

ENVIRONMENT AGENCY BROWN TROUT STOCKING REVIEW 2007/8 REVIEW OUTCOME AND SUMMARY OF CONSULTATION RESPONSE

1. Purpose

Last year we reviewed our brown trout stocking policy. This document sets out the outcome of this review; summarises the key issues raised during the public consultation; how we have used these (including our response to many of the questions raised); and the next steps to implement this change.

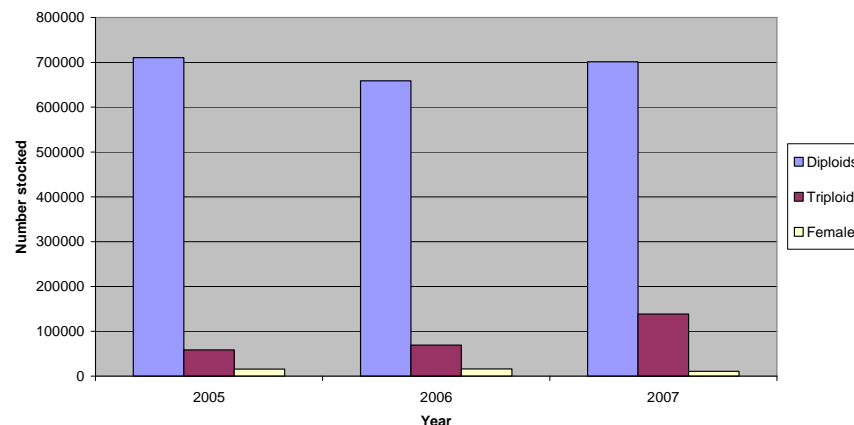
2. Background

Our National Trout & Grayling Fisheries Strategy raised questions about the impact on wild brown trout stocks of around 700,000 farmed brown trout which are stocked into English and Welsh rivers each year by fishery owners and angling clubs to support angling. To address this, in 2003 we capped the number of fertile brown trout (known as “diploids”) being stocked whilst we carried out further research into genetic and other effects.

The research (listed in Appendix III on page 19) demonstrated no apparent impact of stocked fish on wild fish from competition or predation. However, the peer review of over 300 papers across Europe concluded that hybridisation poses a risk that the offspring have a lower ability to survive and reproduce successfully. Whilst the level of fish farm genes in wild stocks exposed to stocking is highly variable and often low (less than 25%) it remains a concern.

The research also indicates there is a practical alternative to stocked fertile farm strain fish – that of using female “triploids”. Triploid brown trout are non-fertile (produced using an established process involving high pressure or temperature shock applied to developing fish eggs) and are already stocked in growing numbers in England and Wales (Figure 1). A high proportion of farmed rainbow trout, including those stocked for angling into stillwaters, are also triploids.

Figure 1. The number of diploid and triploid brown trout stocked into English and Welsh rivers 2005-2007 (source Environment Agency/Cefas Live Fish Movements Database)



3. The Consultation

We started informal consultation with special interest groups on the research findings in mid 2007. That stage of the process led to the proposal that:

Brown trout stocking into all but totally enclosed waters with no significant natural brown trout production should be with non-fertile brown trout or from breeding programmes using locally sourced brood-stock.

In October 2007, we commenced a three month wider consultation on both the evidence and this proposed change in policy, beginning with our Fisheries, Ecology and Recreation Advisory Committee (FERAC) meetings. We then sent the consultation documents directly to a wide variety of interested people (the list is summarised in Appendix 1 on page 11) as well as placing them on our website.

This consultation specifically asked for views on two proposed alternatives for implementing the suggested policy:

Option 1 *proposed mandatory implementation in the medium term (up to 5 years)*

Option 2 *proposed monitored voluntary implementation in the longer term (up to 10 years) switching to a mandatory approach if necessary.*

4. The Consultation Feedback

We received 248 written responses to the consultation from individuals, angling clubs, fishery managers/owners, fish farmers and national representative bodies. We want to offer our thanks to all those who contributed.

This widespread consultation gave considerable support for a move away from stocking fertile farm strain fish but there was a strong minority opposition. Conclusions relating to both the scientific evidence and triploid performance were challenged by some. The issues raised and our responses are given in more detail in the "Key issues raised" section below.

From FERACs

Six regional committees supported the policy and implementation via option 1. Two committees were divided (Thames & Southern)

From the open consultation Oct 2007-Jan 2008

248 responses were generated from:
individuals (61%); angling clubs (21%); fishery managers & owners (6%);
fish farmers (6%); national bodies (3%); consultants (2%).

Those responding were spread around England and Wales although the highest proportion of responses from individuals came from within Southern Region (20%).

Consultation results: have shown widespread support but with sizeable minority opposition:

Support for options -

- **Individuals**
28% supported Option 1; 5% supported Option 2; 16% favoured more restrictions; 19% favoured less restrictions; 32% gave no obvious preference
- **Groups**
20% supported Option 1; 8% supported Option 2; 2% favoured more restrictions; 21% favoured less restrictions; 49% gave no obvious preference

Support for using triploid trout

- **Individuals** – 38% supported use of triploids, 34% objected to using triploids, 28% didn't make clear
- **Groups** – 35% supported use of triploids; 36% objected to triploids; 19% gave no obvious preference

There was little difference in the balance of views between those responding from different regions. However, people responding from the Southern Region made up the highest proportion of both groups and individuals (24% and 35% respectively) of all those expressing opposition to the use of triploid trout.

5. Key Issues Raised

The people we consulted raised a number of issues relating to the introduction of the new policy. A summary of these are given in Appendix II on page 13 and answers to the most **frequently asked questions (FAQ)** are given below:

FAQ 1 What scientific evidence has lead you to believe that stocking with fertile trout damages the fitness of wild populations?

A1 We reviewed 300 papers in the course of our research. The weight of scientific evidence suggests we should be reducing the influence of genes from farmed trout on wild brown trout populations.

In recent years there has been considerable concern expressed over the genetically mediated impacts on wild salmon stocks from the escape of cage-reared salmon. Exactly the same concerns apply to wild trout stocks.

The risks of stocking with fertile, diploid trout have been recognised world wide. Some Scandinavian and European countries have now made the stocking of farmed trout illegal where there are wild stocks. Several states in North America have made similar changes to protect their wild salmonid stocks.

FAQ 2 Although 300 papers were reviewed, few were from England and Wales. Will this information be reliable? Weren't some key conclusions drawn more from salmon than trout?

A2 The majority of research into the impacts of triploid brown trout on native stocks has been done in other parts of Europe, Ireland and Scandinavia. However, findings from these are transferable to our own (England and Wales) situation and the results which have been found in England and Wales are very much in line with those from the other countries.

Atlantic salmon and brown trout are so similar and closely related that they can produce viable hybrids in the wild. Therefore research into the impacts of farmed and wild salmon interbreeding are transferable to trout. Knowledge of the two species suggests that the effects of farmed and wild interbreeding on trout are likely to be the more severe.

FAQ3 Is it not too late to preserve genetic integrity? Is this not already compromised by stocking?

A3 No, it's not too late. The evidence shows that wild populations can recover when stocking is stopped - those domestic traits which do not benefit wild survival will gradually be selected out of such populations. This is based on a large number of studies of populations exposed to stocking in Europe and Scandinavia where in most cases the introgression¹ levels found were less than 25%, meaning that a substantial amount of the natural genetic make-up of the wild trout populations remains

FAQ4 Is there evidence that stocking with diploid trout over the past 150 years has had any negative impact?

A4 For individual populations exposed to stocking, there is very clear evidence from a large number of studies in Europe and Scandinavia (including the River Dove in England) that interbreeding of farmed and wild trout takes place and that stocked farm trout genes pass into wild breeding populations.

Though the limited number of studies so far carried out in England and Wales have revealed no evidence of widespread decline in genetic diversity in brown trout due to farm-strain diploid stocking, continued interbreeding reduces native trout genetic diversity over time. This interbreeding leads to lowered survival and reproduction of trout populations. There can also be damage to the potential of the species to adapt to changing conditions.

FAQ5 Farmed and wild trout breed at different times, so how can they interbreed?

A5 Wild trout breeding tends to take place later than that of stocked farmed trout in rivers, particularly in southern chalk rivers.. However,

¹ the proportion of farm genotypes in a wild population

farm-strain male trout retain the ability to mate after stocked females have laid their eggs. There is also evidence suggesting that the presence of ripe females can induce maturation in male trout. During the Game Conservancy Trust² radio tracking project on a southern chalk stream (commissioned especially for this review) stocked females were observed mating with wild males and subsequently produced viable eggs. The large number of studies reviewed elsewhere during our research clearly demonstrate that interbreeding does occur.

FAQ6 Aren't triploid trout less good to fish for?

A6 There *may* be genuine differences in triploid performance as an angler quarry – but the investigations (undertaken by the Game Conservancy Trust²) revealed no significant difference in performance between triploid and diploid trout. The use of triploid brown trout in fisheries is increasing voluntarily.

Performance differences can also arise as a result of strain differences, breeding arrangements and rearing differences. These are all things that the fish farmer can address. We will consider further work to help establish best practice when we develop our implementation plan.

FAQ7 Triploid trout are sterile and not affected by the stresses of spawning. As they may survive and over-winter better, won't they compete more with wild fish?

A7 The evidence indicates that triploid trout can survive and over winter better than diploid (fertile) stocked fish because they are not expending energy through spawning. Our research suggests around 50% of triploids stocked in September will be recaptured by the following March, while the recaptures of diploids and wild trout over the same winter period are around 30% and 37% respectively. With the better survival of triploids, owners may find that they can reduce the numbers of fish that they need to stock. The impact of triploid trout on wild trout recovering from spawning is an area that we would wish to examine in further detail.

FAQ8 In producing triploid trout are we not messing with their genetic makeup? Are they not a GMO?

A8 The process of producing all female triploid trout involves heat or pressure shocking of fertilised trout eggs in their early development. This causes them to retain an extra (a third) set of trout chromosomes per cell and this makes them sterile. This does not otherwise change their genetic makeup – it is not the same as genetic engineering or genetic modification. As these fish are unable to breed, their genes cannot mingle with those in the wild stock.

Many people who responded are concerned that triploids are Genetically Modified Organisms (GMO). The common view of a GMO is that it has been the subject of genetic engineering; and has had its

² The Game Conservancy Trust is now known as the Game & Wildlife Conservation Trust

genetic material altered, usually by recombinant DNA technology. That technique involves the combination of DNA from different sources (usually from one other plant or animal), in a test-tube, to create new genetic material that is then inserted into an organism (in the case of animals into a fertilised egg) causing it to express new or altered traits. The key point is that new genetic material is introduced.

Triploids are not GMO in the above sense as they do not contain any genetic material introduced from other organisms; it is all their own. Triploid trout can and do occur at low levels in the wild (typically 1 in 5-10,000). Triploid rainbow trout have been produced for many years for restocking stillwater fisheries. Many common food products are triploid, for example bananas, seedless oranges, grapes and some apples.

The Department for the Environment Food and Rural Affairs (Defra) and the European Inland Fisheries Advisory Commission (EIFAC) do not define triploid fish as GMOs. The European Union Regulation 2001/18/EC, which regulates the release of GMOs into the environment, specifically excludes polyploidy (organisms having extra sets of chromosomes) from the definition of genetic modification.

FAQ9 What about the technical and financial burden on fish farms?

A9 We recognise that the change in policy will initially place a technical and financial burden on the fish farm industry. Husbandry practices on the fish farm need to be slightly different for triploid trout than they are for diploid trout.

At present, farms producing triploids are able to select the brood-stock from a large, genetically diverse population of diploids. This is on the basis that any surplus (ie not used for brood-stock) can be sold on as diploids for restocking or for use as brood-stock by other farms.

As the diploid restocking market reduces, there will be less incentive to hold large numbers of diploids from which the necessary number of suitable brood-stock for triploid production can be selected. We recognise this could be a potential issue to some triploid producers. We are willing to work with the industry (British Trout Association and British Trout Farmers Restocking Association) to raise awareness of the risk and identify/facilitate the full range of options to resolve this.

We understand that several sites are already established to produce triploid brown trout. We have already worked with the British Trout Association to produce guidance on good practice in producing these fish. Provided that the pressure shocking technique is applied correctly, the triploiding success can be over 95%.

The industry have said they would welcome a firm timetable for the full introduction of our policy.

FAQ10 Won't there be added costs for fishery owners and anglers?

A10 Triploid trout do cost more (10-15%) now but the evidence from the Game Conservancy Trust suggests that fewer may need to be stocked (as they exhibit better over-wintering and may remain where they are stocked for longer). Relative cost might be expected to reduce over time as fish farms move more production from diploid to triploid trout for stocking.

FAQ11 Isn't the other type of stocking that you'll allow through supportive breeding programmes - using local wild caught broodstock - difficult and costly to get right?

A11 In a supportive breeding program, it is important to introduce as many families of fish as possible from as local a source as possible. Introducing just one or two families should be avoided as this can swamp a small area with large numbers of very similar fish.

Because of this, it is likely to be only appropriate in limited circumstances. These might include where stocking is used to restore rather than enhance trout populations.

Supportive breeding is only justifiable when it increases the survival of fish over their lifecycle – not just for the stage being stocked. It is relatively easy to take large numbers of eggs and to rear and release large numbers of fry, but if they don't survive well, they may produce fewer spawning adults than if they had been left to spawn and grow naturally

We will look at how we can help most effectively in circumstances where this is the best option.

FAQ12 Don't stocked diploids contribute to natural spawning and thereby support wild stocks? If we no longer allow stocking with diploid trout, won't this make post-pollution restocking and stocking to restore depressed natural populations more difficult/costly?

A12 Our research evidence indicates that stocked farm-strain diploid trout have very low survival and breeding capabilities compared with wild trout, and if they cross with wild trout the offspring are less fit. Even when stocked as fry and subject to natural selection until maturity, they are still likely to exhibit a deficit in breeding ability relative to wild fish. If they breed with wild fish they will produce less fit offspring

Where fishery owners or the Environment Agency are looking to restore a wild breeding population following a pollution incident or long-term habitat improvement, the following steps should be considered:

1. Assess the likely success of natural recovery, Where this is slow, temporary triploid stocking to meet angling needs could be considered;

2. If this is unsatisfactory, consider a supportive breeding programme using offspring from local wild brood-stock. This solution should only be undertaken after carefully thinking through the costs and implications.

FAQ13 Why are you extending the mandatory use of triploids to waters (rivers and lakes) with no traditional brown trout populations.

- A13** We have done this for two reasons. Firstly, many of these waters will be recovering rivers which, although they do not currently support wild trout populations, may do as water quality, flows and/or physical habitat improves. Secondly, lower reaches of rivers which aren't typical trout habitat may be used by wild trout to access reaches that *do* support wild stocks, especially where rivers have a migratory trout stock.

Diploid stocking will still be permitted in fully enclosed waters with no natural trout production. This will include many reservoir and smaller stillwater trout fisheries.

FAQ14 A “one size fits all” strategy is not necessary – why can't you adopt regional or local stocking strategies to account for local circumstances?

- A14** The risk posed to wild trout stocks by breeding with domesticated farm-strain fish is not restricted to individual rivers or catchments. While there may be a few rivers without any stocking history, we believe we need to put in place the same level of protection across all of England and Wales.

We accept that different rivers have experienced different levels of stock over the last 100 years or so, but this is no indication of the extent of introgression. Where it has been studied, the extent of this introgression is found to be variable and unpredictable. It shows no obvious relationship to the extent of stocking.

FAQ15 Aren't there better ways to protect and improve wild trout stocks than being so prescriptive about stocking?

- A15** We are keen to pursue all the tools we have to maintain and improve trout fisheries as set out in our National Trout and Grayling Fisheries Strategy. Reducing pollution, protecting flows and restoring physical habitats are all important and we want to continue to work with all interests to address these.

None-the-less, the impact of stocking fertile farm bred trout poses a risk to our native stocks. We committed to examining this issue when we launched our Strategy in 2003 and we believe that it's now right to adjust our policy on fish introductions to reduce this pressure

As well as work we are undertaking ourselves, we are providing funding to both the Wild Trout Trust and the Association of Rivers Trusts to support their work to improve rivers and fisheries.

6. How the consultation has shaped our policy

We have considered all the comments made during the development of this policy. Input from the June 2007 seminar helped shape the initial policy proposal and the two proposed implementation options. As a result of the wider consultation from October 2007 to January 2008, we have arrived at a modified implementation timetable, a clearer definition of “enclosed waters” and identified a number of issues that we need to incorporate into our implementation plan. Some of those that we will be considering are identified in Appendix II – “Summary of comments received and our response”

7. The Way Forward

The new approved policy

Our new policy, which supersedes those relating to brown trout stocking in our National Trout and Grayling Fisheries Strategy, 2003 (policies 17 and 27) will be:

Brown trout stocking into all but totally enclosed waters with no significant natural brown trout production will be with female non-fertile brown trout or from breeding programmes using locally sourced brood-stock.

‘Totally enclosed waters’ means those enclosed waters where there is no outlet or inlet or where there are adequate measures to stop the escape of brown trout.

This change in policy will affect about 1000 applicants who now stock fertile fish, together with about 70 fish farms. Annually, they stock around 700,000 diploid brown trout and 140,000 triploid brown trout into rivers in England and Wales.

We recognise that anglers, fishery owners and the fish farm industry need a lead-in time to change and so we are making this policy mandatory from 2015. This will be consistent with supporting progress towards Good Ecological Status within the first Water Framework Directive planning cycle and is longer than the three-year period the trout farming representatives asked for.

Policy implementation

To implement this policy change, we plan to use the time to 2015 to work with our partners to promote the policy and help people to adapt.

In the meantime, we will set milestones that we want to achieve as:

- 30% less than present of number of farm strain fertile trout stocked into English and Welsh rivers by 2010;
- 50% less by 2013; and
- Full compliance by 2015.

If we do not see significant progress towards these milestones, we could consider bringing forward mandatory compliance to 2013.

The phased change will be accompanied by education, awareness raising and supportive activities with partners.

We will give added emphasis to working with fishery owners to identify and agree where more Wild Fisheries Protection Zones should be established.

We will also support increased focus on habitat improvement and target our resources to support those owners and organisations delivering this sustainably.

APPENDIX 1 – The Consultation Process

1. Formulating the proposed policy

We sent the research findings and an invitation to attend a technical seminar in June 2007 to the following in April 2007 :

Association of Rivers Trusts
British Trout Association
British Trout Farmers Restocking Association
Centre for Environment, Fisheries & Aquaculture Science
Consultants – Vaughan Lewis, Nick Giles, Prof I Cowx, Prof A Ferguson,
Dr D Soloman
Countryside Council for Wales
Dales Rivers Trust
Frome, Piddle & West Dorset Fishery Association
Game Conservancy Trust
Natural England
River Eden fishery owner
Salmon & Trout Association
Test & Itchen Association
Two fish farmers/long term users of triploids
Welsh FERAC Chair
Welsh Salmon & Trout Association
Wild Trout Trust
Wiltshire Fisheries Association
Wye & Usk Foundation

The seminar and subsequent input from invitees helped shape a proposed change in brown trout stocking policy together with two implementation options

2. Consulting on the proposed policy

We presented these proposals to our eight Fisheries, Recreation and Ecology Advisory Committees at their October 2007 meetings.

We then sent the consultation papers containing the policy proposal and the two options for implementation together with supporting evidence (or the website link) to all of the above seminar invitees together with the following:

- All trout farmers who have supplied trout for stocking in the last year (approx 70)
- All those applying to the Environment Agency for a “Section 30 consent” to introduce trout into English and Welsh waters in the last two years (approx 900)
- All anglers purchasing a rod licence on line who receive our electronic newsletter (approx 94,000)

- Association of Stillwater Game Fisheries Managers
- Institute of Fisheries Management
- National Association of Fisheries and Angling Consultatives
- National Trust

Information about the review – including the research papers – has been available on the Environment Agency’s website since June 2007.

We issued a press release in June and October 2007 and articles appeared in the November 2007 edition of “Trout & Salmon”, the winter edition of “Finfish News”; the December edition of “Fly-fishing & Fly-tying” and on at least four fishery interest web sites.

3. The consultation response

The consultation period closed on 18 January 2008 and we received 248 written submissions. All of these were acknowledged. We are grateful to everyone who took part and who, in many cases, took the time to submit detailed comments.

Appendix II gives a summary of the comments made together with our response.

APPENDIX II – A SUMMARY OF THE COMMENTS MADE DURING THE CONSULTATION & OUR RESPONSE

Your concerns and questions	Number of comments made on this topic	Region in which these were raised	Our response
The evidence			
More research is needed into brown trout genetics and the genetic interaction between wild and stocked fish to substantiate the mandatory use of triploids.	10	Predominantly South West	Please see “Frequently Asked Question” (FAQ) numbers 1 to 5 on pages 3 to 5 of this document.
The science in Professor Ferguson’s report (Genetic Impacts of Stocking on Indigenous Brown Trout Populations) is unsound	18	Predominantly South West	Please see FAQ 1 on page 3 of this document
You have placed the wrong interpretation on the results of the Professor Ferguson’s report	9	Predominantly Southern	Please see FAQs 1-5 on pages 3 to 5 of this document
Indigenous “wild” trout no longer exist, because of the long history of stocking with fertile farmed trout. There is no evidence that supplemental stocking has resulted in widespread decline or that interbreeding has caused deterioration.	23	Predominantly North West and Southern	Please see FAQs 3 and 4 on page 4 of this document
Farmed fish are selected to spawn much earlier than their wild counterparts, so is interbreeding really a problem?	4	Southern	Please see FAQ 5 on page 4 of this document
You have presented insufficient evidence in the Game Conservancy Trust report that stocked fish interfere with wild brown trout	3	Various	The GCT report was based on a scientific study which found no apparent impact of stocked fish on wild fish from competition or predation. Please also see FAQ5 on page 4 of this document.
Using triploids			
I am concerned about the behaviour of triploid brown trout because I think– a) they are more voracious/predate more heavily on wild trout fry and other fauna, especially native crayfish; and – b) they out-compete wild brown trout stocks.	23	Predominantly Anglian, North West, South West and Wales	The Game Conservancy work on diet showed no significant difference between wild, diploid and triploid brown trout present/stocked into either upland or lowland streams. Fish eating was generally low across all three groups. See also FAQ 7 on page 5 of this document

Your concerns and questions	Number of comments made on this topic	Region in which these were raised	Our response
Stocked diploids can contribute to natural spawning and thereby support wild stocks. By insisting on triploid only stocking, you will remove this support. In particular, this will reduce the value of egg incubation boxes, where natural selection ensures that only the fittest progeny will survive to breed.	8	Predominantly Southern and North East	Please see FAQ 12 on page 7 of this document
Triploids are Genetically Modified Organisms. As such, they are an unnatural and unattractive angling quarry. Their use for stocking is banned in Germany – this introduces a degree of uncertainty for fishery owners if the ban extends to the rest of Europe. In addition, producing infertile fish entirely for sport is unethical.	21	Predominantly Southern	Triploids are not recognised as GMO's across Europe (please see FAQ8, page 5). We are not aware of plans to promote the German position and if any arose, given the difference in interpretation, we understand the likelihood of adoption across Europe would be very low.
I am concerned over the performance of triploids as an angling quarry. I think they show increased shoaling behaviour, they do not rise freely, they are susceptible to extreme environmental conditions and show poorer site retention than diploid fish.	23	Predominantly Southern and South West	Please see FAQ 6 on page 5 of this document
Anglers will be unable to differentiate between fertile (wild) and infertile (stocked) fish. Won't this lead to over-exploitation of wild stocks?	5	Anglian and North West	This will not change from the current situation – some anglers are unable to differentiate between wild and stocked diploid trout. We can introduce other controls to prevent excessive exploitation of wild stocks and marking stocked fish could allow greater differentiation
Won't stocked triploid brown trout smoltify and migrate to sea, returning as outsize sterile sea trout? These fish or large triploid resident brown trout would displace wild salmon and sea trout.	1	Wales	Triploid trout can smoltify, but there is very high mortality of sea-going stocked <i>domesticated</i> brown trout. The Game Conservancy Trust report indicated no significant difference in growth between triploid and diploid farmed trout in the wild, both showing lower growth than wild trout.

Your concerns and questions	Number of comments made on this topic	Region in which these were raised	Our response
Triploid brown trout should not be stocked into SAC (Special Areas for Conservation) rivers	1	Wales	Whilst the number and size of stocked trout can be an issue in SAC rivers, Natural England and Countryside Council for Wales have not expressed any constraints on ploidy.
Other factors affecting trout stocks			
More emphasis should be placed on addressing the other factors impacting on wild trout stocks and fisheries, rather than or as well as the impact of genetic introgression. You need to provide financial support to fishery owners for projects to improve/ regenerate natural trout stocks.	32	Predominantly South West, North West and North East	Please see FAQ 15 on page 8 of this document
General stocking and fishery management			
Wild trout are an indicator of a good environment – stocking to support fisheries takes the pressure off resolving problems. It may also mask a decline in wild stocks.	3	Various	We agree that we should not lose sight of the need to resolve the environmental pressures that affect wild trout fisheries. We acknowledge the need to differentiate stocked trout in fishery surveys to pick up trends in wild stocks.
The impacts of stocking are not restricted to genetic introgression. We need to consider other factors, including the numbers and sizes of fish being stocked.	16	Various	We will consider this for the implementation plan.
All stocked fish (whether diploid or triploid) should be marked to differentiate them from wild fish. This would raise awareness of wild stocks and help to control exploitation by anglers	9	Predominantly Wales	We will consider this for the implementation plan.
You should insist on more catch and release of wild trout to protect stocks	4	Various	We will consider this for the implementation plan. We agree that this offers a practical means to protect stocks.
Stocking with triploids to protect wild stocks promotes a conservationist image of angling	1	Midlands	We agree with this statement.
Wales could become a wild trout-only country	1	Wales	We will work with fishery stakeholders across England and Wales to

Your concerns and questions	Number of comments made on this topic	Region in which these were raised	Our response
			identify candidate wild fisheries protection zones and promote their adoption.
You should develop strategic, whole-catchment stocking plans	1	Wales	We will consider this for the implementation plan.
You should promote the concept of local “sacrificial stillwater fisheries” to protect wild river stocks from exploitation.	1	Wales	We have noted this suggestion
If you allowed stocking with diploids of a larger size than wild stocks, returning any catch below this minimum size would protect native stocks	1	Southern	These larger stocked fish would still be capable of spawning with wild fish and present the same genetic risk.
Stocked fish of either type (triploid or diploid) will compete with wild fish and lead to long term decline in wild populations.	7	Various	Please see FAQ 7 on page 5 of this document
You will need to allow stocking with fertile fish to restore breeding populations following fish mortalities or where rivers are recovering from long-term habitat problems	11	Various	Please see FAQ 12 on page 7 of this document
Wild fisheries protection zones (ie no stocking) is the correct option where wild fish are shown to be present. This should suffice to protect wild stocks.	4	Various	We will encourage wild fisheries protection zones to protect particularly valuable fisheries.
If you are concerned about interbreeding between wild and farmed brown trout and fisheries are concerned at using triploids, why don't you insist on stocking only with rainbow trout?	3	Various	We have noted this suggestion. We believe that many would see widespread stocking of this non-native fish as unacceptable.
There is no justification for limiting stocking to takeable fish – this would affect using incubation boxes, which have an additional educational role to get local buy-in for trout improvements	2	Various	We have no current plans to limit stocking to takeable fish.
Local brood-stock schemes			
Local brood-stock collection and spawning schemes are likely to be expensive. You need to provide support to clubs for such schemes and be more flexible in what is an	11	Various	We will consider this for the implementation plan. Please also see FAQ 11 on page 7 of this document

Your concerns and questions	Number of comments made on this topic	Region in which these were raised	Our response
acceptable protocol. However, if protocol becomes too flexible, you must guard against local schemes presenting the same problem as stocking with domesticated farmed fish, ie introgression of dominant, albeit wild, genes.			
You could use your salmon hatcheries eg Kielder to provide local stocks for rivers and leave fish farms to supply reservoirs. This ensures we have a gene bank should we have a catastrophic loss.	1	North East	Most of our hatcheries are already at capacity producing salmon for legally binding restocking schemes (eg reservoir mitigation). Spawning <i>wild</i> brown trout also presents a fish health risk to these hatcheries. We will examine if any of our culture units might offer support for specific schemes.
Financial and commercial considerations			
Producing triploid brown trout is more expensive than producing diploids. These costs will be passed on to clubs and fishery owners. The proposals are also bureaucratic.	13	Predominantly Southern	Please see FAQs 9 & 10 on pages 6 and 7 of this document
Smaller trout producers will not be able to switch to producing triploids and no longer be able to supply local rivers.	3	Various	We understand that most trout farms currently buy in their diploid eggs. We anticipate that hatcheries will switch over to producing triploid eggs and can continue to supply the smaller producers.
What happens if there are no local triploid suppliers in certain areas, eg Wales, especially in the short term while farms switch over to triploid egg production?	1	Wales	We are addressing this in our implementation plan. We have adopted a phased introduction of the policy to allow for issues like this.
It is currently difficult to buy smaller sized triploids	1	Thames	We have noted this comment
Despite switching to triploid production, farms will need to retain sufficiently large populations of diploid (fertile) brood-stock to maintain the genetic and physical quality of the triploid progeny. How are you going to make sure this happens?	1	National	Please see FAQ 9 on page 6 of this document

Your concerns and questions	Number of comments made on this topic	Region in which these were raised	Our response
General issues			
You must establish a procedure to hear appeals against stocking consent decisions.	3	Various	We are addressing this in our implementation plan. Appeals can already be accommodated. We will consider if any change is needed.
You need to take anglers and fishery interests with you in implementing this change, using a voluntary approach, rather than imposing a mandatory rule.	6	Predominantly North West	We are addressing this in our implementation plan. We have fixed 2015 as the date for full implementation. This allows 7 years for us to work together and resolve concerns.
A "one size fits all" strategy is not necessary – you should adopt regional or local stocking strategies to account for local circumstances.	5	Predominantly Southern	Please see FAQ 14 on page 8 of this document
You must place a greater emphasis on educating anglers on the role they can play in protecting wild stocks.	1	Wales	We are addressing this in our implementation plan
You need to be able to guarantee the triploiding processes used by farms are successful, to protect the customer	7	Various	We are addressing this in our implementation plan
Mandatory use of triploids should not be extended to waters (rivers and lakes) with no traditional brown trout populations.	1	National	Please see FAQ 13 on page 8 of this document
You should consider removing the brown trout close season from "triploid-only" waters. This will lessen the potential economic impact of changing the policy.	2	Various	We are considering this in our implementation plan
You must monitor how the change in policy is being implemented and review as your understanding is informed by further evidence	2	National and South West	We are considering this in our implementation plan
Will the mandatory use of triploid brown trout present an obstacle to a water-body achieving good ecological status under the Water Framework Directive?	1	Thames	No, the assessment of status considers the indigenous ecology. Our overall consenting process for fish introductions will take into account WFD needs as it does the needs of the Habitats Directive.
The consultation	1	Southern	We disagree. The

Your concerns and questions	Number of comments made on this topic	Region in which these were raised	Our response
arrangements for this policy review were unsatisfactory.			consultation arrangements are described in the Appendix I of this document.
Will you compensate fishery owners if the triploid policy proves to be unworkable/detrimental to fisheries?	1	Southern	Triploids have been used by some fishery owners for several years and the numbers used voluntarily are increasing with apparent angler satisfaction
These restrictions may compromise the viability of some angling clubs.	2	North West and South West	We have noted this comment. Our new policy balances protection and improvement of natural trout stocks with the maintenance and development of fisheries and fishing.

APPENDIX III - Research References (all available from our website – environment-agency.gov.uk)

Brown Trout Rearing & Stocking in Europe (Acrobat, 167KB, 2 minutes)

A report by the Environment Agency on brown trout rearing and stocking in Europe and North America - policies and practices. 2006

Genetic Effects of Captive Breeding Cause a Rapid, Cumulative Fitness Decline in the Wild – BBC news website article 2007

Genetic impacts of stocking on indigenous brown trout populations (Acrobat, 455KB, 3 minutes)
A report for the Environment Agency by Professor A. Ferguson 2007

National Trout & Grayling Fisheries Strategy

The Environment Agency's strategy for these species 2003

Telephone Survey of long-term triploid users (Acrobat, 97KB, 1 minute)

A report by the Environment Agency on a survey of long term triploid users 2005

The potential for restocking using all-female triploid brown trout to avoid genetic impact upon native stocks. D. Solomon. Environment Agency Report (Acrobat, 21KB, 1 minute)

A report for the Environment Agency 2002

Triploid Trout Phase 3 - Performance of stocked triploid and diploid brown trout and their effects on wild brown trout in UK rivers (Acrobat, 224KB, 1 minute)

A summary of a study undertaken by the Game Conservancy Trust in partnership with the Environment Agency 2007. (The Game Conservancy Trust is now known as the Game & Wildlife Conservation Trust)