



Image Moccas Park Hertfordshire. Photo by Ian Thompson



#### Sources:

*Environmental Stewardship and Historic Parklands, Cookson Tickner, Natural England 2013*

*Capability Brown's Contribution to Ecological Resilience, Landscape Character and Ecosystem Services. Webinar as part of the Landscape Institute's webinar series 2016 presented by Leslie Pearman, Senior Heritage Adviser Natural England.*

# Biodiversity in Brownian Landscapes

## Introduction

By designing grassland and parkland trees, woodland and water parkland features in an intricate pattern, Brown created a varied mosaic of habitats, concentrated in one place, that provide plenty of homes for wildlife, some of them very rare. They include grassland, wood pasture, woodland and wetland habitats but most important are the hundreds of parkland trees he incorporated or new trees he planted which are now 300 to 1000 years old. They are important for their decaying wood and the nooks and crannies that develop in old wood, that lichens, fungi and invertebrates such as beetles need to survive, as well as providing roosts for bats. These trees reach a very great age because they grow in open grazed areas rather than competing for light and nutrients in woodland. Brown's landscapes offer important refuges for wildlife and stepping stones for species to connect with habitats in the more intensively farmed or developed landscape that surrounds them.

Sites of Special Scientific Interest (SSSI) are our nationally most important sites for nature conservation, and occur in Brown sites collectively at more than double the density compared to the landscapes that surround them.

Information about specific SSSIs can be found by using Natural England's Designated Sites search tool at <https://designatedsites.naturalengland.org.uk/>

For information about the natural environment including rural, urban, coastal and marine environments mapped across Great Britain, visit the MAGIC website. <http://www.magic.gov.uk/>

# Habitats and species supported by parkland features in Brownian landscapes



## Open Parkland

One of the defining features of parkland is its pasture with scattered or grouped individual trees, woods and clumps of trees. In ecological terms, parklands in the UK provide **wood pasture and parkland** which is rich in wildlife and is considered outstanding at a European level.

One of the more important components of parkland is the **ancient and veteran parkland trees** (see below for definition). They are of value for the very long-term ecological continuity they represent. Some of the highest concentrations of veteran trees in the UK are found in current and former parkland, having often escaped the intensification of land use practices in farming and forestry in the 20th century. An individual tree can be of high value for nature conservation because of its associated species, particularly lichens, fungi and invertebrates that live on or in them. Parks as they are today are invariably the result of several changes in ownership and fashion, often reflected in a range of trees of different ages including those that may predate the creation of the park itself, further benefitting the ecological habitat.

## Ancient and veteran trees

Veteran and ancient trees may be present in parkland as scattered or grouped individual trees, woods and clumps of trees and are important for their contribution to historic landscape character, ecology and heritage associations. Veteran trees provide conditions suitable for a wide range of plants and animals, many of which require the particular conditions provided in an old tree.

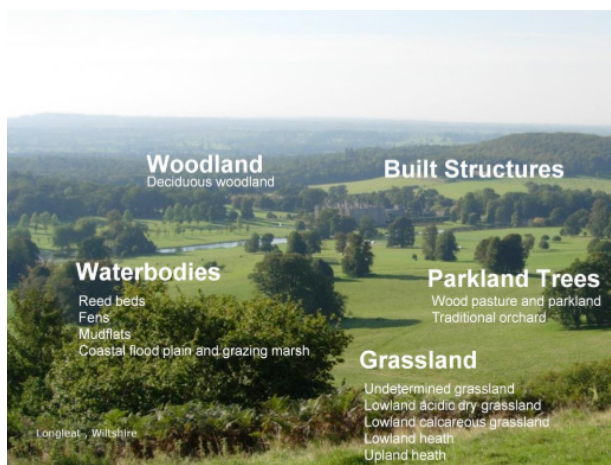
In recent times a distinction has been made between “ancient” and “veteran” trees. Ancient trees are very old trees often of historical interest, either locally or nationally, for associations with particular people or events. Veteran trees are generally large in girth, with deadwood in the crown, and cavities in the trunk or major crown stems. It is currently

accepted that a tree can be veteran without necessarily being very old. Thus, if a tree has the physical characteristics of an ancient tree but is not ancient in years, compared with others of the same species, it is classed as veteran but not ancient.

No tree lasts forever and so dead trees and deadwood are a natural component of all landscapes with trees. Deadwood plays a variety of roles on sites with historic continuity of old trees through its influence on biological, physical and chemical processes. Directly or indirectly it provides a substrate for a wide range of organisms, particularly fungi, lichens and invertebrates; cavities formed by rot are used as nesting sites or shelter by many invertebrates including bats and birds, and decaying logs may act as safe sites for seedling germination or for the growth of bryophytes – mosses, hornworts, and liverworts away from the competition of the woodland ground flora.

Soil structure, nutrient cycling, carbon storage, and forest health also respond to deadwood dynamics. It is now widely understood that large quantities of standing and fallen deadwood are a key element in woodland and parkland ecosystems, not least as it is vital to the continued presence of the saproxylic (wood-eating) invertebrates that depend on the presence of veteran trees.

Habitat continuity is essential for many species dependent on veteran trees that have a limited capacity for dispersal, and the number and continuity of veteran trees with their associated distinctive saproxylic (wood-eating) fauna and epiphytic flora plants that grow on other plants such as ferns, are now more abundant in Britain than elsewhere in Europe. These species are confined to a few sites, much of it parkland, because dead and decaying wood tends to be removed from other parts of the countryside. Their survival depends critically on maintaining continuity in our remaining populations of veteran trees with their associated dead and decaying wood. Organisms that require precise micro-habitats are more likely to find enough to support viable populations on sites containing numerous veteran trees.



Longleat. © Leslie Pearman

## Woodland

Stands and clumps of woodland are typical features of parkland habitats and are distinct from scattered trees due to the relatively closed canopy conditions that prevent the development of grassland or heathland ground layers, and also the lack of grazing animals. Woodlands originating from wood-pasture often possess ancient trees which may support a similar range of notable species to ancient trees in more open conditions.

Many parkland sites also support areas of **ancient woodland** that have a long continuity of closed woodland cover and are rich in woodland indicator plants including bluebells and dog's mercury and animals, including diverse breeding birds, invertebrates, dormice and bats. These ancient stands are often associated with steep valley sides and areas of sloping ground that were historically difficult to convert to pasture. The composition of these **semi-natural woodlands** varies widely across the country in relation to soil conditions, climate and management, but the majority consist of **mixed deciduous woodland** dominated by a combination of ash (*Fraxinus excelsior*), oak (*Quercus robur*) and birch (*Betula pendula*).

## Pasture – Grassland and Heath

An area of pasture historically maintained by grazing animals that provides the green foil for parkland planting. The species make-up of grassland varies immensely and may be ancient and diverse in deer parks but may also be semi-improved and species-rich in many parklands, even though these landscapes have been subject to earth moving in the past.

The type and composition of grassland present is dependent on local conditions, including soil, geology, climate, aspect, as well as past improvements and management. Parklands formed on sandy soils usually support **acid grasslands**, sometimes with mosaics of **heathland**. Unimproved swards on chalk or limestone support **calcareous grassland** that is often of significant botanical interest and high aesthetic appeal on the basis of its species diversity and variety of wildflowers. The majority of parklands that support intact and unimproved grassland comprise **neutral grassland** consisting of an assemblage of typical grasses and flowering plants. Examples of old parklands where ancient trees and unimproved grassland occur in combination are now very uncommon due to reseeded, fertilizing or conversion to arable or other uses, and remaining examples are of great botanical and associated wildlife value. Areas of species rich grassland can provide important habitat for a range of animal species, including **invertebrates (e.g. butterflies, bees, hoverflies and crickets), ground nesting and foraging birds, and reptiles.**



Croome, Worcestershire © National Trust images, Mike Calnan

## Waterbodies

Water has formed a key element in parkland design throughout its history, with features ranging from medieval and later fishponds through to formal canals, and most spectacularly to the great sinuous lakes created by Lancelot ‘Capability’ Brown and others at so many of the great parkland landscapes.

The ecology of water features varies, but both natural and man-made features can be of significant nature conservation value, and complement the overall habitat mix. As areas of **open water** within parklands may be surrounded by land that is not used for intensive commercial agriculture these waterbodies may evade excessive inputs of artificial nutrients through ground water and surface runoff which leads to eutrophication and a decline in biodiversity. Natural and man-made watercourses often incorporate features such as waterfalls and rock-lined splash zones that can be visually and aurally engaging whilst also being important for a range of mosses and liverworts. Similarly other features such as natural meanders, rock-lined channel margins, and pools and riffles can be important for aquatic invertebrates, spawning fish and crayfish.

The most ecologically important open water features would usually be permanent water bodies that are managed to provide a varied range of aquatic habitats and transitions to dry land. However, all areas of open water have some ecological value and it is often

the combination of water-bodies in various stages of hydrosere succession that provide a varied range of habitat conditions. Many waterbodies will support a range of different vegetation types, including submerged aquatic plants including waterlilies, fringes of emergent vegetation and marginal species including **reed beds**.

The gradual transitions to dry land including wet woodland, willow scrub and damp grassland, provide varied conditions that in turn support a greater diversity of plant and animal species. Submerged aquatic plants are likely to provide egg-laying, feeding opportunities and cover for a range of aquatic invertebrates, as well as amphibians such as the great crested newt. Stands of dense emergent and marginal vegetation can be especially important for a range of specialist invertebrates, including aquatic molluscs and beetles, and nesting birds such as reed and sedge warblers.

Large **waterbodies** may provide important habitat for a range of breeding and wintering wildfowl, as well as feeding sites for insect feeding species like swallow and house martins. Waterbodies within parkland sites are also likely to be important areas for foraging bats, particularly in areas where there is an abundance of potential roosting opportunities in the form of old trees and historic buildings.

## Parkland Architecture

Undisturbed stone walls and iron railings can support rare and important lichens in the right growing conditions.

The setting of extensive areas of semi-natural grassland, trees, woodland and open water, all of which represent valuable foraging ground for bats, means that old historic buildings and structures such as ice houses and caves are particularly attractive places for roosting bats and birds. This can include high value maternity and hibernation roosts for bats and nesting sites for birds.