

Scan the QR code to access a simplified version of the app (note: design is not adapted to phone display)

naturalandenvironmentalscience.shinyapps.io/ BeaverApp_tryit



Vewcastle University Aileen Mill aileen mill@powcastle.com

WHY THIS APP?

Living with beavers means we need to understand how beavers will interact with the landscape and people.

New release sites should be assessed for potential as part of the

This app allows practitioners to use a validated model of beaver dynamics to simulate where populations can expand in space and time.

Beavers can change their environment. **CONF** Modification to habitats can create conflict with existing land uses such as LICTS farming, fisheries or built infrastructure.

BEAVERS

..are a

Dams can release water during droughts, reduce damaging peak flood flows, and capture organic sediments, reducing the effects of agricultural and pesticides runoff. Beaver activities improve water quality and benefit wetland wildlife.

BRITISH POPULATIONS

to Great Britain, they were Beavers are once widespread in England, Wales and Scotland but became during the 16th century.

STATUS

Castor fiber is a European protected species. Wild populations are o in Scotland (2019) and England (2022).

TRENDS

are well established at Knapdale, the Tay and the Otter where surveys have shown expanding distributions and territory number. Further are being carried out at multiple locations across Great Britain both into fenced enclosures and into the wild.

BEING READY

Beavers are coming back to Great Britain but we haven't lived with them for centuries. If we can simulate the future of translocated beavers populations, we can select release sites to optimise beaver settlement while









Cyfoeth Naturiol Cymru Natural Resources Wales



The landscape population model requires experts to assess population changes – which is problematic when multiple license applications are requested.

a web-based app instantly test management scenarios.

Output: Users can assess distributions against areas of conflict or with other mapped features.

> **CONFLICT AREAS: assess** probabilities of future population intersecting with specific locations

> > 24.1(11-41)

25

CONFLICT AREAS: simulate populations assuming a specific location becomes unsuitable for beavers

Output: Annual summary statistics about the estimated beaver population abundance as number

A summary table gives annual prediction summaries

year after release	families average (min- max)	number of families median	predicted probability of at least 8 families	of number of territories having at least doubled
1	7(6-8)	7	33%	0%
2	10.3(6-17)	9	87%	7%
3	11.9(7-16)	12	93%	7%
4	14.4(9-20)	15	100%	27%
5	15(8-25)	15	100%	47%
6	16.5(8-26)	16	100%	67%

SIMULATING THE FUTURE OF TRANSLOCATED BEAVER POPULATIONS A WEB-BASED APP TO SUPPORT LICENSING DECISIONS

PLANNING FOR THE MANAGEMENT OF BEAVER POPULATIONS IN GREAT BRITAIN

Mitigation techniques can resolve TRAN acute conflict issues but where SLOC problems persist translocation is ATION necessary.

CHAL ES

EVIDENCE-BASED DECISION-MAKING USING THE APP



Potential translocation sites must be assessed to ensure beaver populations can thrive while avoiding conflict with existing environment.

A landscape population model of beaver population dynamics and behaviours associated with available habitat predicts changes in distribution and territory number in space and time.

individual-based model validated with survey data from Tayside, describes beaver dispersal across landscape

> population dynamics using published species parameters for growth through time

Users can simulate future populations at different candidate sites and test various translocation scenarios using simple toggles and

Inform parameters such as released group demographics

Assume this area becomes unsuitable to beavers

Assess probability of beavers

all adult pairs some adult pairs, some families all families

habitat map assessing suitability for beaver settlement and ovement

Choose a site



Locate release points within site (clicks)

Initial settlement simulated based on release points