



Intra-Sectoral Conflict Resolution in Recreational Fisheries: A Brief Review of Approaches and Strategies

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Abstract

Recreational fishing is a globally popular leisure activity with diverse participants and practices that may lead to conflicts over competing values. Conflicts may affect participation, management, and conservation, yet the degree to which their occurrence and scale have been examined in the primary and secondary literature remains unknown. Here, we reviewed conflict resolution literature related to hunting and fishing to identify strategies for navigating or avoiding conflicts in recreational fisheries. We examined the extent to which those strategies have been applied in three North American recreational fisheries intra-sectoral conflict case studies. Approaches to conflict resolution, prevention and management in the reviewed literature fell into one of three categories: improving situational understanding, collaborative governance, and legal intervention. Collaboration and knowledge sharing approaches—examples of collaborative governance—were the most recommended in the literature but were only applied to conflicts retroactively in the case studies we examined. In contrast, legal intervention—though least recommended as a useful conflict resolution strategy in the literature—was used in each case study. Our findings highlight gaps between recommendations made in the relevant literature on conflict resolution and the management practices employed in real world cases of recreational fisheries conflict, suggesting opportunities for improved collaborative governance and knowledge sharing within organizational structures to better address intra-sectoral (in some cases, manager-angler) conflicts.

Keywords Conflict · Conflict resolution · Fisheries · Human dimensions · Recreational fishing · Resource conflict

Introduction

Recreational fishing is a globally popular activity and is the dominant fisheries sector in inland waters (Arlinghaus et al. 2002) and coastal marine systems (Mora et al. 2009). Despite being previously overlooked, there is a growing recognition of the economic, socio-cultural and ecological importance of recreational fisheries that extends beyond just “fishing for fun” (e.g. Arlinghaus and Cooke 2009; Welcomme et al. 2010) and with it, a better understanding of the

different motivations behind participation. For example, family and social leisure, sport and challenge related values, as well as a connection with nature and tradition (Fedler and Ditton 1986; Toth and Brown 1997; Nguyen et al. 2025). Additionally, many people around the world also rely on recreational fisheries as a component of their diet (Cooke et al. 2018; Nyboer et al. 2022; Nguyen et al. 2025). The blurred line between what constitutes leisure and what contributes towards food security and cultural practice means it is difficult to accurately define “recreational fishing” (Nyboer et al. 2022). For the purposes of this paper, we include those who rely on rod-and-reel to harvest for food sovereignty and cultural traditions (sometimes referred to as “provisioning fisheries”; Nguyen et al. 2025) under the recreational fisheries umbrella.

Fisheries are complex systems involving diverse interactions between fishers and their environment (e.g. Carpenter and Brock 2004; Arlinghaus et al. 2013). Management of fishers and fish stocks must therefore be approached from a social lens as well as an ecological one

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to ensure its functionality and sustainability (Arlinghaus et al. 2013). The angling (those who use rod-and-reel) community (used here synonymously with recreational fishing community) is diverse and can encompass a range of socio-demographics, cultural backgrounds, interests, values, political views, practices and target species (Cowx et al. 2002; Arlinghaus et al. 2007; Cooke et al. 2015; Hunt et al. 2023). These differing values and practices pose challenges for fisheries management, especially when they lead to conflict (Arlinghaus 2005). As recreational fisheries face increasing demographic shifts (age, ethnicity) and ecological pressures, innovative tools and inclusive approaches are needed to prevent and resolve these on-the-ground conflicts (Arlinghaus et al. 2016). Directing attention towards resolving these conflicts when they arise and applying current knowledge to prevent them in the future is important for sustainable management and cooperative use of resources.

“Conflict” is a broad term and varies in its use across different fields. For example, Redpath et al. (2013) defines conflict as disagreements over objectives due to differing opinions where parties are perceived or trying to assert their interests over each other. Thomas (1992) also gives a similar, yet simplified definition of conflict where “one party perceives that another has frustrated, or is about to frustrate, some concern of [theirs]”. Regardless of the definition, conflict is seen as a product of different human values and behaviors and can be disjunctive or divisive in nature. Conflict can manifest in various stages: from latent disagreements (unspoken tensions) to expressed disputes (visible discourse), unilateral actions (one group acting against another), multilateral actions (multiple groups in conflict), and even physical violence (Cusack et al. 2021). In the recreation literature, conflicts may arise from goal-interference (e.g., competition for space, noise, crowding) or social value differences (e.g., disagreements over conservation ethics or animal welfare) (Vaske et al. 1995). For our purposes, we use a general definition of conflict (used synonymously with dispute), developed from Nicholson (1992), as this definition captures the diversity of possible interactions amongst people or organizations in recreational fisheries: Conflict is a direct or indirect (e.g. microaggressions) state of disagreement or hostility between two or more parties that may range in severity from verbal disagreements to physical violence.

Beyond angler diversity, resource competition, institutional factors (e.g. management, regulations and governance) and differences in purposes and values of the fishery all have the potential to trigger and escalate conflicts (social and intra-sectoral) among participants. Intra-sectoral conflicts between different angler groups in a recreational fishery can come down to differences in resource specificity (how a resource should be used, Arlinghaus 2005). Disputes

may occur between anglers who exclusively practice catch-and-release, and those who harvest their catch (Arlinghaus 2005; Nyboer et al. 2022) or between user groups that differ in how they value certain species, highlighting key dissimilarities in how different groups apply their norms onto others (Arlinghaus 2005; Meinelt et al. 2008). Stigma or misperceptions of different angler groups can also trigger conflict or disagreements. For instance, the stigma around people who harvest and eat “trash fish” or “rough fish” as opposed to popular “game fish” (Rypel et al. 2021; Miller 2023), may be interwoven with cultural differences in harvest among racial and ethnic communities (Roop et al. 2020; Love et al. 2022). Recreational fisheries and their management are also embedded within a complex network of non-fishing activities (e.g., resource development) and potentially competing uses of aquatic habitats (Arlinghaus 2005). As such, intersectoral conflict may also occur between recreational anglers and other parties such as conservation and management bodies (Arlinghaus 2005), commercial and Indigenous fishers (e.g. Nguyen et al. 2016), other water users (e.g., swimmers, cottagers, boaters or birdwatchers; Jones 1996), or sectors like agriculture, energy, mining, and transportation, making management difficult and complex (Arlinghaus 2005).

A complete understanding of a conflict must include an understanding of the social nuances between the groups involved in the conflict (Gallo 2013). These nuances are created through the development of in- and out-groups as individuals identify themselves within a certain set of expectations and behaviors (Brown 2000), which, in-turn, can lead to conflicts between individuals and groups (Eidelson and Eidelson 2003; Caldara et al. 2017). There is a need for individuals to perceive their in-group as “better” than the out-group (Hewstone et al. 2002), which leads to prolonged mistrust and prejudice, and the development of negative feelings and behaviors toward the out-group (Pettigrew et al. 1982; Duckitt 2003; Bar-Tal and Teichman 2005). Negative emotions experienced in the face of conflict can also generate a positive feedback loop, escalating the situation. Furthermore, disputes can come in the form of social sanctioning where one group aims to realign another group’s actions to behaviors they believe are the more acceptable norm (Ostrom 2014; Guckian et al. 2018). While social norms are important for guidance of behavior, conflict can be driven by disconnect between groups on what the acceptable norms are and their relative importance (Stensland and Aas 2014).

Unresolved conflicts have the potential to impact individual users, social fabric, and organizational mechanisms (e.g., effective governance, decision-making, policy implementation). In recreational fisheries specifically, this can lead to reductions in trust and participation between angler groups, hinder collaboration and management efforts, as

Table 1 Search strings used to identify articles for review

| Keywords | |
|----------|--|
| | fisher* OR angl* OR hunt* OR “recreational fish**” |
| AND | “social conflict” OR “dispute” OR “resource sharing” OR “conflict” |
| AND | “tools” OR “framework” OR pathway* OR solution* OR model* |

well as marginalize certain members of the angling community (Kaplan and McCay 2004; Poe et al. 2013). Furthermore, the severity of disputes may increase without the proper consideration of conflicts and their causes within management strategies if, for example, there is limited access to fresh water (Wilner 2005), if fisheries stocks decrease (Vasilakopoulos et al. 2014; Ben-Hasan et al. 2017), or if species’ ranges shift because of climate change (Brander 2007). These potential issues may further complicate conflict resolution, where groups may consider conflicts resolved without monitoring of effectiveness or satisfaction (Bartolucci and Gallo 2010), leading only to perceived resolutions of conflict.

While literature addressing conflicts related to natural resource use (including fish) exists, including a recent review of conflict in small-scale commercial fisheries (Cánovas Molina and Gourguet 2025), the degree of its applicability to recreational fisheries is unclear. Additionally, conflicts at the recreation-resource interface are not well understood, and activities such as recreational fishing are often geographically and contextually diverse. To understand what practical strategies could be applied to conflict resolution in recreational fisheries, we first provide a brief synthesis of relevant recommendations for conflict resolution and prevention from literature on hunting and fishing (extending beyond the recreational sector). We then examine how these common approaches have (or have not) been applied within three case studies of conflict in the North American recreational fisheries space: Striped Bass (*Morone saxatilis*) stocking in Tennessee, wild Rainbow Trout (*Oncorhynchus mykiss*) fishing practices in Idaho, and cases of harassment and assault of racialized anglers in Ontario.

Methods

We conducted a scoping review (Decaria et al. 2012) aimed to broadly identify and summarize the available literature and report on its potential to inform conflict resolution practices in recreational fisheries (Peters et al. 2015; Munn et al. 2018). In November 2024, we conducted a search of two major online databases: Web of Science™ Core Collection and Scopus®, using a combination of keywords and

filters selected to capture literature about conflict resolution in recreational fishing and other relevant fields (i.e., non-recreational fisheries, hunting) while excluding irrelevant articles (Table 1). We chose to exclude conservation conflicts (i.e., those related specifically to the conservation of species separate from fisheries) from our search to focus on the use of a shared resource rather than exclusively conservation-based disputes. We also excluded literature focused only on ‘environmental resource’ type conflict (i.e., minerals, oil, gas, forest, water, and land) because of its scale, choosing to focus instead on conflict resolution literature around hunting and fishing (recreational and otherwise) due to the dual leisure-resource sharing nature of these activities and their similar management frameworks. Several combinations of search strings were tested including different truncated versions of “conflict” (e.g. “social conflict,” “conflict resolution”). Literature types included articles, books, proceedings papers and reviews published in English. We limited our search to literature published between 2000 and 2024, as we consider current perspectives of conflict and its resolution to be most relevant to the objectives of this paper. This search criteria identified 392 citations (Web of Science C.C.: 84; Scopus: 308) which were extracted and imported to the web application, Rayyan (Ouzzani et al. 2016), for further screening. We began screening with a total of 343 unique publications. Screening occurred in two stages: abstract screening and full-text screening. In each stage, each document was screened blindly by each of four primary authors and assigned “Exclude”, “Include” or “Maybe” using predetermined inclusion criteria: (1) included a recommendation or approach (e.g., conceptual model, technique, institutional strategy) for navigating or avoiding conflict, and if that conflict was (2) within recreational fisheries, hunting or non-recreational fisheries spaces. Notable exclusions included publications describing population or spatial models (not referring to direct conflict resolution), human-wildlife conflict, and roadway conflict. Abstract screenings refined our results to a selection of 32 publications which were included in full-text screening using the same inclusion criteria. Several (10) applicable papers that discussed fisheries conflicts were known to the authors but not available through Web of Science™ Core Collection or Scopus®. We elected to add these papers to full-text screening as we concluded that the benefit of adding to the sparse relevant literature outweighed the effect of bias in the paper selection process. Ultimately, only four of these 10 were included following full-text screening. All disagreement during screening stages were discussed amongst the reviewers until a consensus was met. Our full-text screening process identified 11 relevant publications out of 42 for data extraction that mentioned a recommendation, or approach (e.g., tool, framework, solution, etc.) for the resolution or

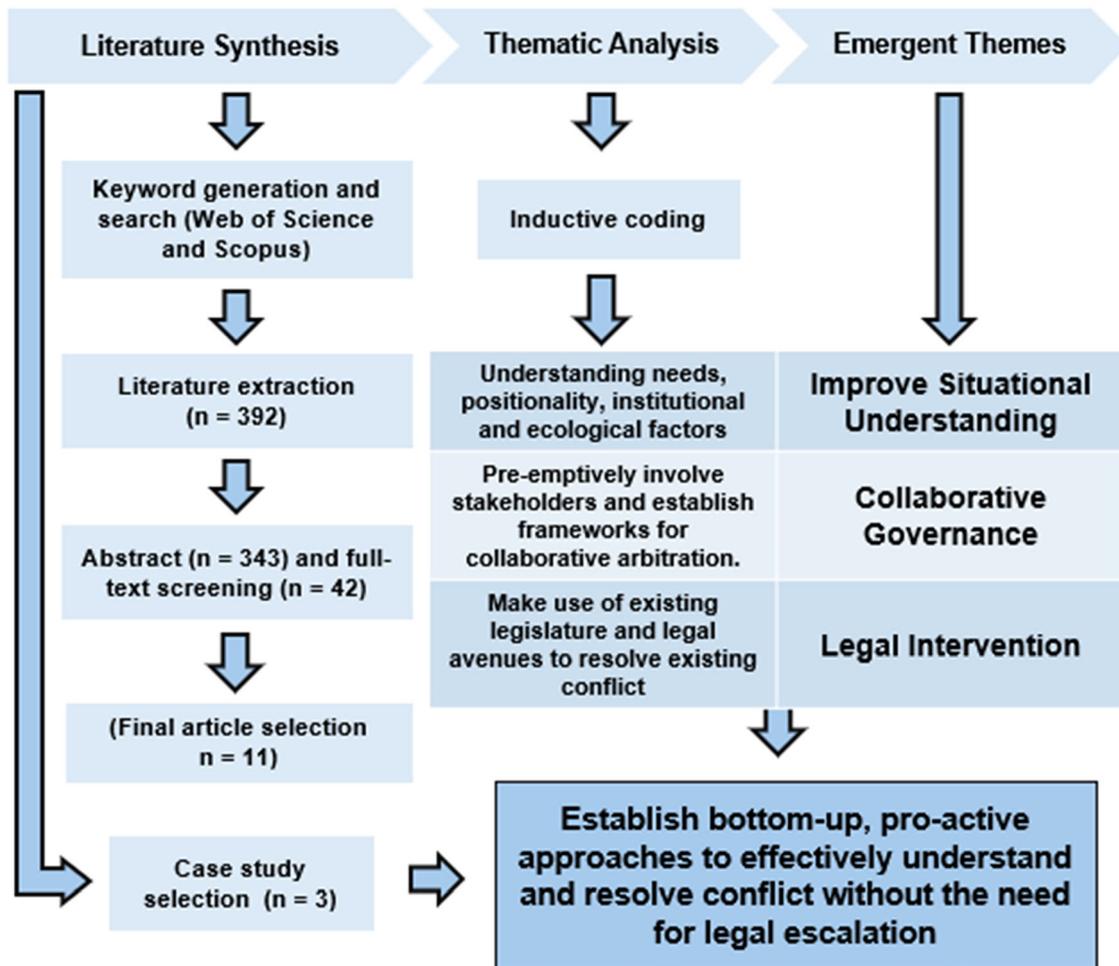


Fig. 1 A summary of approaches used in literature synthesis and thematic analysis along with the identified themes and future steps for resolving intra-sectoral conflict in recreational fisheries

prevention of conflict (see Fig. 1 for summary). While these 11 represent a small selection of papers, our goal was not to provide an exhaustive review, but to highlight common concepts that appear within the literature on conflict-resolution immediately relevant to recreational fisheries, however sparse.

For each of the retained publications, we recorded information about recommendations, frameworks, or approaches for navigating or avoiding conflict. These were then analyzed using a thematic content analysis approach. More specifically, we employed a codebook method using general inductive coding (Attride-Stirling 2001) to identify themes that could inform conflict resolution or prevention in recreational fisheries. This involved using several rounds of inductive coding to first identify recommendations or approaches identified from each paper. Then overarching conflict resolutions themes were identified by grouping specific strategies and recommendations together. Themes were developed using a scan for keywords and phrases that were relevant to a recommended conflict resolution action.

Coding for each document was conducted separately by two or three team members, and approaches were included if agreed upon by the reviewers responsible for that paper. Similar approaches were then grouped together under overarching themes. The target sector of the recommendation or tool was also coded for during this process (i.e., if the recommendation was given specifically for fisheries or for other activities like hunting). Any disagreements among authors during data extraction were discussed amongst the reviewers until decisions were unanimous.

Separately, we reviewed recreational fisheries conflict case studies to better understand the implementation of the resolution themes we identified in past conflicts. Due to differences in cultural perceptions and management of recreational fisheries across the globe, we limited our selection of case studies to cases occurring within North America, where we are situated. We also intentionally excluded case studies describing conflict involving Indigenous peoples as the complexity and nuance of these conflicts include Indigenous lived experiences, rights,

culture, and colonialism, which are beyond the scope of this paper and the expertise of its authors. We selected case studies that were examples of intra-sectoral conflict in North American recreational fisheries, and well-documented with a perceived or actual conclusion, allowing for the identification of conflict resolution approaches to compare with strategies identified in our literature review. To find case studies that met these criteria, we conducted a separate and unstructured media and literature search, through Google, with searches spanning all years. Additional targeted searches for further documentation on candidate case studies were used to rule out any without adequate coverage. One case was selected due to author awareness and the others were selected from the few remaining candidates through discussion amongst authors. We decided that only two additional cases had enough coverage and information for analyses. Selected case studies were reviewed and deductively coded (using previous resolution themes identified in the literature) by a minimum of two authors to identify conflict resolution approaches that were implemented by stakeholders or managers within each case study. We also noted whether these strategies were employed before or after conflict emergence/escalation and if conflicts were deemed resolved by existing documentation. Lastly, we compared the resolution strategies employed in the three case studies of conflict with the resolution themes identified in our thematic analysis of the literature to understand gaps between on-the-ground conflict resolutions and best practices recommended in the literature.

Case Studies

Case study 1: striped bass management in Norris Reservoir, Tennessee

The Striped Bass conflict in Norris Reservoir in Tennessee came to a peak in the early-mid 1990s following decades of mismanagement. For years leading up to the conflict, anglers reported sharp declines in the populations of local fishes such as Walleye (*Sander vitreus*), Black Bass (*Micropterus spp.*) and Black Crappie (*Pomoxis nigromaculatus*). In response to these reports, the Tennessee Wildlife Resources Agency (TWRA) began stocking Striped Bass in the reservoir to supplement fishing activities. This program created a highly successful Striped Bass fishery that is still renowned to this day. However, a subset of anglers believed that the species was directly and indirectly competing with the native fishes, driving further population declines. This divided the local fishing community into two camps: one which supported the stocking of Striped Bass and the other, which called to terminate the program. Despite some attempts by the TWRA to increase Black

Crappie populations, tensions remained, requiring further attempts to resolve the issue (Churchill et al. 2002).

The Norris Reservoir Task Force (NRTF) was created in the early 1990s and included a committee with academic representatives, two anglers (one for and one against the Striped Bass program) and one boat dock owner. Their objective was to research the ecological impacts of Striped Bass on local fish species. Initially, many stakeholders were left out of the conversations led by this committee, and the resulting 5-year plan that emphasized Striped Bass growth and included intensive Walleye and Crappie stocking was met with criticism. At this point, decision-making was still primarily driven by the NRTF and both sides of the angling community remained in disagreement on management approaches. Coverage of this conflict reached local news media, with each side taking “stands” against the other, and the Tennessee Sportsman Association (TSA) was formed to oppose the actions of the NRTF (Churchill et al. 2002).

The TSA eventually brought this issue before state legislature, proposing to prohibit the stocking of Striped Bass and remove all harvest regulations on the species. These proposed bills, along with other private acts (that only affect the county, thus do not require state committee approval) were all rejected, but the state did force the TWRA to reconsider and restructure the current research undertaken by the NRTF. Changes were made to the stocking regime, and different short-term studies would be considered to examine predator-prey interactions and competition with native species. In response, the TSA lobbied for longer moratoriums on Striped Bass stocking and pushed for long-term studies, which were ultimately rejected by the TWRA. This conflict made its way to the Tennessee Senate, in which several bills were rebuffed after heavy opposition by the Tennessee Striped Bass Association (TSBA), who strongly rejected political involvement in ecological decision-making. The two sides continued to disagree on the scope of the research in the reservoir, leading to the eventual disbanding of the NRTF (Churchill et al. 2002).

Case study 2: Big Wood River trout fishery conflict

In the late 1980s, a decades-long decrease in the size and quality of wild Rainbow Trout fishery in Big Wood River (BWR), Idaho, set the stage for a schism in the local angling community. At the behest of the Commission (a team of six officials appointed by the Governor), the Idaho Department of Fish and Game (IDFG) were in the first stages of a 4-year study to examine natural mortality and define the limiting factors (social and biological) of the population. However, a group of primarily fly fishers (pro-regulation) pressed to restrict (or prohibit) the use of bait and harvest, blaming anglers of this kind (pro-harvest) for the declining trout

population and arguing for immediate action to maintain a quality fishery (Thurow and Schill 1994).

While informed of the timeline of the IDFG study, the well-organized pro-regulation party began intensive lobbying of the Commission to implement strict regulations on bait and an expansion of catch-and-release only zones. Under instruction from the Commission, the IDFG study was accelerated. While they found that unless all harvest was eliminated, restrictive bait and harvest regulations only improved the size structure of the population, not the total abundance. In the wake of the study, the IDFG opened a public feedback period that garnered over 3000 comments. They developed a preferred alternative that would (1) improve the size structure of the trout population, and (2) maintain diverse angling experiences: a series of zoning regulations incorporating more no-take areas of the river and slot size regulations based on ecological research findings and the comments received by the public. This proposal was eventually rejected by the Commission for its complexity, which approved a more radical proposal, involving a fivefold increase in the number of no-take zones and changes to slot limits and gear allowances. These new restrictions were met with heavy opposition by the newly formed Idaho Sportfishing Association (ISA, supporting bait and harvest fishing). The ISA sought legal action against the Commission, accusing them of failing to base these regulations off ‘competent and substantive evidence’ (Thurow and Schill 1994).

In 1990, after over a year of litigation between the Commission and the ISA, a new compromise was reached, enacting more relaxed slot and bag limits while doubling the original no-take area on the BWR. In this case, lobbying of the Commission by the pro-regulation group was overwhelmingly successful, and despite efforts from the IDFG to displace as few anglers as possible with proposed regulation alternatives, left the pro-harvest group largely ignored in the development of management strategies. Once formed, the ISA felt it had no choice but to take legal action against the Commission. While not the ideal outcome, this intervention resulted in more moderate trout fishing regulations from the Commission. Both the pro-regulation and pro-harvest groups came to a consensus over shared values, prioritizing the protection of the trout population and improvements to its size structure (Thurow and Schill 1994).

Case study 3: assaults against Asian Canadian anglers in Ontario

In 2007, 11 separate cases of harassment and assaults of Asian Canadian anglers were recorded at popular fishing areas across southern and central Ontario. Some of these cases escalated to physical violence resulting in

hospitalization and criminal charges. Recognized as a series of hate crimes, these cases are embedded within recreational fisheries conflict. While there is no evidence that the victims were breaking any law, perceived or real cultural differences in fishing practices and rights to fish can lead to tension which may then be exacerbated by stereotypes of Asian anglers fishing above legal limits, in protected areas, or without a license. For example, some Asian communities may choose to harvest smaller fish species, many of which have higher catch limits, creating the perception of overfishing by observers. Regardless of the practices, legal or otherwise, racial profiling and discrimination were key in fueling these events (Ontario Human Rights Commission 2007).

Initial incidents and community press conferences led to the Ontario Human Rights Commission (OHRC) Inquiry into Assaults on Asian Canadian Anglers. This investigation included detailed online and telephone surveys in collaboration with the Metro Toronto Chinese and Southeast Asian Legal Clinic to better understand the nature and extent of these experiences. In total, 34 submissions were received, mostly from individual Asian and non-Asian anglers in the Lake Simcoe, Peterborough and Rideau Locks regions, areas popular for locals and tourists (Ontario Human Rights Commission 2007). The final report, entitled “Fishing without Fear,” was released in May 2008 and distributed in several languages including Vietnamese, Korean, as well as simplified and traditional Chinese. The report highlights commitments made by organizations including police, municipal government, the Ontario Ministry of Natural Resources (MNR), angler groups, school boards and other community organizations to long-term and immediate actions taken to reduce crimes against Asian Canadian anglers. In total, 59 commitments were received across 21 of these organizations and municipalities focused on addressing racism and hate crime, primarily through education and outreach. Examples of these actions include the creation of race relations committees and police-stakeholder working groups, developing brochures for the public, and providing training for conservation officers and teachers. The progress of this initiative was monitored for the next year (Ontario Human Rights Commission 2008), although the results of the monitoring were not reported.

Although the conflict was not examined from a socio-ecological perspective, the report suggests differences in angler groups and fear of overfishing may have contributed to racist assumptions and tension between (or towards) certain angling groups. Multiple submissions to the inquiry from non-Asian anglers expressed frustration at Asian Canadian angling practices and often referenced specific incidents as a basis for sweeping generalizations about the entire Asian Canadian angling community. Several of the submissions were hostile towards Asian Canadians and

mentioned language, and accents as a trigger for frustration. The report emphasizes that while differences in fishing practices may have played a role, framing fishing regulations as a solution of this conflict misplaces the debates and minimizes the experience of victims of racism (as there was no evidence that fishing was occurring illegally; Ontario Human Rights Commission 2008).

Results and Discussion

Conflict Resolution Themes in Recreational Fisheries

Current understanding of intra-sectoral conflict management in recreational fisheries is limited in peer-reviewed literature, and we were only able to locate eight papers that specifically addressed conflict resolution in recreational fisheries (i.e., Charles 1992; Rumley 2009; Arlinghaus 2005, 2007; Bower et al. 2014; Boucquey 2017; Berninsone and Newton 2018; Stokesbury et al. 2022). While some include frameworks for exploring and understanding disputes specific to recreational fisheries (e.g. Arlinghaus 2005), few include practical approaches to navigating these conflicts. To overcome this obstacle, we extended our search to also include conflict resolution approaches described in literature addressing conflicts within commercial or artisanal fisheries (e.g., Charles 1992; Berninsone and Newton 2018) and hunting (e.g. Rayfuse 2020; Turschwell et al. 2022). Across literature from hunting, recreational and non-recreational fisheries, we identified 11 approaches (Table 2) that could be applied to navigate or avoid conflict in recreational fisheries, organized into three emergent themes (Fig. 1): cooperative management between stakeholders of a shared resource (collaborative governance); improving understanding of social, ecological and institutional factors leading to conflict (improving situational understanding); and using existing legal structures to navigate existing disputes (legal intervention). Generally, these three emergent themes were used in all three of the cases that were analyzed, with an exception made for collaborative governance in the case of the Tennessee Striped Bass conflict (Table 2).

Approaches for improving situational understanding and collaborative governance were recommended in five and seven papers, respectively, out of 11; legal intervention was only recommended in two out of 11 (Table 2). We found that few papers included approaches for resolving conflicts but rather, addressed how future conflicts can be prevented. This type of resolution aimed at preventing conflict is known as proactive reduction of conflict and highlights the techniques that can be applied for the prevention of conflicts that may include a suite of value alignment, education, programs that aim to foster trust, communication and

collaboration (see Lynn Fitzpatrick 2007; Shin 2009; Rozalski et al. 2013). The three most common approaches within these main themes involved stakeholders to (1) improve understanding of the positionality and needs of the parties involved (2) collaborate on institutional decision-making or co-management of the resource, and (3) provide an organization-integrated system within angler organizations to facilitate arbitration prior to a need for legal escalation. The literature also recommended that following a dispute, more attention should be paid to the factors leading to conflict as a method of understanding where these conflicts may arise in the future. Approaches from the literature recommending legal intervention, as an immediate response or through existing legal avenues, were the least common ($n = 2$ of 11). It is important to note, however, that these recommendations were applied to marine fisheries conflicts, where the benefits of using an existing legal framework are more obvious due to the international nature of fish stocks and the scale of potential jurisdictional complications between users of the shared resource. We argue that in the case of personal-scale recreational fisheries conflict, the benefits of legal interventions are less relevant and may, in fact, serve to escalate conflict as observed in the Norris Reservoir case study. We also note that approaches to conflict resolution are not mutually exclusive, and more than one may be applied to a particular conflict simultaneously or sequentially.

The techniques applied to resolve conflicts in the three case studies we examined differed from recommendations documented across literature. In each case study, there were no documented proactive measures taken to avoid conflict. That is, institutional frameworks to support collaborative governance and arbitration were only implemented retroactively in response to these disputes—in some cases after years of conflict began. When these approaches did occur, they were decreed by a legal authority. As a result, legal approaches to resolving conflict (e.g., legal arbitration, increased law enforcement efforts) were applied more often (3/3) in case studies of conflict in recreational fisheries than recommended by the literature (Table 2). For example, in the Norris Reservoir Striped Bass Conflict, the use of legal authority to resolve this dispute was only attempted 8 years after the conflict began and was not employed until mandated by the Tennessee State Legislature. In the Ontario Asian Canadian Angler Assaults case, government intervention was also implemented post-conflict, and not until an inquiry was launched by the OHRC. Strategies that improve situational understanding were also recommended more often in the literature than in the recreational fisheries case studies, although it is possible that attempts to understand factors contributing to the disputes were undocumented. It is also possible that conflict resolution approaches were not applied in the three case studies because the cases occurred

Table 2 Themes and approaches identified for conflict resolution and their use in selected case studies of recreational fishing conflict in North America

| Emergent theme | Approaches | Field of application | Reference | Case studies that apply these approaches |
|-----------------------------------|---|---|---|--|
| Improve Situational Understanding | Pre-emptively develop framework(s) to support improved understanding of the needs and positionality of parties involved as well as institutional factors (social, economic, ecological) | Resource and Space sharing; Fisheries; Offshore Infrastructure | Stokesbury et al. (2022), Turschwell et al. (2022) | N/A N/A Big Wood River Trout Fishery Asian Canadian Angler Assaults |
| | Pre-emptively incorporate social, economic and ecological interests into framework development | Resource and Space Sharing | Rayfuse (2020) | |
| | Create a framework to describe factors leading to the conflict | Fisheries | Arlinghaus (2007), Boucquey (2017) | |
| Collaborative Governance | Proactively involve all stakeholders in a structured collective decision-making process | Resource and Space sharing; Hunting | Turschwell et al. (2022), Rayfuse et al. (2020), Castañeda et al. (2023), Bower et al. (2014) | |
| | Retroactively explore opportunities for collaborative management | N/A | N/A | Norris Reservoir Striped Bass Fishery Big Wood River Trout Fishery |
| Legal Intervention | Provide a framework upon which to structure collaborative arbitration involving all parties, prior to escalation to a legal debate. | Fisheries | Arlinghaus (2005), Berninsone and Newton (2018), Charles (1992) | Norris Reservoir Striped Bass Fishery Big Wood River Trout Fishery Asian Canadian Angler Assaults |
| | Make use of existing governance structures designed for conflict resolution (e.g. 1892 Law of the Sea) | Fisheries, Space Sharing; Offshore Infrastructure; Environmental protection | Rumley (2009), Rayfuse (2020) | N/A |
| | Make use of legal arbitration and legislature | Fisheries | Rumley (2009) | Big Wood River Trout Fishery |
| | Provide avenues for intervention or threat of intervention by enforcement agencies | Fisheries (e.g. combat illegal fishing) | Rumley (2009) | Asian Canadian Angler Assaults, Norris Reservoir Striped Bass Fishery |
| | Increase enforcement/regulation | Fisheries (e.g. combat illegal fishing) | Rumley (2009) | Asian Canadian Angler Assaults |

prior to most of the attention given to conflict resolution in the literature reviewed. It is unclear whether any themes identified in the available literature have been applied to more recent recreational fisheries conflicts due to the lack of documentation (we included the cases we that had enough detail for thematic analysis), highlighting the need for further study in this space.

Key findings from case studies

A call for proactive management and governance From our analyses, proactive steps toward collaborative governance and knowledge production should be the most recommended approaches to avoid and navigate conflict. Despite this, all three case studies examined in this paper implemented reactive attempts at collaborative governance or improving situational understanding, paired with some form of legal intervention in response to ongoing conflict. This may be the result of a mismatch between theory and application within recreational fisheries, but could also be a function of sparse literature on the navigation of existing conflicts. Generally, lack of resources in fisheries management can also lead to limited capacity to engage in proactive strategies (Howarth et al. 2024). However, it is important to acknowledge the likelihood of reporting bias. If proactive steps, such as those recommended in the literature, were taken by stakeholders and managers to prevent conflict between user groups, these occasions may have gone undocumented.

The generally unresolved nature of the Norris Reservoir conflict and the long-delayed resolution of the Big Wood River conflict highlight how retroactive and superficial attempts at conflict resolution are likely to be ineffective in cases where emotions are high and conflict has become entrenched. In both cases, a lack of proactive and conclusive measures to understand ecosystem dynamics (e.g., trout population declines), ecological impact of Striped Bass (Churchill et al. 2002) and the positionality of resource users on initial and subsequent management projects led to feelings of distrust that ultimately defeated many downstream attempts to reach a consensus or co-manage the resource. Fortunately, the Big Wood River conflict was eventually resolved after several years, following legal intervention and the formation of a new, more representative task force. In cases such as the Big Wood River conflict, this legal intervention can work but often occurs as a last resort. More “heavy-handed” legal intervention (e.g. fines) may provide a short-term resolution, but our results suggest that solutions built upon mutual trust and cooperation may be more effective (see Arlinghaus 2004). Public meetings and the implementation of conflict resolution approaches (e.g., public surveys that identify issues leading to better communication) allowed user

groups to identify shared goals and come to management agreements through thoughtful communication and compromise. For the case of the BWR conflict, these groups eventually did come together over shared values of protecting the fish, further highlighting the importance of communication. In these case studies, the need to develop and integrate proactive strategies (e.g., stakeholder communication, knowledge co-production and study implementation) to avoid future conflict was not addressed. These points also highlight that recreational fisheries are examples of complex, socio-ecological systems that require all actors and systems (ecological, social, institutional) to be involved in the conflict resolution process (Arlinghaus et al. 2016).

The implementation of a proactive framework (a specific and structured set of tools and approaches) to incorporate thorough and meaningful stakeholder involvement in management decisions may seem time consuming and costly. Structural barriers such as these, along with a lack of organizational support and existing institutional cultures or bureaucracy, may be limiting the use of a proactive framework (Nguyen et al. 2019). However, the preventable escalation of a disagreement into conflict also comes at the expense of time and resources (e.g., policing and enforcement costs, legal proceedings, decreased license revenues from fishing participation), and may hinder future collaboration through erosion of trust, and reputational damage. Incorporating user groups and other stakeholders into decision-making processes from the start has the added benefits that accompany incorporating diverse perspectives (e.g., Milem 2003; Roberge and van Dick 2010) and improving compliance (e.g., Wouters et al. 2013; Desai 2015). Additionally, it is important to define the role of various authorities in the implementation of proactive governance. Institutions are complex, and it is difficult to define at which level decisions should be made. Generally, there has been a movement away from top-down approaches in favor of community, or local co-management (Wilson et al. 1994; Welcomme 2015). Despite this, it is likely that these solutions to conflicts must be perpetuated by some form of lower-level government before they can be accepted and utilized by recreational fishing users, as in the most recent case of Asian Canadian angler conflicts.

The case study exploring the series of assaults on Asian Canadian anglers demonstrates the influence of social and cultural dimensions in recreational fisheries, and that management of resources cannot resolve conflicts between anglers without acknowledging human dimensions. Indeed, Arlinghaus (2005, 2007, 2020) describes emotional drivers and reduced tolerance to lifestyle diversity as factors contributing to conflict. Subjective feelings regarding perceived or real differences in how other groups use a resource may lead to an unwillingness to share and such

conflicts should be solved via education and cooperative conflict management before resorting to stricter regulation (Arlinghaus 2005, 2007). In the resolution of this case study, several organizations collaborated to focus on education and outreach on racism and human rights, while also using legal infrastructure to penalize users enacting violence. However, action was once again retroactive and was not initiated until a larger governing body (OHRC) was involved. Although the conflict was not examined socio-ecologically, the report (Ontario Human Rights Commission 2008) suggests differences in angler groups and fear of overfishing could have led to racist assumptions and tension between (or towards) angling groups and that while differences in fishing practices may have played a role, framing fishing regulations as a solution to this conflict minimizes the larger influence of racism underlying these incidents. Further, these actions may divert attention away from a level of personal accountability among anglers, leading to an inability to diffuse conflicts when they arise. There may have been potential in this case to explore more proactive solutions as many of the solutions that were eventually put in place (education, anti-racism group formations) could have been utilized at any point prior to the inquiry (remember, there were 11 separate cases before an inquiry was launched) to the benefit of all angler groups. Proactive methods to involve user groups as a way of avoiding conflict before it occurs are something to consider across recreational fisheries, where we know conflicts of this nature occur elsewhere (e.g., Bengston et al. 2008).

Expanding and investing in human dimensions knowledge through collaboration Our findings highlight an important need to expand stakeholder involvement and co-management to allow recreational fisheries managers the chance to proactively consider varying and alternative strategies for management of fisheries (Howarth et al. 2025). This is commonly cited as an important way to resolve conflicts in non-recreational fisheries (e.g., Cánovas Molina and Gourguet 2025). Our work also highlights the need to direct research attention towards developing conflict resolution strategies that are specific to recreational fisheries. While the literature we reviewed was relevant, it likely did not capture the nuances and contributing factors of North American angling conflict such as socio-demographics, specific legal frameworks for recreational fisheries, how conflicts arise between actors and the dynamic and complex nature of individuals participating in recreational fishing, especially as the true scope and breadth of intra-sectoral conflicts in this sphere is largely unknown.

The involvement of stakeholders in recreational fisheries conservation and management strategies is common (e.g. Bower et al. 2017; Zhang et al. 2024) but not without

difficulty, especially where there are distinct groups in conflict (Arlinghaus 2005). As demonstrated by some of the cases herein consensus was reached, through immense organizational pressure, rather than through fair representation of the parties involved. It should thus be the priority for fisheries managers and practitioners to involve diverse, well-represented groups and create collaborative governance among impacted groups prior to conflicts to alleviate the potential for them to occur down the line (e.g., Howarth et al. 2023). In fact, many of these groups can even be facilitated through grassroots organizations and further accredited by managers or government. An example of this is the creation of the Fraser River Peacemakers: a group created due to conflict between Indigenous and recreational fisher groups in the Fraser watershed in 2009. Organizations like the Fraser River Peacemakers may serve as useful examples of how angler groups can help to prevent conflicts before they begin (Department of Fisheries and Oceans Canada 2018).

Individual anglers and groups have a diverse array of values, beliefs and attitudes to angling (e.g., Hunt 2008; Manfredi 2008; Arlinghaus 2006; Hunt et al. 2023). In each of these three cases, there were clear distinctions between two angling groups with different values, beliefs and attitudes. Differing thoughts on how the fisheries space should be used contributed to conflicts among various stakeholder groups who valued different aspects of the fishing experience. These issues were also driven by social norms and in- and out-group dynamics highlighting the complexity of these behaviors (Gallo 2013). Additionally, while this type of sanctioning can be useful in many contexts, without true understanding of the values and beliefs of each group by the other, there may be difficulty in resolving conflicts of this nature (Stensland and Aas 2014). A potential solution for certain high conflict areas is to organize annual or seasonal meetings among various angler groups to discuss fishery concerns, hosted by local managers. A short list of actionable items can then be distributed at popular fishing areas to facilitate understanding and co-management. Involving key informants such as tackle and bait shop owners, social media influencers, and leaders in fishing clubs can serve as a mechanism to further share messaging more widely. This type of informal work investigating angler value systems can aid in the understanding of region-specific motivations and priorities of angler groups, which may be applied to identify areas of potential conflict (Hunt et al. 2013). Catch-and-release angling is in direct ideological competition with some fisheries as many recreational fisheries also provide an important food source for many people because of previous and conflicting definitions of 'subsistence' and ambiguity of 'recreational in principle' (Cooke et al. 2016), as seen distinctly in the Idaho case

study reviewed. How anglers viewed harvest fisheries in comparison to catch-and-release fisheries was likely also important in both the Tennessee and Ontario cases, highlighting the need to better understand social dynamics to bridge these gaps. It is clear in these cases that a better mutual understanding of a variety of angler values, beliefs and attitudes would have benefited each of the angler groups. In the most recent case among Asian Canadian anglers, there were retroactive attempts to improve situational understanding (including attempts at education and creation of race-relations committees), but again we reiterate the need to take a stand on these issues proactively. While the literature on angler values, beliefs and attitudes is broad, there is little to suggest that this understanding has translated to conflict resolution in fisheries, possibly due to a knowledge-action gap (Fulton and Adelman 2003). We recognize that fisheries managers may not be fully prepared to handle fisheries conflicts from a human dimensions perspective, which emphasizes the need to incorporate suggestions with a bottom-up approach where conflicts are documented, analyzed and subsequent solutions are distributed with education or awareness.

Documentation and reporting of conflicts in recreational fisheries Recreational fishing conflicts in North America are complex issues that have been vastly understudied from the viewpoint of modern fisheries management. Here, we explored how three relatively well-documented North American conflicts in recreational fisheries applied various recommendations and themes in conflict resolution and prevention in their resolution. While none of the themes identified within this project are new, management strategies may consider how to better co-manage resources, especially in recreational fisheries. It is difficult to say how conflict in recreational fisheries will evolve but this is an opportune time to advance our understanding of fisheries conflict through use of bottom-up approaches that involve angler groups to prevent conflict.

In the context of this paper, we recognize that the listed conflict resolution strategies may be theoretical in nature. Conflicts are not well-documented despite existing throughout the fisheries space. There may be no documentation of potential conflicts that were resolved or avoided through proactive approaches, and we are unsure if more recent conflicts (i.e., those resolved after the publication of the reviewed literature) have employed the recommendations highlighted in this paper. The chosen conflicts in this study were among very few with ample documentation and perceived solutions. Even still, information describing the relative success of (i.e., stakeholder satisfaction), and factors leading to, conflict resolution are non-existent. The

lack of monitoring and follow-up assessment of the approaches applied in case study documentation makes it difficult to label a conflict as effectively resolved. Thus, our understanding of how conflict resolution themes have been applied and their relative effectiveness may not be representative of successful approaches used in recreational fisheries. This highlights the need for thorough documentation of recreational fisheries conflicts, such that the factors leading to their effective resolution, or lack thereof, may be applied to future navigation of conflict and development of co-management strategies.

Conclusion

Twenty years following Arlinghaus' (2005) seminal paper on intra-sectoral conflict in recreational fisheries, there is little evidence that efforts to address and overcome such conflicts have been embraced. Social and intra-sectoral conflicts still permeate the recreational fisheries space among a diverse group of users in the North American context. In this paper, we highlight various themes utilized in fisheries and nature-based recreation conflicts and demonstrate how they were applied to three well documented cases of recreational-fisheries conflict in North America. Three case studies presented here—the Norris Reservoir conflict, Big Wood River conflict, and the OHRC Assaults case—highlight that conflicts in recreational fisheries can occur due to ideological differences in how a resource should be managed, how the fishery space itself should be managed, and how different groups may hold perceptions of another group to create conflict (Thurrow and Schill 1994; Churchill et al. 2002; Ontario Human Rights Commission 2008). The mismatch between approaches to navigating conflict applied in these case studies and the recommendations from the literature highlight the reactive nature of current conflict resolution strategies employed within recreational fisheries and the lack of a standardized set of approaches used to navigate conflict when it does occur. To better navigate intra-sectoral conflicts, there needs to be a greater focus on ongoing co-management through bottom-up approaches that aim to effectively resolve issues proactively without the need for heavy-handed legal interventions or greater regulatory processes (Fig. 1). As noted by Fisher et al. (2011), “the best time to handle people problems is before they become people problems.” Addressing these issues will require expanded training for fisheries managers in conflict resolution as well as the engagement of human dimensions experts. Additionally, the full scope of conflicts occurring within recreational fisheries is not well documented and likely under-reported, thus, it is too early to say if there are better or differing strategies that

various groups have utilized to respond to their own conflicts. Regardless, this paper can serve as a good starting point for a conversation with emphasis on intra-sectoral conflicts within recreational fisheries that have long been neglected.

Author Positionality

The authors would like to recognize that this article is rooted, motivated and written through the lens of those involved, as biologists but also importantly, for some of the authors involved, as individuals who have spent substantial time within the Ontario recreational fishing space over the last several decades, several of whom are members of underrepresented, marginalized or racialized communities. Hence, the conclusions of this study may reflect those thoughts and biases that originated through personal observations within recreational fishing spaces. There have long been tensions between different angler groups in Ontario (some of which have been experienced by various authors here) that at times have been hostile and have garnered media and social media attention, although these conflicts are rarely addressed through an academic lens. While we also recognize that conflict itself is not necessarily driven by racial or ethnic-group tensions, it is important to state that it is through these observations that this research group decided there was a need to address conflicts in this space that may continue to permeate the world of recreational fishing. Indeed, we are not the only group that has been motivated by these observations (Martino 2023). As such, the results shared above are not meant to be all-encompassing, but can hopefully be used as a springboard for discussions on how different groups may experience angling in the changing world of recreational fishing, just as some of the authors have.

Data Availability

No datasets were generated or analyzed during the current study.

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