WHITEPAPER

THE BEAVER TENANCY ASSOCIATION

An innovative way of delivering Natural Flood Management solutions on UK rivers by engaging landowners in beaver recovery

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ABSTRACT

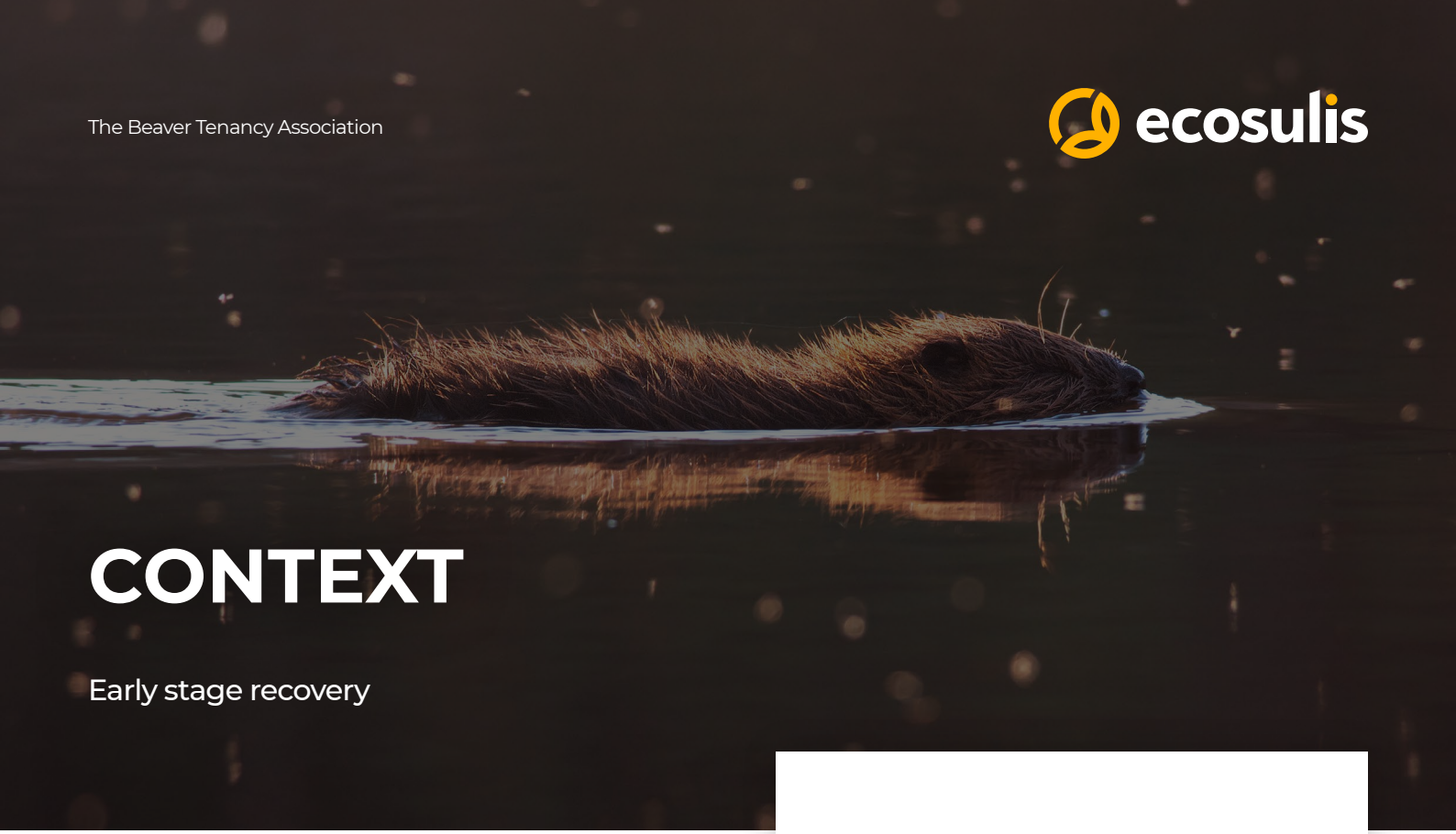
Today, Natural Flood Management (NFM) is increasingly recognised as a viable and in many cases preferable alternative to traditional methods of flood risk management. This white paper proposes a new type of conservation vehicle – the Beaver Tenancy Association – as a means of faciliating the delivery of NFM solutions at scale along UK waterways, based on an innovative payment mechanism for landowners who host beavers on their land.

Coexistence challenges, both perceived and real, mean many UK landowners view the presence of beavers on their land unfavourably. Employing a user-friendly, practical, blockchain-verified system, the Beaver Tenancy Association incentivises beaver landlordship for the very first time.

It does this by providing rental income and support, based on a sustainable financial model that integrates payments for ecosystem services (prinicipally relating to NFM) and public fundraising.

It takes account of the UK's changing policy environment and the realisation of the "public money for public goods" concept.

In our post-Covid-19, post-Brexit world, the Beaver Tenancy Association will generate added value for those involved in flood management, landowners and wider society, and enhance the UK's wild nature. Furthermore, development of the underlying concept has the potential to generate landowner buy-in for the landscape-scale recovery of keystone species, strengthen trust and transparency in the realisation of nature recovery, maximise the impact of conservation donations and investments, and provide income to local conservation managers.



CONTEXT

Early stage recovery

Beavers are native to the UK and were once widespread across England, Wales and Scotland. Hunted to extinction around 400 years ago, they recently returned to British rivers. While some have been reintroduced, others are thought to have been accidentally or illegally released. There are now estimated to be more than 400 beavers living along UK waterways.

While beaver reintroduction has already proven popular across Europe, the UK has adopted a cautious approach. Several informal reintroductions have occurred and a small number of trials have demonstrated significant ecological benefits. Ecosulis has been involved with beaver-related biodiversity assessment work at multiple beaver reintroduction sites across England and Wales.

The coexistence challenge

If UK wildlife lovers are delighted by the beaver's recent resurgence, many farmers and landowners are less enamoured by the animal's return. They claim beavers cause damage to agricultural land by undermining riverbanks, impeding drainage and flooding cropland, for which they bear the cost.

Despite the fact that Scottish beavers have been legally protected since May 2019, many continue to be killed. Pictures of beaver corpses attract media attention, which in turn stokes animal welfare sentiments and amplifies calls for enhanced protection. This leads to feelings of injustice and disenfranchisement among landowners, generating a negative feedback loop that serves neither wildlife nor people.

Compensation schemes for wildlife damage have been tried in many countries; these have met with varying levels of success, in part due to their bureaucratic nature and administrative cost. At present there is no compensation for or insurance against wildlife damage in the UK, with state nature protection institutions lacking the tools and flexibility to fully support nature recovery.

BEAVERS, CLIMATE CHANGE & NATURAL FLOOD MANAGEMENT

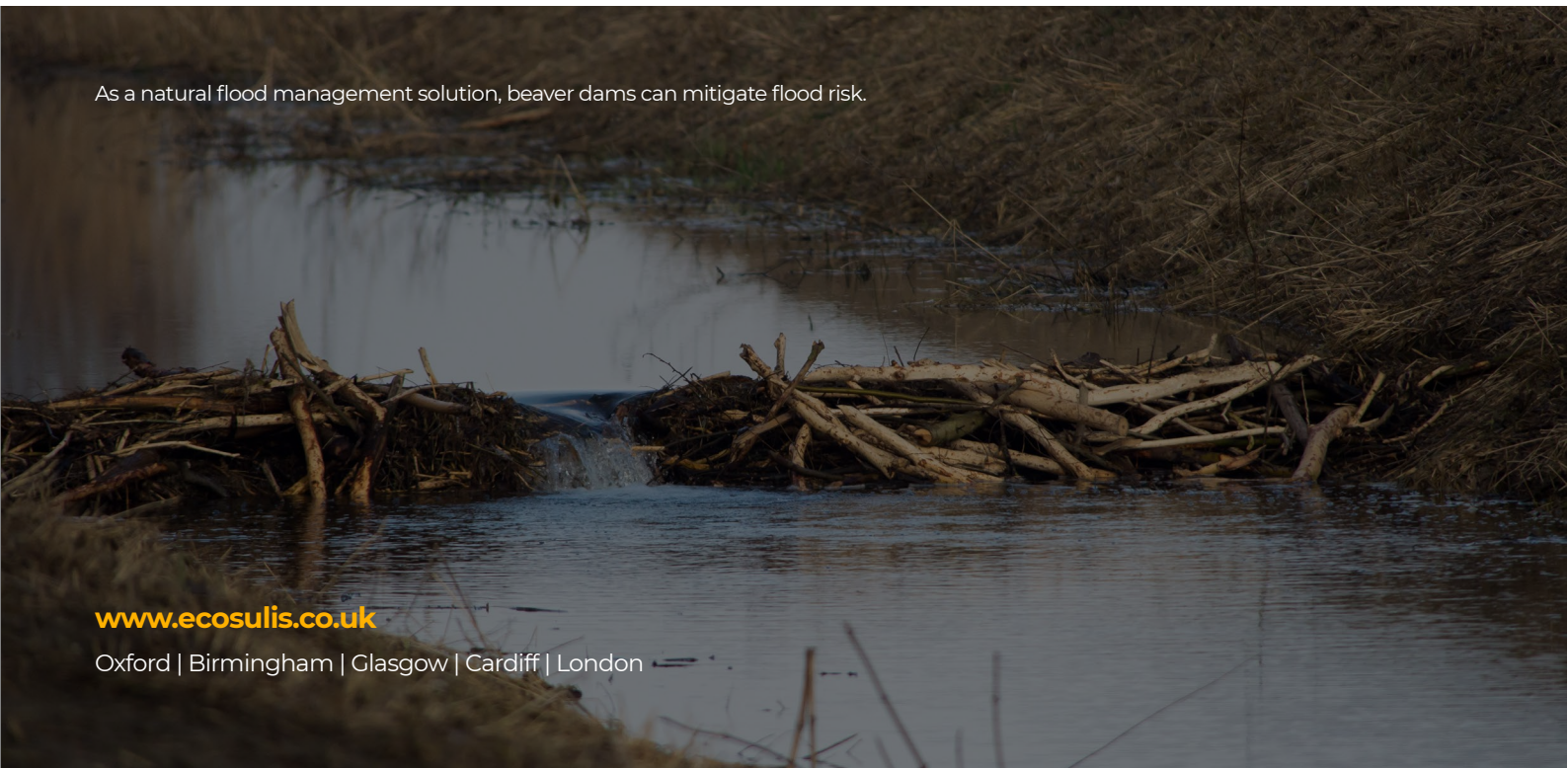
Healthy river catchments store water in the landscape naturally – both in elevated areas and on floodplains – reducing both the volume and speed of water flowing downstream.

In the UK, however, a long history of intervention by man means very few of our modern river landscapes retain their natural form. We have lost water storage in wetlands, created hard, impermeable surfaces that accelerate runoff, and physically changed our river channels so water moves through them far more quickly than would ordinarily be the case.

In periods of heavy rainfall, this makes long stretches of many British rivers far more susceptible to flooding. This has devastating consequences for the people that live and work beside them. Going forwards, the impact of climate change – manifested by warmer, wetter winters and more extreme rainfall events in summer – will only serve to exacerbate this problem.

Natural Flood Management is increasingly being looked at as an alternative to traditional methods of flood risk management. An approach which aims to protect, restore and emulate the natural function of catchments. One avenue of research highlighted by this work is understanding how beavers can be used to mitigate flood risk, with trials now ongoing at many sites across the UK.

Research carried out during a recently concluded five-year trial on the River Otter in Devon found that beaver dams can significantly slow the flow of water downstream and reduce peak flows after heavy rain. This has the effect of protecting land from flooding as well as retaining water in streams during droughts. Researchers also found that beaver dams prevent sediment and inorganic fertilisers being washed from farmland, improving water quality and enabling fresh water system to rebound.



As a natural flood management solution, beaver dams can mitigate flood risk.

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> There is now a growing awareness that beavers should be an integral part of theUK's green recovery.

A CHANGING POLICY LANDSCAPE

Today we stand at a unique and critical juncture in the history of government support for farming and environmental land management. The culmination of a number of political, economic and ideological trends mean our land economy is now at a point of transition. Departure from the EU and its Common Agricultural Policy (CAP), growing consensus around the need to decrease our reliance on food imports and bolster secure, sustainable domestic production, a strong and growing commitment to address the climate and nature emergencies, and a growing awareness of the value (and potential value) of services provided by wild nature, are now driving significant changes in how we think about, use and manage our land-based assets.

The UK government has already responded to these trends with a sweeping range of policy proposals and reforms which, in combination, aim to create a stronger, greener and more sustainable rural economy. The UK government's 25 Year Environment Plan opened with the political commitment to "leave nature in a better state than we found it" and support nature recovery, while Westminster has responded to the UK's withdrawal from the CAP with a new Agriculture Bill that will transform the UK's subsidy-based land economy into one based on the principle of "public payments for public goods". Now is the time to realise this ambition.

A ROLE FOR BEAVERS

There is now a growing awareness that beavers should be an integral part of the UK's green recovery (made even more essential by the Covid-19 pandemic) and included in the UK government's post-Brexit agricultural policy, which will reward farmers for delivering public goods. Goods which, in the case of the beaver, not only include lower flood and drought risk (see boxout on beavers, climate change and Natural Flood Management on page 4), but higher water quality, enhanced biodiversity and sequestered carbon too.

Traditional agricultural, development and flood management practices – which typically rely on humans cutting, digging and building – are proving increasingly unable to cope with the pressures of a changing climate, and in many cases are exacerbating problems. We need a more regenerative, nature-based approach to land and water management that will rebuild resilience for the future – an approach in which beavers could play a key role, if there was a viable way of accelerating their return to the UK's rivers.

An infographic illustrating the BTA concept.

THE BEAVER TENANCY ASSOCIATION

Empowering landowners

The conflict between beavers and landowners raises the question – is there a better way to facilitate co-existence, and in doing so, more effectively harness the potential value that beavers can generate? Taking account of the changing political landscape and the concept of public payment for public goods, our innovative solution – the Beaver Tenancy Association (BTA) – demonstrates that this is both possible and far more preferable to the status quo.

At its heart, the BTA system addresses the need of beavers and other ecosystem engineers for access to land resources. Conservation policy has traditionally asked, expected and required landowners to provide this access, often generating feelings of resentment and antagonism towards both wildlife and conservation groups. The BTA neatly circumvents this issue and changes the narrative by offering landowners – for the first time ever – the opportunity to lease land to wildlife, much like tenant farmers lease land from a landowner.

How will the BTA system work?

Like agricultural tenancies, the BTA offers landowners the opportunity to host one or more beavers on a well-defined area of land under a fixed-term (minimum 36 months) tenancy agreement. For this the landowner receives a reasonable "rent", which is calculated according to the amount and type of land in question, market forces, and the estimated value of ecosystem services generated by the beaver tenancy (principally relating to natural flood management). The BTA system is based on the following key elements.

> **"The BTA changes the narrative by offering landowners – for the first time ever – the opportunity to lease land to wildlife."**

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Location & finance

- An integrated catchment model indicating where resident beavers could most effectively slow river flow and retain water, and thereby aid with NFM (such models are already widely available for many UK rivers)
- A rent model based on agricultural land rents and the estimated value of NFM (and potentially other ecosystem) services
- A blended finance model integrating public natural flood management payments and public "adopt a beaver family" subscriptions to cover the operational costs of the BTA

Verification

A blockchain-based core architecture with verified identies for landlords, beavers and suppliers, and smart "tenancy" and service contracts.

An exchange interface

A user-friendly, web-based platform integrating the above and linking landowners with BTA representatives and service providers.

Implementation, support & monitoring

A network of professional service providers and volunteers, responsible for:

- The translocation, release (and, if necessary) removal of beavers
- The provision of advice and support to landowners
- Impact monitoring
- Management of the BTA system

WHAT WILL THE RESPONSIBILITIES OF THE BTA BE?

In providing people and organisations with a mechanism to finance, manage and scale up the resettlement of beavers in UK river systems, the BTA will have a number of key responsibilities:

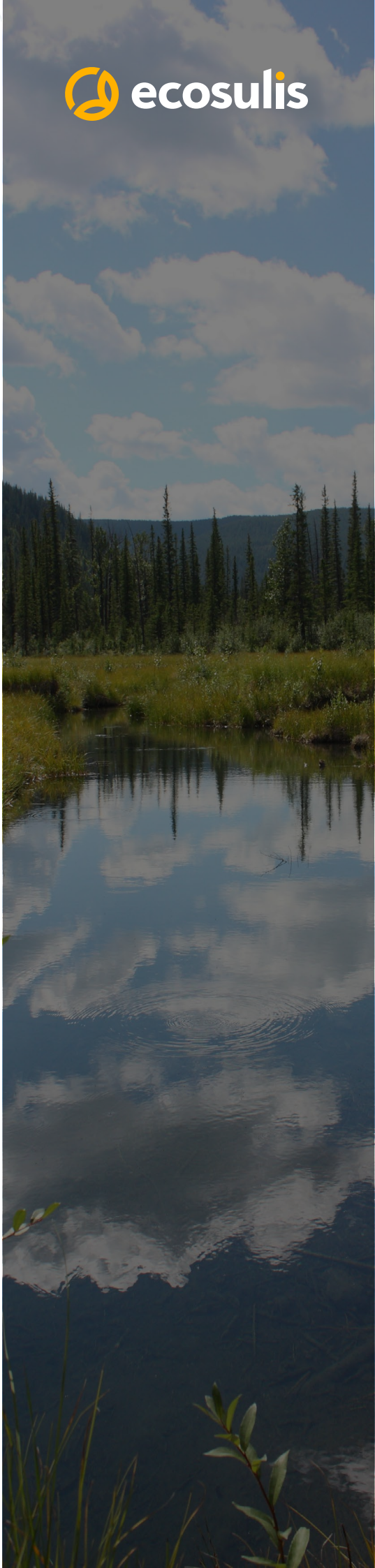
- Securing and managing tenancies on behalf of beavers
- Calculating, paying and guaranteeing fair rents to landowners for tenancies
- Proactively supporting landlords with their tenants (the beavers), including the handling of any beaver damage-related issues
- Developing and maintaining a network of professional and volunteer service providers
- Measuring and aggregating the natural capital gains of beaver tenancy areas, and generating revenues from these gains and associated ecosystem services
- Reporting to relevant authorities on the location of beavers
- Ensuring the welfare of beavers
- Using technology to minimise costs and maximise trust for all involved

HOW WILL THE BTA GENERATE REVENUE?

The BTA will need to generate sufficient revenue to (at minimum) cover the costs of land rental and the provision of associated services. As such, the financial model of the BTA will include the following:

- Through the tenancy contract the BTA will acquire the rights to beavergenerated ecosystem services (principally relating to Natural Flood Management). The BTA can aggregate and sell these services to emerging (and soon to be regulated) biodiversity offset markets, water companies and agencies responsible for flood mitigation.
- The BTA represents a new take on the popular "adopt an animal" fundraising approach: it will provide animal lovers with the opportunity to cover part, or all, of the rent for a beaver family.
- In the longer term the BTA will explore the use of blockchain-generated, fixed value Wildcoin tokens as a way of rewarding citizens for volunteer contributions to the system

In terms of public fundraising, long term buy-in will be strenthened by the ability of citizens to financially support a specific beaver tenancy contract, and the fact that donors will receive curated information and imagery enabling them to follow the story of "their" beavers.



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> As an ‘under the hood’ technology in the BTA system, (blockchain) will provide an added level of trust and enhance outcomes.

WHY INTEGRATE THE BLOCKCHAIN?

At Ecosulis we believe that nature conservation could (and should) benefit hugely from the application of technology, entrepreneurship and innovation.

Blockchain can be thought of as a “keystone” technology around which new systems of nature conservation can be assembled – systems that embed new levels of trust, transparency, efficiency, participation and impact. In real terms, the use of blockchain has the potential to not only minimise the costs associated with transferring funds, but to verify what funds have been spent where and with what impacts. As an “under the hood” technology in the BTA system, it will provide an added level of trust and enhance outcomes.

WHAT HAPPENS IF HOSTED BEAVERS MOVE?

Beavers are typically sedentary animals with well-defined territories. Nevertheless, the beavers (and their offspring) involved in tenancy agreements may, for various reasons, choose to relocate outside the tenancy area. To accommodate this, the tenancy contract will include a notice period on either side (that respects beaver ecology), as well as a deposit reflecting the cost of returning the tenancy area to farmable condition after the beavers have left.

Should a beaver settle on land owned by a landowner not involved in the BTA system, that landowner has three choices:

- To leave the animals in situ
- To apply to be a beaver landlord through the bta
- To ask the bta (or another competent body) to remove and relocate them

There are areas along rivers where beavers can and cannot live (e.g. areas with critical flood/river engineering). Once suitable sites for beaver habitation have been fully occupied in the UK (years from now), a fourth post-removal option might be to harvest the animals and (for example) use their pelts for the production of artisanal products. This would require a softening of UK public attitudes towards wildlife harvesting, which the BTA would promote.

DEVELOPMENT ROADMAP

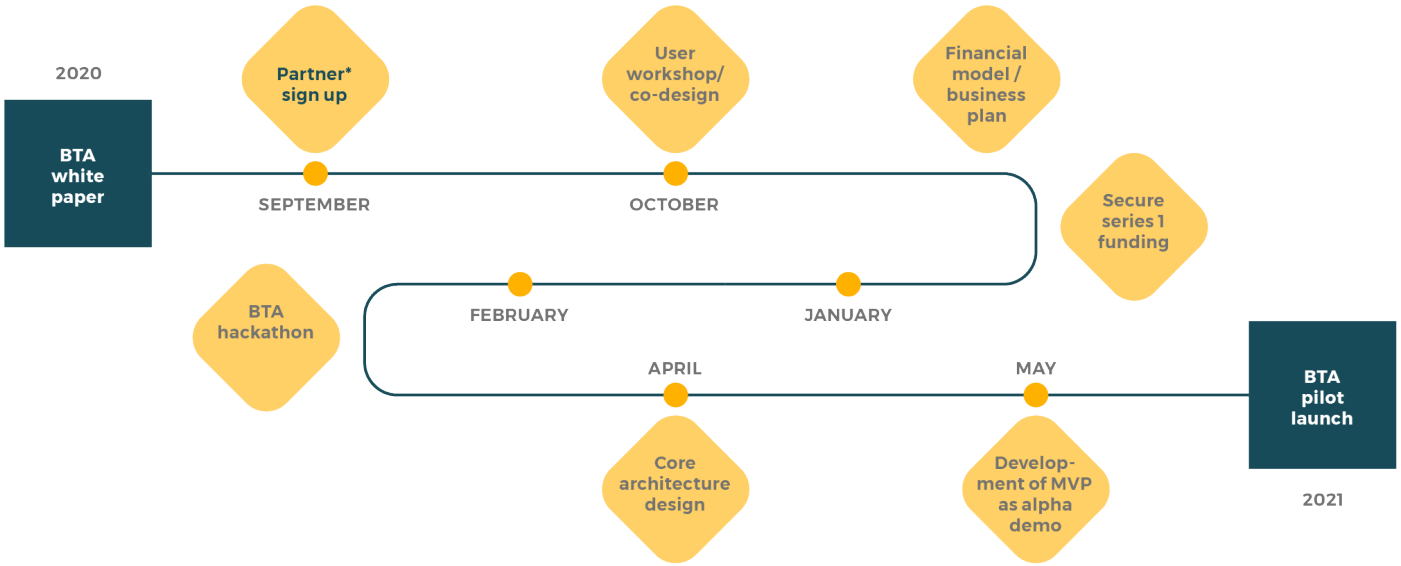
Ecosulis has already consulted with several individuals and organisations who are helping to refine the design of the BTA and contributing to business plan development.

Ecosulis is now seeking additional help in the areas below:

- Large landowners who have (or would like) populations of beavers on their land
- Financial expertise related to tenancy agreements
- Blockchain developers
- Platform developers e.g. python, C++
- Marketing specialists

A development roadmap can be found below.

If you would like to help us take the BTA concept further please contact Dr Paul Jepson (paul.jepson@ecosulis.co.uk, 07741 669 822).



MEET THE TEAM

Main development team

DR PAUL JEPSON

(Ecosulis Nature Recovery Lead), originated the concept of the BTA, drawing on his applied research at the intersection of nature recovery policy, technology and finance in his recent roles as course director of Oxford University's MSc Biodiversity, Conservation & Management and Senior Research Fellow at the Smith School of Enterprises and Environment.

CAIN BLYTHE

(Ecosulis Managing Director) is an experienced ecologist. Alongside his expertise in commerce and enterprise, he has a long-standing interest in the application of blockchain technology.

DANIEL ALLEN

(Ecosulis Communications Manager) is an award-winning journalist, photographer and communications specialist whose articles and images have appeared in more than 60 publications across the globe. He specialises in creating insightful copy and impactful stories around wild nature, conservation and rewilding.

Technical advisors

Ecosulis is particularly grateful to the following people for input and feedback on the development of the BTA concept.

DAVID BROWN (National Trust) is a senior ecologist who has lived and worked in Studland for over 20 years, and has an in-depth knowledge of the local ecology, stakeholders and the cultural and policy context of the case study area.

ALASTAIR GRAHAM (Geoger) is a systems designer with a background in physical geography, Earth observation and open source systems. Alastair combines scientific and technical knowledge with a commercial perspective.

PAUL ORSI and **RICH PIGOTT** (Sylva Foundation) are expert programmers and interface designers. They developed the myForest web platform (used by woodland owners in UK), a reverse auction platform (NatureBid) for the Environment Agency, and the user front-end on NatureTrade.

The **WWF PANDA LABS IMPACTIO** community, who as well as providing valuable advice and feedback, kindly voted the BTA concept second in the 2020 Innovate for Wildlife & People Challenge.

JESSICA & ZANE STARR at ECTLabs for advice on developing the blockchain core architecture.

See how beaver recovery benefits flood management and sustainable finance for landowners.

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