

# Peat and Carbon in the Lye Valley Fens

J A Webb, Feb 2021

*\*The Lye Valley fens store more carbon than the same area of tropical rainforest\**



*Cotton grasses growing and forming new peat in Lye Valley fen*

- Peat is a soft brownish-blackish material formed from dead plant remains and is rich in carbon; historically it was burnt as fuel for heating
- Peat forms under water-logged conditions in bogs and fens (wetlands)
- Waterlogging means a lack of oxygen from the air (anaerobic )
- Up to 1metre depth of peat exists in many fen areas of the Lye Valley, where it is constantly saturated by alkaline groundwater from valley-side springs
- Peat takes 1000s of years to accumulate, at the very slow rate of **1mm per year**
- To form peat, water must be at or near the fen surface most of the time all year
- The wet surface layer of mosses and sedges is always growing – holding water like a sponge
- As plants and mosses grow they take carbon dioxide out of the air and form it to carbon in their bodies
- As their leaves die each year, they sink into the water but don't decay, due to lack of oxygen
- The leaves eventually turn into black peat and their carbon is stored
- The large historic store of peat under the surface is carbon safely stored long term, maybe 1000s of years...
- If the peat dries out from lack of water, oxygen enters and bacteria can then turn the carbon to greenhouse gases like **carbon dioxide** and **methane**, exacerbating **climate change**

- The size of the carbon store in peat is huge, compared to that stored in trees
- A **layer of peat only 30cm deep** can contain more stored carbon per unit area than in a tropical rainforest, with huge trees (1)
- The Lye Valley areas with a metre depth of peat have the carbon content of three tropical rainforests, one on top of each other!
- Peat (if wet) stores carbon **long-term**. Any trees, even a tropical rainforest, cannot do this (because trees rot and decay at the end of their lives, giving off carbon dioxide again)
- Keeping the huge carbon store in peat in the valley wet and capturing more carbon by wetland plant growth is very important, as this can help **combat climate change** (2)
- A key activity of volunteer management work in the Lye Valley is re-wetting dried-out peat areas; thus stopping greenhouse gas emission and getting peat accumulating again, restoring **carbon capture**
- Peat has become dry next to the Lye Brook due to erosion of the channel by road run-off from a large area of Headington
- In the valleys of the Lye and Boundary brooks, FoLV calculate there are over **11 hectares** with at least 30cm depth of historic peat
- Keeping the fens wet needs also protection of good continuous **spring flow**
- This means protection of the '**rainwater catchment**' of the fens – an area that extends far beyond the site limits and takes in much of Headington.



*Lye Valley: beautiful, biodiverse AND very important for carbon capture and storage!*

(1) A thin peat layer of just 30cm deep can contain around 300 tonnes of C per hectare (Dr.Richard Lindsay, Univ of East London)

(2) BBC News 7<sup>th</sup> August 2020 'Climate change: UK peat emissions could cancel forest benefits'

<https://www.bbc.co.uk/news/science-environment-53684047>