

Appendix 7. Bradford Beck – Ecology

Due to limited resources and the difficulty of access to the Beck in many areas across the catchment a dedicated and comprehensive ecological survey of the riparian areas of the Beck was not possible. However an ecological characterisation of the linear corridor of the Beck system's watercourses and surrounding land was achieved through multiple observations and site walkovers over the period of the project.

Habitats and species observations

The flora and fauna of the riparian areas and associated greenspaces of the tributaries and main trunk of the Beck were typical of that expected to be seen in the eastern foothills of the Pennines in northern England. In the western tributaries of Bradford the habitats consist mainly of small areas of semi-natural mixed woodland as well as improved and poor semi-improved grassland, in addition to a running water habitat in a few areas where the sides of the becks have natural banks. There are some parts of the Beck system that feature waste/disturbed land type habitats where artificial banks have been created. There are two sites near Cemetery Road where sloping banks appear to have been made in recent time from builders' rubble and topsoil which encroach onto the floodplain. Around these banks were several thickets of the invasive plants Japanese Knotweed (*Fallopia japonica*), and Himalayan Balsam (*Impatiens glandulifera*). Other examples of both Knotweed and Balsam appeared sporadically across the corridor of the Beck.

A major proportion of the Beck system is modified and has been encased in masonry, concrete or brick lined culverts. All of which are artificial habitats with lessened ecological capacity although gaps in masonry provide space for different kinds of plants, invertebrates, and animals such as birds. The water quality of the Beck is likely to be slightly eutrophic for periods because of the influx of nutrients from sewage spills and misconnections, and this has resulted in green algal growth on rocks in the watercourse. This algal growth is particularly evident around the Canal Road stretch to Shipley Railway station.

The open sections of ground in the west feature numerous grass species including: Italian Rye-grass (*Lolium multiflorum*), Perennial rye-grass (*Lolium perenne*), Cocks-foot (*Dactylis glomerata*), Yorkshire Fog (*Holcus lanatus*), Creeping soft-grass (*Holcus mollis*), False oat-grass (*Arrhenatherum elatius*), Meadow Fescue (*Schedonorus pratensis*), Bearded couch (*Elymus caninus*), Wood meadow-grass (*Poa nemoralis*), Tufted hair-grass (*Deschampsia cespitosa*), and Common couch (*Elytrigia repens*). Wildflowers in the grasslands of the western area were seemingly sparse but species observed included Forget-me-not (*Myosotis spp.*), Daisy (*Bellis perennis*), Buttercup (*Ranunculus sp.*), Bluebells (*Hyacinthoides non-scripta*), Red campion (*Silene dioica*), Greater Celandine (*Chelidonium majus*), Red Clover (*Pratense Trifolium*), Common ragwort (*Senecio jacobaea*), Dandelion (*Taraxacum agg.*), Pineappleweed (*Matricaria discoidea*), plus Ivy-leaved Toadflax, (*Cymbalaria muralis*).

The plants that featured in and around the open western tributaries in the riparian zones included: Flowering rush (*Butomus umbellatus*), Rosebay Willowherb (*Epilobium hirsutum*), Wild Daffodil (*Narcissus pseudonarcissus*), and Water avens (*Geum rivale*). The undergrowth around the Beck was generally dominated by Bramble/Blackberry (*Rubus fruticosus*). Other common plants in the wider riparian zone were Osier (*Salix viminalis*), Common sorrel (*Rumex acetosa*), Broad leafed dock (*Rumex obtusifolius*), Common nettle (*Urtica dioica*), Wild Parsley (*Anthriscus sylvestris*), Bind weed (*Convolvulus arvensis*) and Bracken (*Pteridium aquilinum*).

The flowering shrubs in the riparian zone, grassland, and in the woodland areas were mostly made up by: Common Elder (*Sambucus nigra*), Common Privet (*Ligustrum vulgare*), Gorse (*Ulex europaeus*), and Guelder Rose (*Viburnum opulus*). Butterfly Bush (*Buddleja spp.*) was common across the catchment. Trees in the western and central aspect of the Beck on the riparian strip and in the woodland patches included Hawthorne (*Crataegus monogyna*), White willow (*Salix alba*) and Alder (*Alnus glutinosa*), Hazel (*Corylus avellana*), Hornbeam (*Carpinus betula*), Downy birch (*Betula pubescens*), Silver birch (*Betula pendula*), Wych Elm (*Ulmus glabra*), Elm (*Ulmus procera*), Beech (*Fagus sylvatica*), Sessile oak (*Quercus petraea*), Pedunculate oak (*Quercus robur*), Sycamore (*Acer pseudoplatanus*), Mountain Ash/Rowan (*Sorbus aucuparia*), and Ash (*Fraxinus excelsior L.*).

Freshwater invertebrate were found through kick testing on a site at Cemetery Road in the west of the city. The samples identified were caseless caddisfly (*Rhyacophila sp.*), mayfly (*Ephemeroidea*), olives (*Baetidae*) and freshwater shrimp (*Gammarus*). The presence of these macroinvertebrate species shows relatively good water quality in the western and upstream aspect of the Beck. Other invertebrates were observed, with the most notable being common species of hoverflies - *Merodon equestris* and *Episyrphus balteatus*. Different bee species were also identified, e.g. the common honey-bee (*Apis mellifera*), and bumblebees i.e. *Bombus hortorum*, *Bombus lucorum*, *Bombus lapidarius*, *Bombus pratorum*, *Bombus terrestris*, and *Bombus pascuorum*. It is likely that several species of small solitary bees exist in the Beck system in and around the natural bank areas.

Daubenton bats (*Myotis daubentonii*) have been spotted around the Beck system previously and numerous other species of bats have been identified in and around the target area including Pippistrelles (*Pipistrellus pipistrellus*). No other mammals or reptiles were observed on site visits bar one stoat (*Mustela erminea*) in the Canal Road area in late summer, although numerous reports exist of common species of mammals and reptiles. Freshwater crayfish and fish were not observed on site in the western, central, or northern areas. See appendix 3 for the detailed habitat assessment of the Beck for its fish life.

Bird species that were observed on site visits on both grassland and riparian strips included Wood pigeon (*Columba palumbus*), Cuckoo (*Cuculus canorus*), Lapwing (*Vanellus vanellus*), and Grey Heron (*Ardea cinerea*). A few reports of Kingfishers (*Alcedo atthis*) exist for the central and western aspect of the Beck but none were observed whilst on site.

The parts to the northern and central aspects of the Beck that are open channels, and accessible, with some land around them had very similar biodiversity make-ups overall to the descriptions of the west. However the northern areas of grassland were far more managed and appeared not to have the same kind of floral variability, except for the meadow south of the Shipley Train Station which appeared to have a rich variety of flora, particularly grasses. Above Canal Road on the hillside is the Boars Well Urban Wildlife Reserve. It is a popular site for butterflies and birds including Kestrels. Towards the end of the Canal Road corridor there were some interesting additions to the flora with at least three healthy looking fig trees (*Ficus sp.*) that were growing quite happily out of and next to the Beck wall as well as a Cherry Tree (*Prunus sp.*).

The Shipley Station Butterfly Meadow is another notable space of grassland and scrub right at the northern end of the catchment with a variety of flora. It is managed by Bradford Urban Wildlife and Butterfly Conservation and is where 12 species of butterfly have been recorded in recent time including the Common Blue (*Polyommatus icarus*), Ringlet (*Aphantophus hyperantus*), Wall (*Lasiommata megera*), Orange-tip (*Anthocharis cardamines*), Large Skipper (*Ochlodes sylvanus*), and Meadow Brown (*Maniola jurtina*).