

Beavers:

Nature's Engineers

WHAT YOU MAY NOT KNOW ABOUT EURASIAN BEAVERS...

- Beavers are vegetarians. They don't eat fish. In fact, they are known to co-exist well with them, boosting fish populations. Beavers snack on riverside plants and grasses as well as tree bark and shoots.
- Where beavers go, more wildlife will follow. Beavers are a keystone species and create diverse wetland habitats that can provide a home for a wide range of wildlife, such as amphibians, water voles, dragonflies, birds and even plants.
- Beavers feel safest in still, deep water (around 70cm). They are therefore very unlikely to stray far from it and will create dams if the water levels aren't what they'd like them to be.
- Beaver dams vary in size and structure. In many cases they are small temporary structures made of twigs, which gradually break down as water levels rise. In others, they can be larger stable structures that create big ponds. Both water and fish are able to move through and around them and they are not the huge dam structures made by the North American beaver.
- Beavers can reduce flooding. Beaver dams slow the flow of water; in storms more water is stored; in droughts more water is available. The potential for beavers to reduce flooding and maintain baseflows downstream is significant.
- Beavers can improve water quality. Impoundment of water behind dams can positively affect the quality of water by diffusing pollutants being transported downstream. Their dams act as sediment traps cleaning our waters.



Getting to know Eurasian beavers...

The Eurasian beaver was once widespread throughout Europe, ranging as far as Mongolia and China, and has been around since the late Pliocene. Beavers are one of the largest rodents in the world, with the average weight of a Eurasian beaver being 18kg and a body length of 1.3m nose to tail tip. Fur colour varies but is generally pale to reddish brown.

They are very social animals with family groups consisting of a breeding pair and their last two years' litters. Adult size is reached at three years and they live on average 7-8 years. Mating occurs in January, which normally produces on average 2-3 young (kits), born in spring/summer. At 1 - 2 months kits can look after themselves and will venture out of the lodge (the breeding home).

They are amphibious, using freshwater and don't feel at ease too far from still, deep water. Their sleek, torpedo-shaped bodies, webbed hind feet and flat scaly tail make them excellent swimmers. When diving they hardly make a ripple at the surface. Moving quickly underwater, up to 2.1m per second and can dive for a maximum of 15 minutes. Beaver kits can swim at four days old and can dive within a fortnight!

Beavers are nature's engineers, coppicing woodlands, creating tunnels, channels, lodges and dams. Their winter and breeding homes can be simple excavated tunnels or woody constructions away from banks. They consist of chambers for sleeping and feeding, and food stores at the entrance. Considerable time and effort go into them. One lodge in Russia was occupied for forty years.

Dams are built if there is insufficient still water around their homes and feeding areas. Dams can be built from mud in their simplest form or incorporate other materials for larger projects. Dams provide safety by increasing water levels and allow storage of winter food.

Their very large curved orange incisors are perfect for tree felling, but they need to be kept sharp. They stop every ten minutes or so to sharpen their teeth, by using the bottom incisor as a grinder to sharpen the top one. Their teeth, as with other rodents, continue to grow throughout their life.

Beavers are herbivorous, feeding on herbaceous vegetation; shoots and leaves when available, and tree bark in winter. A variety of tree species are consumed, with willow and aspen being favourites. They are discerning diners, sampling trees for anti-herbivory toxins, before chomping in. Their lack of rumen to digest the herbivorous diet, means they rely on their caecum (hind gut) to digest cellulose, which isn't very effective. Hence, they eat lots of food – 2kg or 10% of their body weight per day! They also do something called caecotrophy – eating their own poo!



What can beavers do for Dorset's wildlife?

Studies have shown that through increasing available niches and habitat heterogeneity we can enhance the landscape for a wide variety of flora and fauna. Increased connectivity between wetland habitats will help aquatic/amphibious species to disperse within the landscape. This could become ever more important with a changing climate.

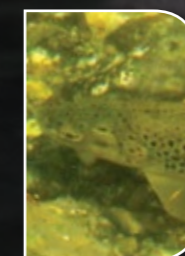


Amphibians; The creation of ponds through damming of watercourses is likely to have positive effects for our native frogs and newts. These species which breed in, and whose larval stages need the shelter of, still waters should increase in beaver altered landscape. In Dorset we would expect to see positive impacts on great crested newts, a species which has seen huge population declines in the latter half of the twentieth century.



Invertebrates; A variety of species both aquatic and terrestrial will likely benefit from beaver modification. Dragonfly species diversity may well increase as further open, aquatic habitat is created. Along with this other saproxylic (feeding on dead wood) species will benefit from increased deadwood produced by beavers.

Mammals; A key species which could benefit from beaver presence is the water vole. The slower moving water and abundantly vegetated channels created provide ideal habitat. Bats and otters have also shown positive responses to beaver activity.



Fish; though it is early days in the research, evidence so far suggests that there is an increase in fish spawning opportunities within beaver territories. Anglers in places like Bavaria, that have healthy beaver populations, welcome their presence, knowing the positive effect they have on fish numbers. Fish migration through and around beaver dams is possible, but more research is needed in the UK to improve our understanding of this.

References: Stringer and Gaywood, 2016. The impacts of beavers Castor spp. on biodiversity and the ecological basis for the reintroduction to Scotland, UK. Mammal Review 46 (2016) 270-283.

What can beavers do for us?

Beavers play a vital role in river ecology, benefiting the biodiversity of our wild spaces, but there can also be many potential benefits for us too.



Waterflow and Flooding

As ecosystem engineers, beavers can change a landscape like no other wild animal. As they create a safe place to live, they produce a rough and complex wetland landscape that can help with potential flooding issues within a river catchment, storing water and slowing flow at times of heavy rainfall.

Beaver release trials in Scotland and Devon have shown evidence of this. Studies indicate a 30% decrease in average peak flows of water entering and leaving a site during storm events. In summer the retention of water also helps during periods of low rainfall and drought.

Water quality

As well as retaining water, beaver habitat can filter out pollutants. As water slowly flows through the landscape an increasing amount of sediment is captured. Excess nutrients like phosphates and nitrates are taken out of the water with the sediment and are taken up by wetland plants. This reduction in the sediment and nutrient load significantly improves water quality downstream, benefitting wildlife.

Evidence for this is growing, with studies in Devon since 2011 indicating that each litre of surface water leaving a beaver project site has 3 times less sediment than water entering.