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Essay

Points of consensus on catch-and-release: Considerations for science, ethics, and fisheries management

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THE NEED FOR CONSENSUS

Catch-and-release (C&R), whether via regulations or voluntary actions, is typically employed with the intent of reducing fishing mortality while maintaining recreational angling opportunities (Isermann & Paukert, 2010), but there has been significant discourse about the relative importance of individual-level (see Cooke et al., 2025) vs. population-level (see Corsi et al., 2025) effects of C&R. We hope to offer the angling, scientific, and management communities some points of consensus from which this multifaceted dialogue on C&R can productively build. We preface this by noting that our collective views were informed by this process and the opportunity to share and learn from each other. What is apparent from this exercise is the value of embracing a holistic, cooperative approach.

From a regulatory perspective, C&R is typically implemented in high-effort fisheries that are popular due to the quality of the fishing. Catch-and-release regulations are also applied in fisheries where populations have declined and fishing mortality is thought or, most appropriately, known to be a limiting factor for the population. When practiced voluntarily, anglers engaging in C&R can be characterized by high avidity and specialization, and angling is often a central component of their identity (e.g., Fisher, 1997). Due to their passion, avid anglers tend to spotlight the ethical, scientific, and regulatory considerations of C&R. As such, there is a need in fisheries management and science to understand in what situations these considerations transcend biological scales and how to navigate the gamut of voluntary actions and regulatory mandates. In this essay, we offer a distillation of the emergent consensus concepts that we hope managers and researchers will consider at both individual and population scales for legal, ethical, and scientific deliberations.

THE GOLDEN RULE: TREAT FISH AND OTHER ANGLERS WITH RESPECT

Fishing, like hunting, is a utilitarian, consumptive activity where outcomes span a spectrum that includes escape, injury, stress, and mortality of fish regardless of whether angler intent includes C&R, harvest, or some combination (Arlinghaus et al., 2021). Many of the principles that fish and wildlife management agencies promote for ethical hunting practices can and should apply to fishing. Practices that reduce the stress of fish during harvest or release are good for individual fish (which is increasingly important in some jurisdictions, where limits have been placed on C&R primarily for ethical reasons) and portray anglers as responsible ambassadors for the sport. Best practices, including pursuing fish with appropriate legal gear, careful and respectful handling, and ethical care of meat, serve to project a positive image to anglers and nonanglers alike.

Treating other anglers with respect is also critical to the continuation of fishing as a healthy and viable outdoor endeavor. Sharing information with anglers about best handling practices benefits fish and fishing by cultivating norms for responsible angling. Unfortunately, some individual anglers, clubs, and media outlets have resorted to public shaming to relay these messages. Instead, we hope that anglers and fishery management professionals can extend a helping hand, model best practices, provide novice anglers with helpful resources in formats that are accessible, understandable, and effective, and offer grace when an angler acts outside the ethical and social norms of a fishery. Afterall, social concerns (e.g., sanctioning, angler alienation, declining relevance, reduced resources for conservation) may be a greater threat to the future of angling than concerns associated with recreational fishing mortality.

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INDIVIDUAL FISH MATTER

Evolution is a function of fitness, which is measured at the scale of individual fish. Evolutionary dynamics have important implications for both fish populations and for fishing. Individual fitness shared across abundant individuals in a population maximizes the long-term viability of populations through genetic diversity, which maximizes the evolutionary potential of fish populations to adapt to dynamic environments, novel interactions, and changing climate conditions. The best fisheries are typically comprised of fish that are fast growing, aggressive, and ultimately catchable. Those traits, in situations where they are both heritable and driven more by genetics than environment, are theoretically protected by regulations or individual anglers maximizing the survival (and fitness) of individual fish (Sutter et al., 2012).

Individual fish also matter since this is the biological level at which anglers interact with the recreational fishery. Where fishing mortality is limiting to a population, it is the collective benefits of individual C&R events amplified at the scale of an entire fishery that improve sustainability. In these instances, science-based best practices (e.g., minimizing air exposure, contact with dry surfaces, handling time) operate at the level of the individual fish by reducing lethal and sublethal effects, which can have potential benefits that scale up to the entire fishery.

FISH POPULATIONS MATTER

In most cases, whether a fish lives or dies matters to the fish, the person who caught the fish, the other anglers that might have interacted with it, and in some cases, broader society, but generally not to the sustainability of the population or the species. Whether a fishing opportunity is sustainable must be considered at a population scale. It is fair to say that there is some confusion about this within the C&R angling sphere, largely because it is easy to make the logical conclusion that the population whole is simply the sum of individual C&R survival parts. However, the realities of population ecology are far more complicated; a myriad of compensating mechanisms and environmental variables make population consequences of C&R difficult to understand at an individual scale (Kerns et al., 2012). Fortunately, these complexities (e.g., reduction of negative density-dependent effects) are also what make many recreational fisheries sustainable, despite inevitable fishing mortality.

The ultimate intent of any restrictive regulations, such as C&R, is to alter population characteristics such as abundance or size structure in a manner desired by public trust beneficiaries (i.e., anglers), and effective management implementation (and objective evaluation) requires a comprehensive understanding of fish population dynamics. Unfortunately, many anglers, managers, and scientists either have an incomplete understanding or make too many assumptions about the nature of fishing mortality and its influence on population dynamics. In our observation, these assumptions are often used as a red herring for gear-specific user groups to argue for exclusivity in fisheries (e.g., Schill & Scarpella, 1997). Regardless of intent, conservation arguments based on incomplete understanding of fishing mortality are not a valid reason for regulation changes.

CONCLUSION

Returning to the Golden Rule (i.e., treat fish and other anglers with respect), an important way scientists and public trust managers can ensure they are fulfilling their professional role is to be crystal clear about the biological scale and scope of either fishing best practices or regulations. Ethical handling practices generally involve improving the capture experience for individual fish, individual anglers, and those individuals who observe the capture event. Empirically scaling the individual effects of C&R up to a population scale can be challenging, but it is an imperative endeavor so that trustees and trust beneficiaries may be properly informed as to whether a concern is at an individual (fishing ethics) or population (fishing regulations) scale. Fishing regulations are best implemented when they improve the abundance, size structure, or viability of a population. Fishing mortality due to C&R (F_{cr}) or sublethal impacts on reproduction can have population-level or evolutionary effects in some situations, but these effects cannot be assumed nor taken for granted. Prioritizing certain types of fisheries for these challenging population scale evaluations is important, particularly for long-lived fishes (e.g., White Sturgeon *Acipenser transmontanus*, rockfishes *Sebastes* spp.) and threatened or endangered fishes—especially those subject to multiple capture events at key life stages (e.g., steelhead *Oncorhynchus mykiss*). While ultimately complicated, quantifying basic population rate functions (i.e., growth, recruitment, mortality) will be most insightful and help inform whether a restrictive regulation will improve population characteristics. When justified, estimating F_{cr} by evaluating fishery-specific angler effort, catch, and harvest, along with the rates at which individual fish die following C&R, is especially important. Science-based best practices are good for fish, good for anglers, and help ensure recreational fishing remains ethically sustainable. These best practices can be promoted through education and outreach using positive messaging. Science-based population management is the proper tool to ensure that recreational fishing is biologically sustainable. That management is best implemented with population-relevant regulations supported by responsible anglers (e.g., compliance with regulations, adoption of responsible fishing practices). Fisheries managers have a professional responsibility for managing and conserving fishery resources but cannot do it alone. Anglers serve as important stewards given their direct interaction with fish as well as with the regulations intended to conserve fish populations. Embracing a holistic, science-based approach to C&R will help to ensure that recreational fisheries are sustainable and responsible.

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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 US 501(c)(3) nonprofit Keep Fish Wet (S. J. C. is Board Chair, A. J. D. is Scientific Advisor, and M. L. G. is a board member).

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REFERENCES

Arlinghaus, R., Aas, Ø, Alós, J., Arismendi, I., Bower, S., Carle, S., Czarkowski, T., Freire, K. M., Hu, J., Hunt, L. M., Lyach, R., Kapusta, A., Salmi, P., Schwab, A., Tsuboi, J.-I., Trella, M., McPhee, D., Potts, W., Wołos, A., & Yang, Z.-J. (2021). Global participation in and public attitudes toward recreational fishing: International perspectives and developments. *Reviews in Fisheries Science & Aquaculture*, *29*, 58–95. https://doi.org/10.1080/23308249.2020.1782340

Cooke, S. J., Danylchuk, S. C., Tracey, S. R., Arlinghaus, R., Brownscombe, J. W., Weir, A., Hinch, S. G., Patterson, D. A., Guckian, M. L., & Danylchuk, A. J. (2025). Individual outcomes matter in the context of responsible and sustainable catch-and-release practices in recreational fisheries and their management. *Fisheries*, *50*, 172–181. https://doi.org/10.1093/fshmag/vuae023

Corsi, M. P., Quist, M. C., Kozfkay, J. R., Roth, C. J., & Schill, D. J. (2025). Why the whole is greater than the sum of its parts: A case for population-level management. *Fisheries*, *50*, 164–171. https://doi.org/10.1093/fishmag/vuae022

Fisher, M. R. (1997). Segmentation of the angler population by catch preference, participation, and experience: A management-oriented application of recreation specialization. *North American Journal of Fisheries Management*, *17*, 1–10. https://doi.org/10.1577/1548-8675(1997)017%3C0001:SOTAPB%3E2.3.CO;2

Isermann, D. A., & Paukert, C. P. (2010). Regulating harvest. In W. A. Hubert, & M. C. Quist (Eds.), *Inland fisheries management in North America* (3rd edition, pp. 185–212). American Fisheries Society.

Kerns, J. A., Allen, M. S., & Harris, J. E. (2012). Importance of assessing population-level impact of catch-and-release mortality. *Fisheries*, *37*, 502–503. https://doi.org/10.1080/03632415.2012.731878

Schill, D. J., & Scarpella, R. L. (1997). Barbed hook restrictions in catch-and-release trout fisheries: A social issue. *North American Journal of Fisheries Management*, *17*, 873–881. https://doi.org/10.1577/1548-8675(1997)017%3C0873:BHRICA%3E2.3.CO;2

Sutter, D. A., Suski, C. D., Philipp, D. P., Klefoth, T., Wahl, D. H., Kersten, P., Cooke, S. J., & Arlinghaus, R. (2012). Recreational fishing selectively captures individuals with the highest fitness potential. *Proceedings of the National Academy of Sciences of the United States of America*, *109*, 20960–20965. https://doi.org/10.1073/pnas.1212536109