

Wild Trout Trust response to the Defra consultation on the approach to beaver reintroduction and management in England, submitted 10 November 2021

Wild Trout Trust responses in italics below; Defra's consultation commentary and questions in normal font.

Q1. Would you like your response to be confidential?

No

Q2. What is your name?

The Wild Trout Trust

Q3. What is your email address?

c/o director@wildtrout.org

Q5. Please briefly describe your interest in the consultation.

The Wild Trout Trust (WTT, www.wildtrout.org) is a charity that seeks to conserve and improve river habitats for all wildlife, with the brown trout as an iconic indicator of the health of the river. Through a team of nine expert Conservation Officers, based from Cumbria to Cornwall, we work with landowners, fishing clubs, River and Wildlife Trusts and a large number of community-based volunteer groups who care passionately for their local river. Our team spends over 1000 days per year working in and by rivers across the UK and Ireland; our response to this consultation is based on that experience and our research into the impact of beavers in the UK and elsewhere, informed by an independent specialist group that provides scientific advice to WTT.

In learning about beavers, their benefits and risks to the environment and society, we have worked extensively with many experienced and expert individuals and organisations across Europe and objectively assessed relevant primary and 'grey' literature. From this, we recognise beavers as intrinsically amazing animals, their popularity with many people in England and the benefits they may bring under certain circumstances for natural ecosystem function, nutrient retention, water and sediment storage, flood attenuation and mitigation of diffuse pollution. Much of our practical habitat improvement seeks to mimic aspects of beavers' work, specifically the addition of woody material to rivers to drive geomorphic complexity.

*In this response, we use the term 'trout' to describe the species, *Salmo trutta*, in all its phenotypic and genotypic diversity which includes sea trout, and brown trout, living their lives mostly or completely in freshwater.*

We have here focused on trout because, although much of our work is designed to benefit all wildlife, we believe that the potential impacts of beavers on trout have been under-represented in discussions about beaver reintroduction. Other fish, including protected

species such as lamprey and bullhead, may also be impacted and are even less well represented.

There is enormous complexity and subtlety in the needs of different trout populations; many of them are genetically unique and locally adapted, with various life stages moving at various times along and between streams (sometimes tiny streams that you can step over), rivers, lakes and the sea.

Our natural environment now is very different from the last time beavers were widespread in the UK; our river habitats are fragmented by physical degradation, pollution, weirs and culverts, with a man-made barrier on average every 1.5 km¹ in the UK. Beavers will inevitably further increase the number of barriers and will change the nature of the habitat above and below dams. We have identified three specific issues for trout that may be exacerbated by beavers in some places and/or at some times:

1. Migration

Almost all fish and certainly all trout migrate upstream and downstream as a fundamental part of their life cycle and will occupy different habitat niches at different life stages. They have evolved to cope with most natural barriers, but not the number of man-made barriers that now exist. The impact of barriers is more subtle than complete interruption of migration. Delay to migration incurs energetic cost, and increased risk of predation, stress and disease, especially at low flows, an all too familiar issue in spring and summer for many of England's rivers, caused by altered hydrology, climate change and abstraction. Fish populations also become more vulnerable as they become isolated in fragmented habitat. This is why considerable Government and charitable funds are invested in removing and by-passing barriers in rivers. Based on our direct experience and discussions with others, most beaver dams may be no less a barrier to migration than made-made obstructions, and whilst some are short lived, others are large and enduring structures.

WTT staff, with many decades of practical assessment of fish passage, have seen beaver dams across Europe and, in the UK, have specifically looked at twelve beaver dams, from Tayside to Cornwall, in summer 2021: we assessed eleven as impassable for trout on the day, either up or downstream.

It is very possible, in the absence of responsive and effective management, that beaver dams will further exacerbate the impact of barriers on the migration of trout and other fish, and the sustainability of their populations.

2. Habitat alteration

Beavers change habitat, and there are plant and animal winners and losers with those changes. For trout, additional pools may provide adult habitat, but at the expense of vital spawning and juvenile habitat in lost riffles. The study of Needham et al (2021)² looked at a trout population living in a Scottish loch, using two inflowing streams as spawning and nursery streams (usually the critical phase). Beaver modification of one of the streams created habitat favouring larger trout at the

expense of spawning and juvenile habitat. Abundance and density of young-of-year trout were consistently higher in the currently unmodified stream. If or when that second stream is modified by beaver dams, and more spawning and juvenile habitat is lost, that possibly unique trout population may be in jeopardy. In terms of benefitting trout, a few individuals may have grown faster and resided for longer in the beaver pools, but, at the population level, adding one or two more larger trout (especially to a lake population) at the expense of effectively halving the reproductive potential is clearly not beneficial. This study did not assess population-level changes and demonstrates one of the key knowledge gaps in the literature.

The significant negative impacts of abstraction (both directly from rivers and from the underlying aquifers), agricultural diffuse pollution, treated and untreated sewage discharge and other chemical pollution (issues yet to be addressed adequately across England) are all greatly amplified within impounded watercourses. Some of the evidence suggests that beaver ponds can remove N, P, and C and hence clean up watercourses downstream. However, the holistic review of Larsen et al (2021)³ also references the increased efflux of greenhouse gases such as methane and nitrous oxide. Therefore, beavers may bring their described benefits in relatively 'clean' or moderately impacted systems, but a very significant percentage of England's rivers are impounded and suffering from chronic and acute nutrient enrichment; in such rivers, beaver ponds' potential benefits for nutrient capture will be less meaningful.

3. Climate change

Climate change means that increased river temperatures are a major threat to freshwater life, especially cold water-adapted species such as trout. Research³ has shown that beaver ponds may increase water temperatures downstream which will exacerbate existing climate-induced problems. Further, beavers change the nature of riparian tree communities and this may have positive or negative effects. The literature widely recognises the importance of riparian trees in providing cooling shade and terrestrial subsidy as leaf litter and invertebrates to the river. It is also widely recognised that beavers' felling activity can encourage regeneration of some tree species through coppicing but may almost certainly reduce canopy cover over the riverbed. Coppiced trees are also highly vulnerable to browsing, particularly the palatable species favoured by beavers. Howe (2020)⁴ recognises the impact of deer grazing (e.g. page 64) but fails to recognise that from farmed livestock, especially sheep. To have a positive impact on tree cover, buffer zones which largely exclude livestock from the riverbank will be vital for both beavers and healthy rivers.

National approach to reintroductions

57. Evidence shows that the reintroduction of beavers can have a positive benefit for nature and society. However, there are, in some instances, risks of negative impacts if reintroductions are not carried out appropriately or where there is insufficient management.

58. It remains unlawful to release a beaver into the wild without a licence, in line with the Wildlife and Countryside Act 1981. Our national approach will be to permit further wild

reintroduction projects where the licence applications demonstrate clear benefits and where risks of negative outcomes are avoided, mitigated for, or managed.

59. This approach will allow the benefits of beaver reintroduction to be realised with limited risks and will provide an opportunity to generate more evidence to help address the evidence gaps identified. It will also provide opportunities to learn from different projects in different circumstances and to adapt or develop management approaches and maximise biodiversity and societal benefits as appropriate.

60. To ensure that only high-quality projects are permitted to take place, proposals for reintroductions will have to apply for appropriate licences, follow the Code and meet strict criteria:

- A project proposal must provide evidence that the project has funding to cover all aspects of the reintroduction, including provision of advice and management of impacts. This funding must be in place for at least five to ten years. The specific time period will vary by project but this range reflects how long it might take for beavers to colonise a catchment and therefore how long support is needed by the public and different stakeholders to become accustomed to living alongside beavers.
- A project proposal must provide evidence of substantial stakeholder engagement at all stages of project development, including landowners, land managers and those working in or using the water environment along with clear working relationships between the project and these relevant organisations and authorities.
- A project proposal must demonstrate significant benefits and that the risk of conflict is low, including consideration, and mitigation as appropriate, of:
 - Area of and proximity to low-lying agricultural land
 - Flood risks to people, infrastructure and environment
 - Risk to protected areas, heritage sites and protected species
 - Costs and benefits to the local economy
 - Level of support locally
 - Opportunities to fill evidence gaps.
- A project proposal must include a Project Plan including funding streams, roles, responsibilities and planning and feasibility study for all aspects of the reintroduction. These Plans will run for a minimum of 5-10 years.
- A project proposal must include details of a Project Steering Group to support the project and must consist of a range of stakeholders with strong local ownership.
- The proposed project must appoint a Local Beaver Officer to act as a local contact point, and support to stakeholders, including risk management authorities and others operating in the water environment.

61. Once the Project Plan concludes (after 5 to 10 years), the partnership will no longer be required to be financially responsible for managing impacts of beavers as landowners, those operating in the water environment and river users become more accustomed to living alongside beavers and understanding how to manage impacts appropriately. This is an important step towards beavers being accepted like other native species in the wild.

Q6. Do you agree or disagree with the proposed approach to beaver reintroductions? Please state your reasons and supporting evidence. If you disagree, please provide any suggested alterations or alternatives and supporting evidence.

Disagree

Para 57: As noted in question 5 above, we agree that beavers may bring environmental and societal benefits under certain circumstances. However...

Para 58: The current approach to illegal releases of beavers undermines the ambition to limit risk, ensure “only high-quality projects are permitted” and, indeed, to maintain control on future beaver releases. It appears that many existing wild populations in England, and the founding population in Tayside, are the product either of illegally released animals and/or those that have escaped from enclosures and not been recovered, presumably in contravention of the conditions of enclosed release licences. There seems little consequence from such illegal activity.

We suggest below that the project-based approach may in itself be fundamentally inappropriate, in the absence of a national strategy.

Para 60: if the project-based approach is pursued, a project duration of 5-10 years is too short. Howe (2020)⁴ and experience from elsewhere in Europe describes beaver population expansion on a multi-decadal scale and thus it is very likely that the risks identified in para 60, and the need for appropriate management, will be only partially realised within 5-10 years. The Eurasian beaver is, after all, a keystone species unlike any other in the wild in England; it may well bring benefits and management challenges in perpetuity. In common with all other stakeholders present at the Defra workshop⁵, we believe that significant Govt funding will be vital to give beaver projects and reintroduction any chance of achieving a positive, harmonious outcome. As an NGO operating in the environmental sector, we can attest to the insecurity of existing funding streams, certainly beyond 3-5 years. We support the need for strong, locally and equitably representative Project Steering Groups and dedicated beaver officers; funding should allow for expert, specialist representation on the Groups, for example input on fish conservation.

Para 61: to repeat the point raised above re para 60, there is a need for significant Government funding to support projects well beyond 5-10 years, since beaver populations are likely to be far from equilibrium by this point, with full benefits, risks and management requirements yet to materialise.

However, more generally, this highly localised project-based approach does not recognise the mobility of beavers and inevitably their spread to and colonisation of locations of minimum benefit and maximum risk, contrary to the intention of Approach 2⁶. Beaver populations will inevitably spread beyond the boundaries of individual projects and their management scope. Thus, we believe that, while a project-based approach might bring benefits from local management and buy-in, it must be complemented by an adequately funded national strategy and management framework.

Q7. What criteria, in addition to those listed above, do you think projects should meet to be granted a licence for wild release? Please state your reasons and supporting evidence.

If the project-based approach is pursued by Defra, applicants must be able to demonstrate high-quality project management pedigree. Included in this must be a robust strategy that mitigates for project failure from, for example, lack of funding, lack of stakeholder agreement or inadequate understanding of the wider impacts on the public or biodiversity.

Natural England recommends the establishment of a National Beaver Management Forum – we believe that this entity is essential but must be impartial, oversee governance of beaver reintroduction and hold accountable each project, as part of its duty to maintain standards.

We also believe that projects must demonstrate mitigation of risk to unique trout populations, such as those reliant on headwaters, coastal or inlet/outlet lake streams, where beaver dams may impact various stages of the life cycle of the fish and thus the sustainability of the population. Howe (2020)⁴ acknowledges this disproportionate risk to sea trout populations but does not recognise the equal risk to unique, freshwater-resident trout populations.

Existing wild-living beaver populations

62. As well as the wild-living beaver population on the River Otter in Devon, which has been permitted to remain and expand naturally, there are records of wild-living beavers elsewhere in England. These beavers have either been unlawfully released or have escaped from fenced enclosures (or are descendants of such beavers).

63. The data we have suggests that it is likely that there are populations of beavers confirmed to be breeding on sections of the following river catchments:

- River Tamar in Devon
- River Stour in Kent
- River Avon and River Brue in Somerset and Wiltshire
- Little Dart in Devon.

64. There is also a potential emerging population in the River Wye catchment in Herefordshire.

65. Further details on the status of beaver populations in England, both wild-living and in enclosures, can be found in Natural England's report: [Beaver reintroductions in England, 2000-2021](#).

66. Under our proposed approach, these existing beaver populations in England will be permitted to remain and will be subject to management in the same way as other beaver populations when not covered by a Project Plan (see Management section below).

67. We are aware that for some existing wild populations, local stakeholders have started to set up management groups to support the public and provide advice. We encourage such

partnerships to form around these populations to enable stakeholders and the public to become used to living alongside beavers.

Q8. Do you agree or disagree with the proposed approach to existing wild-living beaver populations? Please state your reasons and supporting evidence. If you disagree, please provide any suggested alterations or alternatives and supporting evidence.

Disagree

Para 62: effectively to authorise (and condone) post-hoc the illegal release of animals, as is proposed here, seems contrary to established principles of wildlife management whereby releases are only sanctioned under permit; this is the principle that underpins Approach 2 in this consultation and other, widespread animal release programmes in England (e.g. stocking of native fish species to rivers). The very existence of illegally released beavers in the wild highlights a major flaw within the existing permitting and enforcement structure and provides evidence that there are parties who see a route to beaver reintroduction to England without facing the challenges of establishing a viable, reputable project. This proposal will empower those parties and undermine the structured, project-based approach described in para 58 et seq.

Para 66 & 67: provide no clarity on the management of existing, illegally introduced wild beaver populations – who will manage these populations, who will pay for that management and how should any potential impact on landowners be mitigated? Both these paragraphs underline the need for a national strategy and management process on beaver reintroduction.

Current and future beaver enclosures

68. Current government policy allows beavers to be released under licence into secure enclosures. At the time of publication there are beavers present in enclosures at 20 sites in England.

69. We propose to continue permitting releases of beavers into enclosures; however, conditions of licences will be tightened to focus on the clear benefits of a project.

70. A project should contribute to the knowledge base for beavers. This could include research on a specific impact or a particular management technique. An enclosure might be used to pilot a reintroduction in a particular area, allowing the project to gather relevant information and build support and engage with the local community.

71. It is important to note that the licensing of an enclosure project **does not** provide any guarantee that a licence will be granted subsequently for a wild release. If a current or future enclosure project wishes to move towards a wild release, they will be expected to demonstrate how they meet the criteria for wild release, including demonstrating that a wild release at the location would bring substantial benefits with a low risk of conflict.

72. Once the process for licensed release to the wild has been developed, we anticipate the demand for licences to release to enclosures will reduce.

Q9. Do you agree or disagree with the proposed approach to licensing of future beaver enclosures? Please state your reasons and supporting evidence. If you disagree, please provide any suggested alterations or alternatives and supporting evidence.

Disagree

Beavers in enclosures are undoubtedly useful in education or engagement of local stakeholders, but they will not bring the catchment-scale benefits that is hoped from the species, nor add anything to current, detailed knowledge. Further, as has been widely demonstrated, beavers are adept at escaping enclosures.

Q10. What criteria do you think should be taken into consideration when determining whether or not to issue an enclosure licence?

No response.

Legal protection

73. We intend to make beavers a European Protected Species by listing them in Schedule 2 of the Conservation of Habitats and Species Regulations 2017. This change is to implement legal obligations under the Bern Convention and does not form part of the proposed approach that is being consulted upon.

74. While we intend to give beavers legal protection please note we are beginning a review of species legislation with a view to enhancing and modernising it. We intend to publish a Green Paper and seek views later this year.

75. Giving beavers this protection means that it will be an offence to deliberately capture, kill, disturb or injure beavers. It will also be an offence to damage or destroy breeding sites or resting places.

76. Therefore, if an individual wants to undertake management activities which would otherwise be prohibited, they will be required to apply for a licence from Natural England. We will develop guidance to help stakeholders to understand when a licence is required and how to apply for a licence.

Management principles

77. We believe that effective and proportionate management of beavers will play a key role in any successful future reintroductions.

78. Natural England will publish a Management Framework, which will outline solutions that can be employed to manage different impacts from beavers, where such actions might require a licence and where stakeholders can go to seek support and advice with beaver management. Management needs of different populations of beavers are likely to vary over time and the management framework will reflect this.

79. The Management Framework and licensing regime will work together to provide clear processes, providing solutions to situations encountered where action is required.

80. It is recognised that there are a number of organisations and authorities that carry out necessary operational activities in the water environment and riparian zone. Guidance will be provided to ensure that these roles can be carried out within the proposed national approach and framework.

81. In line with government principles on wildlife management, landowners are free to manage wildlife on their land, within the law. Defra supports the following stepwise approach to address wildlife impacts:

- avoidance and tolerance
- using legal methods
- licensed action

82. This process should proceed stepwise from avoidance or tolerance of impacts, to least to most harmful actions, with interventions such as moving beavers to other areas (translocation) or lethal control considered only as a last resort. This is called a management or mitigation 'hierarchy'.

Management hierarchy

83. A management hierarchy for beaver could include the following steps:

- Avoid or tolerate negative impacts, such as:
 - allowing space for potential impacts, for example by creating buffer zones along the side of watercourses where valuable crops or trees are not planted.
 - exploring financial incentives available for landowners to make space for environmental benefits provided by beavers.
- Use legal management or mitigation methods if negative impacts cannot be avoided, including:
 - protecting trees of value from felling with tree guards or anti- beaver paint.
 - fencing to exclude beavers from undesirable areas.
 - protecting banks from burrowing impacts.
- If unavoidable and other solutions are not satisfactory, apply for a licence to undertake actions including:
 - destruction or modification of dams, lodges and burrows,
 - translocation or lethal control

84. Some mitigation and management may require permitting from the relevant authority and all must be undertaken in compliance with existing legislation.

85. Translocation of beavers or lethal control must only be considered as a last resort, however in circumstances where this is unavoidable, licences may be obtainable.

Q11: Does the management hierarchy cover management actions you would expect? Are there additional aspects that you think should be included in the management hierarchy? Please provide further details.

Whilst responses are not expressly sought on legal protection of beavers, we believe that its consideration is vital in developing a management hierarchy. Thus, we offer a view to inform Question 11.

We suggest that Defra should not currently grant beavers European Protected Status (EPS), for two reasons:

- 1. Wild populations in England and Scotland are “displaying evidence of growth and increased distribution”⁴, even, in the latter case, where animals are culled. Thus, there is no current need for EPS, a view shared by the Clinton Devon Estates, a major landowner in the River Otter Beaver Trial⁷. The UK Government is in the process of rewriting much post-Brexit legislation and could do the same here. Appendix III of the Bern Convention includes species in the wild in the UK which the Government will not seek to protect (e.g. *Siluris glanis*), so presumably choices can be made.*
- 2. EPS will greatly restrict rapid, responsive and effective management to protect other Appendix III species (e.g. Atlantic salmon) and trout, the potential risk to which is recognised in Howe (2020)⁴. It is our expert view, supported by that review, that juvenile fish dispersal, including of these two species, will be impeded by beaver dams, particularly when fish dispersal periods coincide with low flow events. This will be exacerbated in the many modified rivers in England where the creation of bypass channels around dams will be limited (as, for example, is illustrated in Bouwes et al, 2016⁸). Further, upstream spawning migration of fish will be interrupted if or when high water does not coincide with migrations; the River Otter Beaver Trial Report⁹ described such interruption of sea trout migration in the River Tale. In these situations, rapid identification of problematical dams is essential, then practical intervention to mitigate for the unintended but predictable consequences, such as dam notching, lowering or possibly removal. If beavers are protected and a licence required for such intervention, the current 60 working day application process time of Natural England will mean impacts from beaver damming on other protected (fish) species, which is obviously inequitable and paradoxical.*

In the absence of EPS, beavers will still rightly be afforded protection under animal welfare and weapons’ legislation, as is the case for wild boar, categorised with beavers in Schedule 9 of the Wildlife & Countryside Act 1981.

In our view, very much a less preferable option (though widely supported by the NGOs attending the Defra workshop⁵) is to protect beavers but develop class licences for management intervention, enabling suitable licensees to carry out pre-determined operations, such as dam notching, lowering or possibly dam removal. If this route is investigated by Defra, consideration should be given to:

- The overlap of the beaver kit dependency period (KDP, defined in Scotland as 1 April to 16 August) and the spring juvenile dispersal period of Atlantic salmon and trout. If*

the example from Scotland is followed and priority given to KDP, management intervention aimed at easing fish passage to protect extant but dwindling native salmonid populations, as discussed above, will be impossible.

- *The need to include beaver dams in any protected status, unless associated with a natal lodge. Dams are not used by beavers as breeding sites (unless but unusually associated with a natal lodge) or resting places. If dams (except those associated with natal lodges) are excluded from any licensing framework, management intervention to minimise impacts on fish migration could be rapid, responsive and effective.*

Para 77: it is welcomed that Defra appreciates the need for management of beavers in the landscape. In addition to being effective and proportionate, management must be rapid, responsive and equitable for those species that might not only gain but also be impacted in certain situations from beaver activity, as described for trout in various responses above. We argue that management can be most effective without the currently unnecessary EPS. Moreover, licensing may create an unreasonable burden on the rural sector which will be left to undertake such management.

Para 80: WTT has specialist skills to contribute to the identification and management of any beaver impacts for fish, working within a national strategy and framework.

Management hierarchy: we agree unreservedly with the principles of the hierarchy, with translocation and lethal control as absolute last measures. However, we reiterate our suggestion and justification that beavers not be granted EPS, enabling responsive and effective management, without compromising beaver establishment. If EPS and licensing does proceed, however, it should exclude dam modification (notching, lowering and possibly removal) as a management intervention, unless any dam is associated with a natal lodge. Most dams are not breeding sites or resting places and thus there is no justification in this context to protect them.

Government policy and support

86. Government policy is that it is the responsibility of landowners to cover the costs of managing impacts of wild animals on their land. In line with this, Defra will not provide direct payments for management of negative impacts of beaver activity or pay compensation. However, we recognise that beaver reintroductions are unique circumstances. Therefore, Defra will consider facilitating the creation of management groups around existing beaver populations to help manage impacts and provide management advice to landowners and stakeholders for beaver populations outside of a Project Plan.

87. Consistent and accessible advice and guidance is essential to successful reintroductions. Natural England and Defra will host advice through gov.uk which will cover applications for reintroduction projects as well as management. Natural England will provide further advice and engagement to guide stakeholders and liaise with local projects and management groups.

88. Any project applying for a wild-release licence will be required to have a Local Beaver Officer for the duration of the Project Plan. Local Beaver Officers will act as a focal point, providing advice and undertaking management as required, to support local landowners and river users.

89. We are working with stakeholders and end users to determine the specific land management actions that will be paid for through the Sustainable Farming Incentive, the Local Nature Recovery scheme and the Landscape Recovery scheme. [‘The Path to Sustainable Farming: An Agricultural Transition Plan 2021 to 2024’](#) sets out examples of the types of actions that we envisage paying for under the schemes, including creating, managing and restoring habitats such as wetlands and freshwater habitats. In March, we published more details on the [first phase of piloting the Sustainable Farming Incentive](#), including the actions we will pay farmers to take to manage their land in an environmentally sustainable way. On 30 June, we also published an [update to the Agricultural Transition Plan](#), which included information on the elements that we will include in the Sustainable Farming Incentive itself, from 2022.

Q12: Excluding direct payment for management activities, what other support do you think should be available and to whom?

Para 86: to reiterate points raised above, we share the view of all the NGOs that attended the Defra workshop⁵ that a national strategy, adequately Government funded, is vital if beaver reintroduction is to succeed. The strategy and its funding must look to the multi-decadal scale, quite possibly in perpetuity, and not an arbitrary 5-10 years.

It is very possible that the landowners incurring the cost of beaver management will not be those who see the animal’s benefits. Thus, it is unfair and illogical for Government to drive a policy of beaver reintroduction but be unprepared to fund that policy, preferring instead to impose costs on landowners. To “consider facilitating the creation of management groups around existing beaver populations to help manage impacts” is a weak and meaningless aim.

Para 87: advice and guidance will be essential if beaver reintroduction is to succeed. WTT’s existing and highly productive advisory programme to landowners and many river conservation organisations could contribute strongly, bringing specialist, expert knowledge.

Para 88: we very much support a role for Local Beaver Officers. In response to what we believe to be a knowledge gap in existing beaver projects, we are developing with The Wildlife Trust an information-sharing workshop on fish ecology; future beaver project officers could also participate and benefit.

Para 89: elements of the developing Environmental Land Management Scheme and projects such as Woodlands for Water developed by the Riverscapes Partnership will be vital in ensuring the success of beaver reintroduction by creating:

- *Significant buffer zones (20m minimum on either bank), making space for beavers and the rivers’ response;*

- reinstatement of appropriate plant diversity, currently severely lacking nationally along watercourses, to support beavers;
- financial incentives for landowners to allow environmental gains from beavers to develop, tolerate any impacts and learn to live with the animals.

Q13. Are there any specific areas where guidance is required? Please provide details.

See comments above. WTT is well placed with expert knowledge in fish ecology, including their needs during times of migration, to inform those leading the beaver reintroduction programme.

Q14: How would you prefer to access advice and guidance (e.g. information on website, via email, focal point for enquiries etc)?

Objective and impartial information and advice should be available through online resources and face-to-face through the Local Beaver Officers and the proposed National Forum, to include specialist areas such as fish conservation.

References

1. Jones, J.J., Borgere, L., Tummers, J., Jones, P., Lucas, M., Kerr, J., Kemp, P., Bizzi, S., Consuegra, S., Marcello, L., Vowles, A., Belletti, B., Verspoor, E., Van de Bund, W., Gough, P., Garcia de Leaniz, C. (2019). *A comprehensive assessment of stream fragmentation in Great Britain*. Science of the Total Environment 673, 756-762
2. Needham, R. J., Gaywood, M., Tree, A., Sotherton, N., Roberts, D., Bean, C.W., Kemp, P.S. (2021). *The response of a brown trout (Salmo trutta) population to reintroduced Eurasian beaver (Castor fiber) habitat modification*. Can. J. Fish. Aquat. Sci. 00: 1–11 (0000) [dx.doi.org/10.1139/cjfas-2021-0023](https://doi.org/10.1139/cjfas-2021-0023)
3. Larsen, A., Larsen, J.R., Lane, S.N. (2021). *Dam builders and their works: Beaver influences on the structure and function of river corridor hydrology, geomorphology, biogeochemistry and ecosystems*. Earth-Science Reviews 2018 103623.
4. Howe, C.V. (Ed) (2020). *A review of the evidence on the interactions of beavers with the natural and human environment in relation to England*. Natural England Evidence Review NEER017. Peterborough: Natural England.
5. Defra Stakeholder Engagement Workshop on Beaver Reintroduction, October 2021.
6. Pouget, D. & Gill, E.L. (2021). *Advice and recommendations for beaver reintroduction, management and licensing in England*. Second edition. Natural England NEER019. York.
7. Clinton Devon estate beaver consultation response: <https://clintondevon.com/defra-consultation-of-beaver-reintroductions/>
8. Bouwes, N., Weber, N., Jordan, C.E., Saunders, W.C., Tattam, I.A., Volk, C., Wheaton, J. M., Pollock, M.M. (2016). *Ecosystem experiment reveals benefits of natural and simulated beaver dams to a threatened population of steelhead (Oncorhynchus mykiss)*. Sci. Rep. 6, 28581. <https://doi.org/10.1038/srep28581>.
9. Brazier, R.E., Elliott, M., Andison, E., Auster, R.E., Bridgewater, S., Burgess, P., Chant, J., Graham, H., Knott, E., Puttock, A.K., Sansum, P., Vowles, A., (2020). *River Otter Beaver Trial: Science and Evidence Report*.