

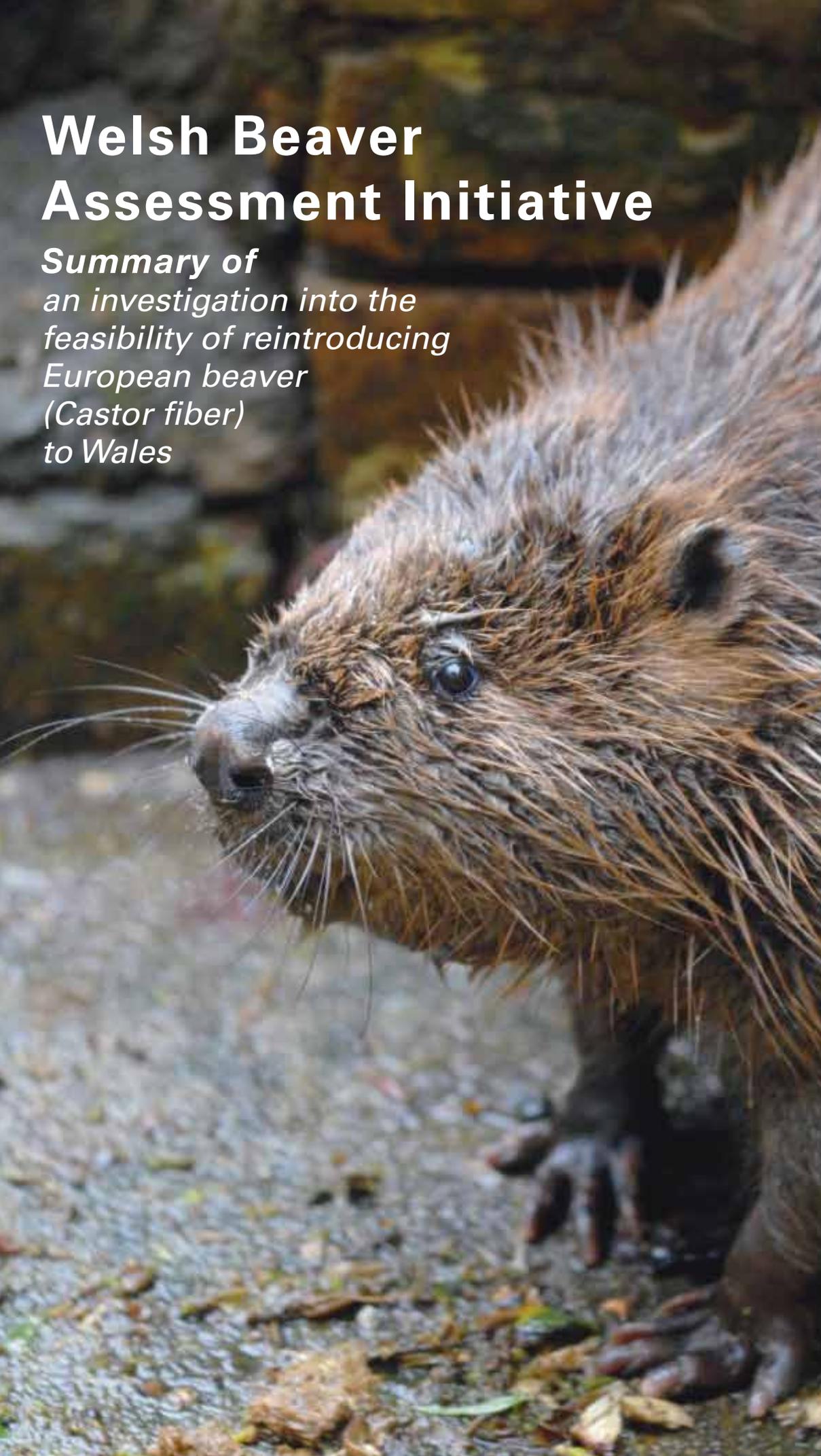
Welsh Beaver Assessment Initiative

*Summary of
an investigation into the
feasibility of reintroducing
European beaver
(*Castor fiber*)
to Wales*

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Summary of *An investigation into the feasibility of reintroducing European beaver (Castor fiber) to Wales*

This summary gives an overview of the full report. Reading the full report is strongly recommended to gain a more complete understanding of beavers, their effects and the proposals for a beaver reintroduction to Wales.

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The Welsh Beaver Project is the result of five years of consultation and investigation undertaken by the Welsh Beaver Assessment Initiative, involving the following partners:



Asiantaeth yr
Amgylchedd Cymru
Environment
Agency Wales



1 Introduction

The Welsh Beaver Assessment Initiative is investigating the feasibility of reintroducing European beaver (*Castor fiber*) to Wales. This investigation is being led by the Wildlife Trusts Wales and has been funded by the Countryside Council for Wales, People's Trust for Endangered Species, Environment Agency Wales, Wild Europe Initiative, Wildlife Trusts Wales and Welsh Power Ltd.

The results of the WBAI are presented in two main documents:

1. The WBAI Report: An Investigation into the feasibility of reintroducing European Beaver (*Castor fiber*) to Wales (2012).
2. Halley, D.J. *et al.* (2009). The reintroduction of the Eurasian beaver *Castor fiber* to Wales: an ecological feasibility study. NINA report 457. (2nd Phase catchment survey report).



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The reintroduction of beavers is being considered for a number of reasons

- Beavers can play an important role in enriching biodiversity and managing wetland areas, and are known as a 'keystone species' because their activities benefit a wide range of other species that live in wetland habitats.
- Beaver activity can also help to improve water quality, regulate flow, alleviate downstream flooding, stabilise water tables and reduce erosion in rivers. These effects fit well with current wildlife conservation strategies in Wales, such as the Welsh Government's Natural Environment Framework, which aims to take an integrated approach to sustainable environmental management.
- Beavers can also give a boost to tourism, which can enhance local economies. The beaver is a popular animal and evidence suggests its reintroduction is supported by the majority of the people of Wales.
- As beavers became extinct in Wales as a result of hunting, many feel their reintroduction is the morally correct thing to do. This is reflected in the EU Habitats Directive requirement for member states to consider reintroduction of extinct species.

2 Background

2.1 History

Beavers were once widespread across Eurasia but hunting by man for fur, food and scent glands led to their extinction across most of Western Europe. Beavers are thought to have become extinct in Wales by about the 15th century. Through natural recolonisation and reintroduction programmes beavers are returning to much of their former range. Britain remains one of a handful of European states yet to reintroduce beavers to the wild, but a trial reintroduction is underway in Scotland following a release in 2009 (the Scottish Beaver Trial) and a release is being considered in England.



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2.2 Biology and Ecology

Adult beavers are usually around 1.3m long (including tail) and weigh approximately 20kg. They live in small family groups on slow moving rivers, streams, lakes and ditches within bankside burrows or in lodges that they build from sticks and mud.

Beavers sometimes build dams to raise water levels to above 0.7m deep to provide an aquatic refuge, ensure lodge entrances remain submerged, increase their range of movement, enable winter food storage and transport branches. European beavers do not normally build dams across rivers over 6m wide and usually prefer to occupy territory that does not require damming. With maintenance, beaver dams usually last around 3-10 years, and are frequently overtopped or destroyed in spate conditions.

Beavers feed exclusively on vegetation including both aquatic and terrestrial plants. They also feed on tree bark, particularly during winter when other food sources are unavailable, and can fell trees to do so. Trees with diameters less than 10cm are favoured. Most beaver-felled trees coppice and regrow with abundant shoots providing easy to reach food in subsequent years.

Beaver population growth is usually slow at first and then increases more rapidly until all suitable habitat is occupied. Natural colonisation can take



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30-50 years to complete, but this process can be more rapid following deliberate reintroduction depending upon the number of beavers released and the catchment size. The size of beaver populations is limited by habitat availability, rather than predation.

Beavers do not like to stray far from water so almost all beaver activity, including tree felling, is undertaken within 20m of the waters edge. Beavers are strongly restricted to suitable riparian habitat so do not readily spread from one catchment to another, especially if this involves movement through hilly or mountainous terrain.



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3 Likely effects of beaver reintroduction

3.1 Hydrology, geomorphology and biochemistry

The activities of beavers can be beneficial to watercourses. Dam and pond networks can slow water movement through catchments, increase catchment water storage, reduce flooding and instances of low-flow, and reduce siltation downstream. Water quality can also be improved with levels of organic pollution within water courses being reduced and acidity decreased. Felling activity can increase levels of woody debris in watercourses, which provides cover and food for fish and other wildlife, but may require management to prevent negative impacts. Beaver activities may help to address issues related to climate change such as water and carbon storage within catchments.

3.2 Biodiversity

Beavers are often referred to as a 'keystone' species in wetland ecosystems, with an ability to modify habitats to the benefit of many other species. Beaver dams and ponds together with dead wood and increased light levels resulting from beaver activity increase the diversity and abundance of animal species associated with such habitats.

Flora

Beaver activity results in a general increase in the abundance and diversity of herbaceous wetland plants. Localised coppicing of trees opens up the canopy, increasing light-levels and encouraging tree regeneration and the growth of diverse ground flora. River banks usually remain well-wooded, with trees thinned and glades created. Beaver ponds create ideal habitats for many aquatic and emergent plant species.

Invertebrates

Beaver activity can have a significant effect on invertebrate species, with beaver ponds, dams and side channels benefitting both pond and stream living species. Increased aquatic and terrestrial deadwood provides living and breeding

habitat for aquatic and terrestrial invertebrates. Localised increases in riverbank light levels and plant diversity as a result of beaver coppicing may also encourage a wider diversity and abundance of invertebrate species. Freshwater pearl mussel colonies would be unlikely to survive in beaver ponds so any dams that could threaten freshwater pearl mussel colonies would require removal.

Fish and Fisheries

The foraging and damming activity undertaken by beavers creates a mosaic of habitats along stream corridors, creating ponds, increasing levels of woody debris and increasing light levels. This leads to a greater abundance and diversity of plants and invertebrates on which fish populations depend, whilst providing cover from predators such as fish eating birds, otters and mink.

The coppicing activities of beavers are similar to those widely undertaken by Rivers Trusts across Wales today to prevent the development of tunnel vegetation. This could allow fisheries managers to focus the considerable resources spent on riparian tree coppicing elsewhere.

Beaver dams can help to stabilize water flow in rivers, trap silt and organic matter, improving conditions for fish. Beaver ponds can also provide refuges for fish during low-flow and cold conditions, as well as deeper water to enable fish to better evade avian predators.



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Amphibians and Reptiles

Beaver ponds with their abundant invertebrate populations and vegetation provide excellent habitat for amphibians such as frogs, toads and newts. Reptile abundance and diversity have been found to be significantly higher at beaver ponds compared with unimpounded streams. Beaver ponds provide excellent hunting opportunity for grass snakes, which can also use beaver lodges as nesting habitat. A more open riparian canopy could also provide more basking opportunities for reptile species.

Birds and Mammals

The abundance and diversity of birds and mammals are higher in beaver occupied sites than in unoccupied sites. Beaver ponds produce an abundance of invertebrates, amphibians and fish providing food for many species such as ducks, kingfisher, mergansers, water shrews and otter. The pond habitats are also excellent for water vole. Changes to vegetation abundance, structure and diversity provide increased opportunities for nesting, roosting and foraging birds and mammals as well as greater protection from predators for ground-nesting birds. Increased abundance of dead wood provides cover, food and nest sites for small mammals including bats as well as birds such as woodpeckers, owls, nuthatch and tree creeper. Water vole, otter and pine marten can also use beaver lodges as nesting and resting sites. Browsing and grazing mammals can also benefit from the creation of beaver coppice/pasture.



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Invasive species

Beavers are not predicted to have a significant effect on the dispersal of any animal at a Wales-wide level. As beavers tend not to move readily between catchments they are unlikely to be significant vectors for invasive plant species. Natural and human processes (e.g. wildlife movements, floods, cattle grazing) can already help spread invasive species, so any additional contribution made by beavers is likely to be negligible. Beaver foraging may also help to control invasive plants such as Japanese knotweed and Himalayan balsam.

3.3 Land-use

Agriculture and Forestry

Beavers do not pose any physical threat to livestock and are not a significant vector for disease transmission. Beavers can feed on arable crops but actual crop loss is usually financially insignificant and preventative action can be undertaken, such as the use of mesh fencing and standard low-voltage electric fencing.



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Bankside burrows may collapse if heavy machinery is driven over them but usually extend no more than 5m in from the water body.

Beavers use broadleaved trees almost exclusively and tend neither to eat nor use coniferous trees so most Welsh commercial forests would not be significantly affected by beavers. Where broadleaved trees exist close to beaver occupied territory most activity occurs within 20m of the riverbank, with most of this being concentrated within the first 5-10m. Where necessary, plantations and individual trees can be protected

by simple methods such as fencing, the application of sand-paint, or the placement of wire mesh around tree trunks.

Dams can cause localised flooding to farmland, forestry, roads, buildings and other sensitive features, and can cause localised death of trees. Low cost methods to limit or negate localised flooding are well developed and simple to employ, including dam removal. Trapping and removal of beavers is also an option.

In the longer-term, beavers could become a useful sustainable option for the management of riparian woodland.

Human infrastructure

Beavers can cause problems for certain human infrastructure. Beavers could potentially fell trees over roads or railways and their activities could block culverts and drains and affect embankments, canals and flood defences. Vulnerable areas occur at specific points where beaver territories and infrastructure intersect and pre-emptive work might be required to prevent adverse impacts. Preventative works usually involve low-tech, low cost solutions such as tree protection or felling, fencing, or the building of wire and post structures to prevent beaver access. Under normal conditions flood barriers closer than 10m from watercourses can be vulnerable to burrowing. Costs of flood barrier protection can be substantial so an initial reintroduction of beavers should avoid catchments with significant flood defence embankments unless resources for protection are available. Work to maintain human infrastructure should normally be able to proceed without licensing.

Landowners and Recreation

Landowners need not be significantly affected by beaver presence on stretches of river passing through their landholdings. In almost all circumstances dams could be removed or modified if they cause problems. Beaver lodges and burrows do not usually cause significant problems but remedial action can be carried out under licence. Amenity trees can be protected with low-tech solutions as described above. Based on the European experience, the risk of liability issues resulting from beaver activity is



low and appears to be less than currently exist with windblown or flood-damaged trees.

Recreational activities such as rambling, fishing and canoeing should not be adversely affected by beavers. It would not usually be necessary to restrict access to beaver territories and beavers are able to live in close proximity to humans. Beavers can offer great potential for wildlife watching activities during the summer months.

3.4 Social and Economic Impacts

A reintroduction of beavers to Wales could have significant economic and social benefits, especially to rural communities. Wildlife tourism is increasingly popular and there are many examples of iconic species, such as white-tailed eagle, osprey and red kite, being a major draw for visitors. Beavers can be an important attraction for wildlife watching in mainland Europe and organised tours are run in some countries. As beavers are most active at dawn and dusk visitors tend to make overnight stays to see them, which provides valuable earnings potential for local hotels, guesthouses and restaurants as well as transport, retail and crafts.



The ecosystem services undertaken by beavers are significant. As well as managing wetland habitats beavers help to improve and manage water resources and increase biodiversity, including greater fish abundance, which can boost fishing opportunities. A study by the University of Oxford WildCRU Consultancy suggests that the benefits of beavers outweigh the costs of their management by 100:1.

Evidence suggests that there are high levels of support among the general public for a beaver reintroduction to Great Britain, and a Welsh survey undertaken in 2004 study revealed that 71.7% of the public were in favour of beaver reintroduction.

The Welsh Beaver Assessment Initiative study and future consultation should help further inform the public about beaver reintroduction.

3.5 Disease

With correct quarantine and veterinary procedures beavers are not considered to pose any significant disease risk to humans, livestock or fish. In order to ensure that imported beavers would not introduce diseases, any beavers released into Wales should undergo a rigorous health screening process involving thorough veterinary examination, removing any danger of importing any health risks.



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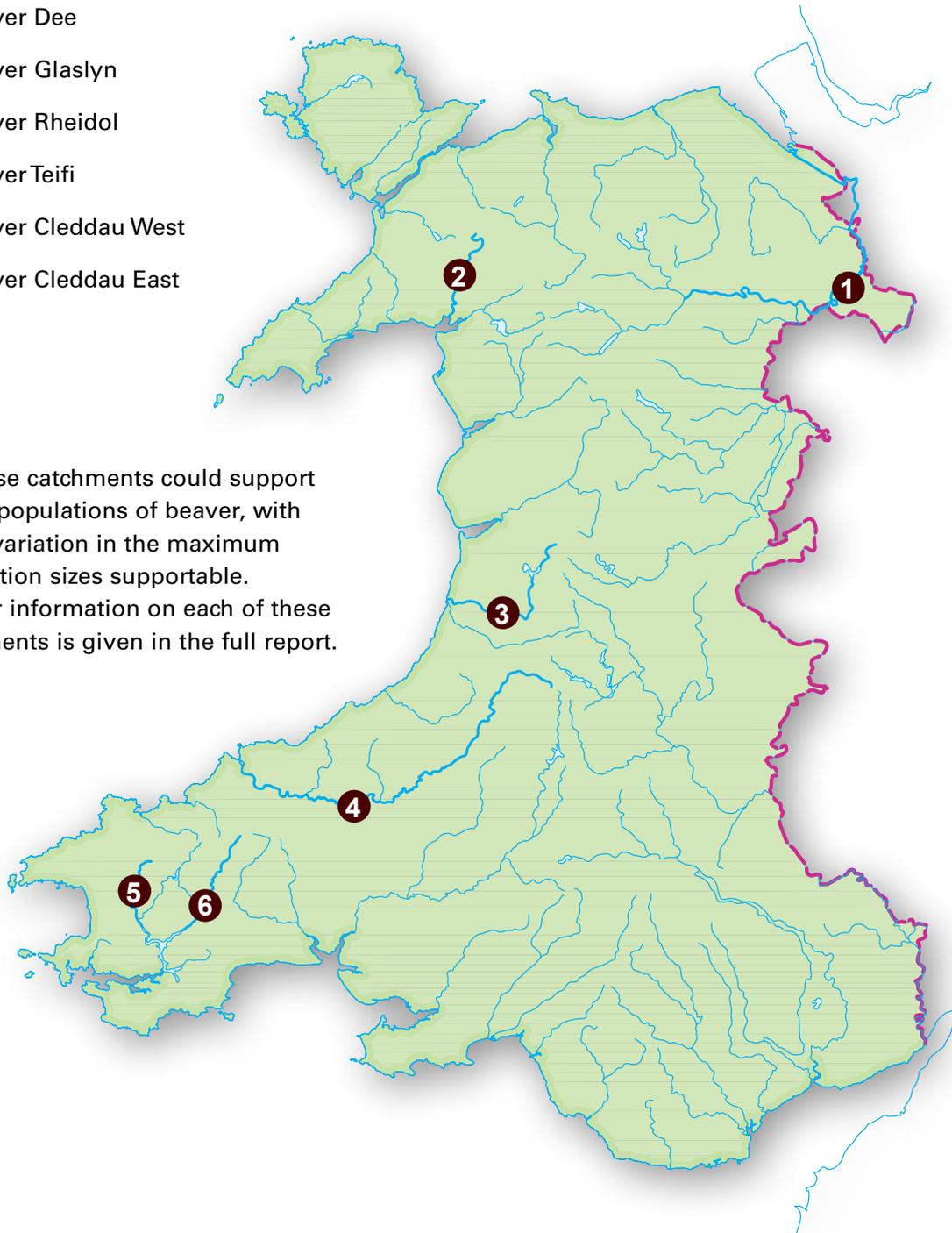


4 Habitat surveys

The ecological surveys undertaken have determined that there is abundant habitat within Wales suitable for beavers. It has also been determined that a beaver reintroduction to Wales is ecologically feasible. Assessments of potential beaver habitat were undertaken including a GIS-based desktop survey and an initial ground-truth survey of all potentially suitable catchments in Wales. As a result of these initial surveys, six river catchments were selected for further study as potential sites for a pilot beaver reintroduction.

- 1 River Dee
- 2 River Glaslyn
- 3 River Rheidol
- 4 River Teifi
- 5 River Cleddau West
- 6 River Cleddau East

All these catchments could support viable populations of beaver, with some variation in the maximum population sizes supportable. Further information on each of these catchments is given in the full report.



5 Stakeholder consultation and fact-finding

A wide range of concerns, ideas and opinions on beaver reintroduction have been gathered from key stakeholders. Responses have been used to inform the issues covered in the report summarized here. There was broad recognition of the benefits that beavers can offer but some groups expressed strong reservations relating to the potential for undesirable impacts of beavers to affect certain human activities.

A fact-finding visit to Bavaria was also undertaken. As well as meetings with representatives from the farming, flood defence, and forestry sectors, the visit enabled assessment of the effects beavers may have, and how beaver impact management is undertaken. Meetings also took place with

members of the network of local volunteer beaver consultants, who address problems that some landowners may occasionally have with beavers.

Fact-finding visits to Norway (Norwegian Institute for Nature Research) and Scotland (Scottish Beaver Trial) have also been undertaken.



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6 Legal status

Beavers are currently listed in the EU Habitats Directive but as they are not an established wild species in the UK they are not listed in the Conservation of Habitats and Species Regulations 2010 (commonly referred to as the Habitats Regulations), which transposes the Habitats Directive into UK law. A release of beavers to the wild would require licensing by the Welsh Government under the Wildlife and Countryside Act 1981 and adherence to the Animal Welfare Act 2006.



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Protection under the Habitats Regulations would render it illegal to deliberately kill, injure or take beavers, or to damage or destroy their breeding and resting places, unless appropriately licensed by the Welsh Government (where there is no reasonable alternative and where the Favourable Conservation Status of the species is not adversely affected). Such licenses can be issued to safeguard property, including crops and trees. Beaver dams would not usually require legal protection or the licensing of modification/removal, but work on some dams during the breeding season might require a licence.

7 Reintroduction and management

A reintroduction of beavers to Wales would follow IUCN/JNCC guidelines. At least 20 breeding pairs of beavers, possibly involving the use of artificial lodges, is recommended to help ensure success. All beavers released should undergo a thorough health examination to ensure that they are not carrying undesirable diseases.

As a minimum, the post-release monitoring of beaver activities is advised. This would include low-intensity, non-intrusive monitoring of the creation of beaver lodges, territories and dams, as well as beaver foraging activities on a catchment so that the progress of beaver colonisation can be followed.

It is likely that there would be some occasional, localised conflicts with certain human activities and infrastructure, such as the creation of dams in inappropriate areas, potential for crop damage, unwanted felling of trees and the blocking of culverts. Management would need to be undertaken to prevent and address such incidents,

including lethal control of beavers if necessary. The formation of a network of trained volunteers to undertake this work is recommended, overseen by a Network Management Group. A similar system has been proven to work well in Bavaria.

The costs of reintroducing beavers to the wild can be modest. A managed beaver release with 5 years of post-release management and funding for an exit strategy could be undertaken for less than £400,000.



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8 Funding for beaver reintroduction in Wales

The beaver has sufficient iconic significance to enable the generation of new funding so reintroduction need not divert resources away from existing conservation priorities. The range of funders who might support beaver re-establishment in Wales include:

- European Union
- Welsh Government
- Independent funding bodies
- Companies
- Voluntary sector conservation bodies
- Appeals to the general public and individual philanthropists



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9 Future action

In order to proceed with a beaver reintroduction to Wales a number of further actions would be required including: agreement from the Welsh Government for a beaver reintroduction conditional on the successful selection of a release

site (following further study and consultation); clarification on legal issues; development of a fully costed reintroduction and management plan; and the securing of appropriate funds.

10 Conclusion

Beaver reintroduction to Wales is ecologically feasible, with re-establishment and the management of impacts being possible at a relatively low financial cost. Beavers offer substantial benefits in terms of ecosystem services and biodiversity conservation, whilst there are social benefits in terms of stimulation of tourism as well as educational and recreational opportunities. Further consultation and exploration of potential local issues will be needed, but the breadth and depth of experience

of beaver reintroduction across Europe provides excellent evidence that impacts on land uses in Wales should be limited and manageable. Given these considerations there is a strong case for concluding that the reintroduction of beavers to Wales is desirable.



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