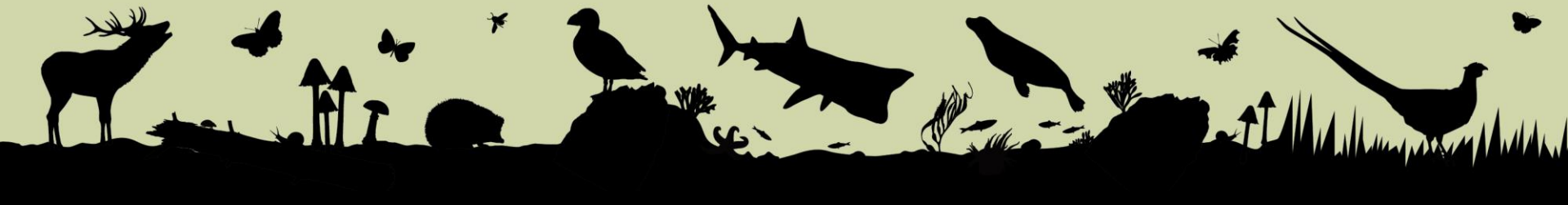
CIEEM Conference Sustainable Management of Freshwater Resources: Bringing Our Rivers Back to Life

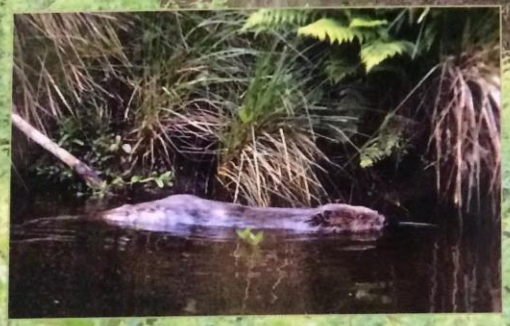
Beavers: the ultimate nature-based solution?

Dr Roisin Campbell-Palmer & Alicia Leow-Dyke

2nd February 2021



Beavers in Britain's Past



Bryony Coles

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WILDLIFE TRUSTS WALES

Britain

Scotland

- 1998 - Initial public consultation.
- 2009 - 2014 Scottish Beaver Trial.
- 2015 - Final report submitted to Scottish Government.
- 2016 - Scottish Government minded to allow beavers to stay.
- 2019 - Beavers granted legal protection.

England

- 2001 - Enclosed beaver project in Kent.
- 2008 - Feasibility studies completed.
- 2014 - Wild beavers discovered in Devon.
- 2015 - Licence granted to Devon Wildlife Trust.
- 2015 - 2020 River Otter Beaver Trial.
- 2020 – ROBT allowed to stay.

Wales

- 2005 - Interest starts.
- 2012 - Feasibility studies completed.
- 2014 – 2021 Release sites investigated, and proposals developed..


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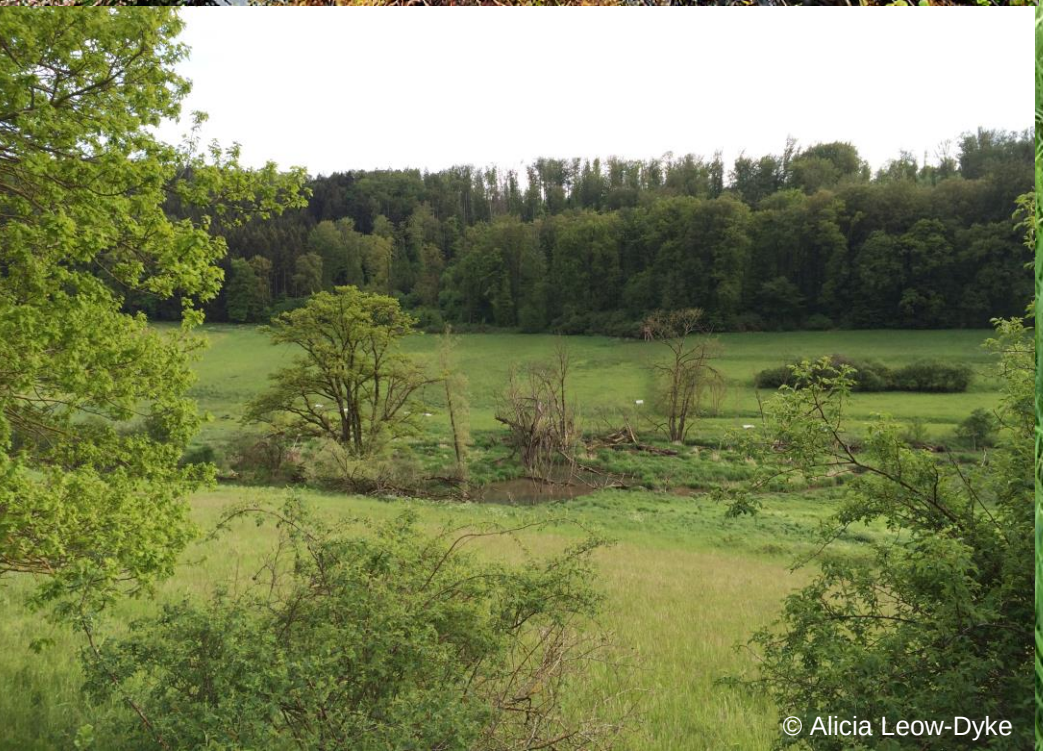
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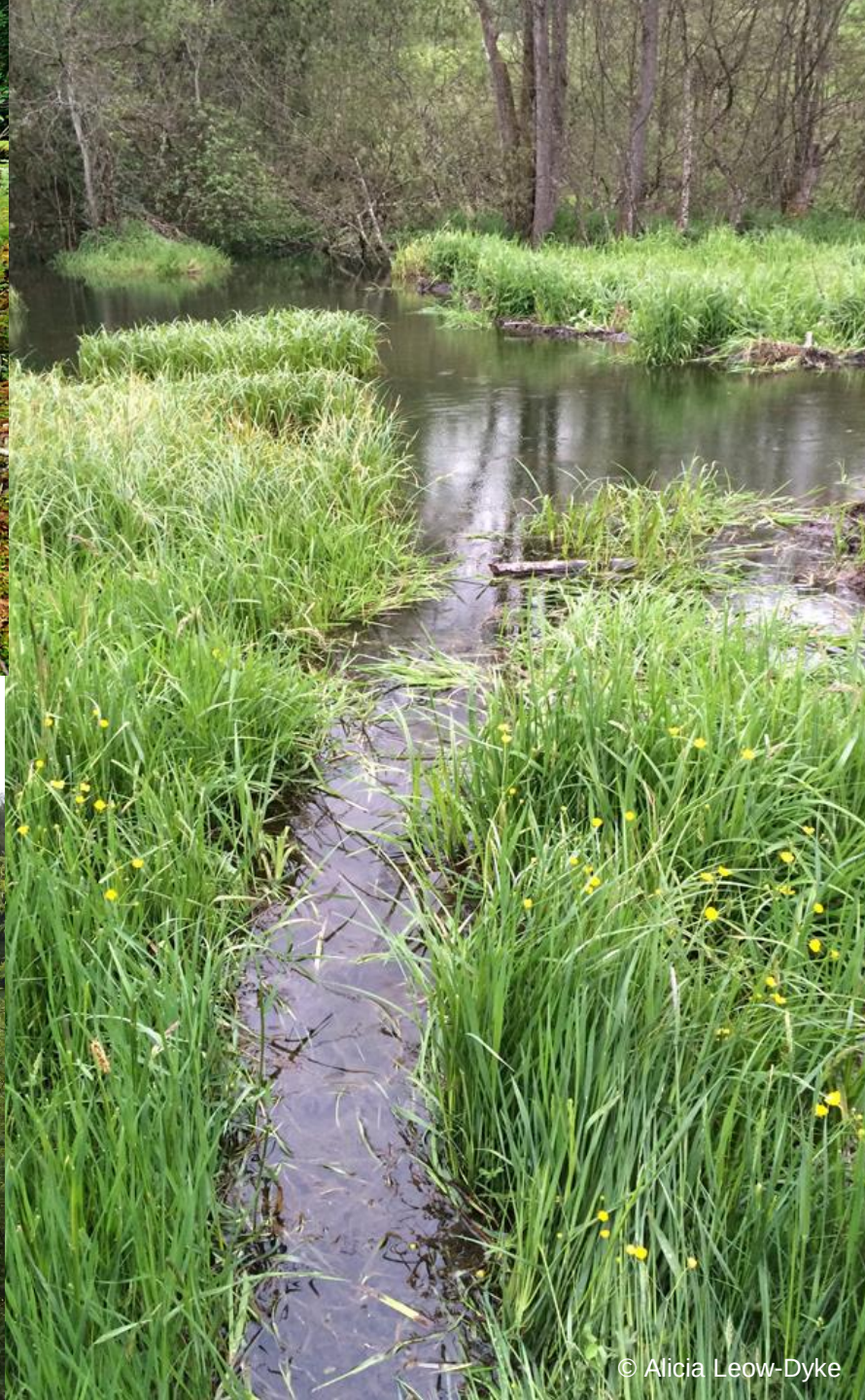
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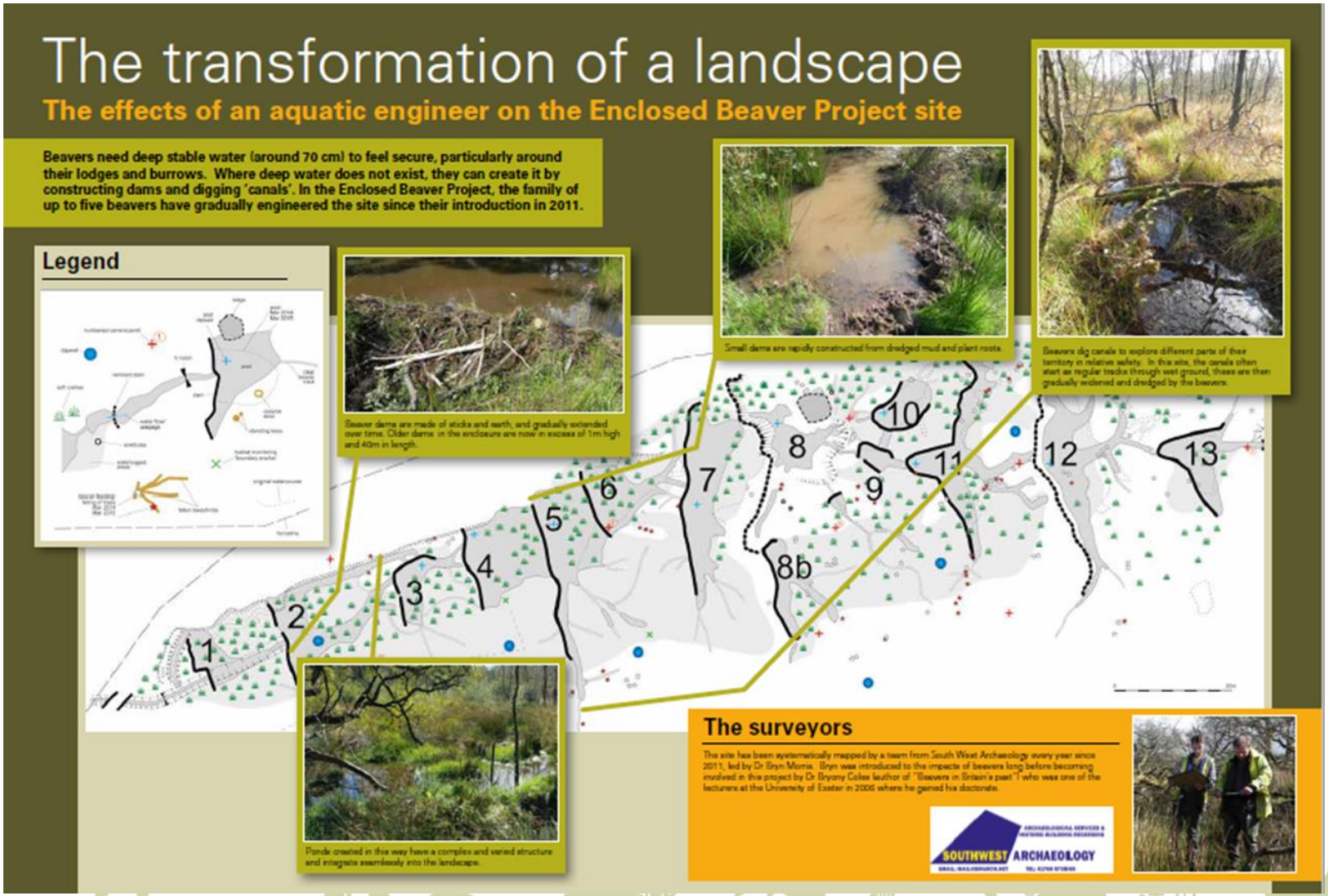
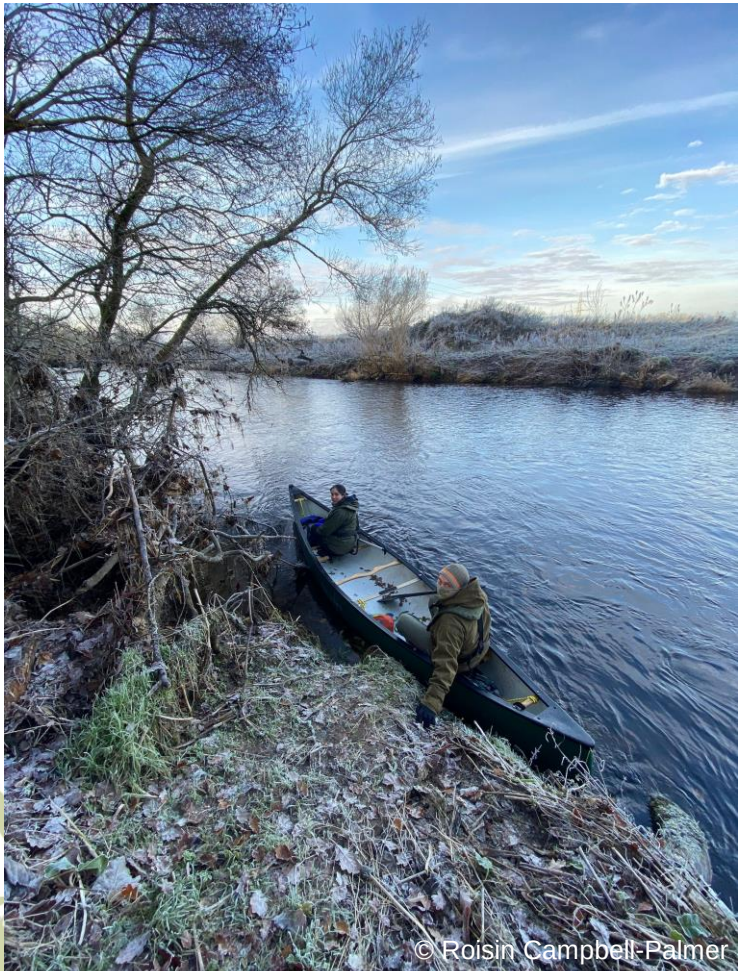
Research



Elliott, M., Blythe, C. Brazier, R.E. Burgess, P., King, S., Puttock, A., Turner, C. (2017). Beavers – Nature's Water Engineers. Devon Wildlife Trust.

Survey and Enhancement Techniques

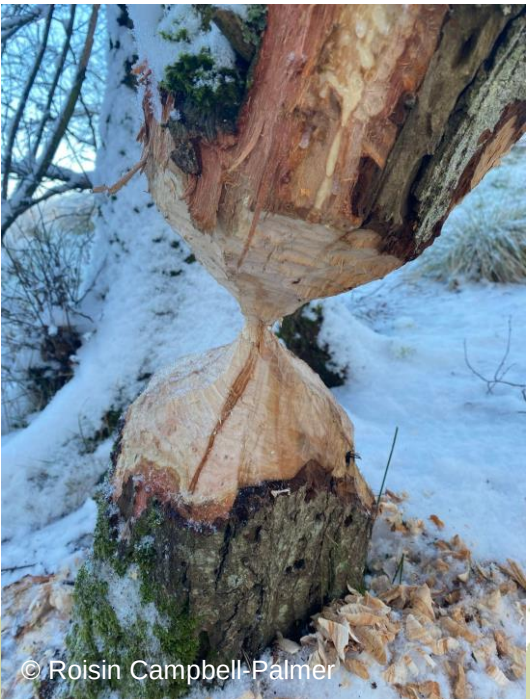
- Field survey techniques to estimate territory dynamics.

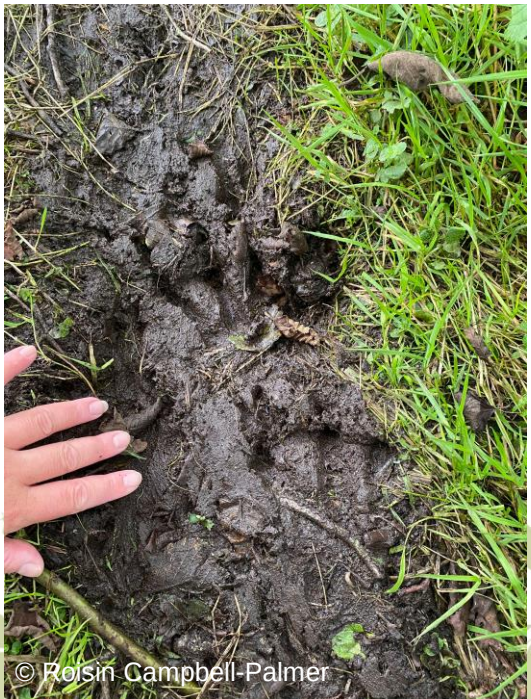


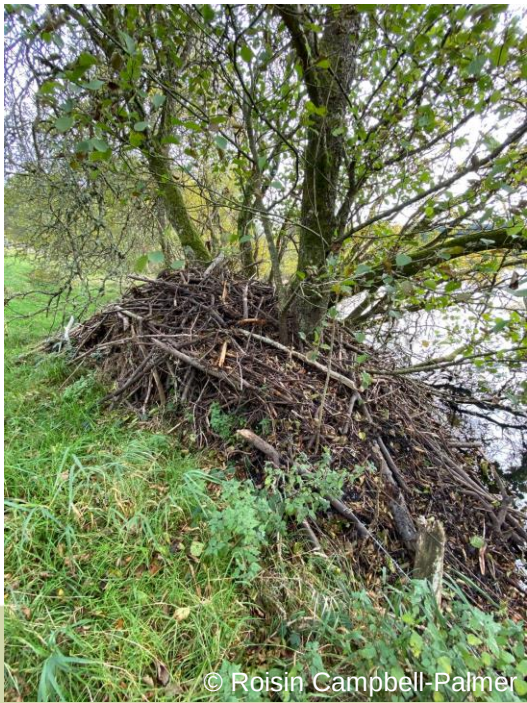
Survey and Enhancement Techniques

- Field survey techniques to estimate territory dynamics.

- Identify obvious and more subtle signs, age and assess in context of territories with seasonal patchy foraging and breeding status.







Survey and Enhancement Techniques

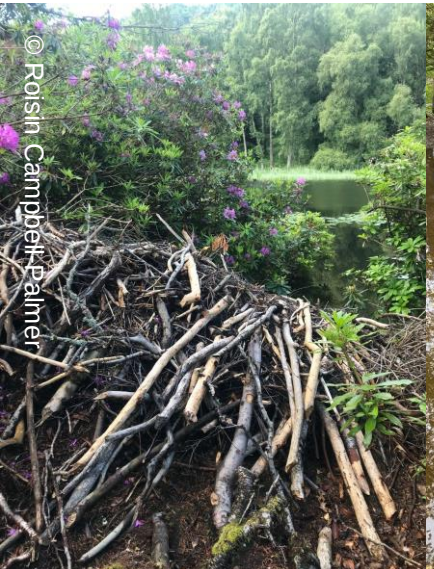
- Field survey techniques to estimate territory dynamics.

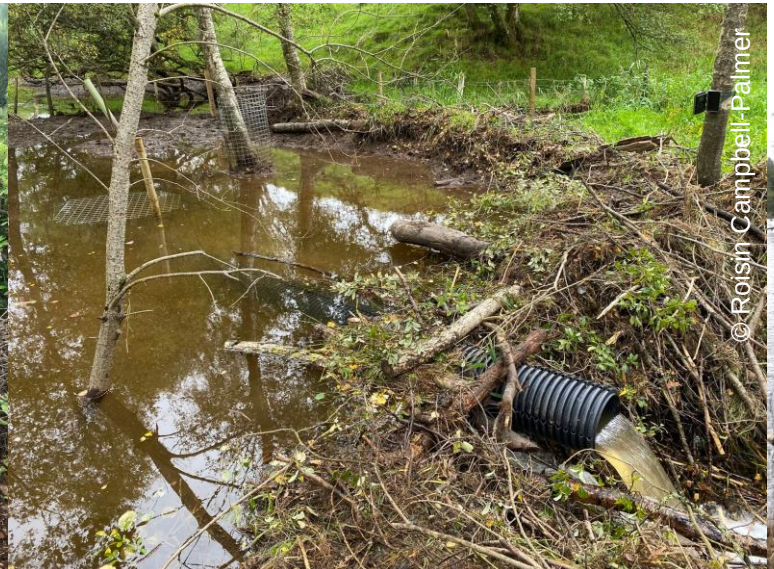
- Identify obvious and more subtle signs, age and assess in context of territories with seasonal patchy foraging and breeding status.

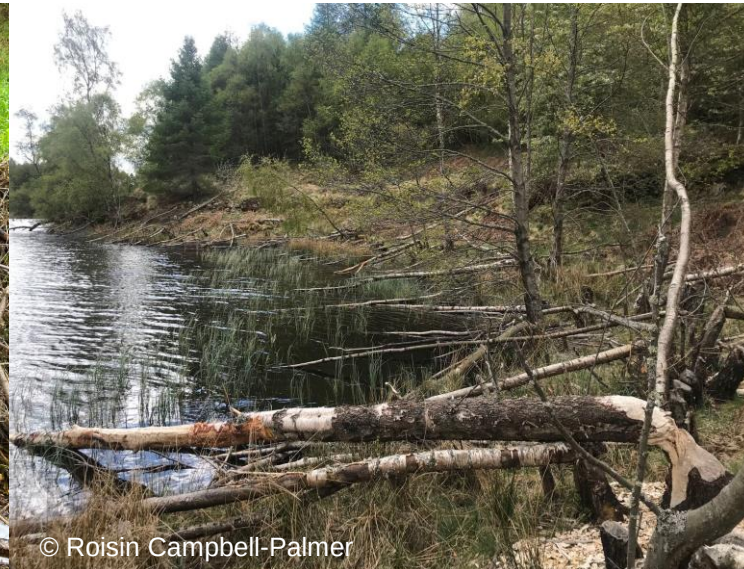
- Active territories more informative than individual count attempts – kernel density analysis along with validation of field sign type and age, in combination with habitat feature data.

Survey and Enhancement Techniques

- Habitat enhancement to facilitate beaver restoration and reduce conflicts have been identified;
    - naturalised riparian zones e.g. native coppicing species
    - stable deeper water zones e.g. ponds, backwaters
    - deep, friable banks open to manipulation
    - conflicting land-use pushed back.

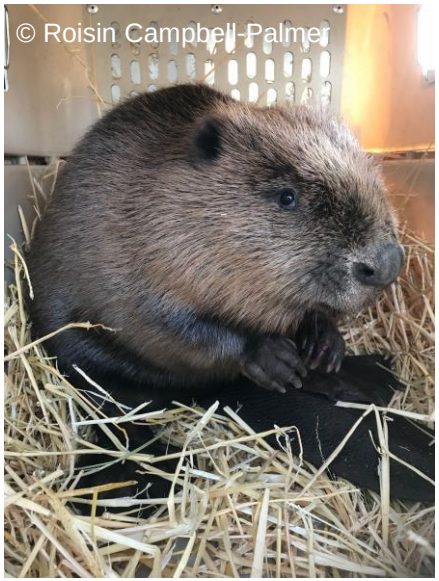


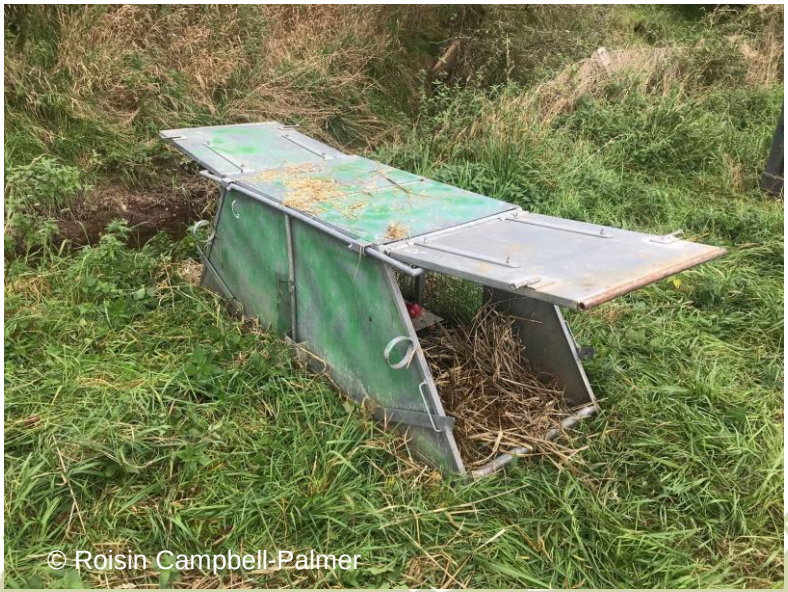


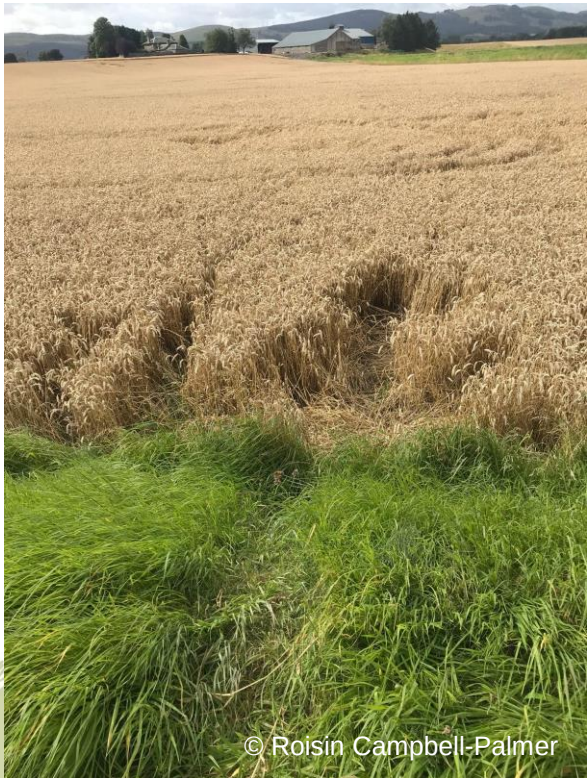


Translocations and release process

- Occurring under license predominantly from Scottish conflict zones to enclosed projects in England.





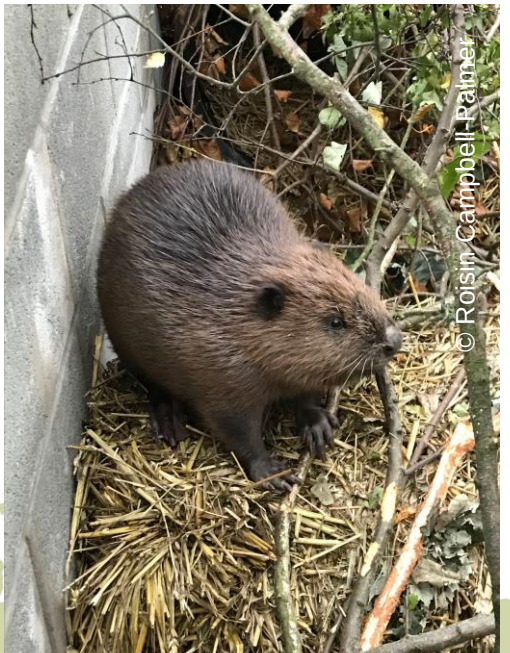


Translocations and release process

- Occurring under license predominantly from Scottish conflict zones to enclosed projects in England.

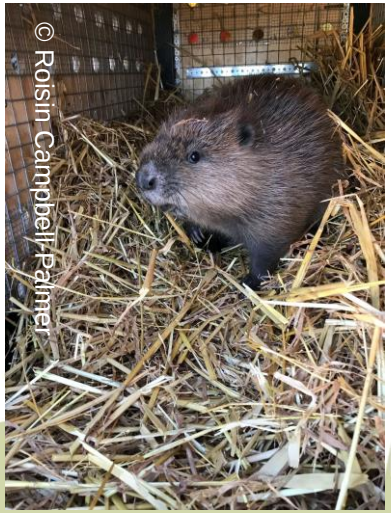
- Feasibility study and license application process.

- Captive animal management considerations strong public engagement and habitat restoration opportunities.



Translocations and release process

- Occurring under license predominantly from Scottish conflict zones to enclosed projects in England.
- Feasibility study and license application process.
- Captive animal management considerations strong public engagement and habitat restoration opportunities.
- Increasing scientific monitoring for beaver impacts in British context.
- Temporary step to future restoration?



New Research

- Long-term studies. Recent reviews in British context overall positive biodiversity and ecological services impacts but will come with a management cost (Brazier *et al.* 2020; Law *et al.* 2017; 2019; Stringer & Gaywood, 2018).

- Genetic and health screening analysis on wild British populations (Girling *et al.* 2019).

- Development of modelling to identify Beaver Forage Index and Beaver Dam Capacity – to allow estimation of dam density and identification of suitable habitat to inform future release areas and management policy (Graham *et al.* 2020).

- Fish research – complex topic and more needs to be undertaken within Britain. Strong perceptions requiring scientific quantification.

- Social perceptions – human wildlife conflict are significant issues in beaver restoration. Stakeholder engagement and recognition of societal opinions are key to develop acceptable management solutions and reduce conflicts (Auster *et al.*2020*).*

Legislation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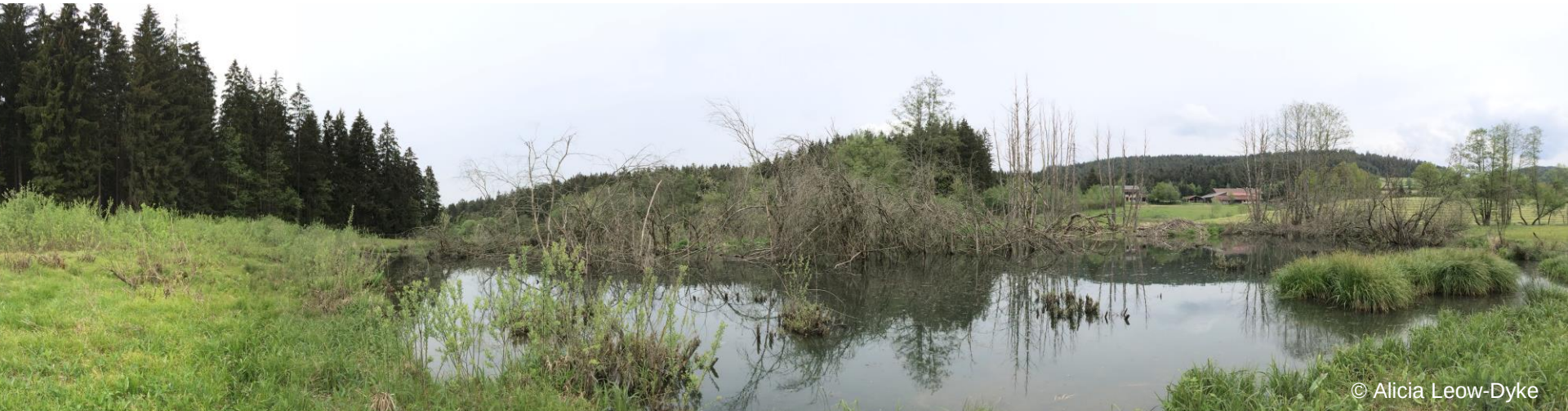
- Habitats Directive Annex II, IV & V and Bern Convention Annex III.
- Wildlife and Countryside Act 1981 (as amended) – Schedule 9 Part 1B; 'Animals No Longer Normally Present'.
- 1st May 2019 – Scottish Government granted legal protection for beavers, in accordance with the EU Habitats Directive (EPS status, licenced disturbance and lethal control).
- August 2020 – Beavers on the River Otter can remain and naturally disperse, but no changes to legal status to date.

Are beavers: the ultimate nature-based solution?

- Beavers are the quintessential ecosystem engineer.
- Create landscape changes and can help restore natural processes to the benefit of many species, including humans.
- There is a role for beavers within nature-based solution projects, but it will be site specific. Mitigation vital part.



The Future

- Recognition that beavers are a native species.
- Distinguish presence (field sign) from conflict and mitigation need.
- Beavers now existing in the wild – further restoration work addressing license application, population health and genetics still required.
- National restoration and management policy required.
- National biodiversity crisis. There is a place for beavers in Britain.

Further Reading

Ecological/Environmental

Brazier, R.E., Puttock, A., Graham, H. Auster, R.E., Davies, K.H. & Brown, C.M.L. (2020). Beaver: Nature's ecosystem engineers. *WIREs Water.* 494: 1-29.

Stringer, A.P. and Gaywood, M.J. (2016). The impacts of beavers *Castor* spp. On biodiversity and the ecological basis for their reintroduction to Scotland, UK. *Mammal Review.* 46: 270-283.

Health and Genetics

Girling, S.J., Naylor, A., Fraser, M. and Campbell-Palmer, R. (2019). Reintroducing beavers *Castor fiber* to Britain: a disease risk analysis. *Mammal Review*. 1-24.

Goodman, G., Girling, S., Pizzi, R., Rosell, F. and Campbell-Palmer, R. (2012). Establishment of a health surveillance program for the reintroduction of the Eurasian beaver (*Castor fiber*) into Scotland. *Journal of Wildlife Disease*. 48(4): 971-978.

Senn, H. *et al.* (2014). Nuclear and mitochondrial genetic structure in the Eurasian beaver (*Castor fiber*) – implications for future reintroductions. *Evolutionary Applications* 7: 645-662.

Further Reading

Surveying

Campbell, R., Puttock, A., Wilson, K.A., Leow-Dyke, A., Graham, H.A., Gaywood, M.J. & Brazier, R. (2020). Using field sign surveys to estimate spatial distribution and territory dynamics following reintroduction of the Eurasian beaver to British river catchments. River Research & Applications. 2020:1-15.

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Gaywood, M. *et al.* (2015). Beavers in Scotland: A report to the Scottish Government. Scottish Natural Heritage, Inverness.

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Brazier, R.E, Elliot, M., Andison, E., Auster, R.E., Bridgewater, S., Burgess, P., Chant, J., Graham, H., Knott, E., Puttock, A.K., Sansum, P., Vowles, A., (2020a). River Otter Beaver Trial: Science and Evidence Report.

Jones, A.C.L., Halley, D.J., Gow, D., Branscombe, J. and Aykroyd, T. (2012). Welsh Beaver Assessment Initiative Report: An Investigation into the feasibility of reintroducing European Beaver (*Castor fiber*) to Wales. Wildlife Trusts Wales.

Diolch!

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