Wye Valley
National Landscape

Water Crowfoot

Ranunculus aquatilis

Species Action Plan 2026 - 2031

To Accompany the

Wye Valley National Landscape Nature Recovery Plan

Dyffryn Gwy
Tirwedd Cenedlaethol
Wye Valley
National Landscape

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1. Background

In 2019, set against a backdrop of unprecedented concern for the future of the natural world, the National Association for Areas of Outstanding Natural Beauty (NAAONB) set in motion plans to significantly increase the scale and pace of nature conservation activity in Areas of Outstanding Natural Beauty (AONBs). The Wye Valley AONB Partnership, along with AONBs across the UK, signed up to the Colchester Declaration. This is an ambitious plan to recover nature in and beyond protected landscapes, build climate resilience and enhance engagement with people. Rebranding has since taken place and AONBs are now known as National Landscapes and the NAAONB the National Landscapes Association (NLA).

As part of this effort, each National Landscape has committed to adopting an IUCN threatened, or locally threatened, species and preparing and delivering a Species Action Plan, in the hope that by 2030 at least 30 species relevant to National Landscapes can be removed from the threatened list (NAAONB, 2019). The Wye Valley National Landscape has committed to adopting 5 locally significant species or assemblage of species, each of which represent one of the National Landscape's Special Qualities, and/or indicate the health of a well-connected landscape. To represent the River Wye and its Tributaries, Water crowfoot was chosen as a characterising feature of the river, threatened by water quality issues and low and high-water events.

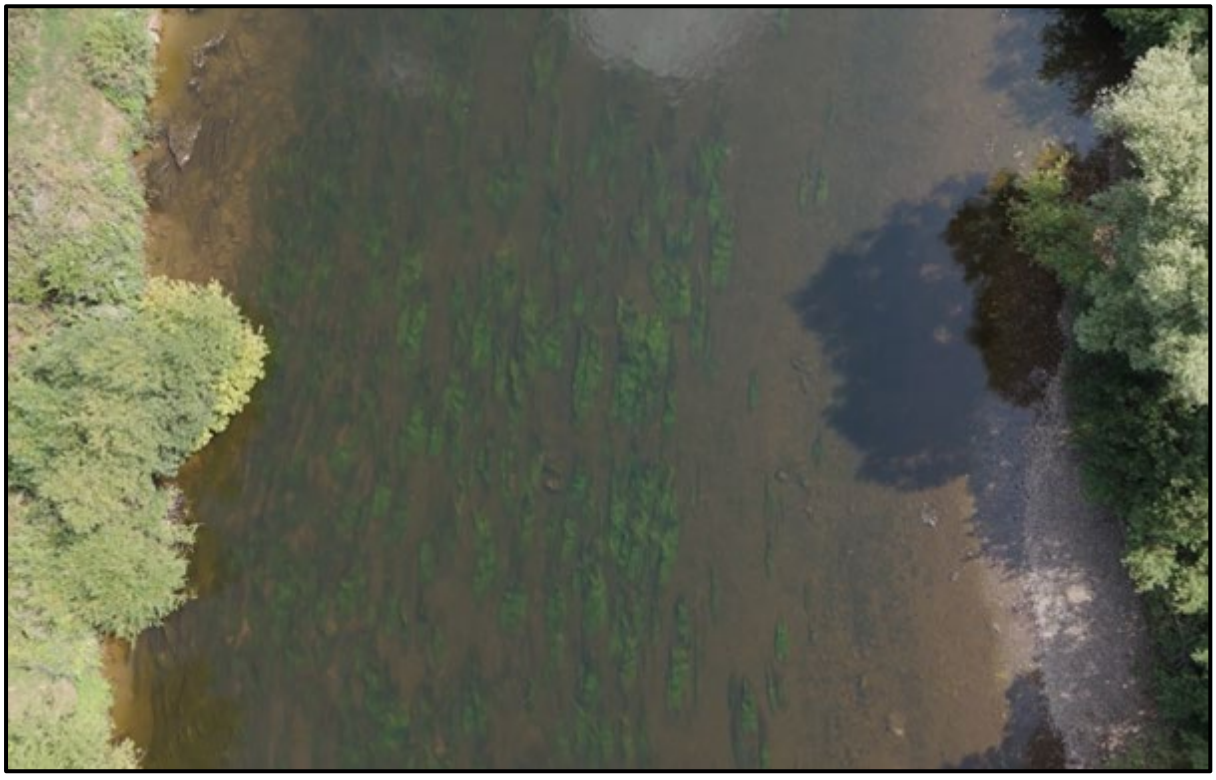

Figure 1. Drone footage of Water crowfoot in the River Wye near Fownhope.

2. Introduction

Water crowfoot (*Ranunculus aquatilis)* is a submerged aquatic plant belonging to the buttercup family. It is native to Europe and common in the UK, and thrives in well-oxygenated, moderately fast-flowing freshwater habitats such as chalk streams, rivers and clear ditches. It prefers gravelly or sandy substrates where it can anchor its roots and avoid being smothered by sediment. Light availability is also crucial, as it thrives in open, unshaded conditions where sunlight can penetrate the water column. Recognised by its delicate white flowers and trailing stems, it plays a key ecological role by stabilising sediment, improving water quality, providing habitat for invertebrates and offering refuge and spawning grounds for fish. It can form mats in rivers and streams during spring and summer. The environmental preferences of Water crowfoot make it especially vulnerable to changes in water quality, flow and habitat structure.

Water crowfoot can be an annual or short-lived perennial plant, and has floating, lobed leaves and solitary white flowers, about 2cm across. Water crowfoot can be a challenging group to identify, as several closely related species share similar features and often cross-breed. *Ranunculus aquatilis* flowers have five rounded petals and a bright yellow center, with the plant displaying two types of leaves; floating leaves that are rounded and lobed, typically with three to seven lobes, and submerged leaves that are finely divided into thread-like segments. Water crowfoot typically grows to a height of 10-50cm and can spread up to 0.5 meters, forming low, trailing mats across the surface of streams and rivers.

Figure 2. Ranunclus mat, Monmouth in 1993 (Guy Mawle).

These floral carpets are not only ecologically important, but also contribute significantly to the aesthetic appeal of river landscapes- drawing in photographers, walkers and nature lovers. For those hoping to see it in bloom, later spring to early summer is the best time to visit watercourses known to support healthy populations of Ranunculus aquatilis. Flowering typically occurs between May and July, when water temperatures rise and daylight increases. In rivers like the Wye, this plant has historically been a cornerstone of riverine biodiversity and function.

Water crowfoot is recognised as an important indicator species of good ecological status under the Water Framework Directive. Its presence in a river system often reflects high water quality, suitable flow conditions and relatively low nutrient pollution, making it a useful species for environmental monitoring and conservation. In recent years, the abundance of Water crowfoot in the River Wye has declined dramatically. Although the exact causes of this decline remain uncertain, several contributing factors are believed to be at play. Coupled with well document water quality issues, major flooding events between 2018-2020 physically scoured the riverbed, removing large stands of the plant. In the seasons that followed, hot and dry conditions hindered re-growth, while grazing birds may have further inhibited recovery (Bailey, 2021).

3. Current Status

3.1 Ecology and habitat requirements

The presence of Water crowfoot creates habitats for other flora and fauna. The plant helps to reduce water velocity within and immediately down-stream of the plant stands, whilst increasing velocity elsewhere by directing water around its cover, thereby altering flow dynamics within the river. The reduction in flow results in an increase of fine sediments being deposited downstream of the plant structure. This encourages growth of other macrophyte species, such as watercress and starworts that may otherwise be unable to establish themselves due to a lack of organic material or high flow rates. Conversely, increased flow elsewhere keeps gravels free from fine silts.

This results in the creation of more complex habitats within the river which, in turn, is linked to the abundant and diverse invertebrate communities that are present by providing diverse food sources and refugia. For example, the submersed parts of macrophytes provide a large surface area for suspension-feeding invertebrates, such as black fly larvae and certain caddis fly larvae, to attach to and feed on organic particles. The mosaic of macrophyte species provides suitable habitat for many different insects during their larval stage, such as damselflies and dragonflies (Marsh, 2018).

3.2 Population and distribution

Historically, Water crowfoot has been recorded across the UK, with specimens dating back to the 19th century. For example, a specimen was collected in west Gloucestershire in 1865, and another in Herefordshire in 1853, indicating its long-standing presence in these regions. These records demonstrate the plant's historical abundance and wide distribution (Herbarium United, 1853).

Today, Water crowfoot continues to be found throughout the UK, although its distribution is influenced by environmental factors (Preston, Pearman and Dines, 2020). It is more prevalent in southern and eastern England, particularly in areas with chalk substrates, which provide alkaline conditions favourable for its growth. Globally, Water crowfoot has a broad distribution, extending beyond Europe to parts of North Africa, Asia and North America (Lansdown, 2014). Its presence is closely tied to specific environmental conditions, and ongoing monitoring is essential to understand and preserve its populations.

3.3 Legislation

While native species of Water crowfoot are not individually protected under UK law, their habitats are safeguarded through broader environmental legislation and designations. The Water Resources Act 1991 and Water Framework Directive set legal standards for water quality, making it an offence to discharge pollutants into rivers. The River Wye is a designated Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI), offering strong protection for aquatic habitats under the Conservation of Habitats and Species Regulations 2017. The Wye is an SAC partly because of its Water crowfoot populations, with Ranunculion fluitantis and Callitricho-Batrachion vegetation listed as a qualifying feature; the species therefore acts as a key benchmark for the health and management of the river (Conservation of Habitats and Species Regulations, 2017).

These designations require public bodies to take steps to avoid damage to the river's ecological features, including key species like Water crowfoot. National initiatives such as the River Wye Action Plan (2023) and the River Basin Management Plans, published by the Environment Agency, have highlighted the urgent need to reduce nutrient inputs, particularly from agriculture and wastewater. Elevated nutrient concentrations can threaten the ecological balance of chalk and lowland river habitats.

Historic practices such as excessive cutting of aquatic vegetation have been reduced due to the recognised ecological value of plant species like Water crowfoot, with the Environment Agency now managing vegetation where necessary for flood risk. These combined legal protections and action plans aim to restore the health of the Wye and safeguard vital aquatic flora for the long term.

3.4 Summary of important sites

In 2025, Friends of the River Wye launched the Big Ranunculus Watch, a citizen science initiative aimed at improving understanding of the distribution and status of water crowfoot (*Ranunculus* spp.) across the River Wye catchment. The project encourages members of the public, river users, and local communities to submit photographs of water crowfoot from along the river and its tributaries, including both recent sightings and historical images where available.

By collecting these observations, the project is building a growing evidence base that helps identify known locations of water crowfoot within the Wye Valley National Landscape (WVNL) and the wider catchment. The information gathered is used to create a mapped record of water crowfoot presence over time, allowing trends in distribution to be explored. This approach helps to highlight areas where the species may be recovering, persisting, or declining, providing valuable insights that can inform river management, habitat restoration, and conservation efforts. Citizen contributions

therefore play an important role in filling knowledge gaps and supporting a clearer picture of how this important aquatic plant is responding to changing environmental conditions in the Wye.

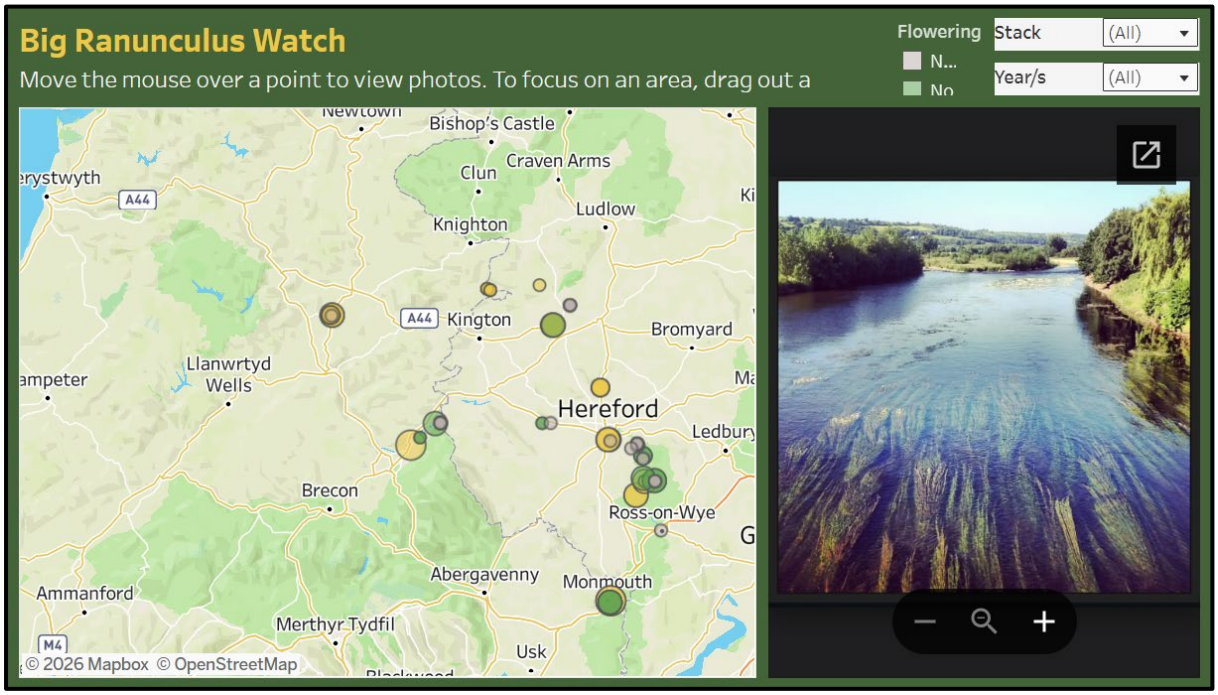

Figure 3. The Big Ranunculus Watch Photo Map (Friends of the River Wye, 2025).

Looking specifically at the Lower Wye Valley downstream of Hereford, the Big Ranunculus Watch map shows that the main concentrations of water crowfoot are found along the main River Wye channel rather than in tributaries. The largest clusters of records appear between Hereford and Ross-on-Wye, suggesting this stretch supports some of the most consistent patches of water crowfoot in the lower catchment. There are also several records further downstream through the Wye Valley around Symonds Yat and Tintern, although these tend to be more scattered and occur as smaller patches. Very few sightings are recorded closer to the tidal section of the river near Chepstow, which likely reflects the reduced suitability of habitat as the river becomes slower and more influenced by tidal conditions.

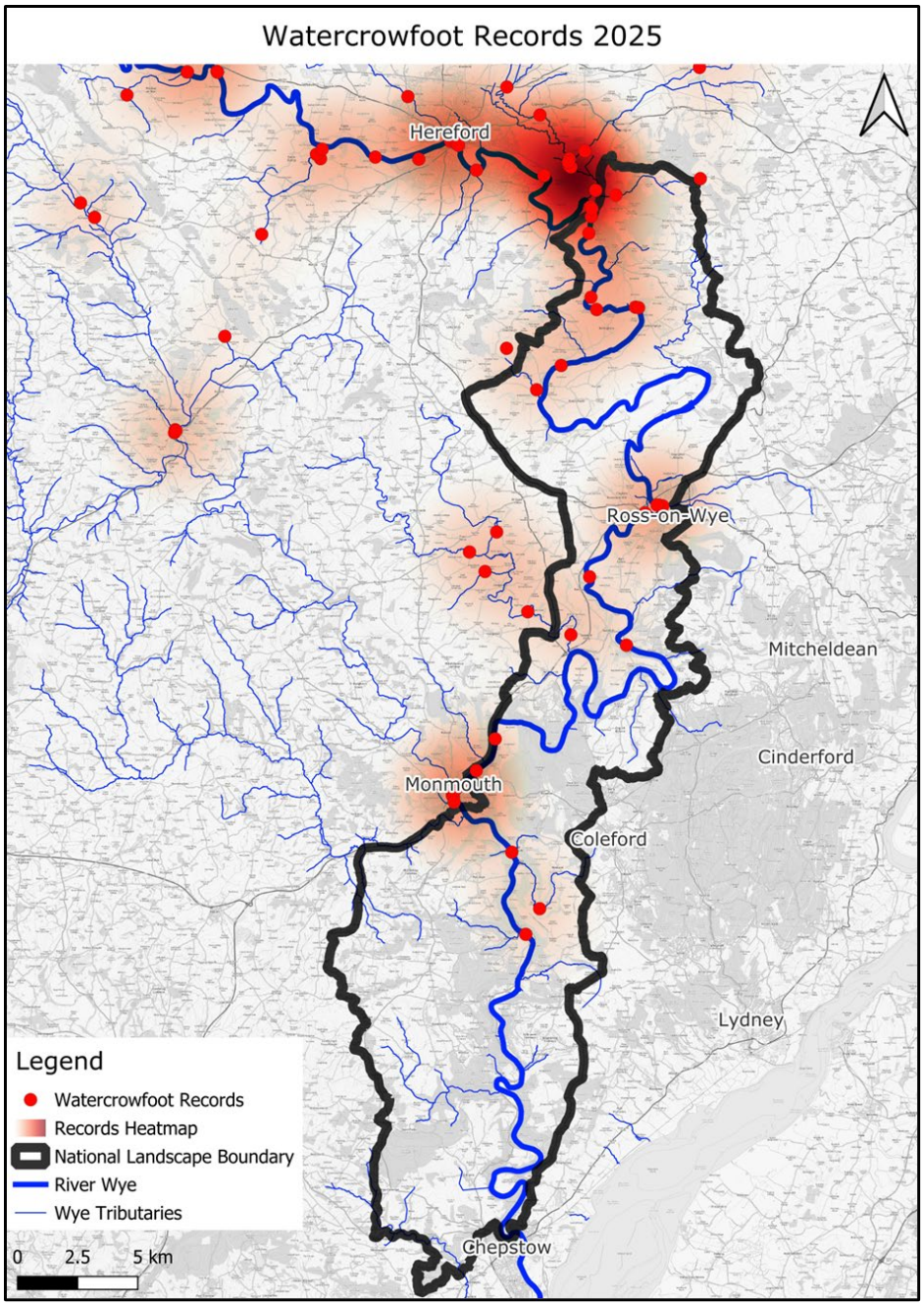

Figure 4. Distribution of water crowfoot records across the Lower Wye Valley (2025).

Figure 4 shows the distribution of recorded water crowfoot observations across the Wye Valley National Landscape in 2025. Red points represent individual species records, while the heatmap illustrates areas of greater record density and concentration. Records are predominantly associated with the main River Wye corridor and connected tributaries, particularly around Hereford, Ross-on-Wye, and Monmouth, highlighting the species' strong association with clean, well-oxygenated, fast-flowing river systems. The distribution pattern also demonstrates the ecological importance of the River Wye catchment and its tributary network in supporting water crowfoot populations throughout the National Landscape.

4. Current factors affecting the species

4.1 Threats

4.1.1 Water Quality

Poor water quality poses a major threat to Ranunculus in the Lower Wye Valley, where this species depends on clear, oxygen-rich conditions. Elevated phosphate and nitrate levels from intensive agricultural practices, and outdated sewage treatment works have driven eutrophication. Climate Change is also driving greater extremes in low and high-water levels and changes in water temperature. The exact cause is unsure, but it is a likely that one or a combination of these causes algal blooms that deplete dissolved oxygen, reduce water clarity and smother crowfoot beds by obstructing light and oxygen supply.

Modelling shows around 66-73% of nutrient pollution in the lower Wye originates from diffuse agricultural sources, while a significant portion stems from sewage effluent (Herefordshire Wildlife Trust, 2022). Early efforts such as the River Wye Nutrient Management Plan, established under the Water Framework Directive and SAC obligations aimed to bring phosphate levels within targets of 0.05mg/l for the Lower Wye through regulatory review and catchment controls (Environment Agency, 2014). More recently, the River Wye Action Plan (April 2024) introduced concrete measures including a £35 million grant programme for poultry manure management, catchment-wide river buffer zones, and manure export mandates to reduce nutrient surplus (Department for Environment, Food & Rural Affairs, 2023). However, enforcement difficulties and diffuse pollution complexities have limited effectiveness so far.

Citizen science initiatives and catchment partnerships have improved monitoring of phosphate and nitrate concentrations, but the river's ecological status remains 'unfavourable-declining', with water crowfoot beds already diminished by over 90% in some stretches (Environment Agency, 2024). Interventions need to be scaled up and better coordinated across farming, wastewater and regulatory sectors to ensure water crowfoot and its supporting habitat do not remain at serious risk.

4.1.2 Climate change

Water crowfoot in the River Wye is increasingly threatened by extreme hydrological events, with both droughts and floods destabilising the conditions it requires to persist and support riverine biodiversity. Severe low-flow conditions intensify pollution impacts, concentrate nutrients, and raise temperatures. In 2022 the Wye at Ross-on-Wye fell to just 8 cm, coinciding with sharp declines in crowfoot beds (Herefordshire Wildlife Trust, 2022). Similar findings from chalk rivers show that drought reduces ranunculus growth and coverage, though populations can recover rapidly when winter flows return (Environment Agency, 2004).

Conversely, floods uproot plants, bury them under sediment, and alter the gravel substrates needed for attachment and nutrient access. Post-flood monitoring in the Wye has shown gravels smothered with sediment, reducing light penetration and suppressing regrowth (Monmouthshire County Council, 2022). Prolonged high flows also increase turbidity, preventing photosynthesis and recolonisation, while repeated scouring strips beds and fragments populations (Poynter, 2013). Storm-driven floods in 2020 and 2021 caused widespread erosion and vegetation loss in Monmouthshire and Ross-on-Wye, with flood-driven siltation and nutrient loading contributing to an

estimated 90% decline in crowfoot cover across some monitored stretches over the last decade (Met Office, 2020; Herefordshire Wildlife Trust, 2022).

With climate change projected to bring longer droughts, hotter summers, and more frequent high-flow extremes (Parry et al., 2024), these pressures are likely to intensify, increasing risks of habitat contraction, fragmentation, and reduced flowering. To help mitigate impacts, management actions include: tightening abstraction controls and securing environmental flow releases; protecting key beds with boulder clusters, coarse gravels, or submerged wood to reduce scouring; avoiding in-channel works during stress periods; monitoring macrophyte health; and implementing catchment-scale measures such as natural flood management, riparian buffers, and improved land use practices.

4.1.3 Invasive non-native species

Invasive non-native species (INNS) are a major driver of habitat degradation in UK freshwater systems, often competing with, over-shading or physically displacing native plants such as water crowfoot. Excess sediment and turbidity reduce light and smother plants, impairing growth and recovery (Jones, 2012). The Wye's management plans reference maintaining these plant communities and controlling pressures, including invasive species (Natural Resources Wales, 2023).

- **Floating pennywort**
  Floating pennywort grows rapidly, forming dense mats that smother native plants like Water crowfoot by blocking light and reducing photosynthesis (NNSS, 2022). These mats slow water flow, trap fine sediments, and lower dissolved oxygen through respiration and decomposition. Management is difficult as mechanical removal fragments the plant, aiding spread; best practice involves early hand-pulling, containment, repeated sweeps, and strict biosecurity (NNSS, 2016).
- **Giant hogweed**
  Giant hogweed destabilises riparian zones by shading vegetation in summer and leaving bare, erosion-prone soil in winter (Welsh Government, 2022). Resulting sediment smothers Water crowfoot, while its phototoxic sap poses risks to public safety, complicating management (NIEA, 2025).
- **Japanese knotweed**
  Japanese knotweed forms dense thickets that displace native vegetation, reduce light to marginal habitats, and leave banks exposed to erosion after winter dieback. Invaded banks show higher erosion rates, especially where stem density is greatest (Matte, Boivin and Lavoie, 2022). The loss of varied root systems further reduces stability, intensifying sedimentation pressures on Water crowfoot.
- **Himalayan balsam**
  Himalayan balsam rapidly colonises riverbanks, outcompeting native plants and shading near-bank habitats (Clun Catchment Partnership, 2024). Winter dieback and shallow roots expose soil to erosion, while explosive seed dispersal drives rapid spread, threatening sensitive aquatic habitats.

Management and prevention

Preventing further spread of invasive non-native species along the River Wye is critical to protecting Water crowfoot and associated habitats. The 'Check, Clean and Dry' methodology is a simple but highly effective approach. Equipment, footwear, boats and clothing should be checked for plant fragments, mud or animals, cleaned thoroughly on site or before moving to another waterbody and dried completely to kill any residual organisms. Mitigating the impacts of INNS requires a

combination of early detection and rapid response to new incursions, coordinated eradication or control programmes, and restoration of native riparian vegetation to stabilise banks and reduce sediment inputs. Integrating biosecurity training for volunteers, contractors and recreational river users will help reduce the risk of inadvertent spread and support the long-term recovery of sensitive species such as Water crowfoot.

4.1.4 Recreational disturbance

Recreational activities- particularly boating, paddling and access infrastructure- can significantly disturb submerged aquatic vegetation. Boats and paddles create waves and turbulence that can uproot or damage plants, while infrastructure like docks, moorings and launching sites often result in sediment disturbance and habitat loss.

A systematic review found that areas used for boat mooring or under docks had just 18% of macrophyte cover compared to undisturbed zones, and regions frequented by boat traffic had only 42% of submerged vegetation remaining (Sagerman et al, 2019). Similarly, a focused study reported that paddling significantly reduces the abundance of submerged plants, affecting species composition more than emergent vegetation (Wegner et al, 2023).

Figure 5. Water crowfoot beds along River Wye

Even 'low impact' pleasure boating has measurable effects. A study of canal systems revealed an opposite relationship between boat movements and macrophyte abundance, with higher boat traffic corresponding with lower plant presence (Murphy and Eaton, 1983). These findings are consistent across multiple aquatic systems, with recreational boating and associated infrastructure leading to reduced species richness, altered biological communities and decreased water clarity (Iburg et al, 2021).

There are several management measures that could be put in place to protect Water crowfoot, including:

- Restricting motorized boat use in sensitive Water crowfoot areas, especially during growth and flowering seasons.
- Designing low-impact access points with floating boardwalks or soft entry zones that avoid trampling or direct disturbance.
- Public education initiatives encouraging visitors to avoid shallow plant rich areas and to understand the ecological sensitivity of water crowfoot habitats.
- Ongoing monitoring such as before and after surveys of plant cover and species composition in high-use areas to guide adaptive management.

4.2 Barriers to conservation

4.2.1 Diffuse pollution complexity

A key barrier to conservation in the River Wye catchment is diffuse pollution- a complex and persistent challenge that undermines aquatic plant communities, particularly for sensitive species like Water crowfoot.

Diffuse pollution arises from widespread, loosely managed landscape activities that collectively cause substantial harm, yet are individually hard to pinpoint and regulate. For the River Wye this is especially problematic with around 70-73% of phosphate loading stemming from agricultural diffuse pollution, primarily as nutrients leaching from livestock manure. An additional portion originates from sewage treatment works and other minor sources like roads and industry (Environment Agency, 2022). This diffuse nature makes it challenging to attribute responsibility and implement effective measures. The cumulative effect of numerous minor pollution sources complicates mitigation and regulatory enforcement.

The Wye catchment has suffered from a sustained phosphorus surplus, estimated at around 2000 tonnes annually, accumulating in soils over decades. Local soil types are less capable of holding onto added phosphorus from manure and fertiliser, making runoff into watercourses more likely (Environment Agency, 2022).

The consequences are stark for native aquatic vegetation. Water crowfoot beds, once abundance have been decimated, with losses tied directly to nutrient pollution (Monmouthshire County Council, 2022).

4.2.2 Insufficient baseline data and monitoring

Conservation of Water crowfoot in the River Wye is significantly constrained by the lack of comprehensive baseline data and long-term monitoring. Historical research on Ranunculus has often been fragmented, with few coordinated and quantitative studies available for many catchments. A review conducted by the Environment Agency in 1999-2000 highlighted that while factors such as flow velocity, substrate quality and nutrient levels are critical to Ranunculus success, robust, long-term data on many of these are scarce or non-existent (Environment Agency, 2001). This makes it

difficult to establish clear cause and effect relationships or to develop evidence-based flow prescriptions and restoration actions.

Initiatives such as the Greater Cambridge Chalk Streams Project have introduced science-led, data driven baseline assessments and monitoring regimes, enabling evidence-based interventions and adaptive management of aquatic habitats. This includes those supporting macrophytes like water crowfoot (University of Cambridge, 2023). However, no such approaches have been established in the Wye catchment so far.

This deficiency in both historical and ongoing data severely limits the ability to monitor changes in Water crowfoot communities, evaluate management efficiency and respond adaptively to threats. Without reliable data, conservation remains reactive rather than proactive, with key questions - such as how flow dynamics, nutrient input, channel morphology and sediment dynamics together affect Water crowfoot viability – left unanswered (Wye Valley National Landscape, 2024).

4.2.3 Conflicting land uses and priorities

Conserving Water crowfoot in the River Wye is made difficult by the competing demands placed on the catchment. The river is expected to support agriculture, recreation, navigation, and development, but these land uses often conflict with the ecological conditions required for Water crowfoot—namely clean, fast-flowing, low-nutrient waters with stable gravels. The River Wye Action Plan highlights how agriculture contributes to excessive phosphate inputs, and over 75% of sediment in the catchment, driving algal blooms and smothering aquatic plants. Climate extremes further intensify this pressure as droughts and floods both damage sensitive habitats (Defra, 2024).

Recreational use of the river also acts as a barrier to conservation. The Wye Waterway Plan and Wye Valley AONB Management Plan (2021-26) highlight how increased boating pressure, poorly designed launch sites and channel engineering can erode banks and increase sediment delivery. These processes undermine macrophyte habitat by burying Water crowfoot stands and reducing light and flow conditions needed for growth (Environment Agency, 2023; Wye Valley National Landscape, 2021–26).

At a broader scale, land use policy itself remains fragmented, with no overarching framework to balance the needs of farming, housing, energy, climate and biodiversity. This lack of integration means that short-term production or access priorities often override long-term ecological needs. National reviews argue that a multifunctional land-use framework is essential to mediate these conflicts, but until such governance is in place, the conservation of water crowfoot will remain constrained by competing land use demands (House of Lords, 2022).

4.2.4 Limited awareness and understanding

A further barrier to conserving Water crowfoot in the River Wye is the low level of public awareness and understanding of its decline. Once carpeting the river in spring and summer, Ranunculus has been reduced substantially in just five years, yet this loss is often hidden beneath the surface and overshadowed by the river's outward scenic appeal (Wye Valley National Landscape, 2025).

Community-led initiatives have stepped in to fill some of this gap. The Friends of the River Wye's 'Big Ranunculus Watch' invites the public to record sightings of water crowfoot, while wider citizen science projects monitor phosphate, nitrate, turbidity and temperature using open-access apps. These efforts generate valuable baseline data and help to raise awareness of Water crowfoot in the public eye (Friends of the River Wye, 2025).

Despite such projects, broader understanding remains limited. Campaigns from groups like the Campaign for the Protection of Rural England (CPRE) Herefordshire and Revive the Wye emphasise that without wider recognition of the species' importance, conservation relies heavily on volunteers and niche interest groups. This lack of mainstream awareness weakens public pressure on policy makers and constrains long term funding and support (CPRE Herefordshire, 2024; Revive the Wye, 2013). In effect, Water crowfoots decline is not just ecological, but also social. Without stronger awareness and cultural recognition, its conservation struggles to gain the momentum needed to overcome multiple pressures facing the River Wye.

4.2.5 Fragmented governance and coordination

The River Wye crosses the England–Wales border, meaning the catchment is managed under multiple jurisdictions, designations and regulatory frameworks. The river is designated as a Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI) across its length, but responsibility for conservation objectives and management is split between authorities in England and Wales. For example, the Core Management Plan produced by Natural Resources Wales applies to the Welsh sections of the SAC, while conservation objectives and regulatory oversight for the English sections are set by Natural England. This shared governance structure can make it more challenging to develop and enforce a consistent, catchment-wide approach to river management (Natural Resources Wales, 2022).

The Wye Catchment Partnership unites over 50 organisations- from Natural Resources Wales and the Wye & Usk Foundation to local councils, NGOS and Citizen Scientists, under a catchment scale plan. Although collaborative, the broad membership brings challenges in coordination, shared vision and consistent delivery. Hundreds of thousands of pounds have been secured by Catchment Partnership members for restoration, nutrient reduction and natural flood management, but maintaining coherence amid diverse stakeholders and funding streams remains a barrier to aligning efforts specifically for Water crowfoot conservation (The Wye Catchment Partnership, 2020).

Environmental governance research confirms the risks of fragmented institutions. Multiple overlapping jurisdictions and agencies often lead to coordination challenges, inefficiencies and ineffective delivery of environmental public goods (Kim, Keane and Bernard, 2015).

5. Current initiatives

1. River Wye Citizen Science Monitoring (CaSTCo Programme)

Citizen science plays an increasingly important role in monitoring river health and informing management across the River Wye catchment. Through the Catchment Systems Thinking Cooperative (CaSTCo) programme, led by the Wye & Usk Foundation and supported by partners

including Save the River Usk, Gwent Wildlife Trust, the Wye Alliance, and Friends of the River Wye, a large volunteer network collects regular water quality and habitat data across the river system.

More than 400 trained volunteers now contribute weekly monitoring, generating over 1,000 water quality samples. Data collected includes key indicators such as phosphate, nitrate, turbidity, conductivity, temperature, dissolved oxygen, pH, and river depth, helping to assess conditions that influence aquatic species such as water crowfoot. Monitoring often takes place before and after on-farm interventions to evaluate improvements to water quality and habitat.

All results are uploaded through Epicollect and visualised via the Wye Viz platform, producing spatial outputs such as phosphate hotspot maps. The Environment Agency increasingly uses this citizen science data alongside statutory monitoring to identify pollution sources and inform management responses. Initiatives led by Friends of the River Wye, including the Big Ranunculus Watch, also contribute species-specific observations that help build a clearer picture of water crowfoot distribution across the catchment.

2. Friends of the River Wye Big Ranunculus Watch

Friends of the River Wye (FoRW) are leading the Big Ranunculus Watch, a catchment-wide initiative designed to track the presence and condition of Water crowfoot across the River Wye. This project invites volunteers to record sightings, abundance and habitat characteristics using a simple survey protocol, generating the first coordinated dataset on the distribution of this declining macrophyte. By mobilising communities and integrating observations into the wider Wye Citizen Science program, the initiative raises public awareness while providing ecological data that can inform restoration efforts and monitor long term trends in Water crowfoot recovery (Friends of the River Wye, 2025).

Figure 6. David Nicholls. Croft Pasture, 09 May 2014

3. Upper Wye Catchment Restoration Project (Natural Resources Wales)

Funded through the Welsh Government's Water Capital Programme, the Upper Wye Catchment Restoration Project focuses on improving river and riparian habitats in the upper Wye catchment, an area that supports important populations of water crowfoot. The project uses nature-based approaches to restore natural river processes and improve water quality, including establishing riparian buffer zones through tree planting to reduce nutrient and sediment runoff, reconnecting rivers with their floodplains to restore natural flow and sediment dynamics, and introducing large woody material to increase channel complexity and habitat diversity.

The project also works with landowners to reduce sediment and pollutant inputs from surrounding land. These actions aim to enhance resilience to extreme weather by slowing runoff and targeting invasive species such as Himalayan balsam and American skunk cabbage.

4. The Environment Agency monitoring

The Environment Agency undertakes ongoing ecological monitoring across the River Wye catchment to track river health and inform management decisions. This programme includes monthly water chemistry sampling, which measures key nutrients such as phosphorus and nitrogen to assess pollution pressures and nutrient enrichment. Alongside this, seasonal biological monitoring is carried out through macroinvertebrate and diatom surveys, providing important indicators of ecological condition and water quality.

The Environment Agency also conducts annual macrophyte surveys, which record aquatic plant communities and capture the presence and distribution of species such as water crowfoot. During the warmer months, growing-season algae monitoring helps identify potential eutrophication issues and excessive algal growth linked to elevated nutrient levels. In addition, fish populations are assessed using methods such as electrofishing and seine netting, allowing scientists to evaluate fish community structure and overall river ecosystem health.

Together, these monitoring programmes provide a comprehensive evidence base that contributes to integrated catchment understanding and helps guide river management, restoration priorities, and regulatory action.

5. Drone Surveying

Working alongside the Friends of the River Wye's Big Ranunculus watch, the Wye Valley National Landscape team have facilitated work to establish a methodology for large scale surveying of Water crowfoot through the use of drones. Methodologies were developed by three drone operators over the summer of 2025, which the aim of carrying out a larger scale survey in 2026. This work will provide a more detailed understanding of baseline data, with a view to restoring Water crowfoot to the river in the future.

Figure 7. Drone footage of Ranunculus near Fownhope (2025).

6. Conservation visions

To enhance opportunities for Water crowfoot across the Wye Valley National Landscape:

- Working with partners, landowners and river managers to ensure that Water crowfoot habitat is considered within all watercourse and catchment management decision making.

Expand the current extent of Water crowfoot within the Wye Valley National Landscape through habitat creation:

- Collaborating with stakeholders to restore river and stream habitats, improve water quality and ensure suitable flow and riverbed conditions that support thriving stands of Water crowfoot.

To see a sustainable increase in Water crowfoot populations across the Wye Valley National Landscape:

- Encouraging and supporting regular surveys and monitoring to assess the extent and health of Water crowfoot beds, track changes over time, and guide future conservation action.

7. Conservation actions

ACTION	HOW
Raise awareness of the decline of Water crowfoot and the potential for recovery through appropriate action.	-Host events and workshops with the general public. -Promote good practices relating to habitat management for Water crowfoot. -Work with partners to create promotional and informative materials.
Monitor the presence and abundance of Water crowfoot	-Encourage partners, volunteers and the general public to carry out surveys (at known established sites and potential new sites) -Add to established datasets and submit records to the relevant local environmental records center. -Support data collection and ongoing citizen science projects and promote to encourage participation. -Conduct drone surveys to build a baseline of Water crowfoot populations.
Encourage responsible recreational use of the River Wye- specifically Water crowfoot habitats	-Produce and distribute promotional material about sustainable and appropriate recreational use of the river. -Signpost the general public to information sources. -Work with partners to host educational events and workshops.
Nurture and encourage citizen science and action groups	-Provide support through funding where available -Assist with funding applications. -Facilitate meetings and promote the work of groups
Encourage habitat enhancements through natural flood management and water quality improvements	-Work with farmers and landowners to encourage good land management practices to improve habitat and reduce diffuse pollution. -Continue to work with partners by supporting and promoting their work. -Encourage farmers and landowners to create natural buffer zones. -Provide funding support, where available, for the delivery of river friendly farming actions
Encourage Water crowfoot reintroduction in suitable locations.	-Work with stakeholders to establish reintroduction methodologies and suitable locations. -Develop projects and source funding for reintroduction work, working with riparian landowners to implement

8. Role of the Wye Valley National Landscape Team

- Support, advise, facilitate and co-ordinate conservation action for Water crowfoot, either as lead or through partnerships with other stakeholders.
- Engage with and support landowners and land managers, encouraging best practice in managing riverine habitats and river friendly farming practices.
- Promote Water crowfoot conservation in partnership with other conservation organisations.
- Provide and encourage the provision of advice to the general public and practical support for landowners.
- Enthuse the general public to take part in surveying and providing records of Water crowfoot.
- Facilitate the monitoring of habitat and Water crowfoot populations, to enable progress reporting.

9. Marking progress

We will mark progress through:

- Water crowfoot records: When there are widespread records of water crowfoot in the National Landscape, indicating population increase, or an improvement in survey efforts.
- Water crowfoot habitat: When there is more suitable and available habitat in the National Landscape, where water crowfoot is being recorded, indicating a population increase, an expansion in range or an improvement in survey efforts.
- Water crowfoot understanding and conservation efforts: When information about water crowfoot is widely available to everybody, and Water crowfoot habitat in the National Landscape is being enhanced.
- Water crowfoot extent: When monitoring and recording can demonstrate an increase in extent and a sustainable population throughout the National Landscape

10. References

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