Introducing the Avalon Marshes

Notes to accompany slide show – KS3 & 4

Overview

Description	These are notes to accompany a PowerPoint presentation for Key Stage Three pupils. The PowerPoint along with the notes introduces the history and characteristics of the wetland landscape of the Avalon Marshes, Somerset.
Time	Approx. 30-40 minutes
Curriculum	**Themes from this presentation can extend into studies of:** KS3 Science –photosynthesis; the carbon cycle; plant reproduction; interactions and interdependencies. GCSE Science – Ecosystems – biodiversity, adaptations, positive and negative impacts of humans on ecosystems; the Earth's water resources. KS3 History – deepening students' chronological understanding of history; local history study; Britain's changing landscape from Iron-Age to present. GCSE History – OCR 'History Around Us' KS3 Geography - understand how human and physical processes interact to influence and change landscapes, environments and the climate; physical geography linking to soil, weather, climate and hydrology GCSE Geography – AQA Climate Change, Ecosystems; Edexcel 4.2 Physical and human processes work together to create distinct UK landscapes.
Aims	• Give students an overview of the history of the Marshes • Link the history of the Marshes to the present day characteristics of the Marshes in terms of the physical landscape, biodiversity, land use, archaeology, industry and tourism
Learning outcomes	• Understand some of the chronological history of the Marshes • Understand some of the human and physical processes that have contributed to creating this unique landscape • Understand what makes the Marshes have a high biodiversity and what that biodiversity profile looks like.
Linked resources	**Pick & Mix** – Getting to Know Peat; Avalon Marshes Timeline; Mapping the Marshes; Water in the Wetlands; Creative Response to Landscape (poetry) **Factsheets** – see all of them on our website **Audio** – Avalon Marshes, A Peatland Story **Film** (YouTube channel) – wildlife films; Sights & Sounds of the Marshes (films about farming, peat and history made by young people).
Follow-up	Hire the Avalon Marshes Water Model from the Avalon Marshes Centre, and do further study in to water use and management in the Marshes. Hire the Avalon Marshes Flood Map and do further Geographical studies linked to the landscape.

Photos: AMLP; RSPB; Joy Russell

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Teachers' notes

1. Avalon Marshes – A changing landscape

The Avalon Marshes is an area of wetland that has been changed over thousands of years both by natural processes and the impact of humans.

2. Landscape overview

The Avalon Marshes is an internationally important wetland landscape. Water is a key characteristic of the area, and supports a huge diversity of flora and fauna, as well as influencing the way people have used, and continue to use the Marshes.

The wetlands consist of large areas of peat, which is an important carbon store. As long as peat soils stay wet they absorb more carbon than they release.

The Avalon Marshes is internationally famous for its important archaeological discoveries – these have been possible thanks to the preservative qualities of waterlogged peat.

The Avalon Marshes is used for farming of cattle and sheep, and is home to a horticultural peat industry. Conservation is also a key activity, and takes places over hundreds of hectares of Nature Reserves. Thanks to the scenery, local wildlife and history, and the town of Glastonbury, the area is a popular tourist destination.

3. Designations

The Avalon Marshes has several designations that highlight its national and international importance as an area for conservation of wildlife and heritage. Designations include:

Sites of Special Scientific Interest – designation given by Natural England (a government body) to protect, by law, areas that are the best examples of particular habitat, or examples of very rare habitat.

National Nature Reserves – also a designation given by Natural England, to protect the UK's most important habitats and species. They are intended to be 'outdoor laboratories' where people can learn about conservation.

Ramsar – The international Ramsar 'Convention on Wetlands' is an intergovernmental treaty that provides a framework for the conservation and wise use of wetlands and their resources. The Somerset Levels and Moors (which the Avalon Marshes is part of) is Ramsar's 'List of Wetlands with International Importance'.

Biodiversity Action Plan – Programme to address threatened species nationally and internationally, by monitoring them and conserving or restoring their habitat. The Avalon Marshes is home to several BAP species.

Scheduled Monuments – these are sites of archaeological important, and are protected by law. Historic England advises the government on which sites should be included. It stems back to the 1882 Ancient Monuments Act.

4. Avalon Marshes logos

Today several organisations are actively involved in the conservation of the Avalon Marshes, including wildlife conservation charities RSBP, Somerset Wildlife Trust and the Hawk and Owl Trust; heritage organisations English Heritage, Historic England and South West Heritage Trust; and government bodies Environment Agency and Natural England.

In 2012 the Heritage Lottery Fund awarded the Avalon Marshes a large grant to help with conservation and celebration of the wetlands.

5. Avalon Marshes, Somerset

This slide is to help students look at the Marshes in relation to their own location.

6. Avalon Marshes – highlands and lowlands

This slide shows that the wetlands lie near the coast, between two sets of hills (the Poldens to the south, and the Mendips to the north). It is the drainage area for the River Brue, and therefore also known as The Brue Valley. In the past the higher areas of land that can be seen at Glastonbury and near Wells and Cheddar have been islands.

7. Landscape view

The entire area of the Avalon Marshes sits less than 10m above sea level. In places the land is below sea level. Within it are several different wetland habitats, including reed-bed, wet woodland, fen and bog, grassland, open water, and farmland. Peat bogs have been formed over thousands of years, from layers of peat. They literally hold the history of the area in their layers of carbon-rich peat.

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8. Map of the AM

This map shows the Avalon Marshes today, and includes detail of the unusual shapes and patterns that are made by the roads, droves, rhynes, drains and peat digging. Take a moment to note sites of interest, including nature reserves, and historic sites.

9. Headline species

The Avalon Marshes is famous for murmurations for starlings (flocks of millions of the birds) that roost in the reedbeds in the winter months. They attract thousands of visitors every year. The great white egret is also famous – a conservation success story, having nested in the Avalon Marshes in 2012 and every year since – the only nesting GWEs in the country. Other famous species include the bittern and otter.

10. 6000 BC

The last Ice Age had finished, but the Avalon Marshes was still an area of freshwater wetlands. Note the sea water just showing at the top left of the map. Hunter-gatherers were present on the areas of higher land.

11. 5000 BC

By 5000BC sea levels had risen so much as a result of the melting glacial ice that the whole area of the Avalon Marshes was flooded with brackish/saline water. It was filled with clays, reed marsh spread, and peat started to form. Fish and birds started to become abundant.

12. 3500 BC

As the peat layers built up and the marsh spread, brackish water was replaced by fresh. A wider variety of plants colonised the area including sedges and mosses. Eventually fen (or wet) woodland replaced much of the reed marsh. Sphagnum mosses grew and raised bogs started to form. All the time the peat layers were growing thicker, eventually replacing the woodland. Wildlife was varied and abundant.

The site of the Sweet Track can be seen on this map, running between an area of high land where the village of Westhay now is, and the ridge of the Polden hills.

13. Ancient track-ways

Neolithic Man settled on the edges of Marshes, farming the hills and burtles (mounds of sand deposits). Wooden trackways were built across the wet marshes linking hills and islands. The most famous of them all, the Sweet Track, was constructed in the spring of 3806 BC. The Abbot's Way was also Neolithic (Stone-Age) and ran between what are now the villages of Westhay and Burtle. Several others have been found, in many different styles. The peat layers gradually preserved track-ways over time, as well as tools and other artefacts.

14. 700 BC

Conditions are far wetter than before. By 700BC the sea had come part-way inland again. The River Brue flowed northwards from Glastonbury, going through the 'Panborough Gap' (just east of the Isle of Wedmore), and went on to join the River Axe. Peat layers have started to form raised bog areas in the middle of the Marshes. Peat forms when mosses die and don't fully decompose because of the wet conditions. More mosses and plants grow on the peat, and when they die the same thing happens. The layers build up and the area becomes raised, hence the name 'raised bog'.

The red stars on this map show the sites of two Iron Age Lake Villages, constructed at slightly later dates.

15. Lake Villages

Iron Age people constructed lake villages near Glastonbury and Meare: the former was occupied throughout the year, the latter may have been a seasonal trading settlement. Dugout canoes rather than track-ways were used to get around. Bones found at the lake villages show that white tailed eagle, crane, puffin and pelican were all nearby at this time.

16. 250 AD

The raised bogs were still growing and tidal creeks reached the edges of the "island" of Burtle.

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17. Roman Industry

The nearby hills were farmed and settled by Romans, with roads and villas being built. The creeks were exploited with salt being produced from the saline water using "Salterns" formed from local clay. A sideline of the salt producers was forging coins! The clay was used for the moulds, transport by water was good and the locations were remote. On Shapwick Heath six hoards of pewter and bronze vessels, and valuable coins were found in 1936 by a peat digger. They may have been buried to hide them by an owner who was never able to return.

18. Somerset

The Anglo-Saxons were the first to name the area. The modern name 'Somerset' possibly refers to 'land of the summer people', linking to the fact that the wetlands were good for summer grazing, and also rich for hunting and foraging in the summer.

19. The Middle Ages

The Middle Ages saw the start of significant changes to the landscape of the Avalon Marshes. Rivers began to be diverted, land was drained, woodland managed and stock grazed.

Glastonbury Abbey's estate extended over most of the Avalon Marshes and the rest of the land was under the control of the Dean and Bishop of Wells. Burtle, Beckery, Godney and Meare were all important to the Abbey, in particular Meare which had a huge lake at this time. The lake is thought to have been 2-4 miles in circumference depending on the time of year. The Marshes were a huge natural resource of fish, fowl, grass for grazing, timber for building, peat for burning and reeds for thatching. The wealth of the Abbey grew during this period, and so did its influence on the area.

20. Draining the Marshes

By 1700, roughly fifty percent of the marshes were enclosed and drained for agriculture. Division and drainage was managed through large drains channelling water into rivers. These in turn were fed by ditches (known locally as rhynes). Enclosure of land in the Avalon Marshes was through wet boundaries like rhynes, as well as raised track-ways, known as droves. This continued into the 1800s as demand for food drove up land values and profits.

21. Peat extraction – 19th Century

Peat has been cut and dried for centuries, the dry product being used as fuel for fires – in homes and for Roman Salterns! People in the Avalon Marshes dug peat by hand in the summer months, cutting large blocks of the wet soil into smaller 'turves' and drying them in the sun in stacks called 'ruckles'. In the winter the dry turves were sold by horse and cart in local villages and towns

The introduction of a canal and later a Railway to the area meant that peat companies could transport peat more easily. However it also brought coal to the area, which reduced the use of peat as fuel.

22. Peat extraction – 20th Century

New uses of peat were devised in the 1900s, to open up a new market for peat products. The main change was the creation of horticultural peat and compost mixes. Alongside this, machines sped up the digging and drying process, and the creation of plastic made it easier to bag peat. The industry boomed and was a huge employer in the area. Peat workers were often the discoverers of buried archaeology (like Ray Sweet, who discovered the Sweet Track in 1970), and the peat industry also meant physical changes for the landscape.

23. Farming

The division of the land and the small field sizes means that farming in the Avalon Marshes is quite unusual. Farmers don't have just one piece of land, they have lots of small pieces of land that they travel between. Field boundaries are wet ditches, rather than fences and hedgerows, which take excess water off the fields. Animals are moved depending on water levels, and taken to higher ground in the winter. The farmers need to have wider wheels than normal on their tractors because of the wet soil. Some farmers work closely with conservationists to manage land on farms and nature reserves in a traditional way, through grazing regimes and hay cutting techniques that minimise the impact on wildlife.

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24. The landscape today

The peat industry has left numerous large voids that have filled with water. They make it an unusual landscape, and the water bodies are now attractive habitats for wildlife. The principal character of today's landscape is one of rich green pastures criss-crossed with a network of water; ditches, drains, rhynes, and the peat voids. Within the landscape there is a lot of variety -

- peat areas have relatively few trees and no hedges, the fields are divided by "wet hedges" of ditches and rhynes
- western levels and moors which are slightly higher (if only a metre or so) with traditional hedges and more trees
- areas of former peat working to the north and south of Meare make up a landscape of reedbeds, lakes and wet woodland
- Sharpham and some other areas are sites of active peat extraction
- "islands" have villages and farms on them, many built of local Blue Lias stone and some of local red brick manufactured from the underlying clays
- The Isle of Avalon is home to the busy town of Glastonbury, with stone and brick buildings of all ages, a countryside of small grass fields and orchards, and Glastonbury Tor.

25. Flora

The mosaic of habitats found within the varied landscape of the Marshes, are home to a diverse range of flora. Not only are there characteristic plant species in the wetlands (the reeds, sedges, rushes, willows etc), but there are several rare species in the area that must be protected and conserved e.g. rare orchids and Devil's bit scabious in meadows, sundew and sphagnum mosses on mires, and royal fern in wet woodlands. These species are important indicators of the health of each different habitat.

26. Birds

As well as common wetland species, the Marshes are now home to several rare species including the Bittern and the Great White Egret which was mentioned earlier. The Bittern, a type of heron, is a secretive species of bird found in the reed-beds. They eat a wide variety of prey, but predominantly fish and amphibians. Bitterns became extinct in the UK at the turn of the 20th Century through habitat loss, but after making a recovery in the 1950s they were nearly lost again in the 1990s. However, a second extinction was averted by some concerted conservation work to create new reed-bed habitats, especially in the Avalon Marshes. The Avalon Marshes now has one of the biggest populations in the UK. Due to their effective camouflage they can be notoriously difficult to see, but in early spring the males make distinctive booming calls to attract a mate, and many people come to hear them rather than see them. Bitterns and the GWE are examples of two species which have chosen to make their home on the Avalon Marshes as the habitat has improved.

27. Other animals and invertebrates

A huge body of volunteers are involved in monitoring and recording all of the different plant, bird and animals species in the area, including invertebrates such as butterflies and moths, dragon and damsel flies, beetles and spiders. There are lots of rare species including the shrill carder bee, lesser silver diving beetle, and shining ram's horn water snail. There are also reptiles, amphibians (like the rare and protected great crested newt) and mammals (including water voles, otters and bats).

28. People and the Marshes

As well as the people that still live and work in the Marshes, hundreds of thousands of people visit the Marshes every year. They come for the scenery, serenity, history, wildlife, family activities, cycling, walking, and to visit Glastonbury town and Tor.

29. Avalon Marshes website

Find out more on the Avalon Marshes website, and on our YouTube channel.

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