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Voluntary catch-and-release can generate conflict within the recreational angling community: a qualitative case study of specialised carp, *Cyprinus carpio*, angling in Germany

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Abstract Because of low fishing mortality that results from catch-and-release angling for carp, *Cyprinius carpio* L, it is counterintuitive that voluntary catch-and-release (vC&R) of this species induces conflicts within the angling community. Originally motivated by animal welfare concerns, vC&R is today probably as or more strongly criticised within the angling community itself than it is intersectorally. This study reviews the institutional treatment of C&R in Germany and explores within a sociological conflict model the conflicting views surrounding vC&R, specifically in specialised carp angling. It is argued that the intrasectoral (i.e. among angler groups) conflicts around vC&R fishing may divide the recreational angling community, which in turn may weaken the coherence of the entire angling sector. Restricting the opportunity to practice vC&R also can have important social and biological implications, which suggest a rethinking on the current treatment of vC&R recreational angling in Germany.

KEYWORDS: anglers, animal welfare, catch-and-release, conflict, recreational fisheries.

Introduction

Catch-and-release (C&R), which involves fish that are returned alive to the water after capture, is widespread in recreational angling. It can occur voluntarily or mandated by a regulation and implies a gradient from zero kill to complete kill of caught fish (Policansky 2002). From a human dimensions perspective, understanding the ethics of voluntary C&R (vC&R) is particularly important. Under vC&R, an angler voluntarily decides not to harvest a fish and thus, consciously or unconsciously, contributes to resource conservation. However, vC&R can also induce conflicts among angler groups (intrasecotoral) or between anglers and non-fisheries stakeholders (intersectoral) (Arlinghaus 2005). Understanding and explaining such conflicts is crucial for improving recreational fisheries management, and thus is the focus of this paper, with emphasis on intrasectoral conflicts.

When angled fish are voluntarily released for future recapture or to conserve fish stocks, provided that hooking mortality (Muoneke & Childress 1994) and sublethal effects (Cooke, Schreer, Dunmall & Philipp 2002) are minimised, the level of rivalry among anglers to appropriate the common-pool-resource fish remains the same because vC&R is not extractive *per se*. Therefore, from an angler's perspective, those who do not practice vC&R should welcome, or at least not resent, the voluntary release decision of other anglers. This is particularly relevant if 'quality' fish (e.g. trophy fish or fish of high food value) are voluntarily released, because these specimens will remain in the stock. Provided that vC&R does not increase the rivalry in consumption for other common-pool resources such as space (e.g. by overcrowding at quality fisheries) and assuming that caught and released fish are equally catchable compared with uncaught fish (which is debated for some species, e.g. Raat 1985), the potential for intrasectoral conflicts in vC&R fishing should be low.

In sharp contrast, vC&R, particularly total vC&R fishing, has created controversy and public debate in Europe (Aas, Thailing & Ditton 2002) and elsewhere (LaChat 1996). Disputes have arisen not only

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intersectorally, but also intrasectorally (Arlinghaus 2005). Aas *et al*. (2002) identified two dichotomous positions on total C&R in Europe. First, total C&R fishing is considered both an ethical and a conservative approach to resource utilisation; this perspective acknowledges that C&R is preferable to catch-and-kill for sustainability. Second, total C&R is regarded as an unethical and reprehensible fishing practice based on concerns about fish experiencing pain and suffering (de Leeuw 1996; Chipeniuk 1997; List 1997; Balon 2000) or post-release mortality and sublethal impacts that are controversely debated publicly and in the scientific literature (Muoneke & Childress 1994; Cooke *et al*. 2002; Cooke & Sneddon, in press).

Negative social attitudes towards C&R are particularly pronounced in Germany, with emphasis on conflicts originally motivated by intersectoral animal welfare concerns. The most frequent theme identified by Aas *et al*. (2002) in the German C&R literature was animal welfare (not to be conceptually confused with animal rights). Spitler (1998) noted that worldwide, recreational fisheries in Germany appear to be most affected by the animal-rights movements. Animal-rights supporters typically do not tolerate any justification for recreational fishing other than, maybe, catching fish for personal consumption and, therefore, view, along with some fish biologists, C&R as 'playing with fish for no good reason' (de Leeuw 1996; Balon 2000). Animal-welfare and animal-rights issues will probably become more important in the future in countries other than Germany.

Few perspectives on C&R in Germany, particularly vC&R, are available in the fisheries literature, with Berg & Rösch (1998) as a notable exception. Therefore, the objectives of this paper were: (i) to review the current institutional environment governing releasing angled fish in Germany; and (ii) to present a case study on specialised carp (SC), *Cyprinus carpio* L., angling in Germany that illustrates that unexpected conflicts within the angling community can result from the vC&R ethics of some angler groupings.

Materials and methods

Qualitative social science methods were applied to explain the inter- and intra-sectoral conflicts surrounding vC&R in Germany using SC angling as model. The intrasectoral conflicts caused by the vC&R behaviour of SC anglers were described and explained within the conflict model of Arlinghaus (2005).

The current laws and by-laws of the 16 German states and a sample of local regulations with relevance to regulating C&R were compiled. Available scientific information and other documents (unpublished reports, articles in angling magazines, opinion articles and essays in the angling press and publications from angling clubs and organisations) on C&R in Germany were reviewed. Additionally, to verify information derived from the literature search, personal interviews (about 1-h each) were conducted with representatives from general angler organisations ($n = 2$), specialised angler organisations ($n = 2$), angling journalists ($n = 1$) and selected highly visible anglers identified in the angling press ($n = 4$). Both SC anglers and non-carp anglers were interviewed. These interviews were semi-structured and open. Terms potentially interpreted differently by the interviewer and the interviewed person were verbally defined or follow-up questions were used to clarify positions and understandings.

Results

The institutional environment of catch-and-release fishing in Germany

In Germany, national, state-level and local laws determine when recreationally caught fish can or must be released.

National scale Of great relevance for the immediate possibility to release caught fish in Germany are two national institutions that specifically deal with animal welfare, termed animal protection (*Tierschutz*) in German. First, animal protection is included in the German constitution as of August 1 2002; thus, at the national scale there exists a constitutional duty to protect the welfare and the well-being of animals including fish. However, this does not mean that animals are granted rights in the human sense (Drossé 2003). Second, a German Animal Protection Act (APA) was enacted on July 24, 1972. The APA is a law providing guidelines for Germany as a whole. It assures animals protection against human influences because of ethical reasons (Drossé 2003). Two paragraphs are paramount for understanding the German viewpoint on C&R. According to §1 'nobody is allowed to inflict pain, suffering or damages to an animal without a reasonable reason'. Second, as laid down in §17, 'penalisation by prison sentence up to 3 years or by fine will take place if somebody 1) kills a vertebrate without having a reasonable reason or 2) causes enduring or repeated pain and suffering to a vertebrate'.

Thus, an angler practicing vC&R can be penalised according to cruelty to animals if this practice causes enduring pain or suffering. Recently, there has been

much controversy over the topic of pain and suffering in fish with opposing scientific perspectives (reviewed by Chandroo, Yue & Moccia 2004). There is growing recognition that fish can experience nociception and that they may have some capacity to experience pain (Cooke & Sneddon, in press). However, scientific evidence is unequivocal, with some researchers questioning the ability of fish to experience pain consciously and suffering in the human sense (Rose 2002); lack of pain perception and suffering does not question the ability of the fish for nociception and other complex neurobiological and behavioural abilities (Rose 2002). Because of the scientific uncertainty regarding pain perception in fish, Jendrusch & Arlinghaus (2005) argued that no German angler can be penalised for vC&R because in Germany there exists the legal principle of *in dubio pro reo* (in doubt in favour of the accused).

Irrespective of this ongoing debate, according to the APA there must be a reasonable reason for recreational fishing, because in every case setting a hook causes tissue damage and may cause pain and suffering. Reasonable reasons, however, are not specified by the APA. Several court decisions debated critical practices of recreational fishing with relevance to animal welfare (competitive fishing, live baiting, use of keep nets, put-and-take fishing and C&R) and, therefore, have helped elucidate what is today unanimously accepted as reasonable reasons for recreational fishing in Germany: (i) fishing with the intent to harvest fish for personal consumption; and (ii) fishing for ecological management reasons, such as to improve the state and structure of fish populations or the provision of ecosystem services such as water quality (Tierschutzbericht 2003). These guidelines set the national framework for C&R fishing in Germany. However, it is important to note that there is no formal, legal ban on C&R stated in the APA.

State and local scale In addition to nation-wide laws such as the APA, recreational fishing must comply with the demands of state legislation. Fisheries legislation differs in all 16 German states. Ownership of the right to catch fish is usually dependent on ownership of land adjacent to the body of water. Fishing rights, more precisely rights to acquire fish in a particular water body, can be purchased or leased from fishing-rights owners (e.g. private persons, companies, the state or Germany). The person or the group that leases or owns the fishing right also has the duty to manage the fishery resources without causing harm to fish populations and entire ecosystem. There is typically the obligation to conserve or improve a 'natural' fish community by fisheries management, and irreversible change should be avoided by appropriate recreational fisheries actions and exploitation patterns. These duties are formulated in state-specific fisheries legislation and in various nature conservations laws nation-wide and state-wide. Legislation is enforced by public fisheries agencies at the state or regional level, and fishing-rights holders (e.g. an angling club) plan and implement local management. They can enforce, supplement, and complement state-wide regulations. For example, private fishing-right holders can expand state-wide minimum size limits or ban harvest of a particular species for a specific time period locally when a particular species is considered declining and limiting angling harvest may help the species recovery. This can involve increasing regulatory C&R rates by increasing legal minimum size limits or expanding protected seasons locally in full agreement with state-specific fisheries legislation and, as long as a reasonable reason for fishing is present, in full agreement with the APA (Jendrusch & Arlinghaus 2005; Niehaus 2005).

Thus, C&R is not forbidden according to state-specific fisheries legislation. All 16 states have fisheries legislation dating between 1985 and 2005 prescribing protected species, sizes and seasons. Thus, releasing undersized or protected fish or fish caught during protected seasons is required according to all fisheries laws to comply with the need for ecological sustainability and to conserve healthy fish communities. With the exception of the state of Bavaria, there is no formal statement in fisheries legislation that prohibits the release of fish that can be legally harvested. In Bavaria, releasing of unprotected fish is prohibited unless C&R is in agreement with the APA and the duty of maintaining healthy and diverse fish communities as stipulated in the Bavarian fisheries law. This statement is a repetition of the formal framework of rules already set by the APA and state-specific fisheries legislation, and thus should be implicitly guiding other German states as well. Therefore, vC&R of unprotected species or sizes is only acceptable if the angler has a reasonable reason for fishing for recreation (i.e. either personal consumption or a socially accepted need for recreational fishing to improve ecological conditions), and the release event complies with the duties formulated in fisheries and nature conservation legislation. Thus, C&R is always allowed if it helps to conserve a natural fish community. Bavarian fisheries authorities, as some others, however, take the position that judging whether a stock needs protection, and in turn deciding whether the partial or total release of a legal fish species or size is allowed, lies outside the control of an individual angler and is the duty of the fishing-rights holder.

According to this perspective, the latter is the only stakeholder allowed to influence the C&R rates in a local fishery by way of a regulatory change (e.g. increased minimum size limit). This perspective limits the potential for individual anglers to practise vC&R of unprotected species and sizes and exposes an individual releasing a fish to the risk of being penalised because of cruelty to animals according to the APA. In theory, as long as an angler does not go fishing with the pre-conditioned intention to release all the fish that are caught, releasing fish is allowed, and is mandatory in specific regulated situations.

If vC&R of unprotected fish is not banned by German law, why then is there the perception in the scientific literature that C&R overall is illegal or at least not acceptable in Germany (compare statements in Berg & Rösch 1998; Hickley 1998; Spitler 1998; Aas *et al*. 2002; Steffens & Winkel 2002)? First, there is an important institutional difference between C&R not being accepted and C&R being illegal. Not accepting C&R refers to an informal 'rule in use', e.g. a social norm of not tolerating total vC&R because of the current interpretation of the APA; it has a voluntary or normative emphasis. In contrast, illegal refers to a formal (legislated) ban; it has a mandatory emphasis. It was explained above that there is no explicitly stated ban on vC&R of unprotected fish in legally binding institutions, but the current animal welfare legislation implicitly leads to a ban of vC&R of harvestable fish, particularly total vC&R, because releasing the fish implies that the angler in the course of his or her fishing experience lacked one of the currently accepted reasonable reasons for interacting with fish (animals). Moreover, at the local scale, there are many angler organisations, associations or clubs that have set up their own fishery rules termed 'Gewässerordnungen'. Often, these local rules contain statements such as 'legally sized fish have to be killed and removed'. Therefore, if an angler in this situation releases an unprotected, legal 'table fish', he or she risks exclusion from the angling club. The angler also risks prosecution if he or she is accused of cruelty to animals by a third party. Obviously, to avoid closer scrutiny by animal welfare activists, many angler clubs and some angler organisations have developed their own fishery regulations or Codes of Conduct that partly ban vC&R of species or sizes that can be legally harvested. This is a self-motivated reaction of the angling community to reduce external animal welfare-motivated pressure (Müller 2002). In any case, the public discussion on C&R 'in general' has led to the false impression, even among many stakeholders in the German angling community, that C&R *per se* is legally banned. This, however, is not true, as explained above, and reduces the potential for an objective public discussion about the pros and cons of releasing unprotected fish for social and biological reasons.

Second, most of the cited papers do not explicitly define C&R such that confusion about what is meant by the term C&R occurs. Berg & Rösch (1998) described the content of a state-wide Code of Practice developed for one German state, Baden-Württemberg. According to this Code, each unprotected species or size has to be anaesthetised and killed after the catch. Therefore, by definition C&R is allowed when releasing protected sizes or species, but vC&R of unprotected fish is not accepted (termed C&R in Berg & Rösch 1998). The Ministry of Justice of Baden-Württemberg declared the guidelines described by Berg & Rösch (1998) obligatory for all public prosecutors. This view is prevalent with many fisheries authorities throughout Germany as well. Consequently, every angler practicing vC&R of unprotected species and sizes risks legal prosecution in conflict with animal welfare legislation, particularly §17 APA, or with local angling rules, or both. This, however, has to be judged by an angling club or a court on a case-by-case basis. This demands that somebody has to bring the action to court. In practice, however, it is extremely difficult to prove that an angler practising vC&R is lacking a reasonable reason (Niehaus 2005). Releasing unprotected, but unwanted species or sizes, such as fishes of low food value, in situations where the angler was fishing, at least in part, to catch fish for consumption is always allowed (by-catch, Drossé 2003). Therefore, C&R without any further amendments on what type of C&R is meant is legal in Germany.

Particularly problematic is total vC&R of unprotected fish that were intentionally the target of the angler such that there is no reasonable reason to go fishing (Niehaus 2005). This applies to many SC anglers (as to other high specialisation anglers), who thus are particularly prone to conflict with German animal welfare legislation and local angling club rules.

Chronology of the conflict surrounding voluntary catch-and-release by specialised carp anglers

In Germany, SC anglers are being attacked by public authorities, popular writers and less specialised anglers, *inter alia* because of their common practice of total vC&R angling of carp (Stolzenburg 1995; Kleint 2001; Stolzenburg 2001; Drossé 2002; VDFF 2005). The first debates around vC&R appeared in the mass media, sharply criticising SC angling in the mid

1990s. Among the criticism was the notion that SC anglers fished exclusively with the objective to catch trophy fish and to experience an enduring fight (Anonymous 1995). The German Animal Protection Organisation, a non-government organisation (NGO) lobbying for the rights of animals, judged this practice as inflicting 'considerable pain and suffering' (Anonymus 1995) or as 'cruelty to animals' (Stolzenburg 1995). The German Organisation for Nature Conservation also took a fierce anti-total-vC&R position against SC anglers by publishing a specific press release (Stolzenburg 1995). The first debates around the total vC&R behaviour of SC anglers were therefore motivated by animal rights activists and some environmentalists and their lobby groups who managed to achieve attention through the mass media. In 2001, an SC angler who released a trophy carp and published the picture in an angling magazine was fined €400 after the Animal Protection Organisation brought this C&R event to court (Drossé 2002). Previous lawsuits (at least four before the 2001 case) all ended without condemnation of the angler; the accused anglers were mostly acquitted because of insignificance of the matter of fact (the C&R event) or because they showed convincing repentance (Drossé 2003).

After the media attention SC angling received, a heated debate against SC anglers developed within the angling community in several regions of Germany (e.g. Stolzenburg 1995; Drossé 2002; Arlinghaus 2003; Mechtel 2005). This also applies to professional German fisheries societies such as the German Society of Fisheries Agency Professionals and Fisheries Scientists (VDFF 2005). Their most recent internal protocol (VDFF 2005) states that 'through the practice of releasing big fish, particularly trophy carp – a practice predominantly conducted in Anglo-Saxon countries – recreational fisheries are gaining a distorted public image. We are called upon to clarify that these forms of C&R are illegal according to animal protection and fisheries legislation'. In fact, many fisheries professionals and anglers have SC anglers in mind when the term C&R is used in the English form in Germany; rarely other anglers are publicly criticised, although it is well known that many German anglers practice vC&R. It appears that many angling NGOs and anglers today take an anti-total vC&R position, specifically lobbying for constraining SC angling. Some SC anglers were brought to court by fellow non-carp anglers. This has occurred both within one angling club (a fellow club member brought the action to court) as well as between angling clubs. There are examples where anglers from neighboring angling clubs brought SC anglers to court after a newspaper article was published in which a release of a carp during an organised youth carp fishing event was documented. Some SC anglers and their lobby groups react to this antipathy by developing visual signs of adherence to a total vC&R ethic. Sometimes, this takes extreme forms. For example, there are labels, stickers and t-shirts that display 'No fear, No Pain, No Kill' statements in relation to carp fishing. Critics of the total vC&R behaviour take a position that it is either: (i) immoral to release legal-sized carp because they can be eaten; or (ii) entirely illegal; or (iii) both. These stakeholders only accept catch-and-kill angling philosophies for unprotected fish. Therefore, on both sides of the conflict, relatively extreme positions favouring or opposing vC&R are held, with limited room for empathetic communication and mutual acceptance.

A common anti-SC angling perspective that is still held by many today was published by Stolzenburg (1995) in a magazine of the largest angler NGO of Germany, the Organisation of the German Sport Fishers (VDSF). Stolzenburg (1995) called SC angling 'absurdity'. He, similarly to the VDFF (2005), stated that SC anglers are 'ruining the image of the great majority of anglers'. Stolzenburg (1995) suspected that if SC angling was not immediately stopped, the already tarnished image of anglers as a result of an animal welfare-stimulated discussion concerning competitive fishing, keep nets or live baiting could be further compromised. Representatives of the VDSF judged this 'extreme form of carp fishing as intolerable' (Stolzenburg 1995). One representative of the VDSF is quoted as saying: 'we have to comply with our image as conservationists of environment and species'; apparently SC anglers stand out as examples of anglers that undermine this image for the angling community in general.

This is an interesting dynamic, because total vC&R in angling is not extractive. First, in SC angling bycatch of other fish species is low. Selectivity for carp is mainly achieved by the use of special baits named 'boilies' (Arlinghaus & Mehner 2003). Carp are typically caught, weighed, measured, photographed and returned alive to the water for the catch of others or to conserve the stock. Because SC anglers have a vested interest in preserving the possibility for recapture or to conserve fish stocks, most carp anglers adhere to strict ethics of proper handling to increase survival of the fish. Release guidelines are of high standards and often reflect the latest developments to enhance survival (Bursell 1999; Janitzki 2005), and SC angling magazines routinely report new insights from C&R conservation science. Further, SC anglers make every effort possible to minimise potential damage to

the carp. For example, they use special unhooking mats and limit air exposure and handling time. By using heavy leads that are fixed on the mainline and a so-called hair rig, deep hooking of carp is minimised (cf. Beckwith & Rand 2005). Moreover, carp are resistant to low oxygen, handling stress, air exposure (Steffens 1980) and holding in keep nets (Raat, Klein Breteler & Jansen 1997; Pottinger 1998). Consequently, hooking mortality is minimal in carp angling ($< 2\%$, Beukema 1970; Raat 1985), and growth impairment as a potential sublethal side effect of C&R is unlikely (Raat *et al*. 1997).

Indeed, recaptures of previously released fish is common in carp angling (Hearn 2000), suggesting limited long-term impacts on the individual fish. Apparently, SC anglers by total vC&R do little harm to carp populations. Consequently, it is unexpected that the total vC&R ethic of SC anglers is so controversial within the angler community in Germany. It seems that the less abundant SC anglers are today more heavily attacked by the more numerous and powerful fellow angling club members than by non-angling stakeholders, including animal welfare and rights activists. It appears that the motivation of the intrasectoral conflict is more about protection of power and image than about conservation or animal welfare. Fisheries professionals, general anglers, some NGOs and some angler clubs in Germany seem to resent SC anglers and their total vC&R practices to divert attention from the concerns of other animal-welfare-related practices such as competitive fishing, live baiting or keep nets, or to preserve a 'clean image' of recreational angling in general.

As a result of the intrasectoral conflict, several local angling rules and general guidelines for ethical angling were explicitly designed to constrain or ban SC angling and other anglers practicing vC&R of unprotected sizes or species. For example, the guidelines for recreational fishing practised by the VDSF state that 'the consumption of fish is indispensably linked with the recreational catch of fish. A caught fish, if legally sized and otherwise unprotected, has to be anaesthetised, killed and afterwards dehooked' (VDSF 2002). This is a clear statement against vC&R. Interestingly, there is a different position concerning C&R in the general guidelines of the second largest German angler NGO, the German Angler Association (DAV). Here, partial release of unprotected fish is preserved as one management option as follows: 'In none of the German laws is a harvesting rule specified. Scientific studies about the genetic potential suggest that systematic removal of large fish might change the genetic architecture of fish populations… Moreover, some anglers cannot appropriately consume trophy fish that are caught resulting in a will to release the fish… We go fishing to catch fish and to consume the fish we catch. However, we retain our option to also release fish' (DAV 2005). But the DAV also has regionally implemented some state-level rules in the fisheries where they have fishing rights specifically designed to exclude the possibility for vC&R of trophy fish. For example, in the regulations of the DAV in Brandenburg, it is stated: 'Targeted angling for trophy fish with the only aim to assess length and weight of the caught fish and later release it alive is not allowed'. Similar to the national perspective of the VDSF, this is a clear position against vC&R of legal fish.

Explaining the conflict from a human dimensions perspective

How can the strong opposition of some in the angler community to the total vC&R behaviour of SC anglers be explained? The single drivers and variables involved are shown in Figure 1. Each of the explanatory factors will be briefly described below.

Cultural drivers Cultural drivers are the cultural values characteristic of specific societies at the national or regional level. Fishing cultures and norms of ethical behaviour largely differ from one nation to another (Aas *et al*. 2002). In Germany, many anglers, managers and fisheries professionals have an agrarian view of human management and control and an entitlement view of the rights (and duty) of humankind to exploit fish resources fully wherever and whenever they can (compare Blann, Light & Musumeci 2003 for similar perspective from the USA). This agrarian view results in views among stakeholders and managers that fish production is there to benefit anglers and fishers, that aquatic ecosystems need fish harvest for ecological reasons and that wise management is removing fish from the ecosystems before they become too old and therefore less productive (Piesker 2003, 2004). This view neglects that recreational anglers may have objectives other than maximising harvest (Arlinghaus 2004), that needs of anglers typically encompass consumptive and non-consumptive aspects of the fishing experience (Arlinghaus & Mehner 2004a), and that the emphasis of inland fisheries management has shifted from maximising yield to conservation and recreation in industrialised societies (Arlinghaus, Mehner & Cowx 2002). In contrast, a strong harvest orientation is characteristic of most anglers in Germany (Arlinghaus 2004).

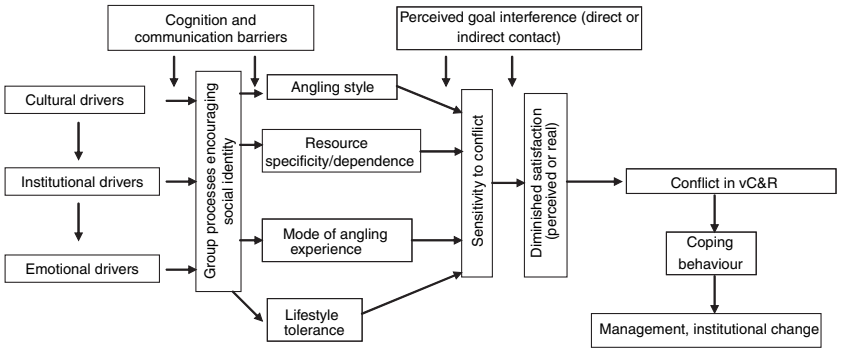

Figure 1. Conflict model framework in total voluntary catch-and-release (vC&R) in Germany (modified from Arlinghaus 2005). See text for explanation.

Institutional drivers Institutional drivers are the formalised rules and informal rules governing recreational fisheries. Cultural drivers such as the consumptive ethic among many managers and anglers strongly influence the establishment of formal and informal institutions such as the formal APA demanding a reasonable reason and in turn not tolerating total vC&R or the informal norm that angling for any other reason than catching fish is unethical. By developing self-motivated regulations and Code of Conduct restricting or banning vC&R, selected angler NGOs or professional fisheries societies such as the VDFF try to take the whole angling community out of the fireline of animal welfare, animal rights and nature conservation activists (Müller 2002).

Emotional drivers Emotional drivers are subjective feelings resulting from cultural or institutional influences. Cultural and institutional drivers together can result in emotional drivers (subjective feelings) evolving among those involved in the management or extractive use of natural aquatic resources. Such an emotion might be the impression among SC anglers of facing unjust restrictions to usual habits such as vC&R because of a new, unfair management policy that restrains the possibility to release fish, coupled with the perception of not being involved in the planning of this regulation (Stoll-Kleemann 2001). On the other hand, SC angling critics may develop negative feelings towards carp angling in general because of rejection of a component of it, total vC&R. This may occur because of direct interactions between total vC&R rejecters and total vC&R supporters at the waterside or at meetings, or indirect interactions through rumours and clichés expressed by fellow anglers about SC anglers. From the perspective of conflict, these emotional drivers will negatively influence the cognition, perception and quality of communication among those involved in recreational fisheries and aquatic resource management. For example, this may result in fear among SC anglers that animal welfare or non-carp anglers are *always* a threat to their angling freedom, or alternatively lead to the feelings among non-carp anglers that SC anglers are *always* inflicting cruelty to animals, that vC&R of harvestable fish is unethical and illegal or that SC anglers pose a threat to the image of angling as a whole (compare Stolzenburg 1995; VDFF 2005). This can, in turn, strengthen a sense of group identity (e.g. groups of SC anglers vs groups of 'other anglers' as perceived by SC anglers), further leading to stereotyping and to increased communication barriers and social group identity that ultimately aggravates the conflicting situations (Stoll-Kleemann 2001; Arlinghaus 2005).

In addition to these three social drivers, four psychological factors (Jacob & Schreyer 1980) explain conflict potentials in total vC&R by SC anglers (Arlinghaus 2005).

Angling style Angling style is the various personal meanings assigned to an activity. Anglers may apply specific norms of proper behaviour to other participants. The more intense the activity style (e.g. SC angling), the greater the likelihood that social interaction with less intense anglers will result in conflict (Jacob & Schreyer 1980). High specialisation carp anglers over time develop specific angling styles that distinguish themselves as specialists from the casually involved causing the development of status and divergent experience-quality norms (Arlinghaus & Mehner 2003). As other anglers may define angling as more a private affair without visible demonstrations of equipment and skill, conflict occurs because the private activity style's disregard for status symbols negates the relevance of the other (the SC) angler's status hierarchy. Furthermore, experience-quality norms

differ between SC carp anglers and other anglers because of divergent motivations and ethics (Arlinghaus & Mehner 2003, 2004a). To meet their expectations, SC anglers are dependent on trophy fish and, therefore, very likely to conflict with more harvest-oriented anglers who focus on table-sized carp.

Resource specificity Resource specificity is the significance attached to using a specific recreation resource for a given recreation experience. Anglers attach varying degrees of importance to the accepted use and the qualities of a particular fishery. Conflict occurs among anglers with a possessive attitude towards the resource (Jacob & Schreyer 1980). Many anglers confront SC anglers perceived as disrupting traditional uses and behavioural norms by claiming how a water body should be fished. One of these unacceptable behaviours is total vC&R, because many may perceive this as wasting food, being unethical or even illegal.

Mode of experience Mode of experience is the varying expectations and abilities among anglers of how the environment is perceived. Anglers differ in the way they experience the environment. Specialised carp anglers, as other high-specialisation anglers, often have a well developed sense for natural processes and can be characterised as being in a focused mode with their senses being more tuned to specific elements of the environment (Bryan 1977). Conflict occurs when an angler in the focused mode interacts with a person in the unfocused mode (Jacob & Schreyer 1980). For example, a SC angler claiming that caught carp should be released because he or she has an understanding of potential overfishing associated with killing rare trophy carp conflicts with other anglers without such knowledge and focused understanding.

Tolerance of lifestyle diversity Tolerance of lifestyle diversity is the tendency to accept or reject lifestyles different from one's own. This last psychological source of conflict in SC angling is related to the general unwillingness of anglers to share common pool resources with members of other lifestyle groups (Jacob & Schreyer 1980). Because of the positive relationship between angling effort, experience and carp catch, SC anglers catch much more carp in terms of total mass per year as compared with the general angler (Arlinghaus & Mehner 2003). Other anglers at the waterside probably only see the pictures of the carp or see large and trophy carp landed that they have never caught themselves during their angling career. Many of the less specialised anglers simply lack the experience of catching larger-sized fish (Vittersø 1997), which influences their tolerance of other lifestyles. This can lead to denigration of SC anglers because of some form of envy. Many anglers also resent technological improvements in outdoor recreation and thus dislike SC anglers using highly sophisticated equipment (Jacob & Schreyer 1980). These additional concerns might cause some anglers to disclaim SC anglers overall, in addition to resenting their total vC&R ethic.

To sum up, at the core of explaining the vC&R controversy in SC angling in Germany are cultural, institutional and emotional drivers that influence individual psychological factors mediated by communication barriers and group processes leading to social identity, i.e. social discrimination between in-groups (e.g. non-carp anglers) and out-groups (e.g. SC anglers) (Fig. 1). This process can operate in such a way as to inhibit the scope for conflict resolution processes and may lead to the development of conflict-inducing institutions (e.g. local club rules banning vC&R of unprotected fish). This causes further negative emotions, leads to diminished satisfaction because of perceived goal interference, facilitates conflicts among different anglers which in turn reinforces social identity, the associated individual factors (angling style, mode of experience, lifestyle tolerance, resource specificity) and the sensitivity to conflict. Clearly, the issue of rejecting the vC&R practices of SC anglers has evolved over time towards an intrasectoral 'people problem' where biological or social arguments in favour of releasing fish are often not accepted. Emotion-focused and problem-solving coping behaviours of anglers such as displacement (i.e. intrasite, intersite or temporal shifts, resource or even activity substitution) or norm shifts (i.e. adjusting expectations or the norm of evaluation) may then occur in response to conflicts (Arlinghaus 2005). However, SC angling is a fairly unique activity, with few other resources (e.g. other waters, other fish species) or activities (e.g. new leisure activity) offering substitutes that provide the same benefits from the angler's point of view. Ultimately, conflict has to be addressed by appropriate management actions or institutional change (Fig. 1).

Discussion

The main finding of the present case study was that the vC&R behaviour of high specialisation anglers can induce seemingly illogical and unexpected conflicts between different angler groups and within the recreational fishing community, a result far different

from the expected conflict between animal-welfare or animal-rights and fisheries stakeholders. These intrasectoral conflicts can, in the long-term, result in division of the angling community. Consciously or unconsciously bundling the critics of the currently largely unacceptable total vC&R behaviour on one angling group, SC anglers (e.g. Drossé 2002; Niehaus 2005; VDFF 2005), may or may not be a wise angling policy strategy in the long-term. It can weaken the coherence of the entire angling sector. This can make the angling sector more vulnerable to streams that oppose recreational fishing overall and that strive to ban fishing for recreation (e.g. animal rights movement, Arlinghaus 2005).

Today, only catch-and-kill is unanimously accepted as ethical angling in Germany, and C&R of unprotected fish is often not accepted and sometimes locally banned by the angling community itself. However, as was shown in this paper, partial C&R (alternatively termed selective harvest), and in extreme cases even total C&R, can be in full agreement with German legislation if recreational fishing harvest negatively impacts fish communities, thereby making C&R a management tool to conserve fisheries resources (Jendrusch & Arlinghaus 2005; Niehaus 2005). However, the opportunity to achieve biological and social sustainability by allowing anglers to decide selectively which fish to kill and which to return (selective harvest according to Cooke & Sneddon (in press) is currently rarely accepted as an option in Germany. Berg & Rösch (1998) stated a popular perception in Germany: 'If fishing intensity is too high, it has to be reduced to an intensity that allows a sustainable yield to be maintained'. This perspective interprets sustainability in a narrow sense of biological sustainability under the umbrella of consumptive fishing without considering other social needs and objectives angling can provide such as relaxation, nature experience or challenge seeking. Such management philosophy can be interpreted as a direct response to animal welfare concerns and the associated legislation in Germany to cripple critics and avoid problems. It corresponds with the established perspective of many public fisheries representatives in Germany. This makes it hard, if not impossible, for anglers who practice total vC&R to receive acceptance in Germany and to enjoy their fishing experience consistently. Constraining or banning vC&R, however, severely reduces the opportunities for recreational fisheries management, because the vC&R option to conserve healthy fish stocks despite high fishing pressure (e.g. to conserve old and large fish in the stock), which can increase angler satisfaction, may accommodate more fishing and increase ecological, social and economic benefits, is often not tolerated or not promoted. It is debatable if the current German fisheries policy to accept exclusively a consumptive, catch-and-kill angling fishery is timely in the 21st century.

From a social perspective, restricting the voluntary decision of anglers to release a legal fish also can have important social implications, particularly for highly specialised anglers who often practice vC&R. It, for example, creates incentives for high specialisation anglers to fish predominantly outside Germany, shifting abroad the socioeconomic benefits angling generates. Constraining the experience of highly committed anglers such as SC anglers also has critical consequences from an equity perspective. This is true because more specialised anglers derive a particularly high amount of benefits from their activity (Arlinghaus & Mehner 2004b). For highly specialised anglers, fishing is typically an integral part of their lifestyle and it is difficult to substitute with other activities or by other species in the case of SC anglers. When making policy decisions in allocating scarce resources, managers could favour specialists or at least consider their interests even if they are the minority overall (Hahn 1991). Otherwise, the total benefits recreational fishing can produce could be reduced (Hahn 1991).

Rejecting highly specialised anglers has an additional disadvantage for recreational fisheries management in general. Marginalising highly specialised anglers (e.g. SC anglers, fly fishers) reduces the potential of these angler segments to be engaged in local co-management schemes. Specialised anglers in general have a high potential to serve as watchdogs against environmental influences. They are highly active, often at the waterside, often willing to improve natural conditions and willing to act against the decline of the fishery. High specialisation anglers are also more supportive of more restrictive fishing regulations to preserve the resource base on which their satisfaction is so highly dependent (Hahn 1991; Allen & Miranda 1996). Specialised carp anglers are also often well informed about ecological processes, and the specialist magazines routinely include articles about scientific findings (Quinn 1992; Allen & Miranda 1996). However, if specialists, as a minority group, are marginalised and not accepted by the majority and the decision makers because of their total vC&R ethic, the potential of these anglers for local management of fisheries is lost. To avoid this, it can be wise to address conflicts in vC&R by appropriate management actions and to rethink the current treatment of vC&R recreational angling in Germany for the benefits of fish stocks,

anglers and angler-dependent industries. However, given the high level of protection animals already experience under current constitutional law in Germany, it might be extremely difficult to accomplish.

The methods of data and information gathering used for the present analysis have some limitations in terms of general application. The amount of inferential reasoning entails a great deal of interpretation by the researcher. Most of the statements must be considered anecdotal, and there are certainly exceptions to the conclusions of this study. Future research is needed that quantitatively tests the conflict model presented. Moreover, a standardised nation-wide social analysis of C&R attitudes, knowledge and understanding in different angler types, states and fishing environments and the perceived conflicts with animal welfare is needed to facilitate the debate about the pros and cons of vC&R in German recreational angling.

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