

# Biodiversity in Oxford City.

Dr Judith A Webb BEM

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Oxford City has a huge and important biodiversity of wildlife in a relatively small area due to its variable geology, landform and situation at the confluence of two rivers. I have been privileged to see much of this biodiversity over the last 30 years of working in the city, some of it as a contracted specialist ecologist and also as a conservation volunteer with a number of wildlife groups.

What is biodiversity? It is the variety of living things, from the biggest trees in Headington Hill Arboretum to the tiniest rare Creeping Marshwort plants on Port Meadow; from Foxes, Deer and Badgers down to the dot-sized tiny rare Water Penny Beetle in Lye valley fen, or our rare Brown Hairstreak butterflies. Yes common and rare species survive within the city limits, despite all the people, houses and roads.

Why does the city biodiversity matter, why is it important to all of us? Above all is biodiversity now safe in future within the City?

Biodiversity matters because it gives us joy, enriches our lives and contributes to our health and mental well-being. Many are uplifted by the electric blue flash of a kingfisher along the river. Just looking at a green landscape is calming, but it is so much better if there is a diversity of flowers present, as in an old meadow. We owe it to our children to look after our biodiversity for their future. 73 percent of adults in the UK cited nature as crucial for their well-being during the pandemic (quote: Natural England's 'Connecting People with Nature' study).

Biodiversity is the Natural Capital and Living Heritage of the city as much as its built heritage and cultural history. Wildlife-rich habitats were here before the buildings and roads. Oxford Brookes University research tells us the Lye Valley fen in Headington started forming 14,000 years ago at the end of the last Ice Age. The Arctic-alpine grass of Parnassus flower would have been there at the fen beginning when mammoths still strode the land, and is still in the valley today. That beats even the oldest historic Oxford building and what an amazing surviving historic living jewel for the city.

Biodiversity is more than just something nice to look at. The more different deep-rooted flower species in a meadow, the more carbon storage occurs deep down in the soil, where it is safe from oxidation loss. Oxford University research has shown some old floodplain meadows around the city have a huge carbon store underground that far exceeds any carbon that could be stored in the same area of trees. Dig up these old carbon-rich soils and the carbon oxidises generating CO<sub>2</sub>, exacerbating Climate Change. Old meadows rich in many flower species soak up water like a sponge because the deep channels made by long roots help rain water penetrate deep into the soil, thus reducing run-off and reducing city flooding.

All wildlife in the city is inter-connected; swifts may nest on a house in Headington but need to hunt over Port Meadow to feed on flying insects breeding in cow dung there. You might be delighted to see an orange tip butterfly in your city garden but not realise it is only there because the Lye Valley wetland nearby has the cuckoo flower upon which its caterpillars feed. There seems little

understanding that biodiversity on one site may be negatively affected by what happens way beyond that site limits. Ignoring this leads to species loss. It will be hard to hang on to the amazing species biodiversity in the Lye Valley fen wetland if building all over the small area of its remaining green rainwater catchment is allowed to continue. Prior development already deprives it of water supply to the springs and this loss will increase with every new development; even with mitigation SuDS and not even considering the stress of increased heat and drought with Climate Change.

This is all important because biodiversity is collapsing around the world. Species are declining and becoming extinct due to many pressures, including the Climate Crisis, pollution and our need to build houses. This loss matters. Many biodiversity-rich sites in the city apparently have official protection, but this is often insufficient for their survival. Much city biodiversity is in sites with no official protection – those undervalued little green meadow patches, green corridors, abandoned allotments and scrubby corners, so easily lost in the city's great pressure for housing. There is particular pressure just to move notable species away to allow development. Relocation of reptiles like slow-worms and lizards has been shown to have very limited success due to not placing them in correct new habitat with enough resources; but it still happens.

With development now required to produce '**Biodiversity Net Gain**' it might be thought that everything is now OK, or even better for wildlife than before. But many wildlife experts are sceptical about this. Trash an old hedge rich in wildlife to build houses and compensate by planting 10x as long a new hedge in another more convenient area. Sounds good, but the new hedge is just a row of twigs in the ground. All the rich community of insects, birds and mammals in the old hedge are dead or forced away to an uncertain future, and there is no new hedge home for them. On paper the accounting numbers say it's a gain, but on the ground it is not a real gain; **today it is a biodiversity loss**. In 30 years' time might the new hedge be as good for wildlife? Only if the lost species can recolonize, and that depends on their mobility and if there still exists habitat for them to come back from. You can get apparent net biodiversity gain by sowing a wildflower mix on an area to compensate for using an old green meadow for housing, but you have gained only a 'facsimile' habitat, without the true biodiversity, and of course without the soil carbon store and the water infiltration of that old meadow lost.

The more city development fragments and isolates biodiverse green sites, the more pressure on those that remain, the more these remaining small habitat islands lose species. 'Recreating' habitat destroyed under development or 'relocating' species is not necessarily enough. City Biodiversity has never been under more threat, but it has never been more important to all of us.