

Link response: EAC inquiry into flood resilience in England

13th January 2025

This consultation response is on behalf of Wildlife and Countryside Link ([Link](#)), a coalition bringing together 86 organisations to campaign for the natural world.

This response is supported by Angling Trust, Beaver Trust, Floodplain Meadows Partnership, Friends of the Earth England, Froglife, Institute of Fisheries Management, National Trust, Paddle UK, River Action, The Rivers Trust, The Wildlife Trusts, WWT.

Summary

Wildlife and Countryside Link welcomes the opportunity to respond to this call for evidence from the Environmental Audit Committee to examine flood resilience.

Flood resilience in England is not sufficient to protect people, nature, infrastructure, properties and businesses from the impacts of flooding. With climate change, extreme weather events are becoming more frequent, and the risk of flooding is increasing.

Our resilience to flooding is undermined by multiple factors. This includes, but is not limited to, a lack of long-term resilience targets, shortfalls in funding and investment, failure to implement Schedule 3 of the Flood and Water Management Act, insufficient resilience to changing climate, and the poor state of the natural environment.

We need to work with nature at catchment scale to manage water holistically and build resilience to flooding. Nature-based and natural flood management solutions can build natural resilience to flooding through slowing and storing water within the environment, whilst delivering multiple wider benefits for nature and people. This can include boosting resilience to drought, increased carbon sequestration, improving water quality, restoration of habitats for aquatic species, and providing quality green and blue spaces for communities and wildlife. These approaches are often cheaper to implement than traditional engineered solutions and can be used in combination to increase the longevity and effectiveness of these assets.



To improve flood resilience and unlock these benefits, Government should:

- Set a long-term target for flood resilience.
- Implement Schedule 3 of the Flood and Water Management Act.
- Set a clear, strategic regulatory framework for regulators to facilitate the uptake and use of nature-based solutions and natural flood management.
- Set clear, comprehensive national guidance to ensure that consistent, high-quality solutions are properly implemented, maintained and monitored.
- Adequately fund regulators and local authorities to ensure they have the expertise, training and resources needed to facilitate nature-based and natural flood management solutions.
- Make Natural England’s green and blue infrastructure standards compulsory for all new developments.
- Commit to publishing a clear licensing framework alongside a national delivery strategy for wild beaver releases across England.
- Better incorporate water resilience into planning and land-use decisions, including the siting of new developments.

We note that this inquiry is being held during the same period as multiple Government consultations on drought planning and management. We find it disappointing that the Government and arms length bodies have not made clear the relationship between these issues in these consultations and this inquiry, or within the proposed approaches to management and mitigation. A more holistic approach to managing water is required.

We would be pleased to discuss any of the points raised in our submission – or in our response to any of these wider drought consultations - further.

Questions

Strengthening flood resilience

- 1. To what extent are current flood resilience assets and interventions fit-for-purpose and what are the strengths and weaknesses?**
 - Are there alternative approaches from across the UK and elsewhere which could help inform improvements and innovation?**

1.1. Flood resilience assets and interventions are not fit for purpose, leaving people, nature, infrastructure, property and businesses vulnerable to the impacts of flooding. This is due to a long-standing lack of preparedness, insufficient investment in and attention to the resilience of both communities and the environment, and failures to apply lessons learnt from previous extreme weather events.¹

1.2. This is exemplified by the impacts of recent flooding events. In September 2024, heavy rainfall saw over 1,000 homes flooded in England. In response, the Minister for Water and Flooding highlighted the poor condition of flood defences due to “a lack of investment” and that asset condition was at just 92%, the lowest point since 2010, leaving 60,000 properties at higher risk.² Indeed, new data published by the Environment Agency in December 2024 highlighted an 88% increase in the number of properties in England at the highest levels of flood risk with a notable rise in risk from surface water flooding.³

1.3. The key weaknesses and issues undermining flood resilience assets and interventions include, but are not limited to:

- A lack of long-term targets.
- Shortfalls in funding.
- The poor state of the natural environment.
- Failure to implement Schedule 3 of the Flood and Water Management Act 2010.
- Insufficient resilience to changing climate conditions.

¹ Wildlife and Countryside Link submitted evidence to the February 2024 Public Accounts Inquiry into ‘Government resilience: extreme weather’, which includes flooding. The detail and references submitted in that response may be of interest to this EAC inquiry: [WCL Response PAC Inquiry Extreme Weather Resilience Feb 2024.pdf](#)

² [Flood Response: September 2024 - Hansard - UK Parliament](#)

³ Environment Agency (2024). Updated ‘National Assessment of Flood Risk’: [Environment Agency publishes major update to national flood and coastal erosion risk assessment - GOV.UK](#)

1.4. There is no long-term target for flood resilience, despite recommendations from the National Infrastructure Commission, the Climate Change Committee, and the National Flood Forum that such a target would help to drive and monitor progress in boosting resilience and reducing flood risk. As the National Audit Office concluded in November 2023, ‘the government wants to achieve greater resilience to flooding in the long term but has no measure for resilience and no target for the level of flood resilience it expects to achieve.’⁴

1.5. Insufficient funding for and investment in flood resilience assets and interventions has led to reduced capacity and competency to maintain infrastructure, to prepare for flooding events, and to adequately respond to, mitigate and manage the impacts of flooding when it does occur. For example, in 2023 it was reported that the Environment Agency faced a £34 million shortfall in funding required to maintain high consequence flood defence assets.⁵ This meant that just 93.5% of assets were being maintained at the required condition, falling below the 98% that the Agency considers to be optimal, and that 203,000 additional properties were at risk of flooding. Funding and resourcing constraints on regulators and public bodies further undermine their ability to prepare for risks, and to manage and mitigate risk when flooding occurs.

1.6. The poor state of the natural environment further undermines resilience to flooding. Degraded and compacted soil,⁶ loss of habitats such as wetlands or seagrass meadows, and damage to the functionality of floodplains mean reduced environmental capacity to store and slow the flow of surface water. Rivers have been straightened, channelled and disconnected from their natural floodplains. This puts further pressure on built assets and interventions and increases risk.

1.7. This is exacerbated by a lack of sustainable drainage, particularly within urban areas. Schedule 3 of the Flood and Water Management Act has still not been implemented despite numerous recommendations, including from a Government review.⁷

⁴ National Audit Office (2023). ‘Resilience to flooding’ report: <https://www.nao.org.uk/wp-content/uploads/2023/11/Resilience-to-flooding-.pdf>

⁵ National Audit Office (2023). ‘Resilience to flooding’ report: <https://www.nao.org.uk/wp-content/uploads/2023/11/Resilience-to-flooding-.pdf>

⁶ The ability of the ground surface to absorb water is called the infiltration rate. Where the ground is paved or compacted, that value is very small (often less than 1 mm of water moving through the soil per hour). Where there is vegetation growing on undisturbed soil, it can be very large (over 30 mm per hour, allowing it to absorb all but the very heaviest rainstorms.)

⁷ The review for implementation of Schedule 3 to The Flood and Water Management Act 2010 (2023): [Sustainable drainage systems review - GOV.UK](#)

1.8. Further to the poor state of nature, the UK climate is also changing rapidly. This has already led to an increase in extreme weather events, including flooding. The Climate Change Risk Assessment Report identifies flooding among the most significant risks associated with climate change, bringing severe economic, social and environmental implications.⁸ Yet we are not sufficiently adapted to these risks. In 2024, the Climate Change Committee's independent assessment of the Third National Adaptation Plan (NAP3) concluded that this 'lacks the pace and ambition to address growing climate risk', including a lack of 'measurable vision' for climate adaptation.⁹ This lack of climate resilience undermines flood resilience and represents poor value for what money is spent.

2. How appropriate is the current balance between 'green' nature-based solutions and 'grey' hard infrastructure resilience assets, and what adjustments, if any, are needed to improve it?

- **What role can natural flood management techniques, such as wetland restoration and tree planting, play in enhancing flood resilience while contributing to broader biodiversity and climate objectives?**

2.1. Whether a green, grey, or hybrid solution is the most appropriate and/or effective intervention for flood management will vary depending on the context and needs of the location or catchment. However, the current balance between 'green' nature-based solutions and 'grey' hard infrastructure resilience assets is weighed heavily in favour of grey solutions, meaning that the multiple benefits of green nature-based solutions (NbS) are not being realised. Both NbS and natural flood management (NFM) are essential to enhancing resilience whilst also contributing to broader biodiversity and climate change objectives, yet these approaches are not being utilised to their full potential.

2.2. For example, £2.6 billion funding has been pledged for investment in flood defences until 2026, whereas the funding ringfenced for NFM is just £25 million. Furthermore, regulatory and decision-making processes currently struggle to fully acknowledge the benefits of and therefore facilitate the use of 'green' solutions, compared to grey solutions. Regulators including Ofwat and the Environment Agency have cited a lack of proper information to assess the benefits of

⁸ [UK Climate Change Risk Assessment 2022 - GOV.UK](#)

⁹ The Climate Change Committee (2024). [Independent Assessment of the Third National Adaptation Programme \(NAP3\)](#)

NbS and NFM, and the difficulty presented by the lack of an outcomes-based approach within regulatory frameworks, as reasons for the slow rollout of these approaches. This is despite Government and regulators being in favour of green solutions. Failures to properly include natural capital and environmental obligations in regulatory decision-making processes and cost-benefit analyses further compound this imbalance.

2.3. In order for more prevalent adoption of NbS we need to take a more holistic approach across responsible bodies, and a more strategic and upstream plan to landscape management, which is shared across those organisations, and which can address and resolve contradictory or competing land management incentives. Important actors here are Internal Drainage Boards (IDBs), covering 1.2million hectares in England (9.7% of total land area), and a further 28,500 hectares in Wales. These boards often favour drainage activity (such as ditch clearance, vegetation removal, restricting habitat growth etc), which might help reduce water levels in a specific area of land, but which reduce the water storage capacity of this land and speed the flow of water downstream. Land drainage activity in this way can result in more rapid runoff, with potentially serious consequences (for both flooding and also drought resilience) for downstream communities.

2.4. Working with nature at catchment scale through NbS and NfM can build natural resilience to flooding, slowing the flow of water, and storing more water within the environment, not only to reduce flood risk but to aid drought reduction and deliver wider biodiversity benefits. For example, through protecting and restoring the natural function of rivers, catchments, soils, and freshwater habitats such as wetlands, peatlands and floodplains. NbS and NFM can also boost the cost effectiveness of public money, through improving the performance and increasing the longevity of grey assets. Whilst NbS and NFM interventions focus on returning the catchment to a more natural state, including more natural retention of peak flows across the whole catchment area, 'grey' solutions tend to treat problems in a more localised way and therefore risk pushing the problem elsewhere.¹⁰

2.5. Examples of NbS and NFM measures include, but are not limited to:

¹⁰ WWT. (2023). Wetlands for Flood Resilience: A Route Map. <https://www.wwt.org.uk/uploads/documents/2023-11-22/wwt-flood-protection-network-route-map-221123.pdf>

- Protecting, restoring and/or creating habitat¹¹ such as wetlands, peatlands¹² and floodplains, to store, intercept and slow the flow of water. For example, well-structured soils in established floodplain meadows can consist of more than 70% void by volume, which can be filled either with air (when dry) or with water (when saturated). This provides huge storage potential for water - potentially as much as 50,000 tonnes per hectare – which reduces the volume of water in the river channel and lowers peak discharge.¹³
- Creating natural river buffers¹⁴ to reduce the rate of water run-off in appropriate and suitable locations in the catchment.
- Using in-channel features such as leaky dams to slow the flow of water, to reduce downstream flood risk.¹⁵
- Revegetating landscapes to increase surface roughness and slow run-off, and to help bind soils together to reduce vulnerability to erosion during flood events. For example, through targeted tree planting.
- Re-meandering rivers, to restore natural river processes, increase the length of the river, and slow down the speed at which the water flows.¹⁶
- Restoring healthy coastal ecosystems such as seagrass meadows, oyster reefs and saltmarsh through active and passive intervention. This will not only play a key role in mitigating climate change through the capture and storage of carbon but will also contribute to protecting coastal communities from rising sea levels and the associated increase in flooding and erosion risk, through dissipating wave energy.
- Reintroducing beavers, to restore natural processes and slow the flow of water through landscapes via dams and wetlands. Research published in 2024 from a ten-year study

¹¹ Nicholson, A. R. et al. (2020). The potential of runoff attenuation features as a Natural Flood Management approach. *Journal of Flood Risk Management*, Vol 13, e12565.

<https://onlinelibrary.wiley.com/doi/full/10.1111/jfr3.12565>

¹² Alderson et al. (2019) Restoration of blanket peat moorland delays stormflow from hillslopes and reduces peak discharge. *Journal of Hydrology X* <https://www.sciencedirect.com/science/article/pii/S2589915518300063>

¹³ Floodplain Meadows Partnership. (2023). Delivering Resilient Floodplains: Report for the APPG for Nature.

[Delivering-Resilient-Floodplains-Nature-APPG-Report-Mar2023.pdf](https://www.floodplainspartnership.org.uk/wp-content/uploads/2023/03/Delivering-Resilient-Floodplains-Nature-APPG-Report-Mar2023.pdf)

¹⁴ A mixture of herbaceous plants, shrubs and trees, extending back from the river bank for at least 10 metres.

¹⁵ Gurnell, A. et al. (2019). Trees and wood: working with natural river processes. *Water and Environment Journal*, Vol 33, 342–352. <https://onlinelibrary.wiley.com/doi/10.1111/wej.12426>

¹⁶ BBC Future Planet. (2024). How restoring rivers' natural curves can prevent flooding. [How restoring rivers' natural curves can prevent flooding - BBC Future](https://www.bbc.com/future-planet/article/2024/03/how-restoring-rivers-natural-curves-can-prevent-flooding)

shows that wild-living beavers are having a positive impact on flood alleviation in Devon, with storm flows reduced by an average of 30% during periods of heavy rainfall.¹⁷

- Implementing nature-friendly agricultural practices to increase the health and permeability of soils, helping to store more water in the environment.¹⁸ Permeable soils can transmit water to underlying porous rock, where it can move slowly as groundwater out to sea without overloading rivers.
- Reducing stocking levels of livestock in targeted areas to reduce soil compaction and allow infiltration.

2.6. These approaches can deliver multiple benefits for both people and nature, making them efficient as well as effective. For example, restored habitats that can store more water will also be more resilient in the face of drought. These twin issues of flooding and drought should be managed holistically to realise these benefits. Further benefits of 'green' NbS and NFM approaches can include:¹⁹

- Reducing the quantity of surface run-off water entering and overloading sewerage systems, with benefits for water quality.
- Creating more quality habitat for wildlife.
- Improving agricultural resilience to both flooding and drought, and supporting land productivity. For example, through reduced soil erosion and loss.
- Water demand and efficiency benefits from increased water storage, for example on farm land.
- Ensuring greater access to quality green and blue spaces for people, helping to engage local communities in the natural environment and water management and delivering health, wellbeing and social cohesion benefits.²⁰
- Increased carbon storage from improved soil quality and healthier habitats including waterbodies, wetlands and coastal vegetated habitats.

¹⁷ <https://news.exeter.ac.uk/centre-for-resilience-in-environment-water-and-waste/research-backs-beavers-in-fight-against-flooding-and-droughts/>

¹⁸ Mudgal, S. et al. (2014). Soil and water in a changing environment: final report 27 June 2014. EUR-OP. <https://op.europa.eu/en/publication-detail/-/publication/56bd4606-4f06-49f6-bced-d6cdd5cb0503/language-en>

¹⁹ Further detail and case studies can be found in Wildlife and Countryside Link's briefings here:

[WCL Briefing Building Resilience Floods Drought December 2023.pdf](#) and here:

[WCL Briefing Nature Based Solutions Water December 2023.pdf](#)

²⁰ Environment Agency. (2024). Health and wellbeing benefits of blue space: lived experience.

<https://www.gov.uk/government/publications/health-and-wellbeing-benefits-of-blue-space-lived-experience>

- Prolonging the life of and/or alleviating stress on built infrastructure and assets, such as flood walls. NFM and NbS can also help to slow diverted flood water from engineered flood defences, helping to manage flood risk downstream of interventions.
- The economic analysis accompanying WWT's Wetland Potential Maps tool quantifies the benefits of NFM to food provision, carbon sequestration, air quality regulation, recreation and physical health – as well as flood risk management. Across the UK, this is estimated to be £1.2 billion over 60 years.²¹

2.7. NFM and NbS approaches can often be cheaper than hard-engineered options, and are low in embodied carbon. In 2021, a comparative study of traditional 'grey' hard engineered flood defences and large-scale nature-based solutions in Belgium showed similar flood security, more ecosystem service benefits, higher biodiversity values, and lower costs associated with nature-based solutions compared to the technical alternative.²² As a 2020 Parliamentary POSTnote concludes, 'these co-benefits may be significant enough to justify investment in natural flood management even where the flood mitigation benefits alone do not'.²³

2.8. The Wyre Natural Flood Management Project demonstrates the significant potential for NFM and NbS in managing flooding.²⁴ Delivered in partnership by Wyre Rivers Trust, The Rivers Trust and Triodos Bank UK, the Wyre NFM project has delivered more than 1,000 targeted measures to reduce flood risk at 120 properties in Churchtown. Modelling of the catchment has shown that approximately 70 hectares of NFM features could reduce the frequency of flooding to up to 120 properties. A commercial business model has been applied by the project, to attract private funding to supplement public funding; the cost savings from implementing NFM will generate a long-term revenue stream for repayment of upfront investment in reduced flood risk and further ecosystem services including carbon sequestration and biodiversity gain.

2.9. Over the last decade, the CaBA technical team and CaBA partnerships have co-designed, and now routinely use, a number of resources which help them to spatially target NFM to maximise cost effectiveness and gain a realistic estimate of flood benefits that they will provide.

²¹ [WWT Wetland Potential Data | WWT Wetland Data Explorer](#)

²² Turkelboom, F. et al. (2021). How does a nature-based solution for flood control compare to a technical solution? Case study evidence from Belgium. <https://link.springer.com/article/10.1007/s13280-021-01548-4>

²³ UK Parliament POST (2020). Natural Mitigation of Flood Risk: <https://researchbriefings.files.parliament.uk/documents/POST-PN-0623/POST-PN-0623.pdf>

²⁴ Further information available here: [Wyre NFM | Wyre Rivers Trust](#)

Government should make use and learn from this approach to support further scaling up of NFM delivery. These CaBA resources include, but are not limited to:

- The [CaBA data Hub](#). This makes spatial information from arm's-length bodies (ALBs) readily available to any community so that they can target NFM where it will make the most difference. The CaBA technical team run training courses to help partnerships use the data.
- The [CaBA website](#). This allows the CaBA community to share best practice (on the Learn section) as it develops.
- Spatial targeting modelling. Partnerships are increasingly using [SciMap Flood](#) and other models to target NFM where it will make the most difference to flooded communities. The CaBA technical team provide training and resources to help build capacity to use these tools.
- Recent modelling in the Soar catchment has, for the first time, identified the level of investment in NFM that can be justified on flood benefits alone. If similar modelling could be incorporated into the NAFRA 2 modelling program it could release significant investment in NFM from the insurance and financial industries. This work was supported by Avia Insurance and WWF. A full technical report is available.

2.10. Further case study examples include:

- **Hesketh Out Marsh East, Lancashire:** the RSPB, the Environment Agency and Natural England created this 160-ha wildlife-rich saltmarsh through constructing breaches through the outer sea wall. As well as restoring vital habitat this marsh also performs a natural flood management role, by reducing wave energy during higher sea levels and thereby improving the resilience of flood embankments. The combined effect of the marsh and embankments reduces the flood risk (for up to a 1 in 200 year event) for around 1050 ha of land, as well as residential and commercial properties. The new marsh has attracted a wide variety of wetland birds, including avocets, little egrets, redshank, teal and wigeon.
- **Wicken Fen, Cambridgeshire:** the National Trust restored arable land to lowland fen, creating a flood storage area capable of dealing with a 1 in 20 year flood event. This is estimated to protect 53 houses and 50 ha of farmland from flooding, providing flood protection benefits of £35/ha/y, as well as gains of £482/ha/y in nature-based recreation and £51/ha/y in climate mitigation.

- **Two Valleys, West Somerset:** WWT and the Environment Agency have used natural flood management to reduce flood risk around the Monksilver and Doniford stream catchments. This makes use of low-cost interventions including leaky dams, tree planting, wet woodlands and ponds to work with the landscape to hold more water upstream and slow the flow downstream. This protects communities from flooding whilst also improving biodiversity, water quality, and carbon capture.
- **Ealing Beaver Project, London:** in October 2023, a family of Eurasian beavers was released at Paradise Fields, an area of woodland and wetlands in urban Greenford. Paradise Fields was already earmarked for expensive flood mitigation engineering works; beavers were presented as an alternative, far less costly solution. Five new beaver dams hold back water on site and release it slowly downstream. With studies underway, anecdotal evidence already suggests that the beavers are having significant positive impact; despite heavy rainfall, winter 2023 saw less urban flooding downstream compared with previous years. Wider studies demonstrate the positive impact beavers can have on flow attenuation,²⁵ and the multiple benefits that beaver re-introduction can deliver.^{26 27}

2.11. There are multiple barriers preventing greater uptake and use of green NbS and NFM solutions. To address these, Government should:

- Set a clear, strategic regulatory framework that will drive all regulators towards facilitating the uptake and use of NbS and NFM, and will provide investors with the framework and incentive to invest. This should ensure a level playing field for decision-making and funding on NbS and NFM, for example through fully incorporating natural capital into cost-benefit analysis.
- Set clear, comprehensive national guidance to ensure consistent, high quality NbS and NFM are delivered. Solutions must be well designed, implemented in appropriate places, and properly maintained and monitored.

²⁵ Puttock et al. (2020). Beaver dams attenuate flow: A multi-site study. <https://onlinelibrary.wiley.com/doi/pdfdirect/10.1002/hyp.14017>

²⁶ Brazier et al. (2020). Beaver: Nature's ecosystem engineers. <https://wires.onlinelibrary.wiley.com/doi/pdfdirect/10.1002/wat2.1494>

²⁷ Stringer et al. (2016). The impacts of beavers *Castor* spp. on biodiversity and the ecological basis for their reintroduction to Scotland, UK. <https://www.martinezbeavers.org/wp-content/uploads/2018/01/Stringer-Gaywood-2016-The-impact-of-beavers-on-biodiversity-and-the-ecological-basis-for-their-reintroduction-to-Scotland-Mamm-Rev-DOI-10.1111-mam.12068.pdf>

- Adequately fund regulators and local authorities (including Lead Local Flood Authorities) to ensure that they have sufficient expertise, training and resources to facilitate NbS and NFM projects.
- Provide more funding for NbS and NFM projects, for example, through the flood grant-in-aid fund.
- Make Natural England’s green and blue infrastructure standards compulsory for all new developments. This will provide a new planning route for NBS creation.
- Commit to publishing a clear licensing framework alongside a national delivery strategy for wild beaver releases across England.
- Streamline the marine and terrestrial licensing framework to support active restoration of coastal and transitional ecosystems.
- Strengthen links between Local Nature Recovery Strategies (LNRSs) and Catchment Management Plans, Shoreline Management Plans and local development plans.
- Recognise the multiple benefits of NbS and NFM formally within the FCERM programme, for example through updating the benefits calculator to include more than just biodiversity and flood risk.

2.12. Farmers should also be better rewarded under Environment Land Management (ELM) schemes for working with nature to restore the health of soils, floodplains and wetlands, and for taking actions that will improve flood resilience. For example, widening river buffers will help to protect and build capacity for river levels to rise safely during heavy rainfall. Restoration of nature-rich and agriculturally productive floodplain meadows can also help absorb and slow the flow of flood water. Wet woodlands can reduce flood peaks by up to 65%.²⁸

2.13. A strategic approach is needed to effectively deliver NbS and NFM. This can be achieved through linking-up better funded Catchment Partnerships, Lead Local Flood Authorities (LLFAs), Local Plans, and the Land Use Framework.

²⁸ Forestry Commission. (2024). The benefits of woodland creation: woods and water: [The benefits of woodland creation: Woods and Water - GOV.UK](#)

3. What changes to the planning system and building regulations are needed to ensure that buildings and infrastructure are resilient to flooding in the short, medium, and long-term?

- **What long-term land use strategies and approaches to flooding should the government consider, especially for communities that cannot be protected from flooding or inundation?**

3.1. Government should implement Schedule 3 of the Flood and Water Management Act as a matter of priority. The benefits of sustainable drainage systems (SuDS) – particularly in urban areas – for reducing flood risk and building resilience are well evidenced. Indeed, a 2023 Government review of Schedule 3 acknowledges the benefits of SuDS in reducing both surface water and sewer flood risk, and recommends that Schedule 3 should be implemented.²⁹

3.2. Flood and drought resilience should be better incorporated into planning and land-use decisions. For example, both water scarcity and flood risk should factor into the sitings of new developments, to steer these away from areas experiencing or likely to experience significant water stress or flood risk, or setting back new development from rivers to make space for any future adaptation of defences. New strategic planning approaches will provide opportunities to identify and implement NFM interventions, but this must also be incorporated into existing plans – for example, catchment plans.

3.3. Unlocking greater use of NbS and NFM approaches will also help to build resilience and reduce flood risk; for example, in communities where flood risk is already high. This could be enabled through the planning system through the introduction of a presumption in favour of sustainable development activity that will deliver genuine sustainable nature-based solutions. The only projects benefiting from this process should be those where a primary aim is to protect and restore habitat, with any built footprint being confined to temporary or permanent structures to enable this restoration - for example, the restoration of a wetland or floodplain meadows, or the construction of natural flood defences.³⁰

3.4. Approaches to NFM interventions are not consistent between local authorities. This means that even for very small-scale projects, the amount of admin time and cost involved in the planning process can significantly impact and impede projects that could significantly benefit

²⁹ The review for implementation of Schedule 3 to The Flood and Water Management Act 2010 (2023): [Sustainable drainage systems review - GOV.UK](#)

³⁰ For further detail, see Wildlife and Countryside Link's response to the National Planning Policy Framework Consultation in September 2024: [Link NPPF consultation response Sept2024.pdf](#)

local communities and properties. Greater consistency, education and resourcing for planning authorities is required, supported by specific guidance for small NFM interventions.

3.5. This is exemplified by the experience of the Don Catchment Rivers Trust when undertaking an NFM project funded by the National Highways scheme, which aimed to install storage ponds. Full planning permission was required. However, following the initial application, further information was requested by the council at intervals, and it ultimately took 11 months for the final decision to be determined. This could have been alleviated through the provision of a full checklist of the information required at the start of the process.

3.6. Government should consider giving more structured support to local authorities to deliver NFM as an element of their flood risk strategies. Some examples:

- The Stroud District Council NFM project has been running for 10 years and has achieved big gains in flood risk reduction through an approach of many small interventions that accumulate over time.³¹ If more local authorities were supported to have dedicated staff roles, then this example could be rolled out across the country.
- Gloucestershire County Council's employment of a dedicated Natural Flood Management Partnership Officer has shown that coordination of NFM at LLFA level can reap benefits in terms of bringing initiatives together to enable them to deliver more than the sum of their parts.

3.7. Additionally, the Thames RFCC's NFM programme could be replicated through support from Government. This project is currently being supported by a third-party advisory post hosted by WWT but feedback from other RFCCs has been that this model is difficult to replicate due to the differences in availability of Local Levy funding across the country.³² This gap in funding could be filled by Government at relatively low cost.

3.8. Government should increase funding for the management of invasive species, particularly in areas that cannot be protected from flooding or inundation. 23% of WFD waterbodies are impacted by invasive non-native species (INNS), making them a significant pressure on the water environment.³³ Damaging INNS are easily dispersed through waterbodies, aggravated during flooding events as high levels of flowing water carry species into new areas. Invasive

³¹ For further detail: <https://www.stroud.gov.uk/environment/projects/stroud-valleys-natural-flood-management-project/>

³² For further detail: <https://www.wwt.org.uk/our-work/projects/thames-catchment-nfm-advice>

³³ [State of the water environment indicator B3: supporting evidence - GOV.UK](#)

plant species including Giant Hogweed, Japanese Knotweed, Water Fern, Himalayan Balsam have all been observed to have spread to new areas after a flooding event.³⁴ Invasive species are not only one of the top five drivers of biodiversity decline globally, but are also extremely costly and difficult to manage. Recent figures suggest that invasive species (excluding fungi) cost the UK Government over £2 billion each year.

3.9. Furthermore, at least 13 invasive species have been found to exacerbate the effects of flooding, primarily invasive freshwater plants such as Floating Pennywort which form thick mats behind weirs and dams and obstruct sediment flow.³⁵ Invasive animals including the American Signal Crayfish and Chinese Mitten Crabs are well evidenced to also undermine flood defences by burrowing into riverbanks.³⁶

Monitoring flood resilience

4. To what extent are current metrics for monitoring the effectiveness of flood resilience fit for purpose, and what improvements could make them more effective?

- **Do current metrics capture the range and effectiveness of privately-owned flood resilience assets, and if not, how can this be improved?**
- **Do we have appropriate metrics and mechanisms to measure the cost effectiveness of flooding assets and interventions in terms of investment versus long-term savings and, if not, what should they look like?**

4.1. Current metrics for monitoring the effectiveness of flood resilience are not fit for purpose. As raised in response to Q1, Government has declined to set a long-term target for flood resilience, and as such does not have sufficient measure or metric for monitoring flood resilience or driving improvements. Government should rectify this and set a target.

4.2. Metrics for monitoring the effectiveness of flood resilience must consider natural resilience in addition to that of communities, infrastructure and assets. Negative impacts of flood events include impacts on the environment; for example, flood waters washing excess nutrients,

³⁴ Wildlife and Countryside Link (2024). 'Stemming the Flood of Invasive Non Native Species':

https://www.wcl.org.uk/assets/uploads/0/Stemming_the_Flood_of_Invasive_Non_Native_Species_3.pdf

³⁵ Gallardo, B., Bacher, S., Barbosa, A.M. et al. Risks posed by invasive species to the provision of ecosystem services in Europe. *Nat Commun* 15, 2631 (2024). <https://doi.org/10.1038/s41467-024-46818-3>

³⁶ <https://www.gov.uk/government/publications/invasive-non-native-species-challenges-for-the-water-environment>

chemicals, sewage and plastic into waterways and thereby reducing water quality, or eroding and destroying habitat such as riverbanks and vegetation. Effective flood management interventions must act to reduce environmental harm, as well as damage to assets and infrastructure.

4.3. This natural resilience and natural capital must also be incorporated into cost benefit analyses of assets and interventions, to ensure that the full range of environmental benefits and ecosystem services is recognised. This will help to unlock the use of NbS and NFM approaches to managing and mitigating flood risk, which as discussed, can deliver multiple benefits yet are currently under-utilised.

4.4 The Government supported the development of the [NFM Hub](#) to evaluate and monitor the effectiveness of NFM delivery from the 2016 £15 million NFM programme and the 2024 £25 million NFM programme. This Hub treats natural assets in a similar way to conventional grey infrastructure and allows the RMA to track the delivery and maintenance of NFM and to identify the wider multiple benefits.

4.5. To measure the effectiveness of flood resilience assets and interventions, it is critical to distinguish the ‘range’ of assets from ‘effectiveness’ of assets. These are different things that should be measured in different ways. Whilst range, type and extent of assets and interventions is fairly easy and cheap to quantify, the effectiveness of assets – particularly NFM and NbS type assets, is far more nuanced and requires longer-term, more in-depth monitoring.

4.6. To date, project measures of NFM quantification have focused on range (type/number) of interventions. Where we are seriously lacking evidence to inform cost-benefit models is in their effectiveness. The effectiveness of flood interventions, particularly into the long term (and particularly for NFM), requires long term monitoring, the funding for which is typically very limited and/or not standardised across projects which reduces its robustness and potentially underestimates co-benefits.

4.7. For example, the measures used for reporting on the 60 government-funded NFM projects (2017 investment of £15 million) centred upon quantifying the number of interventions installed and/or the amount of flood water stored. The extent to which this simple enumeration translates into impact (particularly in terms of co-benefits) is questionable. The commencement of such a large number of projects, within a relatively confined project delivery period provided the opportunity to generate robust data that would have had wide scale applicability.

4.8. Whilst we can appreciate that standardisation of monitoring methods across such a large number of projects would have been challenging given the diversity of projects and stakeholders/deliverers, it would have been massively beneficial to have a standardised 'effectiveness' metric against which projects reported. By focusing on a standardised monitoring metric, rather than a standardised monitoring method, there is the potential to combine data from a number of studies/projects to generate evidence that has increased power and could usefully inform cost benefit analysis.

Coordination of flood resilience

- 5. How effectively and how frequently do flood risk management authorities work together to tackle flooding issues and do they have sufficient resources and skills available to carry out their work?**
- **For instance, how can the government ensure that areas prone to flooding near the mouth of a river, are not negatively impacted by increased pressure on the river, or by flood-mitigation measures taken upstream?**
 - **Where is the interface between the responsibilities for river and surface water flooding, and how could monitoring and coordination be improved to enhance effectiveness and early warning of flooding?**

5.1. Flood Risk Management Authorities (RMAs) do not have sufficient funding, resources and skills. As discussed under Q1, in 2023 the Environment Agency faced a £34 million shortfall in funding required to maintain flood assets.

5.2. This capacity gap is one of the barriers preventing greater uptake of NbS and NFM for managing and mitigating flood risk. Despite being Risk Management Authorities, many local authorities do not have the right skills, expertise and training in-house needed to assess and facilitate applications for NbS and NFM projects, which can prevent or add complexity to an already challenging process. For example, a 2022 survey by ADEPT/ALGE found that as many as 26% of Local Planning Authorities do not have access to any ecological expertise.³⁷

5.3. As discussed, NFM and NbS approaches can be used to help alleviate flood risk downstream of flood mitigation measures. For example, through using NFM and NbS measures to intercept, slow and/or store diverted water from engineered flood interventions. Taking a

³⁷ [ALGE-ADEPT Report on LPAs and BNG.pdf](#) (2022).

holistic, catchment approach to water management will assist with identifying and mitigating these risks.

5.4. There is inconsistency between Lead Local Flood Authorities (LLFAs) in deciding whether wetland areas for flood management require permissions from planning teams, as this is up to their discretion. Furthermore, there are often discussions around liability with Natural Flood Management (NFM) implementation, with much of the policy stating that the landowner is liable for the interventions and any potential changes in water flows. This can prevent landowners wanting to get involved in delivery. Government must address this issue of liability risk.

5.5. The aforementioned NFM hub developed by CaBA supports partnership working and delivery regarding NFM interventions; Government should make use and learn from this approach.

5.6. In addition to RMAs working together to tackle flooding issues, there should be more support for other organisations to play a part. For example, eNGOs and partnerships such as CaBA groups could be providing effective coordination in appropriate circumstances.

6. What should the key priorities be for the Flood Resilience Taskforce, and how can it enhance coordination and improve flood resilience?

- **Is there a role for community-based flood response teams, and who is responsible for building that resource?**

6.1. The Flood Resilience Taskforce does not currently include representation from environmental NGOs. Given the critical role of environmental resilience in managing and mitigating flood risk, and that many eNGOs are landowners or managers working alongside farmers and rural and coastal communities to deliver natural flood management, this is a missed opportunity and should be rectified. Furthermore, eNGOs and academic bodies can contribute to skills, advice, support, surveying and monitoring.

6.2 Government should mandate the use of the aforementioned NFM Hub, to effectively keep track of what work is happening on the ground and to maximise the benefits for flooding and other ecosystem services from the investment. The Environment Agency already mandate the use of the NFM Hub for their £25 million investment in NFM.

7. Is there a backlog in maintenance of existing flooding adaptation/resilience assets and in identifying where new ones could be introduced?

- **Is there clarity about whose responsibilities these are, and how could this be improved?**
- **How strong is the knowledge base on both the condition of existing assets and where new ones might be needed and what steps could strengthen it?**

7.1. Catchment Based Approach (CaBA) organisations have co-designed the [Natural Flood Management Hub](#), an award-winning collaborative site for mapping NFM projects and their multiple benefits. Project managers across England can map the location of and publish information about existing NFM interventions, and can now also create a pipeline of investible NFM opportunities from idea stage, through delivery, and to ongoing maintenance. The NFM Hub was set up to treat NBS with the same respect as grey infrastructure ensuring that stakeholders in the environment know what natural ‘assets’ they have, where these assets are, what ecosystem services they are delivering and how they are being maintained and adapted. It also allows the delivery organisations to quantify both the ‘market’ and ‘non-market’ benefits associated with their work to maximise the potential for private sector co-finance.

7.2. While the NFM Hub is up and running, and has around 6,000 NFM assets in its database, it must be driven forward by Government and public bodies to ensure the widest possible coverage and ensure flood resilience provided by green solutions are properly accounted for.

7.3. WWT has recently launched a [free mapping tool](#) which identifies the potential for NFM solutions to flood resilience (amongst other challenges). Across the UK WWT identified 1,867 catchments where there is potential for NFM interventions in flood risk areas, delivering a net benefit of £800 million over 60 years. This work, in combination with the Government’s recently released update to national flood and coastal erosion risk information, forms a strong start point for identifying NFM solutions to go into the next flood risk management programme.

Resources, funding and support for flood resilience

8. What level of flood resilience is required to address the flood risks identified in the Climate Change Risk Assessment and is current funding adequate to meet these risks effectively?

- Is there sufficient government support and funding for the maintenance of privately-owned flood defence and resilience assets?
- What changes, if any, should be made to the next iteration of the Flood and Coastal Erosion Risk Management (FCERM) investment programme to improve its outcomes?
- How well does the National Adaptation Plan address the need for flooding adaptation measures, and what additional steps should be taken to ensure effective long-term flood resilience in high-risk areas?

8.1. The Climate Change Risk Assessment Report identified flooding among the most significant risks associated with climate change, bringing severe economic, social and environmental impacts. Yet NAP3³⁸ has insufficient pace or ambition to address these growing climate risks, which undermines flood resilience. Building this resilience must be a key priority for Government, and should be a responsibility shared across departments, rather than for Defra alone. As NAP3 acknowledges, taking action sooner can help to reduce future costs and build economic resilience, presenting good value for money.

8.2 The Government states that its National Adaptation Plan (NAP3) “represents a step change in our approach to managing the risks of climate change.” (page 6). It acknowledges the economic risks and the links between economic success and keeping a safe and stable climate. For example, “These climate changes pose a risk to our national security and resilience, from producing food and securing water supplies to maintaining critical infrastructure and supply chains.” (page 14).

8.3. The government also acknowledges the economic risks and the links between economic success and keeping a safe and stable climate: “Disruption from climate change also has the potential to reduce government revenues and increase government expenditure, reduce external performance (exports), damage infrastructure assets, increase social costs thereby

³⁸ The 3rd National Adaptation Programme:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1171028/The_Third_National_Adaptation_Programme.pdf

increasing vulnerability for some population groups, and reduce economic growth... early adaptation action can help to reduce future costs and many adaptation actions represent good value for money.” (page 15) and “Adaptation to climate change plays a role in supporting sustained economic growth by making our economy more resilient. Growth and climate change are closely linked as the climate has important impacts on our daily economic activity. Increasing the resilience of the natural environment, businesses, households and infrastructure can support long-term growth.” (page 15)

8.4. For good measure, the government also states that “Prevention is always better than cure and this approach will achieve greater readiness to respond to the impacts of climate change, while ensuring that adaptation measures are in place to limit its severity and costs.” (page 18) and that “...the government is establishing a process for identifying and assessing chronic risks. These are the risks which are enduring challenges that gradually erode elements of our economy, society, way of life and national security, such as climate change.” (page 24)

8.5. However, by repeating existing plans and policies, such as on farming, wildlife, and the April 2023 Plan for Water, NAP3 implies existing plans are already geared to making the UK resilient yet details of how are not especially clear. Repeating existing aims is not the same as showing how well they are geared to adaptation needs. Apart from actions on drought and to increase water efficiency, the Plan for Water (April 2023) barely touches on adaptation. It is also unclear how well the government’s various nature restoration aims are explicitly geared to nature being able to cope with unstable weather and conditions. Implicitly, action for nature and landscape recovery can aid climate resilience and adaption, but for this should be addressed in precise ways to be more by plan than by coincidence.

8.6. Government should re-examine whether Flood Defence Grant-in-Aid (FDGiA) should be available to organisations other than RMAs. Currently, RMAs can sub-contract work delivered through FDGiA to organisations such as eNGOs, but where the RMA’s resources are stretched, particularly with LLFAs who tend to take responsibility for the smaller NFM projects, it is often difficult to get projects off the ground and they end up stalling or even being dropped from the programme. We suggest that funding could be directly awarded to appropriate organisations who are also given responsibility for delivering projects, with appropriate governance including RMAs.

8.7. Government should encourage the use of and ring-fencing of local levy for NFM projects. This has been successfully trialled in the Thames RFCC area where £2.2 million of local levy has been used to support the delivery of NFM projects across the catchment area. Due to the

nature of NFM and the size of the projects a simplified process has been trialled successfully where applicants fill out key project information and a simple benefits calculator. A business case to model project outcomes was not required.

8.8. These projects have been led by RMAs in collaboration with eNGOs and catchment partners but as per the point made above, changes could be made to allow the transfer of funding directly to partners to reduce the resourcing burden on RMAs.

9. How can the Government encourage more long-term private investment in flooding defences and resilience measures?

• What role can the insurance industry play in supporting this?

9.1. NFM and NbS have potential to encourage more long-term private investment in flood resilience. The multiple benefits that these approaches can deliver create opportunities for blended finance, by drawing in private investors or gaining income from buyers of ecosystem services. As discussed, this is demonstrated by the Wyre NFM Project. The commercial business model applied by the project to attract private funding to supplement public funding will generate a long-term revenue stream for repayment of upfront investment in reduced flood risk and further ecosystem services including carbon sequestration and biodiversity gain.³⁹ The Wyre Catchment Community Interest Company has been set up to raise £850k from private investors, including both individuals and companies.

9.2. The Mainstreaming Nature Based Solutions (MNbS) programme is working to identify and break down barriers to large-scale NbS roll-out, with the aim of making these green solutions part of business-as-usual for Government, regulators and businesses. By testing investible NbS propositions across the UK, exploring a common approach to assessing the total value of NbS projects, and building standardised tools and processes for NbS creation and management, MNbS aims to enable the greater understanding and adoption of these solutions. The outputs of this programme should enable many more projects to draw in private investment and ongoing payments for ecosystem services, which is essential to deliver and then maintain NbS including NFM interventions. Government must back this work so that NbS become an integral part of the UK's policy, regulatory, business and financial approaches.

³⁹ Further information available here: [Wyre NFM | Wyre Rivers Trust](#)

10. What support do property owners and neighbourhoods require to enhance their resilience to flooding?

- **What is the current level of awareness among property owners about flood resilience measures, how they can be improved, and who can support it?**

10.1. The British Red Cross has reported ‘alarming low levels of awareness about flood risk and knowledge of how to prepare for and respond to flooding, particularly in areas with high social vulnerability to flooding.’⁴⁰ In 2014, a social science study conducted for Government found a lack of public understanding of flooding issues include ‘lack of understanding around flood and insurance risk’ and a general ‘ignoring or denial of flood risk by many individuals and other actors’.⁴¹

10.2. To improve awareness about flood resilience measures, and for property owners and neighbourhoods to enhance their resilience to flooding, increased routine communications and engagement is required. This should include communities, businesses and wider stakeholders, and should occur year-round, rather than solely during flooding when impacts are already being felt or in the aftermath. National Flood Week, held annually in October, does provide useful engagement but is no substitute for routine conversations about flood risk, particularly as patterns and risk are changing. Furthermore, it is important that homeowners are not left to front the costs of future insurance and increasing flood risk; the onus must be placed on developers and local authorities.

⁴⁰ The British Red Cross. Vulnerability and Resilience: Public awareness and perceptions of flood risk in the UK: [Public awareness and perceptions of flood risk in the UK](#)

⁴¹ Brook Lyndhurst for Defra, Synthesis of flood social science evidence for policy decision and delivery improvement, Final report September 2014: https://assets.publishing.service.gov.uk/media/6033e7ebd3bf7f265a92b4ea/Synthesis_of_flood_social_science_evidence_report.pdf



Wildlife and Countryside Link (Link) is the largest nature coalition in England, bringing together 86 organisations to protect the natural world. Wildlife and Countryside Link is a registered charity number 1107460 and a company limited by guarantee registered in England and Wales number 3889519.

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