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Maxims for responsible and sustainable black bass management and conservation

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Abstract

Black bass *Micropterus* spp. populations, fisheries, and their management are at a crossroads, creating an opportune time to consider their current state and identify opportunities for working collectively towards a better future. Here I present six maxims (identified from my experiences and familiarity with the literature) for the responsible and sustainable management and conservation of black bass intended to benefit fish and people. Maxims are short statements expressing a general truth or fundamentally held principle and are also logically complemented by considering their implications (in the form of needs). The maxims identified are as follows: (1) Black bass have diverse socioeconomic and cultural value, (2) habitat is the foundation for healthy and productive black bass populations and fisheries, (3) black bass are sometimes good for biodiversity but are not always good for biodiversity, (4) the black bass management toolbox is antiquated, (5) black bass recreational fishing requires two licenses—one for fishing and a social license, and (6) black bass and bass fishing are for everyone. Implications of these maxims are wide-ranging, but all demand action to ensure that black bass are valued, that their habitat and populations are managed using robust evidence-informed practices, that their contribution to biodiversity is understood, that the social license for bass fishing and their management is maintained, and that black bass are managed for the benefit of all.

Keywords: black bass, management, recreational fishing, sustainability

Lay summary

Here I present six maxims for black bass management and conservation: (1) Black bass have diverse socioeconomic and cultural value, (2) habitat is the foundation for healthy and productive black bass populations and fisheries, (3) black bass are sometimes good for biodiversity but are not always good for biodiversity, (4) the black bass management toolbox is antiquated, (5) black bass recreational fishing requires two licences—one for fishing and a social licence, and (6) black bass and bass fishing are for everyone.

Introduction

Black bass *Micropterus* spp. were immortalized in the late 1800s by Dr. James Henshall in his classic tome on this enigmatic group of fishes (Henshall, 1881). He assembled information on the ecology, biology, and systematics of black bass that had been collected by early natural historians, explorers, and systematists. Today, Henshall's book remains a popular read by anglers and researchers despite its acknowledgement of only two species (today we are at 19; Taylor et al., 2019). Over time, black bass were sufficiently exploited (by

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recreational and small-scale commercial fishers) that early resource managers began to engage in active management of black bass populations and their fisheries (reviewed in Long et al., 2015). Issues of the *Transactions of the American Fisheries Society* published in the 1930s included spirited discussions and case studies where various harvest and effort controls had been applied to black bass fisheries (Denmead, 1931, 1934; Osburn, 1933). Simultaneously, much effort was invested in the culture of black bass to support natural populations and to enable their stocking in new waters outside their natural range (Lydell, 1925; Stranahan, 1903; reviewed in Tidwell & Nickum, 2019).

By the 1970s, it was apparent that there was need to assemble experts in black bass science and management to exchange knowledge, so the Sport Fishing Institute organized and hosted a meeting in Tulsa, Oklahoma, in 1975. That effort yielded a proceedings book that served as the essential resource for bass management for more than two decades (Stroud & Clepper, 1975). Recognizing that black bass science and management had continued to evolve, a second symposium organized in conjunction with the American Fisheries Society was held in 2000 in St. Louis, Missouri, which culminated in a book highlighting some of the important black bass research of the time (Philipp & Ridgway, 2002). Since then, there have been several other relevant books published, including an overview of the biology and management of centrarchid fishes (*Micropterus* is a genus in the family Centrarchidae; Cooke & Philipp, 2009) and the proceedings of a symposium on the evolutionary biology, diversity, and conservation of black bass (Tringali et al., 2015; note that the 1975 and 2000 conferences focused primarily on the most common recreationally targeted species—Smallmouth Bass *M. dolomieu*, Largemouth Bass *M. nigricans*, and Florida Bass *M. salmoides*). In 2025, a black bass symposium was held at the American Fisheries Society annual meeting in San Antonio, Texas, to further advance the science and knowledge of all current black bass species. In addition to the sharing of important and relevant research, it was of particular note that the symposium aimed to be forward-looking in terms of considering what was needed to ensure that black bass management and conservation change in ways that will ensure the sustainable future of black bass in their native range.

Although there has been a move away from single-species fisheries management in favor of an ecosystem approach (e.g., Steffansson et al., 2019), the reality is that immense challenges remain with realizing that modality, particularly in inland waters (Beard et al., 2011). Often times, waters where black bass are the primary form of game fish are managed primarily to support the production and maintenance of high quality bass fisheries (in some cases, trophy fisheries) rather than to achieve broader fisheries management objectives (Noble, 2002). That is shared as an observation rather than a criticism, as in many ways it justifies the fact that black bass continue to be the focus of bespoke management efforts and that bass are the focal point for such a symposium. Yet, black bass management is also at a crossroads, as there is increased recognition that there are other valuable members of fish communities and that not all black bass populations should be managed to “make anglers happy.” Indeed, in some regions (e.g., the southeast) the black bass fisheries manager

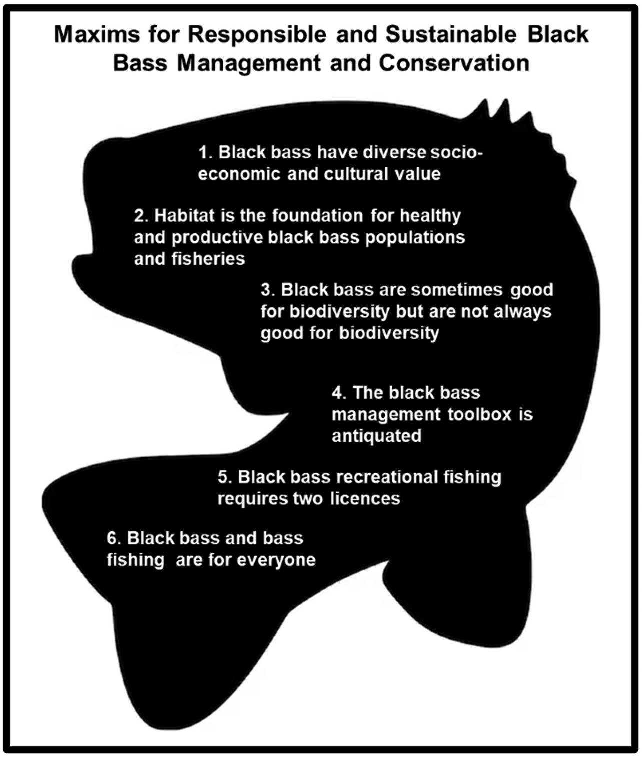

Figure 1 Maxims for responsible and sustainable black bass management and conservation.

of yesterday is now focused on conservation of some of the lesser-known black bass species given their important role in ecosystem function (Tringali et al., 2015), rather than just the two or three species of immense socioeconomic value. There is also recognition that black bass rarely have benefits to native fish populations or freshwater ecosystems when they are introduced outside of their native range (Seguy & Long, 2021). Perhaps it is indeed time to rethink how black bass populations are managed through a more holistic lens that considers the diverse community of resource users and stewards.

To that end, the objective of this paper is to identify maxims for the responsible and sustainable management of black bass populations and fisheries (Figure 1). A maxim (noun) is a short, pithy statement expressing a general truth or fundamentally held principle. For example, maxims include that we will all die and that the sun will set but also include more abstract statements such as “it’s better to be safe than sorry.” In a paper on the biology of winter in cold climate regions, the authors identified maxims for winter, including that winter was cold, dark, and frozen (Studd et al., 2021), which, although superficially obvious, had never been aggregated or critically discussed. Moreover, when one assembles and identifies maxims, it can also be productive to consider the implications of those maxims. To that end, the second objective of this paper is to summarize the implications of those maxims for the community of actors that care about black bass, with each one presented as a bulleted “need” with some detail regarding the why and how. I would like to state that I am not an orator or fisheries manager, so what is presented here is provided in the spirit of sharing ideas and guidance with the many individuals and organizations that work with or for black bass on a daily basis. It is worth noting that the title of the paper is explicit about both the *responsible* AND *sustainable* management of black bass populations and fisheries. That verbiage reflects that of the Food and Agricultural Organization of the United Nations (see https://www.fao.org/responsible-fishing/en/) and recognizes that sustainability (an oft-cited goal of fisheries managers) is predicated on responsible use of resources by individuals and organizations, as well as the embrace of responsible management practices (see Cooke et al., 2019 for discussion). In other words, sustainable black bass populations and fisheries depend on the collective action of many and do not rely solely on the fisheries manager.

This paper is based on a plenary presentation I delivered at the Black Bass 2025 meeting in San Antonio, Texas. This is a perspective article based on *my* perspective yet supported by relevant examples and references. I acknowledge that my training, lived experiences, values, and collective positionality inform that perspective. I am an avid black bass angler and a scholar-practitioner with diverse interests and expertise spanning the natural and social sciences. I am particularly active in recreational fisheries science and in efforts to conserve and manage freshwater biodiversity for the benefit of nature and people. Given that this paper purports to identify maxims (as defined above), it is worth noting that although there are certainly diverse perspectives within our community regarding black bass fisheries, black bass populations, and their management, I am convinced that the maxims themselves will be widely embraced. However, where I consider the implications of those maxims, I submit that my perspective is more likely to have the potential to be misaligned with some individuals on some specific points. I also acknowledge that biology and coupled social-ecological systems are complex, and I am routinely humbled by how much we (and I!) do not know about black bass or the perspectives, motivations, and actions of various actor groups. Exceptions abound and are the norm.

The Maxims

Black bass have diverse socioeconomic and cultural value

When one thinks of black bass and their socioeconomic and cultural values, the first thing that comes to mind is the lucrative recreational fishery and the associated industry. From tackle and fishing gear to fuel-hungry bass boats with specialized electronics to fishing guides and tourist operators (including resorts), black bass fishing is big business and is particularly important in relatively rural communities. According to the American Sportfishing Association (see Southwick & Associates, 2020), black bass fishing generates more than 112,000 jobs in the United States and US$6.9 billion in black bass fishing tackle sales. When aggregated, the black bass fishery in the United States is valued at tens of billions of dollars per year. Black bass tournaments, which emerged initially in the 1960s as catch-and-kill events, transitioned to live release events in the early 1970s, and the current number of events held annually in North America exceeds 100,000 (Driscoll et al., 2012; Schramm et al., 1991). Although the vast majority of those are small club tournaments, there are also several prominent large-scale professional bass tours (e.g., B.A.S.S., Major League Fishing) that are often televised or live-streamed with live weigh-in events (for tournaments that use that format) as entertainment spectacles often held in stadiums with fireworks and music performers (e.g., Bassmaster Classic). The winners of larger tournaments can walk away with hundreds of thousands of dollars in cash but even more in terms of sponsorships. Bass Pro Shops, which was founded by black bass luminary Johnny Morris, is perhaps the quintessential example of what black bass fishing represents in terms of economic impact along with cultural significance. Other examples that highlight the value, prominence, and cultural significance of recreational black bass fishing include dedicated boats specific to bass fishing (i.e., bass boats), bass fishing professional Denny Brauer being celebrated on a Wheaties box in 1990 (just like Wayne Gretzky and Michael Jordan), Eufaula (Alabama) declaring itself (codified with a large statue) as the black bass fishing capital of the world, the much heralded Black Bass Fishing Hall of Fame, and the many black bass fishing magazines, podcasts, and TV shows. Even the hatcheries (government and private) that support bass management in some regions, as well as private lake and pond management companies, employ thousands of people and generate wealth for regional economies.

When one looks back in time (e.g., early 1900s—but extending to the 1960s), there are many historical photos documenting large stringers of black bass being harvested. Today, black bass are often thought of as being primarily targeted by catch-and-release recreational anglers (including those participating in competitive angling events). Indeed, release rates for black bass are among the highest of any freshwater game fish (Brownscombe et al., 2014). Yet, black bass are also good sources of tasty and nutritious food (assuming adequate water quality and no health advisories that typically occur in areas with industrial legacies) for a diverse array of groups and are regarded as important sources of food, just like they were in the early 1900s. Of particular note is the fact that black bass can be captured with relative ease such that they can also be a local food source for low-income, food-insecure peoples. It is unclear the extent to which black bass play a key role in provisioning and subsistence fisheries (Nguyen et al., 2025), but they are a popular food source in Wisconsin (Embke et al., 2020) and presumably other locales in North America.

Although not typically the primary target of commercial fisheries, black bass have been commercially harvested in North America going back to the 1900s, although such fisheries are uncommon today (I could not locate evidence of a current legal commercial black bass fishery). Historically, Indigenous peoples of North America have also harvested black bass. There are faunal remains indicating that the Onondaga Iroquois harvested Smallmouth Bass (Tuck, 1971), with other oral accounts of black bass being consumed by Indigenous peoples across much of the northeast (see Zhang, Philipp, et al., 2026) as well as by the Seminole tribes in Florida. Cultural traditions or particular spiritual connections and customs do not appear to include black bass specifically, and even in areas where black bass are common, Indigenous peoples tend to rely on other freshwater fish for consumption (e.g., Walleye *Sander vitreus*, Northern Pike *Esox lucius*, White Sucker *Catostomus commersonii*). However, anthropological reports and harvest studies are lacking such that the role of black bass in Indigenous communities may be understated.

Black bass are also cultured for food, with a particular emphasis on serving Asian communities. In North America, pond-raised black bass are harvested and sold (often as "green bass") typically as part of the live-fish market. However, the most lucrative and by far the largest production of black bass is in culture facilities in China (Bai & Li, 2018; Zhou & Liu, 2019). Black bass (especially Largemouth Bass) production exceeded 800,000 metric tons in China in 2022 (Yufan and Wong, 2024). Despite a growing demand for cultured fish, such as Largemouth Bass, there are some challenges with development of large-scale culture, including disease and variable demand, but extensive research and development are underway with culture still in its infancy (Hussein et al., 2020; Wang et al., 2024).

Implications

- *Need to capitalize on the strong political narrative for managing and conserving black bass populations with relevant investments for today and the future*. The fact that black bass have such immense socioeconomic and cultural value creates a strong political narrative for proper investments in the sustainable management of black bass populations and fisheries. This includes efforts to recruit, retain, and/or reactivate black bass anglers.
- *Need to acknowledge the diversity of benefits derived by different peoples*. In short, black bass have diverse value that extends well beyond catch-and-release bass fishing and associated tournaments. Recognizing those values and creating space for those values to be reflected in management would be desirable.
- *Need to better quantify their value*. Although some elements of the "value" of black bass are well characterized, more work is needed, especially in the context of food in low-income communities and food and cultural values in Indigenous communities.
- *Need to conserve native black bass diversity in the face of current and emerging threats*. This is an explicit recognition that black bass—especially the less-known species—have value and that they need to be managed as such (Taylor et al., 2019; Tringali et al., 2015).
- *Need to acknowledge that good black bass management does not just benefit black bass; it benefits people*. Efforts to support the protection, maintenance, or restoration of black bass populations is not just good for black bass, but it also supports people in diverse ways (as outlined above). This further strengthens the value proposition of any investments in black bass management or conservation, even if those efforts are primarily related to protecting black bass biodiversity.

Habitat is the foundation for healthy and productive black bass populations and fisheries

Habitat includes the physical, chemical, and biotic elements of a given environment and is often considered in terms of its quality (ability to sustain life and allow fishes to complete their life functions) and quantity (how much habitat is available for fishes). For each black bass species and population, there are a specific suite of habitat characteristics and environmental tolerances that collectively contribute to where black bass are distributed in space and time (Hayes et al., 1996). Specific habitat needs also vary across water body type where black bass reside, from rivers and streams to lakes, ponds, reservoirs, and wetlands, and across latitudes, yielding differences in thermal regimes and system productivity. Not surprisingly, failure to provide black bass (or their forage species) with an adequate quantity of good quality habitat will result in impacts to fish growth, health, reproduction, and survival (Lapointe et al., 2014). Indeed, not all habitat is equal in terms of its contribution to essential life functions (e.g., a structure that attracts fish versus a feature that improves system productivity).

Fish habitat can be lost or degraded for various reasons, including land-use changes related to agriculture, urbanization, and other forms of human infrastructure development (e.g., industry, utilities). In fluvial systems, dams (installed for various purposes) can impede movement of migratory black bass, create flooded reservoirs in areas that were previously more riverine, and change water conditions (e.g., the hydrograph) in downstream regions (Chen et al., 2023). Reservoir aging combined with the extent of timber harvesting prior to reservoir filling influence system productivity and contribute to somewhat predictable patterns of reservoir productivity (see Kimmel & Groeger, 1983; Miranda & DeVries, 1996). Landowners such as cottagers and homeowners often transform riparian habitats and may remove woody debris or vegetation under the auspices of "cleaning up" their waterfront areas, or they apply shoreline armoring, resulting in the absence of essential physical habitat structure (Sass et al., 2006). Poor water quality resulting from nutrient inputs from septic systems or upstream sources (e.g., farms, sewage treatment) contributing to eutrophication (Winfield, 2015) and algal blooms (some of which are harmful to black bass and anglers; Feng et al., 2024), suspended sediment or turbidity, and input of heavy metals (Kolpin et al., 2013) or other contaminants (e.g., pharmaceuticals, plastics) can impair habitat quality such that fishes may experience sublethal impacts or even mortality. Physical habitat can also be altered dramatically by the introduction of invasive plants (e.g., hydrilla *Hydrilla verticillata* [True-Meadows et al., 2016]; Eurasian watermilfoil *Myriophyllum spicatum* [Kusnierz & Tholl, 2024]), while invasive zebra mussels *Dreissena polymorpha* have dramatically altered water clarity, nutrient dynamics, and food availability in some systems (Nalepa & Schloesser, 1992). Climate change also has the potential to impact black bass populations. Modeling efforts suggest that in more northern clines, there will be range extensions, changes in growth, alterations in competitive interactions, and localized changes in distribution (e.g., using deeper water and thus compressing available habitat) attributed to climate change impacts on habitat (Chu et al., 2005; Lynch et al., 2016; Van Zuiden et al., 2016).

Implications

- *Need to protect/create/restore functional habitat.* Habitat is foundational, and thus, when it is in good condition, it needs to be protected; when it does not exist (e.g., in an old reservoir or excavated pond), it needs to be created; and when it is degraded, it needs to be restored. It happens to be the United Nations Decade for Ecosystem Restoration (2021–2030), making it an ideal time to do habitat work. This requires an understanding of the trajectory of a system to ensure that efforts are not working against broader forces (like climate change).

- *Need to think about what type of habitat is needed "in water."* When habitat creation or restoration efforts are undertaken, there are a wide range of materials that can be used, including natural materials (like trees; Smith et al., 2022) or plastic structures (Feger & Spier, 2010). Where possible, natural materials have a number of benefits over plastic structures (Cooke et al., 2023).
- *Need to address root causes and think upstream and upland.* Often restoration efforts focus on the symptoms rather than the causal problem such that restoration efforts are destined to fail (Bradshaw, 1996). Identifying the cause of the degradation (e.g., septic inputs causing nutrient enrichment and thus eutrophication and algae blooms) is critical. Often, efforts are focused in or under water, like building physical habitat, whereas the real issues are upland and upstream and are best addressed through actions such as fencing to keep livestock out of streams (Grudzinski et al., 2020), planting trees in riparian areas (Pusey & Arthington, 2003), or other actions that contribute to overall system health.
- *Need to tailor habitat enhancement to limiting factors.* Understanding which resources are limiting for black bass is needed to identify the appropriate types of habitat enhancement (e.g., nesting habitat, foraging habitat, juvenile nursery habitat, flow refuge habitat, etc.).
- *Need to ensure that habitat management is guided by evidence and includes long-term monitoring.* Although there are many actions that can be taken when it comes to habitat management, it is important to ensure that those efforts actually work (Miller & Hobbs, 2007). To that end, it is important to embrace habitat management actions that are supported by evidence (Cooke et al., 2018). Moreover, far too often habitat management occurs, yet there is no or insufficient monitoring to track relevant outcomes, thus making it uncertain about whether such actions achieved their objectives (Geist & Hawkins, 2016).
- *Need to think about habitat connectivity*. Black bass populations can experience limitations in lateral and longitudinal connectivity arising from stranding in backwaters, encountering dams or other barriers, and so on. Ensuring black bass have access to all necessary habitats to complete their life functions and express population variation is essential. This may require efforts to connect or reconnect backwater channels (Tripp et al., 2016), dam removal (Kanehl et al., 1997), or the installation of fish passage facilities that have been demonstrated to be effective for black bass (e.g., Bunt et al., 1999).

Black bass are sometimes good for biodiversity but are not always good for biodiversity

This maxim acknowledges the conflict between black bass as important elements of biodiversity as well as invaders that negatively impact native biodiversity. The maxims are presented in that order.

Across their native ranges, black bass are important components of freshwater ecosystems. For example, as top predators, they often play a key role in structuring freshwater ecosystems, particularly in lentic systems (i.e., top-down control; McQueen et al., 1989; Nowlin et al., 2006). Smallmouth Bass and Largemouth Bass are also important contributors to the cycling of nutrients from benthic organisms and habitats (Schindler & Scheuerell, 2002). When male black bass construct nests, they contribute to the redistribution of bottom substrates (e.g., Lukas & Orth, 1995) and benthic invertebrates (Kupriyanova & Bailey, 1998). Additionally, black bass are known to consume invasive species such as Round Goby *Neogobius melanostomus* (Crane & Einhouse, 2016), further contributing to the structuring and restructuring of freshwater ecosystems. Smallmouth Bass sometimes provide parental care for Longnose Gar *Lepisosteus osseus*, thus increasing the reproductive success of another species (Goff, 1984). Conversely, black bass are food for other fishes (e.g., Muskellunge *Esox masquinongy*, Walleye), snakes (Mushinsky et al., 1982), turtles (Lagler, 1943; Turner, 2001), and fish-eating birds, including ospreys *Pandion haliaetus* (Edwards, 1989), loons *Gavia immer* (Merrill et al., 2005), and bald eagles *Haliaeetus leucocephalus* (Jackman et al., 1999). Another key ecological role of black bass is as glochidial hosts for freshwater mollusks. In fact, Largemouth Bass are documented hosts to more than 80 species of mollusks, which is substantially higher than any other fish species (Aubrey et al., 2025). Black bass are also increasingly being recognized as themselves being biodiverse (Bagley et al., 2011; Taylor et al., 2019). Once believed to be comprised of only a handful of species, the genus *Micropterus* now has at least 19 species, with definite possibilities for more as molecular genetics tools are applied. The ecological roles of the recently identified and lesser-known species have yet to be clarified.

Yet, black bass are also harmful for biodiversity. Indeed, black bass (especially Largemouth Bass) are among the most widely introduced species on the planet. In fact, Largemouth Bass are on the International Union for Conservation of Nature list of top 100 invasive species (Lowe et al., 2004). In North America, black bass are endemic to eastern regions but have been widely introduced throughout most areas where environmental conditions enable their survival. In some cases, those introductions were intentional, as a result of stocking and fisheries enhancement efforts extending back to the early 1900s or even earlier (Costantini et al., 2023; Seguy & Long, 2021). In other cases, the introductions were not done by managers but rather by members of the public, intentionally or unintentionally. Even in regions where black bass are endemic, they have been introduced to previously fishless ponds, where they have negative impacts on anuran populations (Holbrook & Dorn, 2016). Today, black bass populations are thriving in areas of the southwest, where they impact imperiled fish in the Sacramento River basin (Moyle, 1976) and Colorado River basin (Burgad et al., 2023); in the Pacific Northwest, where black bass compete with Pacific salmon *Oncorhynchus* spp. (Carey et al., 2011); and in the St. John's River basin of eastern Canada, where they compete with Atlantic Salmon *Salmo salar* (Valois et al., 2009). Similarly, introduced black bass have had impacts on the biodiversity of waters in far-reaching places (reviewed in Costantini et al., 2023; Jackson, 2002; Long & Seguy, 2024; Robbins & MacCrimmon, 1974), including Japan (Takamura, 2012), South Korea (Choi & Kim, 2020), South Africa (Weyl et al., 2017), Portugal (Ribeiro et al., 2009), Cuba (Rivero, 1937), and Iran (Coad & Abdoli, 1993). Control programs are underway in some regions, although there is also conflict given that black bass are now valued for their recreational benefits (Long & Seguy, 2024).

Implications

- *Need to better understand the role of black bass in ecosystems.* Black bass are common constituents of ecosystems in North America (and beyond, where they have been introduced). Management of black bass populations and their ecosystems would be well served with a better understanding of the role of black bass in ecosystems where they are endemic and introduced.
- *Need to embrace black bass diversity and conservation as management objectives.* Black bass are often managed primarily for achieving recreational fisheries management objectives. Yet, black bass also represent important components of biodiversity and should be managed accordingly—especially where there are unique populations and rare species (see Rauschmayer et al., 2008; Taylor et al., 2019).
- *Need to clarify black bass taxonomy and ensure that all black bass species are properly described before they are lost.* As outlined clearly in Taylor et al. (2019), black bass taxonomy has changed extensively over the past two decades, with new species being identified and, more recently, revisions to black bass nomenclature (see Taylor et al., 2024 for discussion of the consequences of those revisions). There is need for more efforts focused on using modern molecular and phylogenetic tools to fully document and describe the biodiversity of black bass. This is timely, given that pressures (including introduction of black bass species) may impact black bass species that have yet to be described.
- *Need to ensure that black bass introductions only occur following thorough risk assessments.* For various reasons, black bass have been widely introduced, yet rarely do proper risk assessments occur (Probert et al., 2020). The lack of risk assessment means that the full suite of potential impacts are rarely considered a priori, leaving managers to deal with consequences in the future.
- *Need to identify effective mechanisms for controlling black bass populations when they have negative impacts on freshwater biodiversity (and support such efforts).* Where black bass have been deemed to be invasive and there is interest in their control or eradication, there is need for evidence-based methods that are effective (see Rytwinski et al., 2019). However, attempts to eradicate black bass are rarely successful except in small systems, where there is potential for dewatering (Maezono & Miyashita, 2004), use of piscicides (Jordaan & Weyl, 2013), or extensive mechanical removal of fish and nests (van Der Walt et al., 2019).
- *Need to stop celebrating the fact that we can catch black bass in temperate waters around the globe.* Past introductions of black bass around the globe have created vibrant recreational fisheries, yet those populations of introduced fish often have negative impacts on other freshwater life (Long & Seguy, 2024). Too often, we celebrate the fact that black bass can be caught around the globe (including with competitive live-release angling events in far-flung places) or even in North America outside their endemic range, rather than focusing on the reality that black bass fisheries do not need to exist everywhere. Addressing this issue will require creativity given that some individuals have built their livelihoods around these fisheries (e.g., bass fishing guides in Japan and South Africa).

The black bass management toolbox is antiquated

The contemporary black bass management toolbox is essentially identical to that discussed at the two previous black bass symposia (i.e., Noble, 2002; Stroud & Clepper, 1975). This is not the fault of any particular actor group or organization; it is systemic. Social science studies reveal that resource managers tend to rely on "tradition" or consult colleagues (often in the same role) within their agencies when making decisions (Pullin et al., 2004; Young et al., 2016). That means that managers are not embracing the totality of the evidence base and, in particular, tend to ignore new knowledge (Pullin et al., 2004; Walsh et al., 2019). Moreover, resource managers are usually embedded within agencies that are resistant to change given institutional inertia (Kadykalo, Cooke, & Young, 2021). Yet, even if managers want to embrace new knowledge, it is often inaccessible (behind paywalls; Cvitanovic et al., 2014) and not synthesized in a useable format (Kadykalo, Buxton, et al., 2021; Walsh et al., 2019). Much of the research on management interventions is based on short-term studies that lack replication in space and time and lack comparators (i.e., a before-after–control-impact approach; Stewart et al., 2005). In other words, studies are not done at a management scale, making it difficult for managers to embrace findings. When adaptive management approaches are used, it is uncommon for the outcome of such studies to be published (Westgate et al., 2013). In short, there is lack of clarity on what works and what does not, such that some of the resources expended on management interventions are likely ineffective or even counterproductive.

In terms of specifics, contemporary management is largely focused on harvest controls, with less focus on effort controls. Effort controls are being embraced in the marine realm for intensively managed species (Anderson et al., 2019) and may have a role to play in black bass management in a recreational context (Arlinghaus et al., 2015). Closed areas and closed seasons are rarely used for black bass management with the exception of some seasonal closures in Ontario to protect nesting black bass. Yet, research based on long-standing, year-round fishing sanctuaries instituted in the 1930s and 1940s to protect black bass from overharvest has documented both higher biomass of black bass in the sanctuaries (relative to outside) and evidence of spillover benefits (Zolderdo et al., 2019). Efforts to protect black bass during reproduction also have the potential to reduce reliance on stocking so that fisheries can become more self-sustaining. Indeed, the need to stock has become engrained in black bass management circles and the black bass angling world, especially in the southern part of North America, such that the thoughts of managing a black bass fishery without stocking is far from the norm (Long et al., 2015), despite highly variable outcomes arising from stocking (e.g., Boxrucker, 1986; Diana & Wahl, 2008). As a result, the reliance on stocking has hampered the ability to fully embrace other management levers, including habitat management.

Another missing element of black bass management is the full embrace of evolutionary principles. For example, we know that vulnerability to angling is a heritable trait for black bass (Philipp et al., 2009) and there are a number of correlated traits, including metabolic rate, locomotor activity, and parental care ability associated with angling vulnerability (see Cooke et al., 2007). That sets up the potential for fisheries-induced evolution, particularly when fishing occurs during the reproductive period (see Philipp et al., 2015). Similarly, stocking decisions that involve the use of black bass broodstock that are not from the same waters or region (i.e., not locally adapted to the stocking area) can lead to outbreeding depression (Claussen & Philipp, 2023), again a failure to consider fundamentals of evolutionary biology.

Often, management of black bass is reactive rather than proactive, despite a growing suite of technological tools that can generate new knowledge quickly. From use of apps on angler phones (to assess effort and catch; Venturelli et al., 2017) to drone footage (to assess effort; Harris et al., 2019) to environmental DNA (to quantify fish abundance and distribution; Spear et al., 2021) to the use of artificial intelligence and machine learning (I acknowledge that it is unclear what this will mean yet in the context of black bass assessment and management; Lim, 2024), technology is revolutionizing fisheries management, although efforts have yet to be fully realized for black bass management (Cooke et al., 2022).

Finally, black bass (and other inland fishes) are facing an uncertain future. The world is dynamic, and freshwater ecosystems and freshwater life are among the most impacted on the planet (Harrison et al., 2018). Climate change is a threat multiplier (Smol, 2010), which will complicate black bass management and potentially transform what bass populations and black bass fisheries look like. Management strategies of today tend to assume static environmental conditions, whereas there is already evidence of warming waters and changing hydrological regimes (Lynch et al., 2016). There is a growing suite of climate adaptation strategies that could be included in black bass management to ensure resilience in the future (Holsman et al., 2019; Mason et al., 2022).

Implications

- *Need for robust evidence synthesis to identify what works and what does not.* At present, there is rather haphazard use of evidence (for the reasons outlined above). There is a need to synthesize evidence using robust, rigorous, repeatable, and transparent methods (e.g., systematic reviews with meta-analysis) to determine what works and what does not so that black bass management can be evidence-informed (Cooke et al., 2017).
- *Need to recognize that catch and release has fundamentally changed how most bass fisheries are managed.* With high rates of catch and release rather than harvest, management efforts need to look beyond stocking and harvest controls that have become the go-to tools (Noble, 2002).
- *Need for management-scale experiments with replication over space and time.* Managers are challenged with embracing knowledge generated by empirical management studies given that such studies tend to lack replication (in space—often just one or a few systems—and in time—often short term). Managers need management-scale research to have confidence in the findings. It is also necessary to include relevant comparators (e.g., control waters) to ensure that findings are not spurious. Functionally, this is a call for adaptive management, which is well recognized as a way to do science relevant to management (Walters, 2007).
- *Need to embrace evolutionary principles in management.* There is a growing movement to recognize that resource management and conservation actions need to be anchored in evolutionary thinking and principles. Evolutionarily enlightened management (see Ashley et al., 2003) has the potential to ensure that wild fish populations are kept as wild as possible, with the greatest potential for evolutionary resilience (Lankau et al., 2011).
- *Need to modernize the toolbox by embracing technology.* There are a growing number of tools that will enable researchers and stock assessment biologists to provide fisheries managers with information that was previously difficult to obtain. New technology has the potential to increase the speed at which data can be collected and analyzed, which could even extend to it being in near real time (Cooke et al., 2022).
- *Need to be more proactive than reactive.* As new technologies evolve, it is useful if management bodies are keeping their finger on the pulse and being prepared for a new world. Engaging in horizon-scanning activities can be productive to ensure that fisheries management is not always having to be reactive to change (such as technology).
- *Need to embrace strategies that consider climate change and other dynamic pressures to ensure resilience.* Some management actions allow for resilience and are considered to be consistent with climate change adaptation (Bryndum-Buchholz et al., 2021). For example, in the Midwest, angler harvest of black bass may be useful for mitigating climate-related expansion on other species (Sullivan et al., 2020). Failure to manage for resilience will mean that we are ill prepared for climate change or other challenges.

Black bass recreational fishing requires two licenses

It is a given that in most jurisdictions, recreational fishing licenses are required to partake in black bass angling (notwithstanding various exemptions, such as for children and seniors). However, the second license needed to engage in recreational fishing for black bass is the so-called "social license," which cannot be purchased. The concept of a social license recognizes that society sets social norms about which activities are acceptable or not (Boutilier & Thomson, 2018). Over time, the social license for a given activity and its legitimacy can change, reflecting changes in societal values, beliefs, and norms (Gehman et al., 2017). Recreational fishing writ large has seen its social license questioned as a result of efforts related to animal rights and animal liberation organizations, in some cases leading to legislation that restricts how anglers can engage with fish when angling (Skrzypczak & Karpiński, 2020). The question salient to this context is where does the social license for recreational black bass fishing stand; this may differ for native and introduced populations and from region to region, fishery to fishery. Although I am unaware of any particular social science studies that address that question for black bass, it is fair to say that it cannot and should not be taken for granted. Black bass fishing can be a high-profile activity with splashy tournaments, fast boats, the displacement of fish from the location caught to the location released, and other characteristics that could contribute to it being unsupported by the masses (or at the very least, other water users), leading to access restrictions on public waters. To be clear, that is not the case now, but things can change quickly. Similarly, there is also a social license required to manage black bass in certain ways (e.g., restricting fishing during spawning seasons, stocking, culling, trophy fisheries, etc.—potentially at the expense of other fish populations that might be desirable for other users) that also should not be taken for granted. The social license has been questioned for other fisheries-related topics, including Sea Lamprey *Petromyzon marinus* control efforts on the Laurentian Great Lakes (Gaden et al., 2021) and marine fisheries activities (Kelly et al., 2017).

When conflicts exist either within the sector (e.g., between trophy black bass and harvest-oriented anglers) or external to the sector (e.g., between tournament anglers fishing around docks and property owners), there tends to be few opportunities to address those conflicts, and the expectation is often that the fisheries manager should be the arbiter. This is challenging given that both sides of the conflict generally have adequate and reasonable arguments. Recent high-profile accidents between bass boats (including during tournaments) and other boats have highlighted conflicts arising with shared use of public waters and safety concerns with speed. In reality, most fisheries managers do not have training in conflict resolution, such that they are ill prepared for such roles. In general, there seems to be lack of effort to identify common ground and mutual respect when conflicts exist emphasizing the importance of dialogue and listening. Failure to address conflicts and generate positive relationships between the black bass fishing community and other sectors or peoples further contributes to the potential loss of social license. Much more research (likely though human dimensions case studies) is needed on this topic.

Implications

- *Need to conduct research to better understand what is needed to maintain the social license.* Proactive research to understand the determinants of the black bass social license would be productive. Such work has been done on other issues and in other sectors, such as in the mining industry (Prno & Slocombe, 2014).
- *Need to recognize that individuals in the black bass fishing community play a key role in maintaining that license.* When it comes to maintaining the social license for black bass fishing and management, it is important to recognize that it is not the responsibility of any one organization or subsector but rather the responsibility of all individuals that are engaged in the sector (Cooke et al., 2019, 2025). Working collectively to be responsible stewards will be critical.
- *Need to endorse fishing celebrities and influencers that are champions for conservation and fish welfare that set the norms for "good" behavior.* The average angler often looks to various fishing celebrities and influencers for indications about norms. Identifying, endorsing, and showcasing fishing celebrities that can model conservation-minded behaviors and fish welfare that contribute to responsible and sustainable fisheries will be important for influencing the angling community (Danylchuk et al., 2018).
- *Need to ensure that fisheries managers have training to enable them to support conflict resolution.* Professional development opportunities and creation of a toolkit for conflict resolution specific to black bass would ensure that there are mechanisms in place to attempt to address and mitigate conflict. Festering conflicts have the potential to impact social licenses and the use of recreational fishing licenses.

Black bass and bass fishing are for everyone

Motivations for black bass fishing are diverse and include essential food provisioning, fun, wellness, competition, and cultural expression, which should lead to diverse strategies to achieve management objectives. Yet, black bass fisheries management objectives tend to be rather narrow, with a focus on catch-and-release anglers interested in trophy bass (Dotson et al., 2013). Lots of people (cottagers/summer homeowners, swimmers, kayakers, etc.) care about black bass despite not fishing for them. For example, I have frequently heard cottagers take pride in the fact that the same black bass returns year after year to spawn off their dock, even though they have never fished for black bass in their life. Not many fishes can claim to be of such interest to individuals that do not fish for or presumably eat them. With emerging technologies (live sonar) sufficiently expensive that they are not accessible to the masses, there are also important conversations to have about ethical aspects of a segment of the angling population that has an advantage in accessing black bass (Cooke et al., 2025). In addition, even when fisheries managers ask anglers to harvest smaller black bass, there is such an odium from some anglers associated with doing so that there are examples of violence and racism being directed towards low-income and/or racialized anglers attempting to harvest black bass (or other species), as seen in some Ontario contexts (Zhang, Yeung, et al., 2026).

When one looks at the demographics of black bass anglers, girls and women are poorly represented. The reasons for low recruitment and retention of women in recreational fishing are many (Schroeder et al., 2006), but one of the largest barriers is the fact that it is so male-dominated with tendencies towards misogynistic messaging (e.g., names of fishing lures, social media content, male-only tournaments) or simply the exclusion of women in positions of leadership (e.g., fishing celebrities, podcasters, etc.; notwithstanding women like Penny Berryman or Braci Ault). In extreme instances, there are examples of women being harassed (or worse), such that they do not just feel unwelcome but also unsafe (Goodenough, 2025). This limits participation and reinforces the "fact" that black bass fishing is a "man's" sport (which is far from the truth).

In addition, there are other important interests in black bass that have been poorly represented. Indigenous peoples and tribal governments with territorial and traditional rights in a given area should also have a voice in identifying management objectives (which may or may not benefit black bass). If there are ceremonial or traditional cultural expressions that involve black bass, those practices should be supported and prioritized.

Implications

- *Need to think about fisheries management objectives that extend beyond keeping catch-and-release bass anglers happy while also managing for provisioning fisheries*. Provisioning fisheries recognize that some individuals depend on fish for supporting their nutritional security (Nguyen et al., 2025) and that individuals may fish for a variety of reasons. Traditionally those voices (often from marginalized and racialized communities) and users are not well represented when crafting fisheries management objectives, leading to violence and conflict (Zhang, Yeung, et al., 2026). There remains an odium to harvesting black bass that needs to be overcome given that fisheries managers have harvest regulations whose goal is to reduce the likelihood of overharvest (Long et al., 2015).
- *Need to ensure that black bass fishing is a safe and inclusive space for girls and women*. There is much work needed in this space, with a key role for male allies (e.g., calling out misogynistic behavior in online forums), to make black bass fishing a safe environment and community for all. The industry also has a key role in whom they showcase and support in advertising, while the angling media plays a role in terms of the voices they showcase on their shows, online, or in print media.
- *Need to create space for Indigenous communities and governments to have access to black bass and a voice in crafting management objectives*. In short, Indigenous peoples and governments are rarely consulted or engaged in the management of black bass populations or the fisheries they support (Boiral et al., 2020). On a pathway to reconciliation and in recognition of the moral and legal imperative to consult and engage (Wong et al., 2020), there is ample room to create space for Indigenous peoples to exercise their sovereign rights as it relates to black bass (recognizing that at times their priorities may conflict with those of anglers, such as trophy black bass catch and release). There is also benefit that could be derived from embracing a two-eyed seeing approach (Reid et al., 2021).

Synthesis and conclusions

As noted by Philipp et al. (2025) in a paper where they outlined the goals of the 2025 Black Bass Symposium, "there is urgent need to revisit black bass management with a collaborative goal of identifying evidence-based actions that balance conservation and management objectives, and future-proof black bass management for the benefit of black bass and people." The maxims outlined here identify six thematic areas, with the related implications providing direction with respect to what could be done. The ordering of the maxims does not imply a hierarchy or any form of prioritization. I also want to reiterate that these are based on my perspective and experiences. That said, when this was delivered as a plenary talk, I spoke with many participants at the symposium who all indicated that the maxims identified were indeed consistent with what they would consider to be a maxim. I do not claim to speak for all, but I believe this to be a good starting point. I submit that all of the maxims and especially the related implications (listed as needs) are important, and if we collectively embrace the challenge of making changes to what we do (as anglers, fisheries managers, industry, partners/collaborators), black bass populations, fisheries, and stakeholders would all be in a much better position.

Yet, there will be unexpected developments that have the potential to disrupt progress, which demands more efforts in foresight science (Ednie et al., 2023). This will allow us to be much more proactive than reactive. Climate change is but one example of a challenge that we can now clearly foresee, yet we are doing little to future proof our management actions or consider what climate change will mean for black bass fishing. It also goes without saying that any and all efforts to increase and diversify the black bass stakeholder community (which does not just mean more catch-and-release anglers) will further strengthen the sector and provide resiliency. That is not just the right thing to do; it will also yield many practical benefits. Finding balance between the diverse needs and goals of different stakeholders (and rightsholders) and ensuring that fisheries management efforts intended to benefit black bass also contribute to the protection and restoration of freshwater biodiversity will remain a challenge but one that we are well positioned to take on, provided that diverse voices and perspectives are at the table. In some instances, that means looking beyond a given water body or stream reach and instead looking far upstream and far upland towards agricultural development, hydropower utilities, urban areas, and so on, where their actions have manifold impacts on freshwater ecosystems (Cooke et al., 2016; Welcomme et al., 2010), including those that support black bass.

To conclude, embracing the maxims presented here and using them as a framework to explore issues and chart a path forward has the potential to help guide us as we already begin to think about a future Black Bass Symposium (hopefully before another 25 years transpires).

Data availability

None declared.

Ethics statement

None declared.

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