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A Survey of Catch & Release in Stocked UK Stillwater Trout Fisheries.

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Cover picture: courtesy of Larry McCarthy: Corrib View Lodge, Co Mayo.

1. Main conclusions

- The importance of catch & release (C&R) for fishery managers is underlined by the remarkable 97% participation rate, out of 205 UK fisheries contacted.
- More than 80% of the participating UK fisheries currently offer a C&R option.
- This change has been mainly driven by market forces, in response to the growing numbers of anglers who prefer to release fish and the economics of fishery management.
- Regardless of what rules apply to rainbows, the majority of mixed stock fisheries practice C&R for brown trout.
- Under the right conditions, and with reasonable angler motivation and compliance, C&R appears to be an effective management and conservation tool for stillwater trout fisheries.
- C&R, as currently conducted, creates benefits for managers but it can also create problems. It is not yet achieving optimal fish survival and health.
- Although many anglers perform C&R with dexterity and skill, others do not. Whether approached from an economic, biological or ethical standpoint it is important that C&R should be carried out efficiently with minimal stress and damage to fish.
- There is a need for better education of anglers in C&R techniques.
- It has been suggested by a number of fishery managers and anglers that there should be a Code of Practice for C&R in game fishing.
- Scientific evidence, principles and practical aspects that need be taken into account when formulating a Code of Practice are discussed.

2. Background

The catch and release debate

This study has been designed to provide information on the extent of C&R across UK stillwater stocked trout fisheries, and is supplemented with comments from fishery managers the pros and cons associated with the practice.

There have always been reasons for releasing fish, for example they are very small. However, this survey focusses on C&R when it is applied as a deliberate strategy, either in the context of returning all fish caught regardless of size, or in circumstances that allow an angler to keep fishing after he has killed his bag limit.

But before getting into the detailed information collected in the study, it is important to consider the results against a common understanding of what is meant by C&R and some of the key issues surrounding it, including the extent to which it is practiced elsewhere, both in trout fisheries and other types of fisheries at home and abroad.

What is catch and release?

At face value C&R is very simple. It refers to the capturing of a fish by rod and line and then the returning of it into the water, with the presumption that it will survive unharmed. But things are not always as simple as they seem. There are two types of C&R: 'voluntary' and 'mandatory'. The angler may voluntarily release a fish on humane or conservation grounds or simply because he or she has no desire to eat it. Alternatively the angler may be complying with regulations that require the fish to be released. Either motive can apply in UK stillwater fisheries. The practice contrasts with catch and kill whereby fish are killed, generally with the intention that they will be eaten.

C&R attracts controversy. It raises important issues in the fields of fish biology, fisheries management and ethics. Diverging views need to be aired, respected and openly discussed.

Why is catch and release controversial?

There are differing views amongst UK stillwater trout fisherman on whether catch and release is a good thing, and some of these views are well entrenched. Many of the opinions expressed – both for and against – are based on personal experiences and prejudices rather than on any considered assessment of the real issues involved. An obvious argument to support C&R is conservation (i.e. protecting an endangered species), but that is a less strong argument in the case of stocked brown or rainbow trout fisheries because fresh supply is readily available from commercial hatcheries. Nevertheless even in stocked fisheries conservation is not to be forgotten, since hatchery-reared fish are fed on processed foods largely derived from marine harvest. Wasteful depletion of the resources of the sea is a serious problem. So what are the key arguments in this debate?

The arguments against C&R centre on the following;

- a) It injures the fish, either through hook damage or by handling. A common view seems to exist that many fish will eventually die as a result of C&R.
- b) Fish are more difficult to catch after they have been caught and released; thus reducing the quality of fishing for others.
- c) C&R caters to greedy anglers who just want to catch large numbers of fish as quickly and as easily as possible, which is against the general spirit of angling as a recognised field sport.
- d) A policy of C&R is only fully successful when anglers are well motivated and skilled in its application.

The arguments in favour of C&R centre on the following;

- a) A basic economic argument is that it is much cheaper to return a fish rather than kill it, thereby avoiding the need to re-stock (this assumes low or nil mortality of returned fish). The belief is that this should financially benefit both fisheries and anglers.
- b) There is an increasing preference by anglers not to kill fish or to significantly limit the number killed, thus avoiding the dumping of dead fish that is increasingly prevalent in many fisheries.
- c) Customer demand: anglers want to be able to fish for set periods, often a full day, rather than have to pack up after an hour or two because they have caught their kill limit.
- d) Socio-economic and other changes have meant that anglers are less interested in the trout they catch as a food source and more interested in it from a sporting and recreational perspective.

To what extent is C&R practiced elsewhere?

In the UK anglers for coarse fish have long practiced C&R. They would argue that they could not sustain their fisheries if they had to kill all they caught. The international intermingling of competition anglers has recently played a large part in spreading C&R to other parts of Europe.

In fly fishing, there has always been an element of C&R but it became popular in the 20th century in Britain where the so called 'sporting tradition' contained an important element of conservation i.e husbandry of the environment and of the creatures it contained.

C&R is now extensively applied in river fishing for trout and grayling, mainly because of conservation. In many rivers in the UK and Ireland there are now limits on the number of salmon and sea trout that can be killed, due to concerns over decreasing river stocks.

C&R was exported from the UK in the late 19th and 20th centuries to Canada, Australia, New Zealand and South Africa where it is now well established.

In the USA C&R was widely adopted in the 20th Century as a means of compensating for the growing angling pressure on fish stocks. Much of the scientific evidence underpinning C&R comes from research in the USA and Canada.

C&R is illegal in Germany^{1,41} and Switzerland^{47,49} under Animal Protection Acts.

Practice varies in other European countries. In Scandinavia where there is a strong tradition of fishing for food rather than recreation, C&R is nevertheless being increasingly adopted on conservation grounds.

The sustained successes over the last 25 years, despite angling pressure, of the salmon fisheries of Northern Russia, the trout fisheries of Argentina, Chile, New Zealand and North America and the mixed stock fisheries of Alaska owe a huge debt to the adoption of C&R.

C&R is widely practiced in salt water fly-fishing around the world.

In summary: despite continued opposition in some countries, there is an increasing worldwide trend towards C&R across the whole range of sport fishing. Fisheries scientists have estimated that, around 60% of the fish caught by recreational anglers worldwide are now released.⁸ The motives for introducing it are likely to be varied, ranging from commercial to conservation (probably a mix of these), and in many cases the practice has been introduced at the initiative of anglers.

3.Objectives

The survey was set up with the following aims:

- 1. To better inform discussions among anglers on the pros and cons of C&R by providing reliable information concerning modern practice and opinion, as currently applied in UK stocked stillwater trout fisheries.*
- 2. To obtain the views of fishery managers on the advantages and disadvantages of C&R.*
- 3. To provide an unbiased report that it is hoped will be of interest and/or assistance to fishery managers and anglers.*

4 How the survey was carried out

The survey was devised and conducted by anglers each of whom has a lifetime's experience of angling in the UK and abroad and who practice both the killing of fish for the table and catch and release. It was limited to stocked stillwater trout fisheries for practical reasons. These fisheries, unlike wild fisheries, are easy to identify, they are run on broadly similar lines and their owners and managers can usually be readily contacted.

During the survey the authors' motives have occasionally been questioned. Rightly so. Fishery managers have reason to be wary. But once assured that the authors would respect confidentiality, had no axes to grind and were independent of all fishery, angling or animal rights organisations, co-operation was rarely withheld.

Indeed most fishery owners and managers welcomed the study, generously given their time to answer questions and provided supportive, constructive and interesting responses. Many were keen to discuss the topic well beyond the scope of the specific questions. Their comments add realism and are included in the report.

Scope

A minimum target of 200 was set as achievable within limited time and resources. The survey covered all parts of the UK and included fisheries varying in size from one acre to more than a thousand acres. Most fisheries are run as commercial enterprises. Others are run as private clubs half of which also issue day tickets, while many of the bigger fisheries are run by regional water authorities.

How participants were selected

Fisheries were identified via their advertisements in angling journals, published fishery reports, internet searches and web sites. This method of finding fisheries meant that, although there was no element of selection or prioritisation intended, it was inevitable that the survey included the better known and more commercially active fisheries. Those that did not advertise or publish reports were less likely to be included. It was also the case that the commercially active fisheries were more likely to have a manager who was readily contactable on site.

Every contactable fishery was included regardless of size or location. The information provided by all who were willing to participate was included in the analysis, regardless of whether C&R was practiced or not.

Survey method and data collection

The information was collected via email or telephone. A preliminary pilot study to test the questionnaire was conducted in 2010, with the help of a number of fishery managers in Scotland and England.

The survey commenced with an initial email distribution of 195 questionnaires and covering letters (appendices 1 & 2). The yield of 41 returns (20%) showed that email

was not an effective way of obtaining information. It was then converted to a telephone survey, which yielded an excellent response rate.

Upon making contact by telephone a request was made to speak to the owner or manager. For brevity the responder will be referred to as the 'manager' although this might not always have been his or her official job title. In a few cases, where neither the owner nor the manager was available, answers were provided by a responsible member of staff such as a club secretary or a bailiff.

When the initial attempt to make telephone contact failed, further attempts were made, up to a maximum of six calls. Thereafter the fishery was regarded as an unsuccessful contact and excluded from further enquiry.

Response and participation rates

Out of a total of 205 successfully contacted fisheries 7 managers (3%) declined to cooperate, leaving a total of 198 participants, a positive response rate of 97%. Their responses form the basis of this report.

Fishery locations and characteristics

One hundred and fifteen fisheries (58%) were in England, 60 (30%) in Scotland, 16 (8%) in Wales and 7 (4%) in Northern Ireland. Table 1 lists the main fishery characteristics in respect of categories of anglers, fishery size and bank or boat fishing. Ninety-six percent of fisheries were ticket waters. Sixteen of the fisheries were run by private clubs, half of which also allowed day ticket anglers. One hundred and fourteen (58%) were solely bank fisheries, 8 (4%) were boat only and 76 (38%) were both bank and boat. Because it was felt that interesting differences might emerge in practices and opinions depending on the size of the waters, fisheries were arbitrarily divided into small (less than 5 acres) medium (5-10 acres) and large (more than 10 acres). Fifty-four (27%) were classed as small, 58 (29%) as medium and 86 (44%) as large.

Confidentiality

Confidentiality was considered important. From the outset an assurance was given by the authors that neither the information provided, nor the opinions expressed, would be attributed to individual fishery staff or to specific fisheries. For this reason the authors have refrained from listing the participating fisheries.

Timescale

The preparation and pilot studies were performed from October through December 2010. The questionnaire was revised and the main survey was conducted over a 6 month period, January to June 2011. The information was entered on Excel spread sheets. This was followed by data analysis and writing the report.

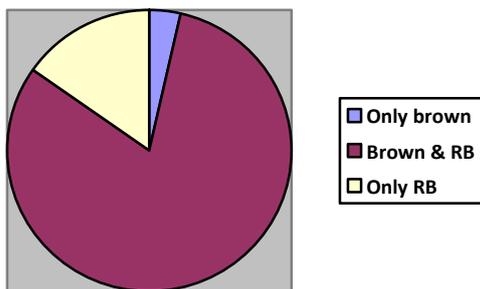
5. Findings

The questionnaire can be found in Appendix I. The first part sought to establish the basic facts about the fishery, its size, types of fish, bank or boat fishing, stocking policies etc. The second half of the questionnaire focussed on the managers' experience and opinions in relation to the pros and cons of C&R. Consequently some responders, whose fisheries did not allow C&R and/or had no experience of this mode of fishery management, did not offer opinions in this second section. However, a number of managers on non-C&R fisheries who had previous experience of C&R, did provide answers for this section.

The results of the survey are set out below. A summary of the findings can be found in chapter 8 and the full statistics are tabulated in Appendix III.

Percentages are rounded to the nearest whole number. As with most surveys, questions were occasionally missed, or not answered because the responder did not know the answer or answered in a manner that was not suitable for tabulation. **Therefore it is important to note that the percentages in each table relate not to the total number of participating fisheries but to the number of answers received to the specific question.**

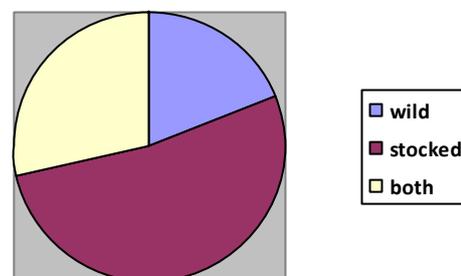
1 Types of trout (Table 2)



One hundred and sixty fisheries (81%) contained mixed populations of rainbow (blues included) and brown trout. Thirty (15%) contained rainbows only and 7 (4%) contained brown trout only.

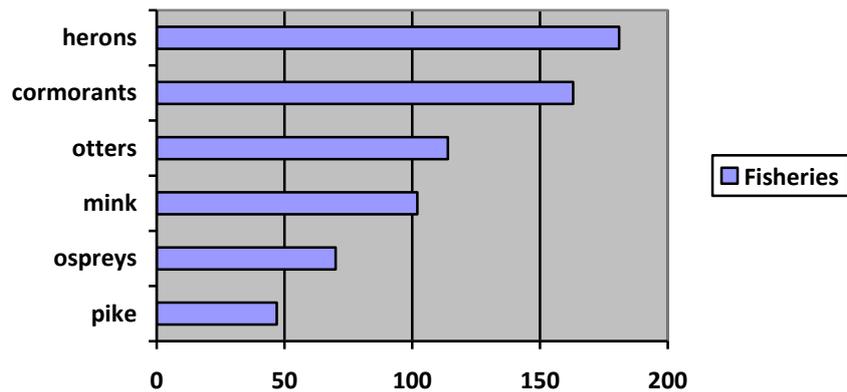
Brown trout

Concerning the brown trout, 52% of fisheries had populations that were purely stocked, 19% were indigenous wild fish and 29% comprised a mixture of wild and stocked trout (Table 3). Many fisheries, particularly those of larger size, had originated as wild brown trout fisheries to which rainbows had been added. In smaller purpose-built fisheries most of the brown trout were of hatchery origin. Two fisheries reported that rainbows spawned successfully in the fishery.



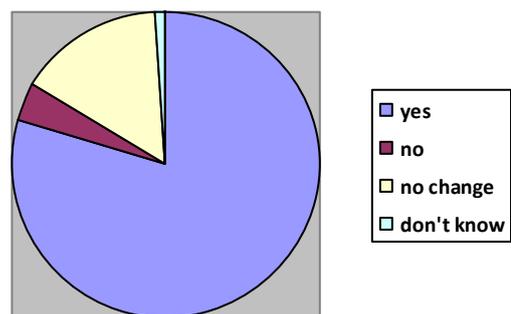
2 Predators (Table 4)

Managers were asked what predators they had in their fisheries. Cormorants and herons were almost universal. The larger waters were more likely to contain pike. Ospreys were common, especially in the more northerly waters. The questionnaire did not distinguish between birds of passage and those that were nesting in the vicinity of the fisheries. Otters and/or mink were reported in 159 fisheries and Table 5 shows their relative distributions.



3 Has C&R increased in popularity? (Table 6)

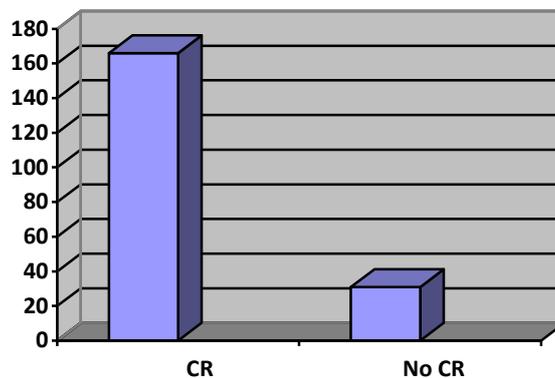
Managers were asked whether in their experience C&R had become more popular among anglers in recent years. Of the 188 who answered this question 150 (80%) reported that the demand for C&R had increased in recent years, only 7 (2%) gave the contrary view, while 29 (15%) had not noticed any change and 2 (1%) were unable to comment.



4 Fishery C&R policies for rainbows (Table 8)

C&R was practiced in 166 fisheries (84%). In 32 (16%) C&R was not allowed. Of those allowing C&R 122 (74%) included a so called 'sporting ticket', i.e. total C&R, was among their ticket options. A sporting ticket was not available in 44 fisheries (26%) but C&R was allowed in conjunction with a bag limit. After a bag limit had been reached unlimited C&R was allowed in 115 (69%). In the remainder a limit was set on the number of fish that could be caught beyond the bag limit. This included fisheries that allowed C&R until the bag limit had been killed after which the angler was required to purchase another ticket or cease fishing.

C&R policies for rainbows



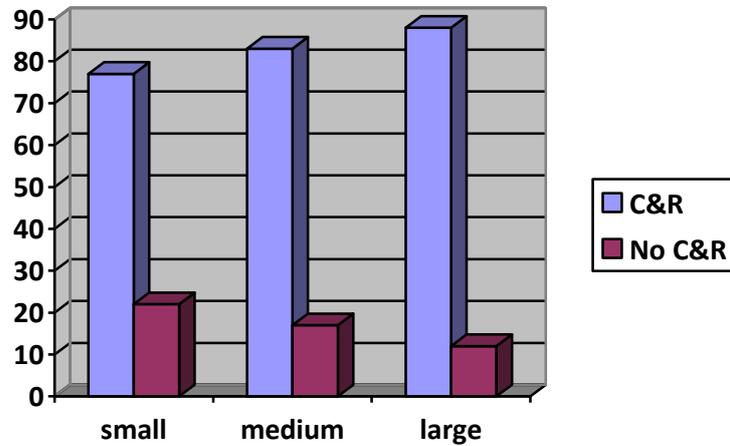
5 Preferential C&R for brown trout (Table 9).

One hundred and fifty-five managers of fisheries that contained both brown trout and rainbows provided information on their C&R policies for browns. In 91 (59%) the policies for the two species were different, i.e. the standard practice was that all brown trout were returned. In 59 (38%) the same policies were applied to both species. Four fisheries applied a different bag limit for browns i.e. either a maximum of 1 or 2 fish, followed by release.

6 C&R according to fishery size (Table 10).

The fisheries have been arbitrarily divided into small (less than 5 acres), medium (5-10 acres) and large (larger than 10 acres) and further divided into those which permit C&R and those which do not. The lowest percentage of C&R (77%) was in the smallest fisheries and the highest (88%) in the largest fisheries, with the medium sized fisheries occupying an intermediate position (83%). The graph shows the same data and clearly illustrates the difference according to fishery size.

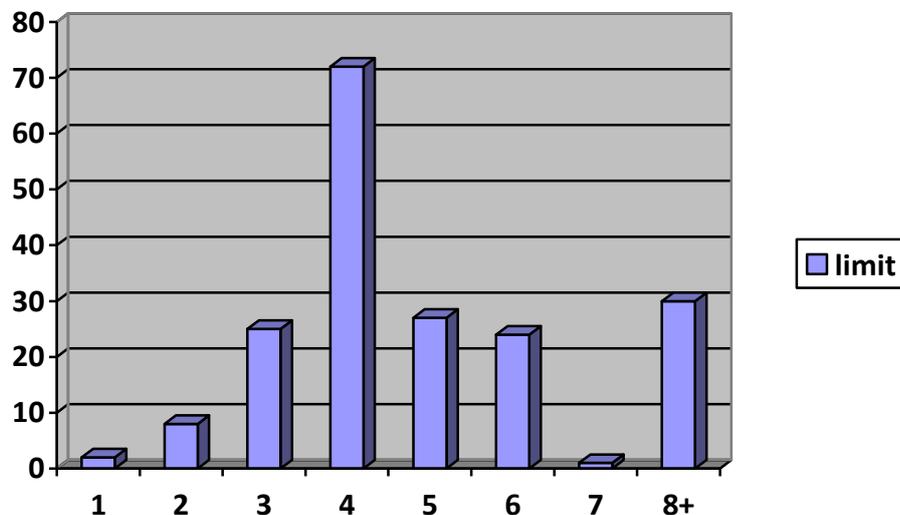
C&R according to fishery size.



7 Bag limits (Table 7)

Many managers described flexible systems whereby the ticket prices and bag limits were adjusted according to the number of hours fished and/or the number of fish the angler wished to keep. For the purposes of the graph and Table 7 managers were asked what the maximum bag limit was for a full day's fishing. In 65% of fisheries the limit was 3-5 fish with the commonest limit being 4. In 30 fisheries a bag limit of 8 or more fish were allowed to be killed.

Bag limits

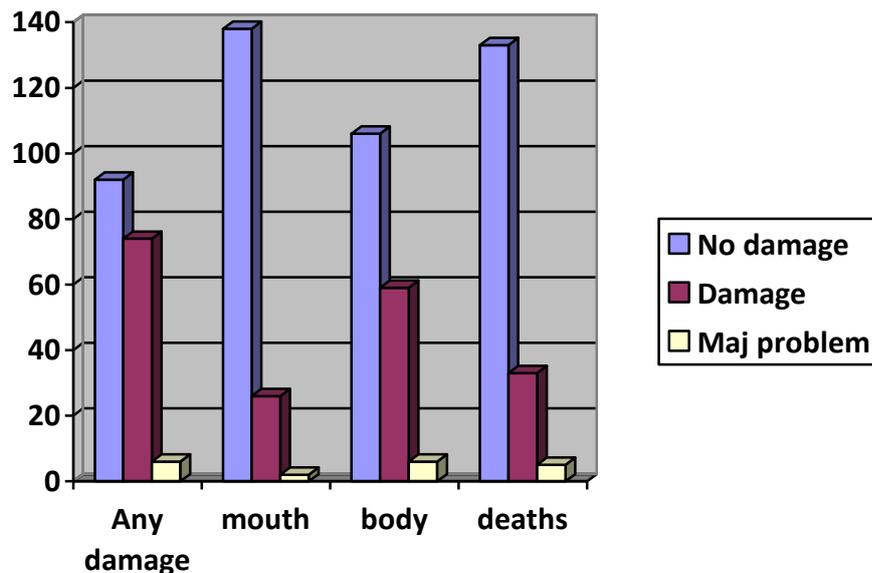


8 Fish Damage (Table 11).

Fishery managers were asked whether they had observed evidence of fish damage as a result of C&R. Seventy four (45%) said they had seen damage of whom 19% had observed dead fish, 16% had seen instances of damage to the mouths of fish and 36% had seen instances of net marks or scale loss that they attributed to unsatisfactory handling.

In 11 (34%) of the fisheries where dead fish had been seen, or 7% of the 166 fisheries allowing C&R, the managers considered post-C&R mortality to be a major problem. Only 2 (8% of those acknowledging the problem) considered mouth damage to be a major problem and 6 (10%) considered body damage to be a major problem. On looking at the sizes of the 11 fisheries where mortality was considered a problem 5 were small, 3 medium and 3 large. Discussion with the managers indicated that dead fish were largely observed in the summer months when water temperatures were high (see managers' comments).

Fish damage



(Column 1 refers to damage in general, the other 3 columns refer to specific types of damage. In addition to asking whether any damage had been observed managers were also asked whether the observed damage was considered to be a major problem- white columns))

A number of managers of non-C&R fisheries answered the questions on fish mortality and damage on the basis of their previous experience. For completeness it is reported that 5 managers of non-C&R fisheries commented that they had experimented with C&R and had ceased to offer that option because they had found that some anglers had not handled the fish satisfactorily with consequent fish deaths, particularly at times of high water temperatures.

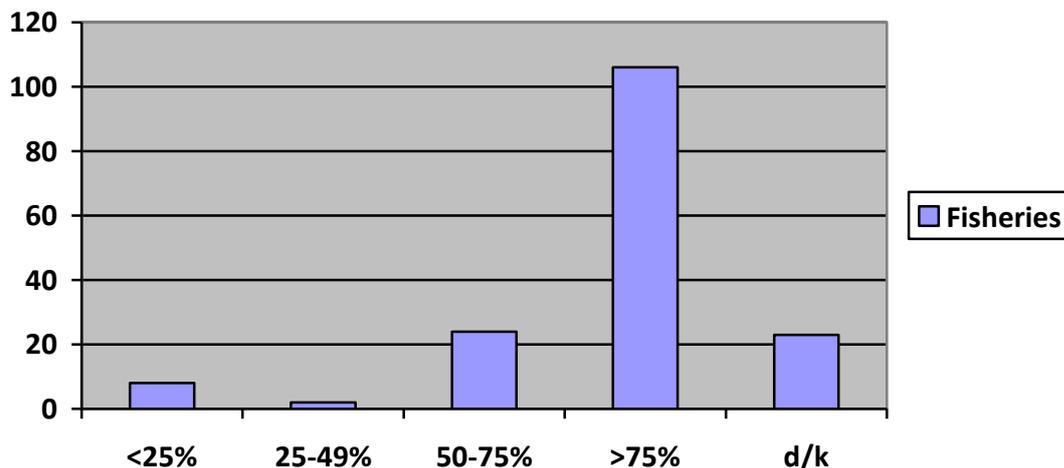
9 Does C&R spread disease? (Table 12)

C&R is sometimes opposed on the grounds that it spreads disease. Although recognising that fungus growth was commonly due to faulty handling with loss of slime and abrasion of body and fins, two thirds of managers considered that C&R was not responsible for spreading disease from one fish to another.

10 The percentage of anglers using satisfactory release techniques (Table 13)

Fishery managers were asked to estimate what percentage of their anglers released fish with suitable safe techniques. An interesting variety of techniques was mentioned (see chapter 7). Of the 163 managers who considered the question 140 (86%) felt able to provide an estimate of the quality of their anglers' releasing techniques. Sixty-five per cent of managers said that more than 75% of their angling clientele used satisfactory techniques when releasing fish, several giving estimates in the 90-100% range.

Percentage of anglers using satisfactory release techniques



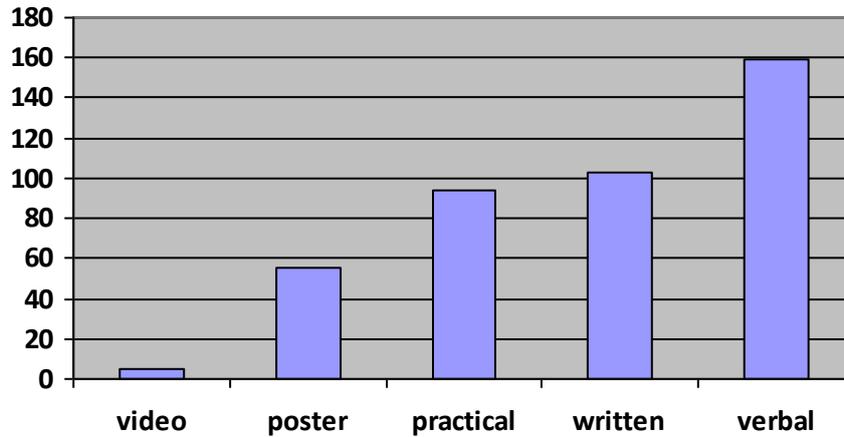
The horizontal axis shows the estimated percentage of anglers using satisfactory release techniques.

The vertical axis shows the number of fisheries. d/k = don't know i.e. not possible to estimate.

11 Education in release techniques (Table 14).

Managers were asked whether they took any steps to educate anglers in optimal releasing techniques and if so by what means. A total of 165 managers (99% of those allowing C&R) stated that they endeavoured to educate the anglers. The questionnaire options for education were (i) verbal, (ii) written, (iii) posters, (iv) video and (v) practical demonstration at the waterside. Most managers gave verbal advice, around half issued information leaflets, around a quarter exhibited posters on fish handling methods, 5 (2%) provided video demonstrations and about half gave practical demonstrations at the waterside.

Education methods



(Practical refers to 'live' demonstration of methods of releasing fish)

12 Is C&R necessary for the fishery?

Each manager was asked whether he or she believed that C&R was necessary for the fishery. A total of 186 managers (including 20 whose fisheries did not allow C&R) answered this question of whom 155 (83% of the total or 93% of those offering C&R) answered 'yes'. The principal reasons given for this high proportion of positive responses are set out in Table 15. The two reasons offered in the questionnaire were (i) financial: for example: C&R attracts more anglers (83% answered yes) or (ii) stocking-related, for example: C&R allows lower numbers of fish to be stocked (53% answered yes).

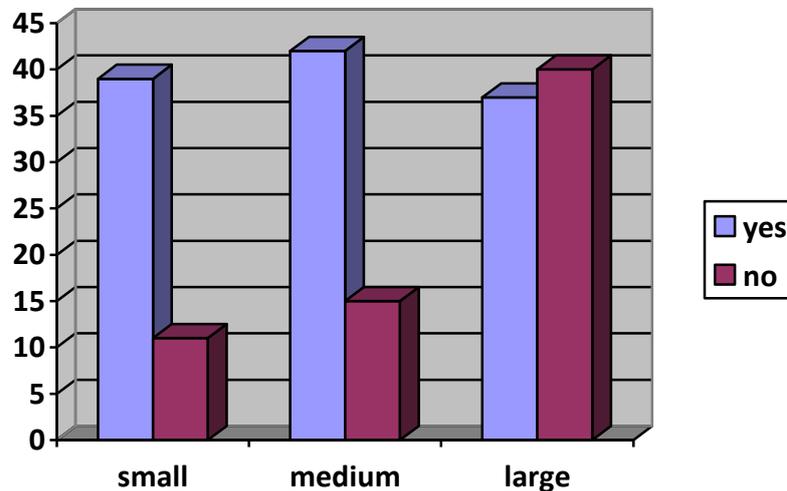
13 Fish growth (Table 16)

In order to try to shed light on the question as to what effect C&R might have on the capacity of the fish population to feed normally and thrive, managers were asked whether the introduction of a C&R policy had led to an increase in average fish size. Forty-one per cent reported that the policy of C&R had resulted in increase in average size, 36% said it had made no difference and 23% did not answer or stated it was impossible to judge. Fisheries where the brown trout were routinely released and where the food supply was rich reported that C&R had resulted in the development of healthy stocks of large brown trout which enhanced the quality of the fishing.

14 Catchability (Table 17)

Managers were asked whether in their opinions released fish became more difficult to catch. Sixty three per cent answered 'yes', 35% answered 'no' and 2% said that they did not know. Striking differences were shown when the responses were correlated with the size of the fishery. While the majority of managers in small and medium sized fisheries considered that C&R reduced catchability, the majority of managers in large fisheries disagreed.

Does C&R impair catchability? – according to size of fishery.



15 Reasons for reduced catchability (Table 18).

Managers who considered that trout became more difficult catch were asked what they believed to be the reasons. The two options offered in the questionnaire were (a) that it was because the stocked fish switched over to natural foods and (b) because a proportion will have been caught before. Seventy two thought (a) was important and 102 considered that (b) was important. Of these 59 considered that both reasons were important.

16 Discards (Table 19)

Managers were asked whether the fishery had a freezer and if so whether C&R reduced the number of fish left in the freezer for others to dispose of. Twenty six percent said that fewer fish were left in the fishery freezer since the introduction of C&R. They were also asked whether C&R had reduced the number of fish discarded in to dustbins. Fifty six per cent reported that C&R had reduced or abolished the numbers of fish discarded into dustbins.

17 Anti-fishing (tables 20 & 21).

The final questions related to anti-fishing lobbies. Managers were asked whether they felt that C&R fuelled support for anti-fishing lobbies. The majority thought not, although opinions were fairly evenly divided. They were asked whether they had experienced any problems in their fisheries from this source and 3 (2%) responded yes. No recent episodes were reported.

5. Commentary

It is acknowledged that certain aspects of C&R merit more detailed study than we have provided. The authors were conscious that fishery managers were busy people and therefore the size and scope of the questionnaire was deliberately restricted. It was a pleasant surprise to find that many managers were keen to discuss the issues at greater length, outside the confines of the structured questions, making it possible to base this commentary not only on the specific questions but also on managers' wide ranging opinions (Appendix IV).

C&R cannot be discussed without considering fishery management in general. The survey confirmed that C&R has become an established fishery management tool. Stillwater fishery management is all about supply and demand and therefore is about maintaining a balance between running a business and caring for the ecology. Evidently many features of a fishery would influence a manager's approach to achieving that balance. For this reason it was necessary to establish the fishery characteristics at the outset.

1 Types of trout

The survey focussed on rainbow and brown trout. No attempt was made to catalogue sub-species of trout or other salmonids. However, among the other stocked fish mentioned were steelhead, golden trout, tiger trout, brook trout and char. It would be interesting to know what effect, other than curiosity value, these varieties have on fisheries, how they impact on ecological balance, population control, interspecies competition and how they react to C&R. These are complex relationships^{17,38} that would merit detailed study.

Likewise no specific questions were asked about coarse fish other than pike (see predators) although in general conversation the impression was gained that most of the larger waters contained a variety of coarse fish whereas many of the small 'purpose-built' fisheries (<5 acres), apart from sticklebacks and minnows, contained only trout.

The majority of fisheries contained brown trout, roughly half of which were of wild origin.

2 Predators

Most predators were well tolerated by managers, even welcomed, particularly in waters that were also managed as nature reserves. The only predators about which concern was expressed were cormorants and mink. Whereas the latter could be treated as vermin and successfully controlled in most fisheries, the former were regarded as a serious uncontrolled menace. Managers in many fisheries reported that cormorants were taking heavy tolls of stocks, to such an extent that in some instances the economic viability of the fisheries was seriously threatened.

There was some support for the view that otters and mink are incompatible. Of the 159 fisheries that reported otters and/or mink only 57 (36%) reported sightings of both species whereas 45 (28%) reported only otters and 57 (36%) reported only mink i.e roughly two thirds of the total did not report both species. More detailed study on this topic would be of interest.

In discussion a view was expressed that C&R made fish vulnerable to predation, especially if they were played for too long a time and not resuscitated carefully. In most environments this is a difficult problem to investigate. In salt water fly fishing studies have shown that newly released bone fish are vulnerable to predation by shark and barracuda.^{9,12}

3 Has C&R increased in popularity?

Photographs of catches in magazines of bygone years normally displayed the fish suspended by their tails or gills or as rows of carcasses on the ground – a sight many modern anglers would find unappealing. This type of photograph has largely faded out, to be replaced by pictures showing single fish held horizontally. Appearances can be deceptive but such a pose often means that the fish is about to be released. This survey reflects that change, both in respect of the popularity of C&R among anglers and the adaptation of fishery regulations.

Not every manager who had introduced C&R was entirely happy with it (see managers' comments) especially when witnessing fish being handled badly, when detecting corpses the following day, when noting anglers abusing the fishery rules or when tetchy clients grumbled that C&R was making fish uncatchable. A few managers had abandoned C&R after observing unsatisfactory handling of the fish and consequent mortalities. Nevertheless, angler pressure and competition between fisheries led others to remark that it was economically essential for them to adopt the C&R option.

Many managers pointed out that where fish were becoming more difficult to catch it was essential to adjust the proportions of catch and kill to ensure regular turnover of fresh stock. A simple rule that the first fish should be taken was said by several managers to have solved the problem. Only one fishery reported a policy of total C&R for rainbows.

4 Fishery C&R policies

The survey has revealed something of a national divide already familiar to many anglers, which is that C&R is less popular with fishery managers in the South of England. This is a trend rather than a clear difference, as the survey revealed a wide variety of regulations and practices in all parts of the UK. Southern fisheries opposed to C&R are usually small and liable to high water temperatures in the summer. Moreover many are stocked with big fish which some managers believe are less likely to survive C&R - although this is disputed by others (see managers' comments).

5 Preferential C&R for brown trout

In 62% of the fisheries containing both rainbows and browns, despite the fact that in half the fisheries the browns were stocked, the two species were treated differently - the policy being to release all browns. A policy that cherishes the native species has a certain appeal, but what is the rationale?

Are UK anglers emotionally attached to browns? Perhaps they feel that the natives deserve better treatment than the foreigners? Are rainbows better eating? Is the greater longevity of browns a factor? Are the brown trout recycled because hatchery-reared browns are more expensive than rainbows? Are the browns thought to be tougher survivors? Whatever the explanation, this discrimination accords with research studies that have shown that brown trout have lower mortality rates after C&R than other species of non-migratory trout.⁴²

Finally it can be noted that very few waters have the optimal combination of habitat and food supply that would allow continued growth and survival of the entire trout population to older age (5-6 years and beyond).⁴ Therefore to restrict C&R to a hardier and longer living fraction of the trout population makes ecological sense.

6 Fishery size and C&R

Fishery size influences opinions, policies and practices. It was evident, for example, that the managers of small bank fisheries were able to get to know their clientele well and to observe at first hand their fishing methods and fish-handling techniques. In some small fisheries managers acknowledged the helpful roles played by their 'regulars' in teaching inexperienced anglers, discouraging undesirable practices and protecting the environment.

When correlating C&R regulations with fishery size the lowest percentage of C&R (77%) was found in fisheries of less than 5 acres and the highest (88%) in fisheries larger than 10 acres. In large waters where the behaviour of anglers who are boat fishing is difficult or impossible to police, managers probably have little alternative but to sanction the release of fish.

Another aspect in which differences emerged between small and large fisheries was the effect of C&R on catchability – or at least the managers' perceptions of that effect (Table 17). Most managers of small and medium sized fisheries considered that C&R impaired catchability. When angling pressure is focused in a relatively small area it will impact more strongly on fish behaviour and, where the water is clear, the effects on mortality, morbidity and catchability can be closely observed.

The majority of managers of large fisheries took a different view and considered that C&R did not impair catchability. In large waters the fishing pressure per unit area is different and anglers are in blissful ignorance of how often the fish are spooked by their flies or the flies ignored.

Whether these differences are simply due to the opportunities to closely observe fish behaviour in small fisheries or whether large fisheries confer genuine differences in fish behaviour would be an interesting (although difficult) topic for further study.

7 Bag limits and C&R – use and abuse

A bag limit is a long standing management tool for protecting fish populations. Managers described a number of strategies whose common aim was to maintain the balance between uneconomic stock depletion and turnover sufficient to ensure satisfactory sport. Some fisheries offered a range of bag limits and matching ticket prices. The majority (64%) of bag limits for a full day's fishing were in the 3-5 fish range, with 4 fish being the most frequent choice. Several required the first fish to be killed. Some allowed C&R until the bag limit had been taken after which fishing must stop or a second ticket purchased. Some fisheries have remarkably high bag limits - 8 fish or more in 30 instances.

Managers of remote rural fisheries made the point that when anglers travelled long distances to their fishing they were generally making a day of it. Since, on a good day, it was possible to catch the limit within a short time it was not reasonable to curtail their fishing after the bag limit had been reached. Thus the introduction of C&R has become an inevitable consequence of bag limits, allowing anglers to fish for their preferred time.

A less laudable consequence of the bag limit is the acquisitive attitude that it has generated in some quarters. As one manager remarked, in bygone years most anglers would have been happy to take away a brace of fish, but now the bag limit is regarded as a target, a badge of success, or worse still an entitlement. The corollary is that failure to return a bag limit may be regarded as indicating lack of skill, a defect of the fishery or C&R causing the fish to be uncatchable.

C&R could also create administrative problems. Was it reasonable to allow unlimited C&R or should a limit be set on the grounds that it was potentially damaging fish and making them less catchable? 'Stockie bashing' is considered by many to be unsporting and is a frequent cause of friction in fisheries.

In a similar category is 'cherry picking' whereby anglers use C&R to selectively bag larger fish. At its worst this may be achieved by 'releasing' or secreting dead fish (shades of marine bycatch). Some fisheries set limits on the number of fish that could be released – a regulation that unfortunately is impossible to police on big waters. Regulations are only as effective as angler motivation and compliance allow.

8 Fish damage

Approximately half of the fishery managers said that they had observed damage to fish as a result of C&R, although this was seldom considered a serious problem. Twenty percent said they had seen numbers of dead fish. Several managers reported finding dead fish in the summer months and some of those where C&R was otherwise allowed had adopted policies of prohibiting C&R when water temperatures rose to critical levels (around 20°C). Seven percent of fisheries that allowed C&R considered deaths to be a major problem.

In small clear water fisheries managers and anglers are more likely to be notice fish damage and mortality because the fish are more easily observed, more stressed and

more at risk when temperatures rise. As water temperature rises the quantity of dissolved oxygen in water decreases. Studies on hooking mortalities have consistently shown higher mortalities when water temperatures were warmer.^{14,21,33,34,46,51,52}

Deep fisheries and those fed by rivers or springs were usually able to avoid the hazards of high water temperatures and did not consider mortality to be a problem.

Death rates from C&R vary hugely in the scientific literature, ranging from 0-89%.^{1,3,44,52} Where hooking mortality has been studied in fly-caught salmonids, the mortalities have been below 5%.^{3,6,13,32,39,41,49} As noted above, brown trout tolerate C&R more robustly than other non migratory salmonids.⁴²

Of the various types of damage (Table 11) injury to body or fins was regarded as the commonest, leading as it does to fungus infection (see below).

When considering the various ways in which fish may be damaged it is important to maintain perspective. C&R is far from being the main cause of fish mortality and/or damage in fisheries. Several managers remarked that cormorants inflict far more damage on fish than do C&R anglers.

It is conceded that data such as these are of limited accuracy since they depend on random opportunities for subjective assessments of damage. Nevertheless they constitute sufficient evidence for a conclusion to be drawn that fish are often badly handled by anglers in the UK.

9 Does C&R spread disease?

It is not unusual, particularly in small fisheries, to see fish affected by fungus infection. Managers agreed that faulty handling could make an individual fish susceptible to fungal infection in anatomical areas where clumsy handling, net trauma or beaching on hard or abrasive surfaces had caused loss of slime or scales or abrasion of fins or body. However, only one in five managers thought that C&R was responsible for spreading disease among fish populations.

10 Quality of release techniques

This was a difficult question, particularly for managers of large fisheries, where the majority of boat fishing anglers could not be directly observed. Managers' estimates of the proportion of their clientele using satisfactory C&R techniques could only be 'soft' data, because the figures were based on subjective impressions. Those who were most confident in the figures that they put forward were managers of small bank fisheries where they could closely observe and influence angler behaviour. Where anglers were mainly out of sight, boat fishing on large waters, managers had difficulty arriving at a figure.

Out of the 163 managers who answered this question 23 (14%) said it was impossible to estimate, 106 (65%) said that 75-100% of their anglers handled fish satisfactorily, 24 (15%) estimated 50-75% and 10 (6%) estimated less than 50%.

Many managers distinguished between 'regulars' and occasional or holiday anglers. They considered that most of their regulars were incentivised to handle fish well – and had become experts – whereas most occasional visitors did badly.

Managers were concerned that elderly anglers had difficulty adapting to satisfactory methods of releasing fish and were less receptive to advice than young anglers who were keen to learn and soon became skilled at returning fish without injury.

Methods mentioned favourably by managers included landing fish quickly, releasing in deep water, keeping fish in the water at all times, not beaching fish on to hard or dry surfaces, minimising exposure to air, moistening the hands, using knotless nets and barbless hooks. When fish were deeply hooked the advice was that the angler should cut the monofilament rather than dig out the fly. The fish will usually harmlessly shed the fly after a relatively short time. A number of fisheries banned certain fishing methods and/or types of flies such as static boobies or buzzers that they associated with deep hooking. Factors influencing survival after hooking are discussed in chapter 7.

One fishery manager expressed a hope that the survey might result in the formulation of a Code of Practice for C&R. Chapter 7 summarises some of the principles and evidence that would need to be taken into account.

11 Education in release techniques

Almost all fishery managers said that they attempted to educate their clients in proper fish handling methods: by verbal instruction (96%), written instruction (59%), posters (32%), videos (3%) and/or practical demonstration at the waterside (57%). Education was easier to achieve in small bank fisheries than in large boat fisheries. In the latter managers were seldom able to monitor or influence anglers' behaviour.

C&R is easier to perform efficiently in a river than in a Stillwater fishery. It is also easier to perform well when bank fishing compared with boat fishing. Several managers remarked that they had not been able to find teaching materials specifically relevant to stillwater angling.

12 Necessity for C&R

Although 8 out of 10 of the fisheries that responded to the survey included C&R in their policies, managers opinions on the principles involved were mixed (see managers' comments). The most important and frequently mentioned incentive to introducing C&R into a fishery was market forces, driven by angler preferences, without the manager necessarily wholly favouring the practice. The financial benefits were predominantly that the introduction of C&R had attracted more anglers to the fishery, and 53% of managers had also found that they had been able to economise on stocking.

When fish are killed and recorded stock replacement is a simple matter. Some managers felt that C&R added an unwelcome 'hassle' factor, since it required angler education and policing, it was open to abuse, it was more difficult to monitor catches

and it made calculations of stocking levels more of a problem. Other managers warmly favoured C&R both in principle and in practice.

13 C&R & fish growth

When managers were asked whether C&R had resulted in an increase in average fish size; 41% replied 'yes', 36% responded 'no' and 23% said it was impossible to judge. This is another question that would repay more detailed study. Factors that can play a part include not only the richness of the feeding but also the ecology, interspecies competition, predation, stocking densities, ratios of C&R to catch and kill (C&K), angling pressure and rate of turnover of stock.

The survey revealed instances of waters where the regular application of C&R to brown trout in mixed fisheries has resulted, where waters have plentiful feeding, in the survival of populations of browns that have often reached impressive size and added an exciting dimension to the fishing. This phenomenon can also arise in less productive waters where pre-stock fish are cage-reared at the same location, enabling large trout to scavenge beneath the cages.

There is no scientific evidence that C&R impairs the ability of trout to feed, grow and reproduce in comparison with fish not subjected to C&R.^{2,40,45,49} Thus the survey supports the view that where limitations of food supply are not a dominant factor, the introduction of C&R into a fishery results in increase in the average size of fish and therefore an improved quality of the fishing experience – provided of course that the fish remain catchable. This was reported to be the case, as applied to brown trout, in a considerable number of the fisheries in the survey. It can be argued that in fisheries where stocked fish lose condition over time, due to insufficient feeding, the case for C&R is weak. The size at which fish are stocked has a bearing on this point.

14 C&R and catchability

Newly stocked fish feed indiscriminately and can often be easily caught in large numbers. The stomach contents will contain a selection of non-food items such as bits of weed or twig, cigarette ends and the like. At this stage they will take a wide variety of lures including some that bear no relation to anything natural – not that 'educated' fish are always different. Once established in the environment they become more discerning in their food selection and are less easily caught. Unless anglers are prepared to adapt their tactics to match the invertebrates, fry etc upon which the trout are now feeding they may claim that their quarry have become 'uncatchable'.

Many anglers believe that a further level of difficulty is added by the fish having been caught before. Two thirds of managers surveyed considered that C&R makes trout more difficult to catch – although the majority of managers of large fisheries disagreed.

Understandably there was a trend for the 'yes' responses to come more frequently from small bank fisheries where the angling pressure would be concentrated in a small area, where the fish were constantly within casting distance, where they would

have seen a lot of flies and where the behaviour of the fish, as they ignored or shied away from an angler's flies, could be closely observed.

15 Reasons for reduced catchability

The next question was why did the trout become more difficult to catch? Seventy two managers considered that the switch to natural feeding was a factor, 99 considered that having been caught before was a factor and 59 felt that both factors were important.

The counter argument is that trout that have been caught before continue to grow and to feed just as successfully as those that have not been caught. Therefore catchability depends on the angler, not the fish. It is not a problem if appropriate techniques and skills are used. Managers produced impressive anecdotes about fish that had been caught multiple times, often at remarkably short intervals (see managers' comments).

The differences of opinion in this survey reflect differences in the published literature. There are many examples that could be cited. To quote simply from two: *Schill et al. (1986)* reported that cutthroat trout in Yellowstone National Park were caught on average 9.7 times per season.⁴¹ By contrast *Van Poorten and Post (2005)* reported a study in which catch rates decreased rapidly after the introduction of angling into a previously unexploited rainbow trout population.⁴⁷ This is a complex management issue requiring a fine balance to be maintained between angling pressure and stock replenishment.

16 Discards

The deplorable dumping of bycatch at sea as a result of EU quota systems has recently come under the media spotlight. There is a parallel in recreational angling. Unlike river competitions where C&R is now the norm, in the majority of boat-fished stillwater competitions fish are killed for the weigh-in. On wild fisheries this is unacceptable. On stocked stillwaters it is a matter for debate.

For competition anglers, who are regularly catching large numbers of fish, disposal presents a problem. Many UK anglers do not wish to eat their catch, especially when it comprises large farmed fish. The increase in size at which fish are stocked is partly to satisfy anglers' expectations and partly an attempt to exceed cormorants' ability to swallow. A brace of trout in former years would have made a nice meal for two people. Nowadays it would take quite a crowd to consume two typical stillwater rainbows.

Consequently trout are commonly placed in fishery freezers for others to dispose of, abandoned at the fishery premises and discarded into dustbins or elsewhere. Why non-competition anglers should choose to kill fish and later discard them is a mystery. Angler behaviour in relation to the discarding of fish is not possible to monitor accurately and these were questions which some managers felt unable to answer.

It was apparent, on discussion, that many managers considered the practice of discarding fish, especially in relation to competitions, as unacceptable. Nor did they think it reasonable to expect fisheries to dispose of unwanted catches.

More than 50% observed that C&R had reduced or abolished the habitual discarding fish on the premises or in dustbins – with the exception of catch and kill competitions. Many competition anglers share the managers' distaste and there is a growing movement towards C&R competitions. This is also a major conservation issue given that fish pellets are manufactured from the marine harvest of key components of the food chain such as sand eels, small fish, crustacea etc..

17 Animal rights

The majority of managers did not feel that C&R fuelled support for anti-fishing lobbies. Although rare examples were quoted of damage to fishery property, equipment, fish or livestock, only 3(2%) had any first hand experience of this type of problem and none of the quoted examples were recent.

18. Where do we go from here?

It has been suggested in the course of this survey that there is a need for a code of practice to improve the ways in which anglers deal with their catches. The following chapter brings together the principal issues that would need to be taken into account.

7. Towards a code of practice for C&R

Given the widely varying circumstances in which fish are caught, the species differences and not forgetting the range of ages and physical capabilities of anglers, it is obvious that there is no single 'right way' for C&R applicable to every situation and every mode of fishing. A code will need to be adaptable to disparate angling situations.

A number of principles have come under discussion in the course of this survey that could provide a framework for any group setting out to devise a code. Several of these principles have been validated by scientific research. Others carry elements of uncertainty. Most are a matter of practical common sense, yet all too often ignored.

It is debatable whether a single code will suffice for all varieties of recreational fishing or whether different codes may be required for different types of fishing, different species and different environments.

1 Education and Preparation

Effective C&R begins long before the angler arrives at the water. It has been reported that novice anglers injure more fish than experienced anglers.²⁹ As a 'one-off' observation this may be true, but novices can be taught. Managers tell us that the bigger problem actually lies at the other end of the age spectrum. Experienced and elderly anglers, we are told, do not always welcome new methods and may adapt poorly to the necessary change in a life-time's habits.

Unprepared improvisation does the fish no favours. The angler needs to be clear in his mind whether he intends to kill or release any fish **before he commences fishing**. Thought should already have been given to the type of tackle to be used and the practical implications for playing, netting, landing, unhooking, photographing and resuscitating.

2 Shortening the duration of play

Most breakages occur on or shortly after the strike, rather than during prolonged play. It is a common observation that many anglers do not play fish firmly enough. Competition anglers do not waste time playing fish – and certainly it is not in their interests to lose fish.

Length of playing time contributes to mortality.⁴² Exhaustion and stress may be fatal.^{25,31} Depletion of vital metabolites such as plasma cortisol, pH, lactic acid and glycogen in blood and muscles in response to strenuous exercise have been recorded by fish biologists in research studies.^{25,51} These studies confirm the

obvious, which is that the degree of chemical exhaustion and stress is proportional to the severity and duration of the exercise.²⁹

Susceptibility to exercise-induced exhaustion and stress is made significantly worse in extreme water temperatures, especially high temperatures.^{29,52} Fish size may also make a difference, although the evidence on this is scanty.²²

The message is clear. Fish should be brought to hand or net as fast as possible. Some anglers delight in the 'sporting challenge' of catching fish on superfine tackle. It is a bad idea, and certainly not 'sporting', to use tackle (unnecessarily light rod, flimsy leader) which prevents the subduing of the fish in optimal time – especially in warm water conditions. In terms of the damage this may do to the fish, the sporting challenge is not justified. Moreover the low visibility and high strength/diameter ratios of modern monofilaments mean that fishing so fine as to prevent efficient landing time should rarely be necessary.

3 Bank or boat

Bank fishing usually makes it easier to release a fish without harm and minimal air exposure. Some anglers have become skilled at removing the hook while the fish is still in the water without use of a net. The same technique can be used when boat fishing but it is less easy and most anglers prefer to use a net – especially in high sided craft and especially for the less agile, elderly, frail or disabled angler. Fishing from a high bank creates similar difficulties. Whichever method is used barbless hooks make release much easier.

One manager instructed his clients to wade as deep as possible when releasing, to avoid the potential harm of releasing fish into warm (oxygen deficient) shallow water.

Bringing a fish into a boat exposes it to risk of being dropped, abraded, descaled, stressed and damaged. How often have we seen a dropped fish hammering around the bottom of the boat? Boat anglers therefore need to consider carefully how to alter their methods and their kit to minimise injury.

4 Modifications to tackle

Managers in this study reported seeing fish damage due to rough handling and also due to nets. Where the use of a net is unavoidable deep nets make C&R more difficult and may cause damage when the net twists around the fish. Designs and materials used in some modern nets are changing to meet the needs of C&R e.g. knotless pan-shaped nets. Knotless nets have been shown to cause significantly less fin damage and dermal abrasion²⁶ while a shallow pan-shaped net allows the fish to remain flat rather than screwed up in the depths of a deep net. It also makes it easier for the angler to get at the fish to remove the hook and make the release.

Other modifications to tackle that are beginning to appear in C&R fisheries include moist fish-release mats (as used by coarse fishermen), specially designed bags

for weighing fish and water-containing receptacles in which to place the netted fish while removing the hook, disentangling the leader, measuring the fish or preparing to photograph.

Some managers in this survey reported seeing mouth damage and many, in C&R fisheries, insisted on barbless hooks. The design of hooks is changing to facilitate C&R. Scientific studies comparing damage caused by hook varieties have given mixed results. Statistically, barbless hooks offer no proven benefit in terms of mortality⁴ Their main benefit is the ease and speed with which they can be removed with fingers, forceps or release tools – so much so that in many circumstances there is no need to net fish.

Some anglers claim that barbless hooks do damage by penetrating more deeply. In the hook sizes normally use in trout flies that cannot be a valid argument and in fact there are studies that have shown that barbless hooks minimise injury and cause less bleeding.^{18,19}

Circle hooks are claimed to do less damage than straight J-hooks by avoiding deep hooking^{16,24,29,30} but as yet there seems to be little enthusiasm for this type of hook among fly fishermen. Obviously singles, doubles and trebles differ in their potential to cause damage.

5 Hooking site

A number of studies have shown hooking location to be the most significant factor affecting the survival of released fish.^{5,13,22,27,37} Fish hooked in the gullet, gills or eye are less likely to survive.

Certain fishing methods and certain types of flies, especially when fished static are associated with deep hooking. As noted, some fisheries forbid particular fly patterns and techniques (eg static boobies, buzzers) because of their propensity to cause deep hooking, but most do not. Therefore the onus is on anglers to consider the consequences of their techniques.

Anglers' attempts to extract hooks deeply embedded in the gullet, the floor of the mouth or gills are a significant cause of fish bleeding and death. Research has shown that a fly left in a fish will generally fall out without harm to the fish after a few weeks.⁴¹ The preferred way to deal with a deeply embedded hook is to cut the monofilament.^{41,42,51} Stainless steel hooks should be avoided as they will take longer to corrode and fall out.

6 Water depth, temperature and chemistry.

Extreme water temperatures, both warm and cold, have been shown by research studies to increase fish deaths in relation to C&R.^{6,21,23,33} Fish do not recover well in warm water. Deaths reported in this survey were especially related to high summer temperatures. A manager made the point that trying to resuscitate a fish in shallow water, which is usually warmer and less well oxygenated than the water

from which the fish was taken, was a mistake. He insisted that bank anglers waded out as far as possible to resuscitate and release fish.

Not a lot is known about the effects of various chemical constituents of water on fish survival after C&R. But one interesting study on Atlantic salmon showed a 32% mortality of 59 grilse when exercised to exhaustion in soft water compared to 0% mortality of 16 grilse under identical experimental conditions in hard water.¹⁵

7 Landing fish

Ideally fish should be landed by hand, but this can only be done in particular circumstances and it requires a level of experience and dexterity that many of us do not possess. As discussed above, where the use of a net is unavoidable the net should be knotless, made of soft non-abrasive material and relatively shallow.

Beaching into shallow water can be a good way to land a fish, but continuing to pull the fish on to dry ground before releasing is a mistake.

8 Fish handling

The holding of a fish with dry hands will strip off protective slime. It is recommended that a fish should be held horizontally, if it is large, with both hands taking the weight. A struggling fish will usually immediately quieten if turned upside down.

9 Fish size.

Data are scanty as to what difference fish size makes to survival after C&R. It is sometimes argued that fish that put on weight rapidly have small heart size relative to body weight and therefore have low exercise tolerance. In this survey a number of managers were of the opinion that large fish had worse survival. Others contested this (see managers' comments). In a study of bluegills Hoxmeier & Wahl (2009) found that the probability of dying decreased with increasing fish length.²²

Obviously the bigger the fish the longer the playing time and therefore longer the angler may have to spend ensuring safe recovery. An exhausted fish, although perfectly capable of recovery, given time, is vulnerable to predation.^{9,12}

Air exposure

There are no scientific experiments that precisely define a safe duration of air exposure, but studies have shown that length of time out of water contributes to mortality.⁴¹

10 Bleeding

It is commonly said by anglers that a bleeding fish will die and the fish should be killed. This excuse for quick resort to the priest is generally not true. As with any animal, heavy and sustained bleeding is likely to be fatal. Light bleeding is not necessarily fatal.³⁴ In one study 70 fish were bleeding when released and of these only 15 (21%) died.⁵ Fish often survive remarkably severe injuries. Time should be taken to assess the severity of the bleeding and the condition of the fish. This is a topic meriting closer examination.

11 Photography

Consideration should be given to such issues as camera accessibility, keeping the fish in the water until the photographer is ready, leaving the fly in place until the picture is taken, holding the fish over water (in case it flips out of the hands), and supporting it well with one hand under the belly and one in front of the tail so as to cause minimal damage.

12 Return to the water

Some anglers, especially those who wish to return quickly to their fishing, simply toss the fish back into the water, asserting that the shock stimulates revival. There appears to be no evidence for this convenient view. Others favour carefully cradling a fish in hand or net, until it can swim strongly away. As noted, releasing a fish into warm shallow water should be avoided. Given the proven vulnerability of newly released fish to predation, techniques of release merit further study.

8. Summary of survey findings

1. Out of 205 fishery managers successfully contacted by email or telephone 198 (97%) agreed to participate and 7 (3%) refused.
2. Locations of participating fisheries comprised England 115 (58%), Scotland 60 (30%), Wales 16 (8%) and Northern Ireland 7 (4%).
3. The survey included every size of fishery from 1 acre to many hundreds of acres. For purposes of analysis fisheries were arbitrarily divided into small i.e. less than 5 acres, 54 (27%), medium i.e. 5-10 acres 58 (29%) and large i.e. more than 10 acres 86 (44%).
4. One hundred and eighty two were ticket waters, 16 were private clubs of which 8 also issued day tickets.
5. One hundred and fourteen (58%) provided bank fishing only, 8 (4%) were boat only and 76 (38%) were both bank and boat.
6. One hundred and sixty (81%) contained both rainbows and brown trout, 30 (15%) contained rainbows only and 7 (4%) contained browns only.
7. In fisheries containing browns 19% of the browns were purely wild, in 52% they were purely stocked and in 29% they were both wild and stocked.
8. The most common predators were herons (92%) and cormorants (83%). The only predators considered to cause substantial damage to the fishery were cormorants. Otters and mink were common (58% and 52% respectively).
9. One hundred and fifty managers (80%) reported that C&R had become more popular in recent years.
10. C&R was allowed in 166 (84%) of the fisheries.
11. C&R was allowed in 77% of small fisheries, 83% of medium sized fisheries and 88% of large fisheries.
12. One hundred and twenty-two (62% of the whole series and 73% of the fisheries offering C&R) offered a 'sporting' ticket (only C&R) option.
13. Principal motivations for introducing C&R were angler pressure and economic necessity.
14. C&R makes it more difficult to estimate stock levels, especially as C&R catches are generally not recorded as accurately as C&K.
15. In 155 fisheries containing both browns and rainbows 91 (59%) had a policy of releasing the browns regardless whether of they were wild or stocked while 59 (37%) applied similar policies to both species.
16. In fisheries with plentiful feeding, managers reported that the policies of releasing brown trout had resulted in populations of big trout beneficial to the quality of the sport in the fishery.
17. Bag limits ranged from 1 to 8 or more, but 75% were in the range 3 to 6 fish (75%) with 4 fish the commonest limit (39%).
18. Managers were aware of a need to maintain a turnover of fish to ensure catchability.

- 19 Fish damage due to C&R was reported by 45% of managers, but it was rarely considered to be a major problem.
- 20 Thirty-two managers (20%) sometimes saw dead fish attributable to C&R. In 11 this was considered a major problem.
- 21 A view was expressed that big fish were more likely to die after C&R. Others disagreed.
- 22 Mouth damage was sometimes seen in 26 fisheries (28%) but in only 2 (1%) was this considered a major problem.
- 23 Body damage due to handling or net injury was sometimes seen in 59 fisheries (36%). In 6 (4%) it was considered a major problem.
- 24 Two thirds of fisheries managers reported that more than 75% of their anglers treated fish satisfactorily when releasing.
- 25 Fishery managers used a variety of methods of educating anglers how to land and release without injury, including verbal advice (96%), written advice (59%), posters (32%), videos (3%) and practical demonstrations at the waterside (57%).
- 26 Of the 166 managers who allowed C&R 154 (83%) considered that it was necessary for their fishery.
- 27 Concerning the financial benefits 133 (83%) considered that C&R attracted more anglers and 85 (53%) considered that C&R allowed them to introduce lower stocking levels.
- 28 Forty two (26%) managers reported that C&R had resulted in fewer fish being left in the fishery freezer for others to dispose of, 26 (16%) said there had been no change and 93 (58%) did not have a freezer or expressed no opinion.
- 29 Ninety three (56%) managers reported that C&R had resulted in the cessation of fish being dumped in the dustbin, 53 (32%) said that it had made no difference and 19 (12%) did not know.
- 30 Sixty four (41%) stated that C&R had resulted in improvement in the average size of fish while 33% felt that it made no difference and 26% considered it impossible to judge.
- 31 Concerning catchability 120 (63%) of managers said that C&R made fish more difficult to catch while 68 (35%) disagreed.
- 32 When catchability was analysed according to fishery size 76% of the managers of small fisheries considered that C&R impaired the catchability of their population while only 46% of the managers of large fisheries thought that this was the case.
- 33 When asked the reason that stocked fish became more difficult to catch 72 (63%) considered that the switch to natural food was an important factor while 102 (88%) considered that the fact that the fish had been caught before was more important.
- 34 Two thirds of managers believed that C&R was not responsible for spreading disease.
- 35 Concerning anti-fishing organisations 74 (38%) managers felt that C&R fuelled anti-fishing lobbies, while 87 (45%) held the contrary view and 33 (17%) did not know.
- 36 Only 3 fisheries (2%) had ever experienced any trespass and/or damage to property by protesters.

Appendix I. Questionnaire

UK SURVEY OF FISHERIES AND CATCH & RELEASE 2011

Fishery: ...Name of Manager.....Size of the fishery?..... acres

1. **TYPE OF FISHERY** ticket water / private club./. other (please specify)

2. **TYPE OF FISHING** bank only / boat only./.bank and boat

3. **TYPE OF FISH** rainbows only / browns only /.both browns and rainbows

If you have browns are they (1) all wild (2) all stocked (3) both wild and stocked?

4. **PREDATORS** Do you have:

pike?	yes/no
cormorants?	yes/no,
ospreys?:	yes/no
herons?	yes/no
otters?	yes/no
mink?	yes/no

5. **C&R** Do you allow catch & release at your fisheryyes/no
If yes do you include a ticket option which is solely C&R ('Sporting' ticket)?.....yes/no
If 'no' we would still like you to answer any question that you have an opinion on.

6. **TRENDS** Has C&R increased in popularity among anglers in recent years? yes/no/no change

7, **REGARDING RAINBOWS:** What is your bag limit per angler for a day? 0,1,2,3,4,5,6,7,8+

Do you limit the number of fish which can be released after the bag limit yes/no
If 'yes' how many?.....

Do you vary the C&R limit according to the number of hours fished? yes/no

8. **REGARDING BROWNS:** Is your C&R policy: the same as for rainbows? yes/no

If 'no' are all browns expected to be returned? yes/no

9. **FISH DAMAGE** Do you see evidence of fish damage as a result of C&R? yes/no

If 'yes' is this damage

(i) frequent observation of dead fish?yes/no

If 'yes', do you consider it to be a major problem? yes/no

(ii) evidence of damage to fish mouths?.....yes/no

If 'yes', do you consider it to be a major problem? yes/no

(iii) body marks/fungal damage likely to be due to
handling or net damage?.....yes/no

If 'yes', do you consider it to be a major problem? yes/no

(iv) evidence of other non-lethal damage?.....yes/no

If 'yes', do you consider it to be a major problem? yes/no

Please specify the nature of such damage:-

10. **TECHNIQUES OF RELEASING FISH** From your observations roughly what proportion of anglers use suitable safe technique when releasing fish?25% / 50% / 75% / not possible to estimate

11 **EDUCATION** Do you try to educate anglers on proper fish release methods? yes/no
If 'yes' how? verbal yes/no
written advice yes/no
Poster yes/no
Video yes/no
demonstration yes/no

12. **BENEFITS OF C&R**

Do you believe C&R is necessary to your fishery?.....yes/no

If 'yes' (i) does C&R offer recognisable financial benefit to the fishery? for

example: by reducing stocking costs, attracting more anglers etc.....yes/no

(ii) is there a recognisable benefit in preservation of fish stocks?.....yes/no

(iii) does it reduce the number of fish put into the fishery freezer?.....yes/no

discarded egg put into the dustbin.....yes/no

(iii) has C&R led to an increase in average fish size:.....yes/no/impossible to estimate

13. **DRAWBACKS OF C&R**

(i) Fish become more difficult to catch?.....yes/no

If 'yes', is this (a) simply because they have survived

longer and moved on to natural feeding.....yes/no/don't know

(b) been caught before.....yes/no/don't know

(ii) C&R may spread disease?.....yes/no/don't know

If 'yes' is this a significant risk.....yes/no/don't know

(iii) Do you feel that C&R fuels support for the

'anti-fishing' lobby.....yes/no/don't know

If 'yes' are you aware of this causing any problems?.....yes/no

If 'yes' please comment

(iv) any other drawbacks?.....yes/no

If 'yes' please specify:-

Any other comments?

Would you like to receive a copy of the results our survey?.....yes/no

Appendix II. Survey covering letter.

Dear Fishery Manager

CATCH AND RELEASE SURVEY 2011

We would be grateful for your help with a survey on catch and release (C&R) in managed stillwater trout fisheries. As you know this topic remains controversial among anglers. We are experienced anglers and are members and office bearers in a number of angling clubs. We have strictly no commercial or vested interest and no axes to grind. We are keen to hear from you regardless of whether you favour C&R or not.

The objectives of this survey are as follows:-

1. Main objective To better inform discussions among anglers on the pros and cons of C&R by providing reliable information concerning modern practice and opinion as currently applied in UK stillwater trout fisheries.

2. Specific objectives:

- (i) To obtain facts on C&R practice in stillwater trout fisheries by conducting a large scale survey.
- (ii) To obtain the views of fishery managers on the advantages and disadvantages of C&R.
- (iii) To provide an unbiased report that we hope will be of interest and/or assistance to fisheries managers and anglers.

NB. When reporting our survey we make the following guarantees:

- (i) We will only offer our findings for publication to reputable angling or fisheries management journals.
- (ii) Under no circumstances will we release specific figures or descriptions of C&R practices relating to named individual fisheries.

OUR SHORT QUESTIONNAIRE IS ATTACHED AND HOPEFULLY SHOULD ONLY TAKE A FEW MINUTES OF YOUR TIME. WE WOULD BE GRATEFUL IF YOU WOULD KINDLY COMPLETE AND RETURN IT TO US AS SOON AS CONVENIENT.

The quickest and easiest way to complete the questionnaire is to enter your answers and comments directly on to the attached form and email it back to us. If you have computing problems a return by post would be fine. If you send a note of your postal address we will be pleased to send you a stamped and addressed envelope.

If you manage more than one fishery and apply different policies at different locations it would be very helpful if you would fill in one questionnaire for each. If you are not the appropriate person to fill in the questionnaire we would be grateful if you would pass it to the correct person or let us know who we can contact. Comments or queries on any aspect of our project would be gratefully received by email, phone or letter.

Yours Sincerely,

Appendix III *Tables*

Table 1 FISHERY CHARACTERISTICS

Type of fishery		
ticket	182	92%
private & ticket	8	4%
private	8	4%
total	198	
Size of fishery		
less than 5 acres	54	27%
5-10 acres	58	29%
more than 10 acres	86	44%
total	198	
Bank &/or boat fishing		
bank only	114	58%
boat only	8	4%
bank & boat	76	38%
total	198	

Table 2 TYPES OF TROUT

browns & rainbows	160	81%
rainbows only	30	15%
browns only	7	4%
total	197	

Table 3 ORIGINS OF BROWN TROUT

wild only	32	19%
stocked only	87	52%
both wild & stocked	48	29%
total	167	

Table 4 PREDATORS

Predator	Yes	Percent	No	Percent
Pike	47	24%	147	76%
cormorant	163	83%	33	17%
Osprey	70	36%	126	64%
heron	181	92%	15	8%
Otter	114	58%	82	42%
Mink	102	52%	94	48%

Table 5 OTTERS & MINK

otter & mink	57	36%
otter only	45	28%
mink only	57	36%

Table 6 HAS C&R INCREASED IN POPULARITY IN RECENT YEARS?

yes	150	80%
no	7	2%
no change	29	15%
don't know	2	1%
not answered	7	3%
total	195	

Table 7 BAG LIMIT

Limit	No	%
1	2	1
2	8	4
3	25	13
4	72	38
5	27	14
6	24	13
7	1	0.5
8+	30	16
total	189	

Table 8 C&R: RAINBOWS

C&R allowed	166	84%
C&R not allowed	32	16%
'sporting' ticket	122	73%

Table 9 C&R: BROWN TROUT

all browns returned	91	59%
same policies for browns & rainbows	59	38%
bag limit of 2 (4 fisheries) or 1 (1 fishery) followed by release	5	3%
Total	155	

Table 10 C&R ACCORDING SIZE OF FISHERY

Fishery size	Catch & release permitted				Total
	Yes	%	No	%	
Small	42	77%	12	22%	54
Medium	48	84%	10	16%	58
Large	76	88%	10	12%	86
Total	166		32		198

(Small = less than 5 acres, medium = 5-10 acres, large = greater than 10 acres)

Table 11 FISH DAMAGE FROM C&R

						If 'yes' is it a major problem		
	yes	%	no	%	total	yes	% of those reporting yes	% of the C&R fisheries
Do you see damage after C&R?	74	45%	92	55%	166	6	8%	4%
Type of damage								
fish deaths	32	19%	134	80%	166	11	34%	7%
mouth damage	26	16%	138	84%	164	2	8%	1%
Body damage	59	36%	106	64%	165	6	10%	4%

This table only includes responses of 166 managers whose fisheries currently offer the option of C&R (see Table 9).

Table 12 DOES C&R SPREAD DISEASE?

Does C&R spread disease?		%
Yes	39	21%
No	123	68%
D/K	23	13%
Total	185	

Table 13 PERCENTAGE OF ANGLERS USING SATISFACTORY RELEASE TECHNIQUES?

Estimated percentage	Fisheries	%
<25%	8	5%
25-49%	2	1%
50-75%	24	15%
>75%	106	65%
impossible to estimate	23	14%
Total	163	

Table 14 EDUCATING ANGLERS

	Method of providing education	Per cent of managers
Verbal	159	96%
Written (eg.leaflets)	97	59%
Posters	52	32%
Video	5	3%
Practical demonstration	94	57%

Table 15 WHY IS C&R NECESSARY FOR YOUR FISHERY?

	C&R fisheries							Non-C&R fisheries				Grand total		
	Yes		No		d/k		Total	Yes		No			d/k	Total
financial reasons	133	83%	26	16%	2	1%	161	1	5%	19	95%	0	20	181
allows lower stocking	85	53%	72	45%	2	1%	159	1		2		0	3	162

Table 16 EFFECTS OF C&R ON AVERAGE FISH SIZE

Has C&R resulted in increase in average size of fish?	Number	%
Yes	64	41%
No	56	36%
dk/ impossible to judge	36	23%
	156	

Table 17 DOES C&R IMPAIR CATCHABILITY? RELATED TO FISHERY SIZE

Fishery size	Yes	No	d/k	Total
Small (<5 acres)	39 (76%)	11 (22%)	1(2%)	51
Medium (5-10 acres)	42 (74%)	15(26%)	0	57
Large (>10 acres)	37 (46%)	40(50%)	3 (4%)	80
Totals	118 (63%)	66(35%)	4(2%)	188

Table 18 REASONS FOR TROUT BECOMING MORE DIFFICULT TO CATCH

Why do trout become more difficult to catch?	Yes	%	No	%	Dk	%	Total
switch to natural food	72	63%	27	23%	16	14%	115
caught before	102	88%	8	7%	9	8%	119
Both	59	51%					

Table 19 DISCARDS.

Fish disposal	n/a	%	Yes	%	no	%	Total
Fewer fish put in freezer	93	58%	42	26%	26	16%	161
Fewer fish put in dustbin	19	12%	93	56%	53	32%	165

(n/a refers to fisheries that do not provide a freezer and/or where the manager was not able to answer the question)

Table 20 DOES C&R FUEL SUPPORT FOR ANTI-FISHING LOBBIES?

Do you feel that C&R fuels support for anti-fishing lobbies?		
Yes	74	38%
No	87	45%
	33	17%
Total	194	

Table 21 ANTI-FISHING PROTESTS

Have you experienced any trouble from protesters at your own fishery?		%
Yes	3	2%
No	180	99%

Appendix IV

5. Fishery managers' comments.

On trends

- *We would prefer catch and kill but have found it necessary to comply with the increasing proportion of anglers who do not wish to carry fish away.*
- *We have not up to now permitted C&R but we have canvassed our angling clientele and have received the advice that it would be a good idea to have a C&R option. We are also going to trial a sporting ticket option.*
- *We are planning to change to C&R this season.*
- *C&R was introduced last summer; approximately 30% opted for C&R.*
- *We introduced the option of C&R in 2003 subject to certain rules and conditions e.g. that fishermen had to remove their first fish and could then only catch and release another four. C&R has since become more and more popular; today our membership is 100% C&R.*
- *Several years ago the number of trout anglers suddenly dropped and after speaking to some of them we introduced C&R and within a months the numbers were back up.*
- *With C&R we get more of the genuine sportsmen (people who really love angling) coming to fish and a lot less people who want a profit (fishmongers, folks who sell fish on).*

On sporting ticket

- *We used to do a sporting ticket but fish became difficult to catch. Since introducing a minimum kill of one fish catchability is not a problem.*
- *Suspicious that some anglers may bag the occasional fish when on sporting ticket.*
- *This fishery has operated a 'sporting ticket' in the past but this has now been discontinued due to lack of turnover of stock.*

On C&R in general

- *It is all down to a matter of how C&R is conducted which is important.*
- *C&R is not allowed because we stock large fish.*
- *C&R should not be limitless; a daily limit is essential to preserve the quality of the fishing for others.*
- *I doubt that C&R would work well for a large commercial fishery – the possibility of abuse is too great.*
- *It seems that C&R on any stillwater further South than the Pennines is a 'no no' (unless waters are river/spring fed). In 37 years of running these fisheries I have tried it a few times and the results have been financially and visually disastrous.*
- *Why do we allow C&R? – because we are in a remote rural location and we want anglers to come for whole day. They may catch all they wish to kill in an hour.*

On predators

- *Hérons do more damage than anglers.*
- *We see damage due to cormorants and mink.*

- *The only fish damage seen is from otters.*
- *Lots of damage by cormorants and herons.*
- *Returned fish, particularly when stressed or exhausted, are susceptible to predation viz bonefish and sharks.*
- *Cormorants are a serious nuisance and do far more damage to our fish than C&R anglers (this point, variously worded, was made by many managers).*

On the disposal of fish

- *If anglers do not wish to take fish we distribute them locally or get them smoked.*
- *Dumping fish is unacceptable*

On catchability

- *We now stagger our stocking days to avoid anglers pulling out stockies with lures.*
- *Essential to crop the fish and restock to ensure reasonable catchability.*
- *We used to have sporting tickets but the fish became difficult to catch. When we switched to requiring the first fish to be killed, ensuring a steady turnover of stock, the fish were no longer difficult to catch.*
- *On the question whether C&R makes fish more difficult to catch we have done experiments which have proved to our satisfaction that it does not. We have a number of ponds and had total kills in one and total C&R in the others. There was no difference in catchability between the two. On some days the fishing would be poor on all ponds and on other days good on all ponds. The C&R ponds did not fish differently from the C&K ponds. Whether or not the fish had been caught a number of times made no difference.*
- *The drawback to C&R is that trout do become educated. This is either a problem or a challenge, depending on your point of view. To overcome the problem you do need to turnover your stock. We do this by the occasional corporate/group day which is always catch and take only.*
- *My father put in a golden trout and offered a bottle of whiskey for whoever caught and returned it. He had to stop after a few weeks because it was becoming too expensive – the fish was caught repeatedly.*
- *We experimented one year by putting 3 golden trout in – requesting that they be returned. There were 70 recorded occasions of the fish being caught.*
- *We have a golden trout that has been caught at least 20 times.*
- *We have seen the same fish caught three times in the same week.*
- *We have a one-eyed fish that was caught twice in one day – perhaps he should have gone to Spec-Savers.*

On stocking policies

- *We stock 100 fish weekly and the water is well fished so there is regular turnover of stock which is essential for ensuring that the fish do not become hook shy.*
- *It is important only to stock to a level which can be sustained from the natural food available, however this takes you out of the commercial scene of high density stocking to satisfy the stockie bashers and fishmongers which this fishery certainly does not want or need.*

On bag limits

- *The big problem over the last 5-6 years has been the attitude of anglers who become disgruntled and disenchanting if they do not achieve the bag limit.*

On fish handling and educating anglers about proper release methods

- *It would be nice if the survey might result in a Code of Practice for C&R*
- *We have classes for youngsters and teach them the right C&R methods – it is the elderly anglers who do not take to it so well and don't like to be told how to do it.*
- *The anglers who take best to C&R are the youngsters and those who are least good are the older anglers. We have a lot of youngsters fishing. Below 15 they are allowed to fish free.*
- *I feel that if you can teach anglers the proper way to handle fish they will use these skills when fishing a totally wild fishery, which will lead to the angler actively preserving natural fish stocks.*
- *Pleased to see good numbers of youngsters taking up fishing. It teaches them good manners and good behaviour.*
- *Anglers fish from platforms which are low enough that the anglers can unhook fish without taking them from the water. We have staff on the bank at all times who instruct and demonstrate C&R. We also have a lot of regular anglers who, if they see a fish being badly handled will help the angler or notify staff.*
- *Regular anglers generally prefer catch and release and usually do it expertly. Visiting anglers, holiday makers and tourists usually like to take a fish home and often do catch and release badly.*
- *We have weeded out anglers who handle fish badly – banned them from the fishery – word gets round like wildfire – and our clientele handle fish very well, release them in the water – apart from a couple of old gentlemen who can't bend down so they still net the fish.*
- *We only allow C&R to regular anglers who are considered competent to handle fish safely.*
- *Season ticket holders are more careful in fish handling than day ticket holders because they have a vested interest in maintaining healthy fish.*
- *The best places to ensure that anglers see and read the guidance about C&R are on the lavatory wall and on the back of the lavatory door.*

On the benefits of C&R

- *Do you believe C&R is necessary to your fishery? – yes, but how do you define necessary? In terms of making the business viable it is not necessary but in terms of angler freedom to release a fish that he doesn't want for the pot – definitely yes.*
- *C&R is deemed as a more economical way to manage a fishery with the angler having the option to take fish or not but still enjoy the thrill of fishing.*
- *We believe that C&R brings more people to the fishery especially from a distance because at least on an easy day's fishing they know they can have a full day's fishing.*
- *For remote fisheries where anglers may have to travel a long way to their fishing catch and release is essential to ensure that they are able to fish for the number of hours that they pay for.*
- *C&R allows competition anglers to practice all day without taking any fish whereas in previous years they would have had to cease fishing after their limit had been taken.*

- *The C&R policy for brown trout was introduced over 20 years ago and has resulted in wild browns in the 5-7lb mark with some more than 10lbs (this comment, variously worded, was made by several managers).*
- *With the right anglers and in a controlled environment, C&R has everything to commend it and nothing against it.*

On the drawbacks of C&R

- *Catch and release spoils the fishing – the pleasure of fishing is to catch a fish and eat it for breakfast – there is no pleasure in catching fish which have been caught before.*
- *When we bought the fishery most of the fishing was C&R. We did not change anything for the first year but then decided that although C&R was beneficial to the fishery as far as costs it was not good for the fish. In a small stillwater fishery like ours C&R does not work as the fish get stressed. We first restricted C&R then stopped it altogether. The condition of our fish definitely improved.*
- *Competition anglers complain that there are too many fish in the reservoir but our argument is that we stock the water for our regular customers who partake in catch and kill and we have a weekly stocking to cater for day ticket visitors.*
- *A fishery needs a turnover of fish to ensure a proportion of fresh easy-to-catch fish to maintain the interest of the majority of customers. In a small fishery it is difficult to maintain an adequate turnover if there is too much catch and release.*
- *Anglers are sometimes less likely to fill in catch returns regarding released fish.*
- *We stop C&R in Summer if water temperatures rise.*
- *The only time we see dead fish is in the Summer when the water temperature rises.*
- *We ban C&R in the Summer if water temperatures are above 20°C. Argulus problem.*
- *The modern angler wants to catch fish all day so the percentage fish damage on some tickets is quite high.*
- *As a small put and take fishery with high Summer water temperatures and open to anyone whose fishing methods might be questionable, the introduction of C&R would result in diseased and dead fish.*
- *We are also a nature reserve and not under financial constraints. One of our prime concerns is fish welfare. C&R is potentially harmful to fish. We believe many fisheries are forced to adopt C&R for financial reasons even although they do not really believe in it.*
- *Anglers these days will go on all day catching and releasing any number of fish if you allow them.*
- *We are concerned about the greed of anglers wanting to catch up to 60 fish on C&R (now restricted to 6 fish).*
- *Some take advantage and release more than our C&R limits.*
- *C&R encourages stockie bashing and cherry picking.*
- *I have to spend too much time trying to educate the anglers.*
- *Policing C&R is a lot of hassle and we are thinking of stopping it next year.*
- *C&R creates practical problems – eg policing, angler education, gauging stock levels etc.*

On competitions

- *Clubs running competitions still kill fish and some of these anglers discard their catch. Because of this our fishery offers anglers at competitions the opportunity to have their fish weighed on the bank by fishery staff so the fish can then be returned.*
- *The competition anglers are considered competent in C&R.*

On economics

- *We introduced C&R because of angling demand for it but it made no significant difference to fishery economics.*
- *The next 2-3 years are going to be difficult for fisheries and fish farmers because of the escalating costs of fish feed.*
- *We are struggling to make a living because of the price of fish – currently £1.90 per pound. We had to introduce C&R because of competition from other fisheries. The price of fish is such that we would not be able to make a living if we just did catch and kill.*
- *Fish food is now £12-1500 per ton. I stock with fish (rainbows and triploid browns) from 2lb to 20 lb. I can't afford to feed fish up to perfect condition only to have them released and then lose condition and lose value.*
- *C&R now makes up 30% of our day ticket income and 50% of our season ticket income.*
- *Left to ourselves we would probably not bother with C&R but feel obliged to offer it because other fisheries do.*
- *If I had the choice I would not offer C&R – it is necessary because of competition.*
- *I would prefer not to have C&R but we were obliged to introduce it because it was available in other fisheries.*

On damage to fish

- *Retained hooks are shed extremely quickly if the hooks are barbless.*
- *Spring fed so no problem with warm water fatalities.*
- *We used to allow C&R until 5 years ago – too many damaged fish from bad handling.*
- *The fishery is fairly shallow. If we get a warm summer we will probably cancel the C&R fishing because the fish do not tolerate it as well. We have installed wind-driven aerators since when the fish have done better, especially in the Summer.*
- *In the Summer in the last 3 years with rise in water temperatures we have had some fish deaths after C&R.*
- *We stop C&R in the Summer if water temperatures exceed 20° except for the browns, tigers and char all of whom tolerate C&R better than rainbows.*
- *C&R has to be suspended during prolonged heat.*
- *Trout are very strong fish, but if you play them on line for 15 minutes they are probably only fit for one thing, a bash on the head.*
- *Cormorants are a bigger problem than anglers in causing damage to fish.*
- *Any damage is from cormorants, not anglers.*

- *We tried C&R for a period of six months. We stopped because of the number of dead fish that we found. Our anglers did not treat the fish well.*
- *We have stopped C&R because of warm water problems. This is not a problem in deep fisheries.*
- *Fish released become easy prey for other predators, especially pike and cormorants. Although fish may swim away strongly they often go to the bottom for rest and are much more susceptible to predators.*
- *C&R can never be done on some waters due to the size of the fish. Any fish over 6lb will struggle if released back into the water. In the summer months releasing fish would be a nightmare. So I am 100% against C&R.*
- *It is a myth that large double-figure sized fish cannot be released. We had an exceptional rainbow last season which weighed 24lbs and became famous for stripping all of the backing from members' reels. This fish was hooked and lost at least 3 times and landed and released 3 times. It graphically illustrates the benefits of C&R.*
- *The fishery stocks with 'doubles' and it is emphasised that large fish (small hearts) require a long time to recover. Large fish are weighed and photographed by fishery staff with only very few mortalities.*
- *When fish are fattened quickly their hearts are not big enough.*

On animal rights protesters

- *We do get crank calls in the middle of the night – we assume that this may be from the animal rights people.*
- *6-7 years ago the fishery was attacked by an animal liberation group who poured a chemical into the water which killed the entire stock of 6000 fish.*
- *About 6 years ago a group of protesters did damage to the property.*
- *We do not use a large dog as deterrent but do have a large gamekeeper.*
- *I am six foot six and twenty stone. I have two Alsatians and a twelve bore – what do you think?*
- *Problems with the anti-fishing lobby are dealt with by quoting from the bible.*

Miscellaneous

- *This is a club water that also issues tickets. Ticket holders are not allowed C&R but club members practice it.*
- *We have had a lot of interest in C&R and some of our local regulars do it unofficially to which we turn a blind eye. We employed a chap to investigate and he visited a number of fisheries including some in XXXXXXXX where anglers' behaviour and the condition of the fish was terrible. Unfortunately in XXXXXXXXXX there are a lot of anglers who misbehave – they drink and shout and swear, drop litter, trample banks and mistreat the fish dragging them up on to the banks and then kicking them back into the water – so we have raised our ticket prices to discourage them. We prefer a quiet, litter-free, peaceful fishery and accept the loss of revenue. We would like to move to C&R and are considering it – as long as the fishing louts stay away.*
- *Mobile phones with cameras have done more for fish conservation than all the conservation groups put together. Many anglers (a) do not like to kill anything and (b) do not know what to do after they have killed it – how to gut or cook it.*
- *Greed of modern anglers – most expect to catch (& return) at least 10 fish. Some years ago a brace was all that was sought.*

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