantifiable metrics of impaired well-being, such as physiological changes or injury (Arlinghaus et al., 2009), and this approach to welfare alone is sufficient to motivate an individual-level, impact-reducing focus in C&R (Ferter et al., 2020).

Because individual-level impacts can scale up to affect the population and even the ecosystem

Catch-and-release impacts may or may not have significant population effects, depending on how these impacts interact with the level of fishing effort/catchability, life history characteristics/vital rates (and other aspects of population biology), and other sources of mortality or stressors that reduce biological productivity (Jennings et al., 1999; Johnston et al., 2013, 2015). For example, a small population of a long-lived, late-maturing, low recruitment, and low replacement fish like sturgeon (Acipenserids) is more vulnerable to C&R impacts due to the high value of each individual to the population. Targeted fishing for important reproducers in a population, such as large females, can have disproportionate population impacts (Marshall, 2009), so the best C&R handling practices of fish in these situations should be a priority. Even more robust and large populations of short-lived species could in theory be impacted by high exploitation levels when poor C&R practices lead to large cumulative mortality, resulting in reduced abundance and truncated spawning population structure. Catch-and-release can have a relatively major impact on fish populations in other instances, such as fishing during the spawning period when it interferes with parental care (Philipp et al., 1997) or other aspects of reproduction (Richard et al., 2013; Papatheodoulou et al., 2022, 2024) or when released fish are vulnerable to predation (Holder et al., 2020). Potentially large population effects from C&R may be mitigated by catchability, such as in cases where catch rates decline during spawning, or in warm water temperatures, which can increase the C&R mortality rate, but the catch rates might drop in certain species (McCarrick et al., 2019; Meyer et al., 2023). Importantly, C&R impacts often coincide with many other (often cumulative) stressors such as harvest fisheries, habitat change and degradation, warming, pollution, and invasive species (Killen et al., 2022). Although rarely documented, it is conceivable that changes in the abundance of a population because of C&R impacts could precipitate changes in community structure and ecosystem function as is possible in any overexploited system (Altieri et al., 2012). For all of these reasons, releasing all fish in the best possible conditions is consistent with a precautionary approach to limit population-level impacts.

Because individuals matter in evolutionary biology

Although abundance (number of individuals) is an obvious endpoint of concern to fisheries managers, mortality or sub-lethal impacts of C&R can extend beyond "simple" concerns about the contribution of C&R mortality to total mortality. Genetic variation (expressed as phenotypic variation) is a fundamental requirement for evolution by natural selection, and population evolution is how we will have resilient fisheries under a changing climate and in the face of other stressors (e.g., Duncan et al., 2019). This has two implications. One, we know that not all fish are equally catchable by anglers because of variation (Lennox et al., 2017). Fish do not have a single "catchability" gene, but, rather, a series of correlated characters (e.g., activity, aggression, hunger), some genetic and others expressed depending on the environment, that contribute to the probability of capture (e.g., bold behavior with relatively high metabolic rates and food demands; Lennox et al., 2017). Second, if "extreme" fish (e.g., large body size, early/late run timing) do not survive C&R, that variation is removed from the population, truncating its ability to evolutionarily respond to future events. Thus, this selective mortality of fish can, in extreme cases, cause fisheries-induced evolution, including changes in trait values and a decline of population-level catchability (Philipp et al., 2009; Sbragaglia et al., 2019), with possible consequences for ecosystem functions and human welfare (Arlinghaus et al., 2017). Fisheries managers have been encouraged to embrace evolutionarily informed management strategies (Jørgensen et al., 2007) and those that protect diverse phenotypes and their underlying genotypes can sustain higher catch rates and good angling quality (Camp et al., 2015; Koeck et al., 2020).

Because fish should not be wasted

The concept that "game fish should not be wasted" is a tenet of the North American model of fish and wildlife management (i.e., wildlife is a shared resource that must not be wasted;

Organ et al., 2012). It is embedded in some recreational fisheries regulations and, therefore, embraced by most natural resource management agencies (and many groups within the recreational fishing sector). For example, the province of Alberta states that "The edible flesh of legally kept game fish must not be wasted, destroyed, spoiled or abandoned." Also, the Idaho Fish and Game regulations state, "It is illegal through carelessness, neglect or otherwise to allow or cause the waste of edible portions of any game fish." Yet, in the context of C&R, fish that do not survive release is tantamount to "wasting fish" from a management perspective (Coggins et al., 2007). Therefore, actions taken by anglers to reduce mortality and sublethal impacts could be seen as legally mandated under the "fish should not be wasted" concept. A fish that is "wasted" is unable to provide ecological functions or serve as a future food source for people (recreational anglers or subsistence fishers). Moreover, there can be significant economic cost to C&R mortality if anglers decide to forgo fishing at a given site or if the choice is made to supplement fish populations via stocking. There is growing evidence that recreational fishing supports nutritional security (particularly in rural areas and for food-insecure people; Cooke et al., 2018; Embke et al., 2022; Nyboer et al., 2022) so needlessly wasting fish is unforgivable on a biological and human welfare level. Given that more people are supporting animal rights in some countries (Arlinghaus & Schwab, 2011) and these people might see C&R particularly negatively (Riepe et al., 2014a, 2014b), it is problematic if the fishing sector is associated by the public with unnecessary "waste" (i.e., a lack of concern or appreciation for the individual) as this fosters negative attitudes towards recreational fishing (Riepe & Arlinghaus, 2014a, 2014b). We acknowledge that in fisheries with harvest regulations in place, mandatory release of fish may in fact contribute to wastage if there is C&R mortality, but also in these conditions minimizing impacts on the individual can lead to less issues.

In support of a conservation ethic

Conservation ethics in recreational fishing emerged from early writers, practitioners, and scholars. For example, Zane Grey and Izaak Walton were both avid anglers and authors who wrote extensively about the role of anglers in conservation and the importance of them embracing a conservation ethic (see Elder, 2018; Swann, 2023). Later, Aldo Leopold introduced the Land Ethic (reviewed in Norton, 1988) although it has equal relevance to the aquatic realm (Cooke et al., 2021). The origin of C&R has its roots in fish conservation because regulations that limited harvest (Arlinghaus et al., 2007) increased the fraction of fish that had to be released. Engaging in C&R independent of regulations has emerged more recently as a personal ethic of some anglers and their communities, particularly within specialized fisheries such as Salmonids, black bass *Micropterus* spp., Striped Bass *Morone saxatilis*, bonefish *Albula* spp., and Muskellunge *Esox masquinongy*. Organizations such as Trout Unlimited embrace the idea of a conservation ethic through C&R or selective harvest and tried to instill that way of thinking within their members and the broader angling community. Anglers and other outdoor enthusiasts have the potential to encourage people to engage in stewardship and develop their own conservation ethic (McMullin et al., 2007; Shephard et al., 2023; Van Riper et al., 2023). Catch-and-release represents a real-world application of a conservation ethic that anglers can embrace that not only benefits individual fish (see Figure 2) but, when being done by multitudes of anglers, affects the population (Arlinghaus et al., 2010b). A true conservation ethic should be broadly applied (e.g., target and nontarget species) rather than in a selective way (e.g., only for populations where fishing mortality is problematic or for species that anglers want to exploit through C&R, such as black bass tournaments).

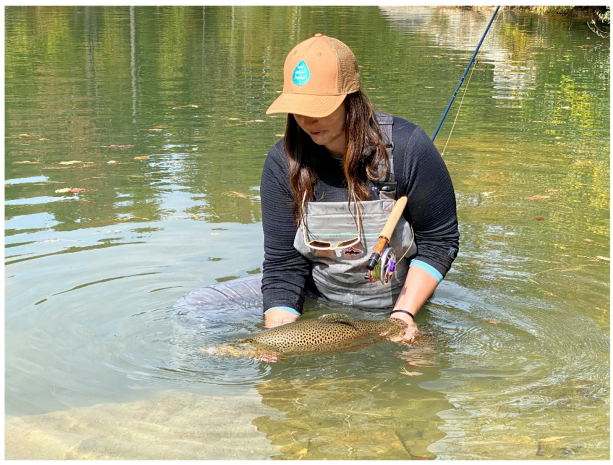

Figure 2. Catch-and-release fishing provides opportunities for anglers to make connections between their behavior and outcomes for angled fish while appreciating nature and being environmental stewards. Photo credit: A. Danylchuk.

Because of religious, cultural, and spiritual connections to fish

Fish mean different things to different people. In many cultures, religions, and regions, fish have special significance and intrinsic value that extends beyond food. For example, the Golden Mahseer *Tor putitora* from Southeast Asia is a prized fish for recreational angling, yet is also of spiritual importance in both Hinduism, where it is regarded as an incarnation of the god Vishnu (Gupta et al., 2016), and in Buddhism, where it is one of the eight auspicious symbols (Everard et al., 2019). However, C&R fisheries for mahseer are allowed, though anglers are expected to treat fish in a manner that reduces injury, stress, and mortality. These are examples where the religious, cultural, moral, and spiritual values demand efforts to ensure that the welfare status of each individual fish is maintained independent of whether there is any mortality or population-level impacts. In contrast, in many Indigenous cultures in the eastern Pacific fish are considered to be "relations" (Todd, 2018) and so some Indigenous communities consider C&R tantamount to playing with one's sacred food (Nguyen et al., 2016). Similarly, in some European countries, C&R is seen as unnecessary cruelty and "playing with food" (Aas et al., 2002); other beliefs consider C&R unnecessary "torture." Here, the moral intention of the angler performing C&R determines whether the release event is seen as acceptable or not (Ferter et al., 2020), and anglers will face high social pressure to ensure that fish that are released are handled respectfully, which

may be the morally acceptable way forward (Evans, 2005) from a position of personal ethics (doing the right thing) and to support peoples' meaningful connections to fish.

Because anglers are social creatures

The perspective that only population impacts matter suggests the only truly meaningful way anglers can contribute to fisheries is by complying with regulations that are intended to keep populations sustainable. Regulatory-centric approaches often fail to fully account for angler behavior and decision making, not only in terms of anglers' direct effect on individual fish outcomes (as many aspects of angler decisions during the C&R process are not regulated), but also how their actions extend to and influence the broader angling community through social norms. Humans are social creatures, and decades of research across various domains demonstrates that people use direct and indirect cues from others to recognize what is important and what constitutes context-appropriate behavior (Nyborg, 2018; Ostrom, 2000). The development and maintenance of social norms, or shared systems of beliefs, has the potential to create widespread and rapid shifts in attitudes and practice (Cialdini, 2009; Constantino et al., 2022). Indeed, it is not enough to simply regulate anglers; they must see and understand how other anglers behave and so learn what is deemed good or a positive behavior (e.g., Cialdini et al., 1990; Constantino et al., 2022). Organizational values and cultures (e.g., of wildlife agencies) are also important in this context because anglers may assume those in management positions or are influencers know best and so may live by example of what they teach. With the emergence of science-based best practices (Brownscombe et al., 2017), anglers (and managers) have the opportunity to adopt and perpetuate new norms in the angling community, with anglers driving bottom-up change that maximizes the efficacy and conservation value of C&R as a management tool (Nyborg et al., 2016). Importantly, social science work suggests that anglers are willing to adopt best practices and are committed to reinforcing those practices among others (e.g., Chapman et al., 2018; Guckian et al., 2018). New norms, behaviors, and beliefs can also arise from and be supported by educational campaigns or communications made by institutional players and relevant actors (though poor information also spreads this way). This reinforces the need for consistent messaging that orients the broader angling community to the influence of angler behavior and decision making on the viability and sustainability of recreational fisheries, even when the motivations of anglers are diverse (e.g., where harvest, regulation-based C&R, and voluntary C&R are practiced). Here, it is obvious that a focus on treating each fish to be released well matters because it is the individual fish with whom each angler has the most direct contact, not the aggregate of all individuals within the population. Of course, it is not possible to modify angler behavior (whether by social norms or education) to eliminate all mortality or sublethal impacts on fish—it will always be about minimizing them.

Because it reinforces angler commitments as responsible stewards

Just as engaging in science-based best practices is important for the fitness of individual fish and shaping shared beliefs of what constitutes appropriate angling behavior, it also reinforces our own commitments to fish and fisheries. That commitment starts, as mentioned above, with an individual fish, but here we want to make the point that not only norms matter, but ultimately the stewardship that emerges from it. In cultures where C&R fishing is regarded as a good stewardship practice, the commitment to conserving nature starts with a "fish friendly" release event. Such an approach with a focus on the individual interaction between an angler and a fish enables anglers to see themselves as responsible participants, stewards, and conservationists of fish and fisheries. That is, the influence of our own behaviors reinforces personal norms, values, and identities that can transcend specific actions and situations (Maki et al., 2019; Truelove et al., 2014). Even the most adamant supporters of systems change (e.g., habitat restoration and associated policy) would likely take steps to limit their direct impact on the biological fitness of an individual fish during a C&R event, and thereby limit one's own impacts on shared resources and populations. Such behavior is fully compatible and consistent with larger social movements that many societies are experiencing (e.g., inclusion and diversity, climate adaptation, responsible energy use). Minimising individual impacts, through proper and responsible C&R of each fish, is a logical step in the same direction. The collective actions of people and communities, particularly when people share similar beliefs, have the potential to drive meaningful socioecological outcomes and push both industry and policy forward through new stewardship norms (Arlinghaus et al., 2010a; Danylchuk et al., 2018; Shephard et al., 2023). Norms for pro-environmental behavior related to fisheries resources thus emerge, directly and intimately, from the conservation of each individual fish that is the possible future spawner in a local fishery.

To maintain the social license to fish and engage in C&R

Recreational fishing, particularly when done from a C&R perspective, requires some level of social license, which is a product of political and public acceptance (Cullen-Knox et al., 2017). The social license can be eroded as societies become more urbanized. Surveys indicate there is a strong positive association between the proportion of people who live in urban areas in a given region and their agreement with the statement that fishing for fun is cruel (see Arlinghaus et al., 2012). Given trends of further population increases in urban centres, there will be growing pressure to demonstrate that anglers are catching and releasing fish with care and according to science-based best practices (Riepe & Arlinghaus, 2014a, 2014b). Fostering participation and maintaining public acceptance of fishing including C&R is critically important for conservation because, in many places, anglers purchase of fishing licenses partly or fully funds government programming and staffing (e.g., monitoring and assessment, research, stocking, enforcement) to support recreational fisheries science and management. As anglers may choose to quit fishing if the social environment is hostile, efforts to maintain the public acceptance to fish by ensuring best practices are shared and embraced supports their overall mission. Without C&R as a management or conservation tool, much would be lost. Efforts to address welfare issues head on rather than being purely reactive has much merit as

Figure 3. Future proofing recreational fishing (in the context of climate change) may require refinements in angler behavior to reduce handling stress (e.g., by minimizing air exposure). Organizations like Keep Fish Wet work with anglers and industry partners to develop and share science-based best practices with a focus on individual fish with the recognition that such stewardship actions will aggregate across many angler interactions and benefit fish populations and fisheries. Photo credit: Dave McCoy, Emerald Water Anglers.

it helps maintain fishing as a socially accepted activity in a changing world where public values on how to interact with wildlife and animals change.

So that we can future-proof recreational fishing in times of change

Climate change and other compounded stressors (e.g., land-use change, increases in disease) means it is necessary to contemplate future-proof recreational fishing, including C&R (Elmer et al., 2017; Jones et al., 2013; Townhill et al., 2019). It is well known that warmer water temperatures (the word warm is a relative term and varies among populations and species) increase physiological demands on most fish during and after exercise and exercise (angling duration) is a stressor associated with C&R (reviewed in Cooke & Suski, 2005; Gale et al., 2013). As such, all efforts to improve angler behavior as it relates to fish care will likely pay dividends in creating resilient fisheries now and into the future. Already, there are a growing number of C&R closures during warm periods (reviewed in Jeanson et al., 2021) and even without mandated closures, anglers can choose when (water temperature) and how (fight duration, level of handling) to practice C&R, which could be especially important for certain sensitive species (e.g., some salmonids; Figure 3). A global analysis of the climate threats facing popular recreational fish species revealed mismatches between regions where game fish will face the most extreme climate stressors and established conservation actions (e.g., existence of recreational fishing regulations) emphasizing the need for bottom–up action, including changes in angler behavior (Nyboer et al., 2021). Changing social norms and angler behavior takes time (Figure 4); thus, efforts to future-proof recreational C&R fishing should start now by improving interactions with individual fish to ensure that populations are sufficiently robust and the sector is resilient to climate change.

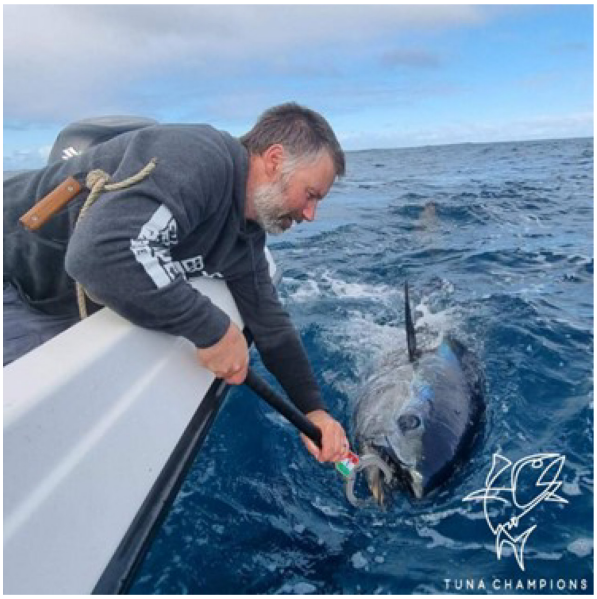

Figure 4. Changing social norms for catch-and-release practices can take time and can be enabled through creative education and marketing initiatives. The Tuna Champions program out of Australia represents an example of such an organization working with the angling community to share best practices such as the use of gripping devices such as the one pictured in the photo thus eliminating the need to bring the fish on board. Photo credit: Andy Smith, Ebbtide Tackle, Australia.

CONCLUSIONS

If only populations of fish and their status matter to management, then C&R impacts on the individual fish only become relevant if population-level impacts emerge. When C&R sublethal effects or mortality rates are low or recreational fishing in general is a minor component of the overall mortality of a population, C&R impacts might not be severe enough to be of relevance to (population-level) metrics considered by managers (e.g., fish size, abundance). Yet, as we have shown above, there are many other reasons why a focus on the individual fish is relevant, for example, for evolutionary reasons (conserving individuals that are reactive to fishing gear, important spawners, those with extreme traits), for ethical reasons, and because each C&R event has educational value to improve or signal stewardship. Importantly, while C&R impacts on individual fish may not always be relevant from a population sustainability perspective they are clearly always important from an ethical framework of responsible recreational fishing (Arlinghaus et al., 2010a; FAO, 2012). A C&R event is, by design, always harmful to the individual fish to some degree, even if it is not lethal and sublethal impacts (e.g., injury, stress) are reversible. Because the individual catch event is the most direct and obvious interaction of an angler with the aquatic environment, responsible fishing demands one to take due care of the individual fish, be it harvested or released, and to do so being respectful of the specific social norms present in a given cultural environment. Catch-and-release may by itself be seen as good conservation practice (e.g., in many areas of North America), a sign of respect for the individual fish (Evans, 2005), or as critical

in harvest-oriented fisheries where it becomes particularly important that each fish that is released is treated carefully. Being aware of the individual fish and its well-being is what ultimately contributes to individual-level stewardship through personal action (Shephard et al., 2023), thereby contributing to conservation or fish friendly norms, showing that one cares about the animal that one harms via angling. We acknowledge that even with best intentions, there may be situations where despite best efforts (e.g., use of science-based best fishing practices), that mortality may still be high, such as for fish with severe barotrauma living in predator-rich ecosystems. Nonetheless, focusing on an individual fish enforces the salient role that anglers as a whole play as part of a responsible community even if imperfect; this defines their contribution to the sustainability of the natural populations that they value. Importantly, C&R may also interfere with local customs, e.g., when fishing just for fun is not acceptable as is the case in some culture (Aas et al., 2002). But if releasing fish is part of local fisheries regulations, it is then particularly important that the welfare of each fish is respected and that no game fish is "wasted." Thus, neither managers nor anglers have anything to lose from considering impacts of C&R on each individual fish, whether the aggregated impacts of C&R have population level impacts or not. Recreational fisheries need to be both responsible and sustainable (Cooke et al., 2019), which requires considering impacts on both individuals (as per our perspective presented here) and on the population (as per the pespective presented in Corsi et al., 2025).

DATA AVAILABILITY

This is a perspective paper so no data are available.

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CONFLICTS OF INTEREST

S. J. C. is Editor-in-Chief of Fisheries but was not involved in handling this manuscript. Several members of the author team are involved with the U.S. 501(c)(3) nonprofit Keep Fish Wet (S. J. C. is Board Chair, S. C. D. is Executive Director, A. J. D. is Scientific Advisor, and S. R. T. and M. L. G. are board members and R.A. is Ambassador). Moreover, S. R. T. is involved in the leadership of Australian-based Tuna Champions. Both Keep Fish Wet and Tuna Champions are science-based social movements focused on providing anglers with information on responsible fishing practices.

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