

Beavers are herbivorous rodents that feed on the bark and stems of waterside trees, reeds and grasses. Their powerful front teeth are also used to fell trees, creating waterside clearings and ponds that change the nature of the landscape.

CONSERVATION

# BEAVERS ARE BACK!

This month, beavers are being reintroduced to Scotland after a 500-year absence. Conservationists claim that these 'landscape engineers' will create new habitats for a range of wildlife. But will they? And is everyone happy about their return?  
**JAMES FAIR** investigates.



# The impact of beavers on other wildlife

Few European animals have the potential to change their physical environment as much as the beaver. These diagrams show what conservationists expect to happen to our rivers after the rodents are reintroduced (based on studies in Europe and North America).

**HALF AN HOUR'S** walk from the Norwegian city of Trondheim (population 150,000) is the forest park of Bymarka, an area popular with hikers in summer and cross-country skiers in winter. Two years ago, some city residents were annoyed to find that a trail on the shore of Baklidammen lake had been blocked by a fallen birch tree.

It wasn't hard to deduce the culprits – the trunk had a cone-shaped end with chisel marks typical of *Castor fiber*, the European beaver. There followed letters to a local paper complaining that the beavers were getting out of hand and it was time something was done.

But the correspondents were mistaken; the beavers weren't getting out of hand, they'd just moved home. There had been a family living around the lake for at least 15 years and all that had happened was they had cut down a tree on the trail for the first time. Until then, many people were unaware the beavers lived there.

## KINGS OF COPPICING

As European beaver expert and naturalised Norwegian Duncan Halley notes, the beavers had relocated their lodge to access a new food source and they "set to work doing what beavers do on a new patch: felling several large trees, one of which came down across the path." Felling trees is one way a beaver increases its food supply – when the coppice resprouts in the spring, they eat the bark of the new shoots.

"In my experience, British visitors tend to be overwhelmed by beavers," adds Halley. "They imagine the animals felling huge trees and building massive dams. But in the same way that it is true a golden eagle can kill an adult red deer, this is unusual and at the extreme end of the range."

Hang on – didn't experts claim that bringing beavers back to Britain would be momentous? That it would end the downstream flooding that has plagued everywhere from Northumberland to Cornwall in the past decade, and turn

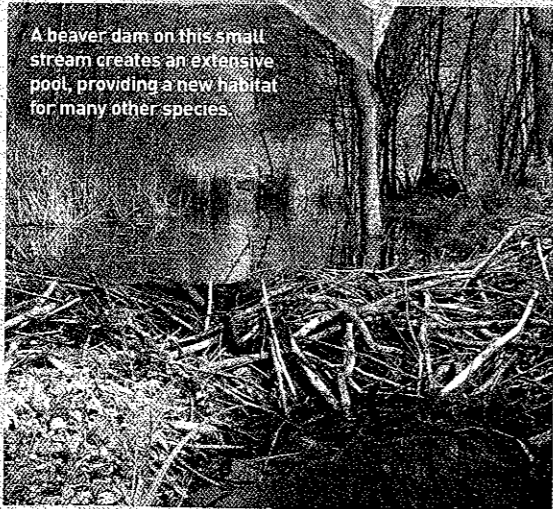
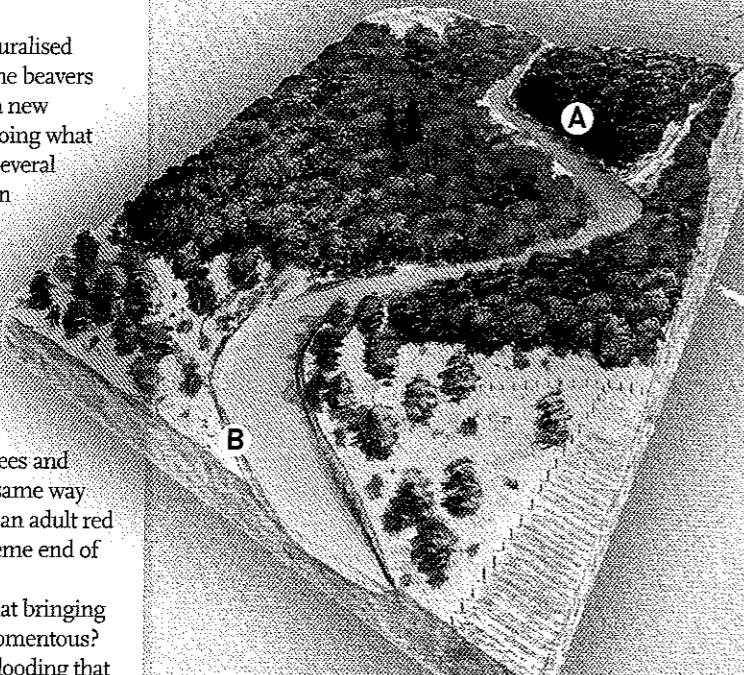
species-poor woodland and farmland into biodiverse, carbon-sequestering, climate-change decelerating wetlands humming with life?

I wondered whether scientists had been talking up the beaver's 'eco-bounce' effect in

At 80–100cm long plus a 30–35cm tail, the beaver is now our largest rodent.

## BEFORE BEAVERS

Many of Britain's rivers and surrounding habitats have become increasingly hostile to wildlife over the past 50 years. As well as obvious man-made problems, such as pollution, excessive nutrient enrichment (from fertilisers) and silting, the decline of woodland management practices, such as pollarding and coppicing, has allowed trees to crowd riverbanks and block life-giving sunlight (A). Other rivers have been straightened or deepened to 'improve' flow (B), losing shallow rapids or meanders that offer important habitat diversity and character.



A beaver dam on this small stream creates an extensive pool, providing a new habitat for many other species.



### 1 INSECTS

Dragonflies and a host of other aquatic insects breed in the shallow, warm, sunlit pools made by beavers.

### 2 SEDGES

When beavers cut down or drown trees, they let in sunlight, and this encourages aquatic plants such as sedges and reeds. These offer food and habitat to other species.

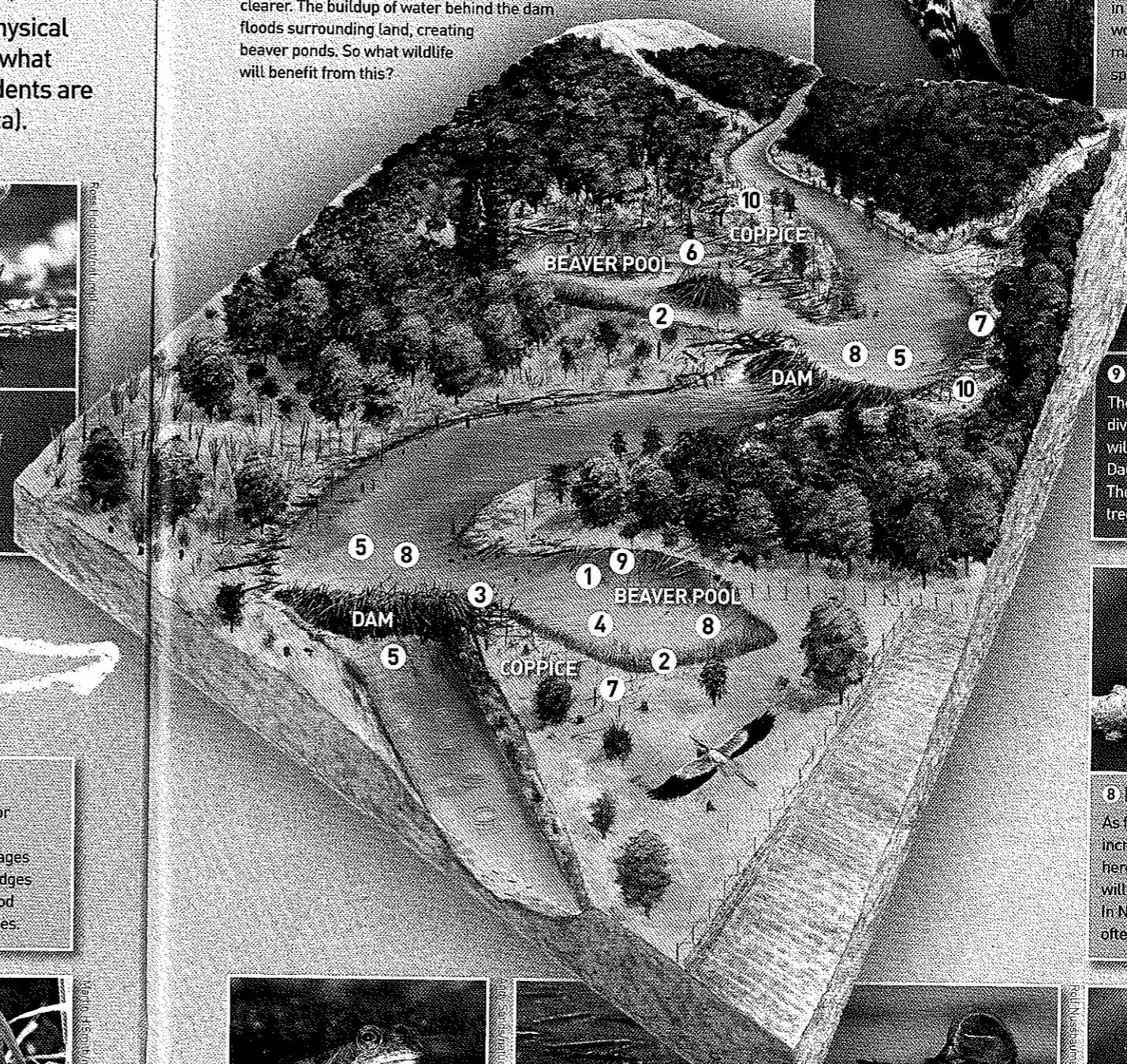


### 3 MAMMALS

Water voles will relish the reeds, sedges and other aquatic vegetation that flourish around beaver pools. Others may also be attracted, making their holts in old beaver dams.

## AFTER BEAVERS

By felling riverside trees, beavers immediately allow sunlight to flood the river, allowing light-dependent organisms to flourish. The woods develop small but crucial areas of beaver coppice. Beaver dams change the flow of the river, slowing fast-flowing water so that it drops its load of silt and becomes clearer. The buildup of water behind the dam floods surrounding land, creating beaver ponds. So what wildlife will benefit from this?



### 4 AMPHIBIANS

Shallow-sided beaver pools are ideal for frogs, toads and newts. First, they have somewhere deep enough to spawn, but there is also plenty of insect prey for the adults.

### 5 FISH

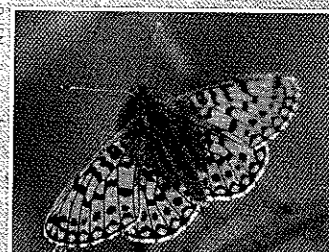
Fish are attracted by an increase in insects (see 1). Beaver dams regulate river flow, offering a greater range of habitats. Beaver pools also offer refuges for fish fry from strong currents.

### 6 WATERFOWL

Secretive shallow woodland pools created by beavers will offer perfect feeding and breeding sanctuaries for dabbling birds such as mallard and teal.

### 7 BUTTERFLIES

Beaver-coppiced trees create the mosaic of open glades and new growth favoured by a range of rare woodland butterflies, such as hairstreaks and fritillaries (above).



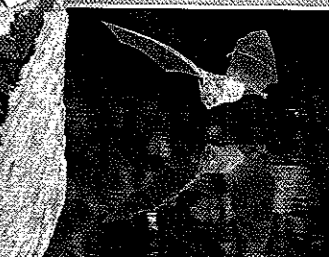
### 8 FISH-EATING BIRDS

As fish numbers and diversity increase (see 5), kingfishers, herons and other fish-eaters will turn up to take advantage. In North America, ospreys often nest beside beaver pools.



### 9 BATS

The increase in number and diversity of flying insects will draw bat species such as Daubenton's and Natterer's. The bats will also roost in dead trees during the summer.

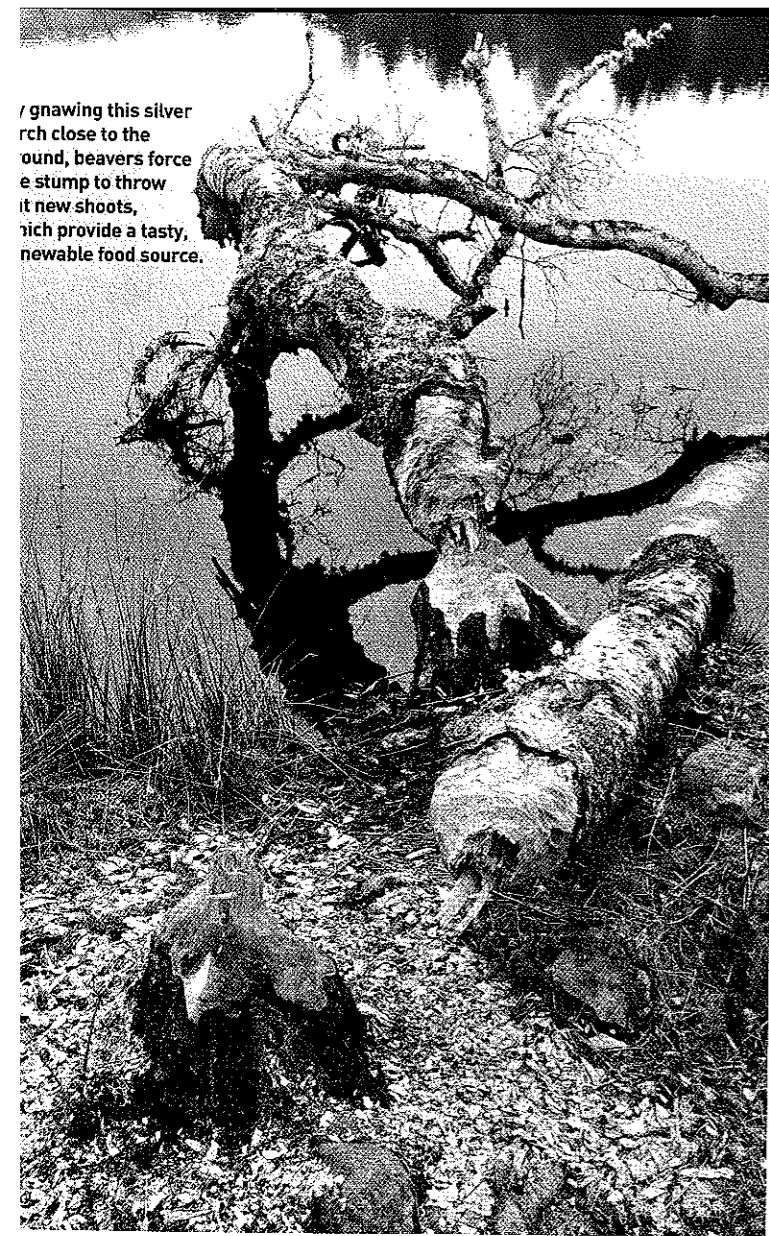


### 10 WOODPECKERS

Beavers create a lot of dead wood, which attracts wood-boring insects. These in turn draw woodpeckers, which feed and nest in dead trees. It's hoped our rarest woodpecker, the lesser spotted, may particularly benefit. Other species will use abandoned woodpecker nests.



gnawing this silver birch close to the ground, beavers force the stump to throw out new shoots, which provide a tasty, renewable food source.



A beaver gathers twigs to help reinforce its dam on a stream nearby. By interrupting the river's flow, the beaver's construction creates pools above the dam and faster-flowing shallows below it.

## KNAPDALE AND BEYOND

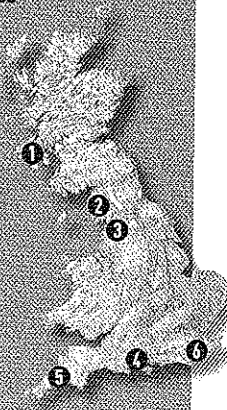
Four beaver families will be set free in a remote corner of Scotland.

The first beaver reintroduction is taking place in Knapdale Forest in Argyllshire, Scotland (1), under a special licence granted to the Scottish Wildlife Trust and the Royal Zoological Society, under the overall control of Scottish Natural Heritage.

Owned by the Forestry Commission, Knapdale's 44km<sup>2</sup> of mixed woodland is criss-crossed by streams and rivers and studded with lochs – perfect beaver habitat. It was chosen because the area's geography would contain the beavers if they spread rapidly, thus assuaging the concerns of local landowners. For more information, visit [www.scotsbeavers.org](http://www.scotsbeavers.org)

Natural England has also identified sites in England where beavers could be reintroduced, though no plans are in place as yet. These are:

- 2 Grizedale, Lake District, Cumbria
- 3 Forest of Bowland, Lancashire
- 4 New Forest, Hampshire
- 5 Bodmin Moor, Cornwall
- 6 The Weald, Sussex



recent years, only to be retracting their claims now that this much-misunderstood rodent (they don't eat fish, as I saw one *Observer* columnist claim earlier this year) is going to be living wild in Britain once again.

So, I ask Halley what he, with his vast knowledge of beavers, expects to happen in Knapdale, Argyll, when four beaver families are released this month. How will the landscape change? Will anyone even notice they are there?

To begin with, Halley explains, the beavers will occupy the lochs and little will happen. This autumn, they will start taking down large trees to create 'beaver pastures' – this natural coppicing creates new edible growth and also allows food items, such as sedges and other grasses, to flourish. This will occur in small, localised areas, but elsewhere in the forest, you'll be lucky to notice any changes.

Essentially, the beavers will be occupying the best territory. Why go to the energy expense of building a dam when there's no need? But, after three or four years, the population may have grown to the extent that it is forced to expand its range and colonise the streams and

ivers that feed into the lochs. At that point, the first dams will start appearing. "This might not happen at all or it could happen far quicker – it's very hard to predict," says Halley.

Dam-building is like tree-coppicing. Beavers do it to modify their environment to create not just somewhere to live, but a place where food sources grow more readily. As water builds up behind a beaver dam, it kills off trees and plants. After a year, the area will appear dead to the casual observer. But with light pouring into the opened, flooded woodland, tasty marginal plants will flourish.

### DID YOU KNOW?

Beavers were hunted to extinction in Britain and much of continental Europe, largely because their thick fur was so highly prized.

### EVERYONE BENEFITS

What happens next is one reason why conservationists have been advocating the reintroduction of beavers for so long. The pool becomes perfect for invertebrates, which in turn attract hungry birds and bats. In time, amphibians such as frogs, toads and newts will also take advantage of this new, natural pond. The dead trees, unsightly at first, will offer nesting and foraging opportunities for woodpeckers. The lush herbaceous growth around the edges of the pool will attract water

voles. Ducks will colonise the pond itself, and the marginal habitat may lure species such as water rails. It's wildlife Disneyland.

The water flowing through the stream will be held up by the dam (or, possibly, a series of dams). In times of heavy rainfall, these could slow down the rate of water flow and lessen the impact of flooding in towns downstream. "Studies show that water takes 10 times longer to get downstream through a series of beaver dams," says Derek Gow, the most ardent beaver advocate in Britain in the past decade.

So far, so good, but unfortunately, there is a more controversial aspect to the beaver's impact on the environment, and it's to do with fish. Salmon and trout fishermen, including the former cricketer Ian Botham and *Newsnight* presenter Jeremy Paxman, say that beavers and their dams will destroy many rivers as suitable habitats for salmon.

They reflect the views of groups such as the Tweed Foundation, which argues that dams prevent salmon and trout from migrating upstream to breed. "Beaver dams are no different to man-made obstacles such as weirs, dams, fords and bridge foundations," the foundation argues on its website, "and nobody thinks that increasing the numbers of weirs

**"If introduced beavers adapt to areas where we don't want them, we will have to kill them." Derek Gow**

and dams in a stream is a 'good' thing for migratory fish." It also points out that salmon fishing is worth £100 million a year, and governments would be foolish to put such a goldmine at risk.

Halley is having none of it. "It's close to being a non-issue in Norway," he says. "Five of the country's top 10 salmon rivers have significant beaver populations and, on some of these waterways, there are so many beavers that they are hunted without a quota. I have found salmon parr (juvenile salmon) behind a series of four dams on one river in Norway."

Part of the problem with the dispute is the lack of knowledge (and both sides of the argument do, at least, agree on this). The Scottish Beaver Partnership argues that, were there any real suggestion that beavers have a negative impact on "such an economically

important species as Atlantic salmon", then it would have been properly researched. "Such research and management is lacking because this is not perceived as an issue in countries where beavers and salmon co-exist," it says. This feels contentious to me: you could equally argue that problems only become apparent when they are investigated.

But, in any case, it's not as if all salmon-fishing lobby groups oppose the Knapdale or other beaver trials. The Salmon & Trout Association is happy to support beaver reintroductions, but only into "non-significant salmonid catchments". Its briefing paper stresses the possible advantages of regulating water flow that reduces downstream flooding, a classic bio-control solution similar to the role of reedbeds in sewage management or the process of 'managed retreat' to cope with rising sea levels.

Derek Gow points out that beaver pools will be mostly good news for river fish, and could even recreate the conditions necessary for species extinct in the UK, such as the burbot, to thrive again. Research published in *Ecology Journal* in 2000 confirmed that burbot were more abundant in an area of northern Minnesota where beavers were present.

Gow is clear that beavers must not become sacred cows – "If introduced beavers adapt to areas where we don't want them, we will have to kill them" – but he feels they have a rightful place in our landscape. "When our ancestors arrived here, they used the waterways to travel and fed on the fish living there. The beaver was the architect of that landscape – we depended on this animal and then drove it to extinction."

With Scotland proceeding with its trial, and Natural England now supporting beaver releases south of the border, we may be about to right that wrong. Within 20 or 30 years, given the experience of reintroductions elsewhere in Europe, the beaver could again be a common British mammal. Whether a conservative people will be able to accept this newcomer and its tree-toppling ways is another question, and it may have a bearing on other mooted reintroduction schemes. But if we are ever going to see larger beasts from our past – elk, lynx, wolf – back on this island, we surely have to accept the presence of this much smaller, exclusively herbivorous rodent.

JAMES FAIR is staff writer for *BBC Wildlife Magazine*.



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