

Bog-tastic activity sheet

39 Ways to Save the Planet

Bogs

This is a resource linked to the BBC Radio 4 programme *39 Ways to Save the Planet*. Listen to the episode [Bog-tastic!](#) and complete the tasks below.

This teaching resource is on the importance of maintaining bogs — especially peat bogs which trap and store carbon dioxide (CO₂). Keeping peatlands wet keeps CO₂ safely locked away because when they dry out, half the peat is carbon. They are increasingly recognised as a very important store of carbon and are now labelled as essential carbon sinks. Dr Renou-Wilson explains in the episode:

Peatlands are the largest and most concentrated global store of carbon of all terrestrial ecosystems. They actually contain twice the amount of all the global forest, even though they only cover 3% of the planet. They are energy bowls of carbon if you like.

Dr Florence Renou-Wilson

Bogs are essentially waterlogged, soft, spongy landscapes in northern climates. They are often in areas with high levels of rainfall, and they form over thousands of years.

1. Read the [Bog National Geographic article](#) and write a definition for the following 6 bogs:

a. Blanket bogs

b. Cataract bogs

c. Quaking bogs

d. Raised bogs

e. String bogs

f. Valley bogs

Some of the above bogs (blanket, quaking, raised) are also classified as ombrotrophic bogs, meaning the soil or vegetation (which has grown over time) receives all their water and nutrients from precipitation. The remaining bogs broadly fall into the other category of minerotrophic fens, which are fed either by groundwater or by collected surface water.

Once a bog has matured i.e., it has been taken over by both decaying and living plants, histosol forms. This is when a bog largely consists of decaying vegetation with high acidity, low density, and

a high proportion of organic material. With the decomposition of ancient plants the histosol becomes thick and spongy, and peat forms. Peat is a fossil fuel and in the past was cut from the British Isles for burning, particularly in Ireland. The fossils in peat are the ancient sphagnum plants that have decomposed, without oxygen, in a watery environment. A peatland is the first stage of plant material turning into coal.

1. Access [the Bog Day webpage](#) and identify the 3 types of bogs found in the UK. Add the information to your definitions on page 1.

Most of the UK's peat is found in Scotland with 20% of the country's land area (2 million hectares) being covered by peat bogs. Estimates of UK peatlands range from 1.5 million hectares to 2.5 million hectares. This unique landscape in the UK accounts for between 8.8 and 14.8% of all the peatland in Europe.

2. Data table 1 below shows the (2019) updated figures for peat areas in the UK. Using the data, describe the distribution of peatlands across the UK.

Country/administration	2011 (ha)	Updated (ha) 2019	Change
Scotland	1,726,900	1,947,750	+220,850
England (deep)	495,828	495,828	-
England (wasted)	186,372	186,372	-
Wales	70,600	90,050	+19,450
Northern Ireland	206,400	242,622	+36,222
UK total	2,686,100	2,962,622	+276,522

Table 1 © ICUN UK Peatland Programme

Why are peatlands important?

Historically, the waterlogged nature of peatlands has prevented decomposition. However, increasing population pressure and the expansion of agriculture has meant these landscapes have been drained and repurposed. Microbes in the soil are subsequently reawakened and consume carbon. This means carbon that was once stored, under the safety cap of a peatland, is now released into the atmosphere. For every hectare of drained bog 6 tonnes of CO₂ are released per year.

The world's largest bog wetland is found in the Russian region of Siberia. Here, increasing temperatures have caused a positive feedback loop where global warming has led to the melting of permafrost, soil exposure, and greater amounts of CO₂ being released into the atmosphere. Ultimately this again increases air temperatures, and the cycle continues. You can read more about the melting of Arctic tundra and frozen peatlands in [Climate change and the Russian Arctic](#).

In Scotland, 70% of raised bogs and 90% of blanket bogs are damaged according to Nature Scotland. When peatlands dry out the effect is twofold: carbon is released, and future sequestration is lost. Future carbon sequestration is important because it is the capture and storage of CO₂ from the atmosphere. Therefore, the problem worsens incrementally over time.

Peatlands also influence water. If peatlands are restored and rewetted, water quality improves. This is due to water being filtered and slowed down as it moves through the water cycle. If water is slowed erosion is limited, flooding is lessened, and sphagnum moss is allowed to grow. Silt is also prevented from being flushed into reservoirs. This leads to fine particles in drinking water which need cleaning. The release of sediment from damaged peatlands also takes more acidic water downstream which can kill fish eggs. In Scotland this has reduced Wild brown trout numbers. Peatlands are therefore key to healthy river ecosystems in upland areas.



Bog Cotton, Flanders Moss © Lorne Gill SNH www.nature.scot

The Roaches wildfire of 2018

In addition to the draining of peatlands sudden catastrophic events increasingly release carbon from UK bogs, namely wildfires. These events are strongly correlated with increases in UK temperature and aridity. The last decade (2010-2020) was identified by climate scientists as the hottest decade on record with [NASA analysis](#) showing 2020 being tied for warmest year on record.

In 2018 an extremely dry heatwave combined with a careless campfire led to the destruction of 200 acres of moorland in Upper Hulme, Staffordshire. The IUCN UK Peatland Programme estimated that 3,115 tonnes of carbon were released into the atmosphere as smoke and fumes, with a further 129 tonnes being redeposited back into the peat as pyrogenic material such as Black Char. In 2020 the BBC reported on a study by the Moors for the Future Partnership which calculated that 50 years' worth of peat had been burnt with an overall total of 11,000 tonnes carbon being released into the atmosphere.

What can you do?

As a consumer you have the power to influence and protect our UK peatlands and help stop the release of carbon from all peatlands by simply choosing to not buy products that contain peat. Look to see if the compost you are buying contains peat. The Guardian argued that [gardeners should end their love affair with peat](#), as long ago as 2012. It is certainly a problem if it is used for domestic heating, as incineration direct releases stored CO₂.

Further reading

- Ombrotrophic or minerotrophic bogs
www.link.springer.com/referenceworkentry/10.1007%2F978-94-007-6173-5_279-1

- The Roaches wildlife in 2018 www.iucn-uk-peatlandprogramme.org/projects/case-study-estimating-amount-carbon-released-roaches-wildfire-2018?destination=/projects-map
- 'Devastating' Roaches moorland blaze caused by campfire www.bbc.co.uk/news/uk-england-stoke-staffordshire-45220747
- Roaches moor fire recovery could take half a century www.bbc.co.uk/news/uk-england-stoke-staffordshire-55363287
- Peatland biodiversity 2010 Scientific Review www.iucn-uk-peatlandprogramme.org/sites/default/files/Review%20Peatland%20Biodiversity%2C%20June%202011%20Final_1.pdf
- UK peatlands www.iucn-uk-peatlandprogramme.org/sites/default/files/2020-01/IUCN_S~1.PDF
- The Importance of Scotland's Peatlands www.youtube.com/watch?v=qxPQGI9LA2Q
- What is special about peat? www.nationaltrust.org.uk/features/whats-so-special-about-peat

Suggested questions for Bog-tastic!

- Once a bog is drained of its water, for every hectare, 6 tonnes of CO₂ is released every year until it is returned to its natural state. What does Dr Renou-Wilson say is the equivalent of this amount of carbon being released?
- What project, in partnership with Manchester Metropolitan University, is being done in Lancashire?
- We cannot stop the private sector doing what they want with peatlands. According to Dr Renou-Wilson, what *can* be done?
- Dr Tasmin Edwards says a brand-new study is looking into drained peatland capacity. What does the project led, Christopher Evans, think might be achievable in the future?

An RGS-IBG expert

Go to [What our expert says](#) to hear further analysis from Dr Tasmin Edwards, Mike Peacock from the Swedish University of Agricultural Sciences and Professor Christopher Evans.

