# Contents



## THE SPECIES ACCOUNTS

By 1400 much of the population was still engaged in subsistence agriculture, which occupied nearly all usable land. Through the 15th and 16th centuries, rising demand for firewood and charcoal placed increasing pressure on woodlands, although their area remained broadly stable at around 10%. This period also saw the beginnings of the practice of enclosure that would continue through several centuries, creating tens of thousands of miles of new hedge. As the total length of hedge continued to grow, the number of hedge trees also began to increase as a source of wood fuel.

An early painting of the English treescape at Henley-on-Thames, Oxfordshire by Jan Siberechts (1627–*c.*1703).

## The 16th and 17th centuries

Prior to 1500, little information was available about tree planting or selection of species, but after the Roman withdrawal, very few new trees arrived in Britain & Ireland. It is thought that the Sycamore, an excellent colonizer, arrived from northern Europe sometime after the late 13th century, although no specific date can be identified. Equally, the arrival of the Horse Chestnut from Turkey around 1600 was the beginning of an entertaining relationship with a characterful tree.

It was not until 1523, when Fitzherbert published his *Book of Husbandry*, that a written work explained exactly how people might plant and manage trees. Further valuable plant information became accessible in the early English herbals. William Turner published his illustrated *Herbal* in three parts between 1551 and 1568. This was followed in 1597 by John Gerard's *Herball*.

In the following century John Parkinson published his *Paradisi in sole Paradisus terrestris* in 1629. He was an enthusiastic gardener and plant collector who was keen to pass on his wealth of experience and knowledge. However, it was with the publication of John Evelyn's *Sylva – A Discourse on Forest Trees* in 1662 that a dedicated work for tree planters became available. Evelyn went into the minutest detail of how to nurture various species successfully and, with the commercial forester in mind, set forth the virtues of the timber and expectations of their harvest potential. So comprehensive was this work that it went to several editions for more than a century.

By the 17th century in Ireland, woodland cover had dropped significantly to somewhere between about 12% and 2% (the estimates differing as the real data are poor), because of trees being felled for timber which was often exported to Britain for ships, house building and barrel making. The remaining woodland was often coppiced to produce charcoal for smelting iron ore.

### Introduction of the London Plane

Meanwhile the plant hunters had begun to visit distant shores, returning with all manner of trees and plants. In the mid-16th century, the Eastern Plane arrived from the Caucasus and began to grow alongside the Western Plane, one of the earliest arrivals from the Americas in the 1620s. The result was a hybrid between the two – named the London Plane.

The first hybrid is generally thought to date from 1663 in Britain, and it is highly likely that the cross occurred in the Lambeth Garden of the famous 17th-century gardener and plant hunter John Tradescant, as it is known that both species were growing there. It is now estimated that around 50% of trees in the streets and squares of Britain's capital are London Planes, the oldest, in Berkeley Square, being more than 200 years old.

In 1638 the first Cedar of Lebanon seed was brought to Britain from Syria by Dr Edward Pococke, and tradition has it that he planted one in his rectory garden at Childrey in Oxfordshire in 1646. Stately homes, country mansions and municipal parks then spread them around the country.

Throughout the 17th century, new trees continued to cross the Atlantic from eastern and central North America. One of the most handsome was the Tulip-tree, which was planted as an amenity tree with striking golden yellow autumnal colour.

In the late 17th and early 18th centuries the influence of Dutch garden design during the reign of William and Mary brought a renewed passion for topiary, which had fallen out of fashion. John Evelyn, in 1662, promoted Yew for topiary as an alternative to the benchmark species, Box, and in 1694 a grand Yew design was created at Levens Hall in Cumbria, which remains the finest topiary garden in Britain.

In 1638, the first Cedar of Lebanon seed was brought to Britain. This tree was planted by Dr Edward Pococke in Oxfordshire from those first seeds.

## The 18th and 19th centuries

Almost all the maps of the 17th century show parishes across England having some length of hedge. By the 18th century, reforms of agricultural practices paved the way for the Industrial Revolution and had two major effects: i) increasing the output of farms and ii) reducing the number of people who needed to work on the land. This resulted in a movement of people from the countryside to the towns, where there was work available in the emerging industries.

### Enclosure Acts

To allow farmers to farm in the new ways, they needed large, consolidated plots of land instead of the scattered 'strip' system that had previously been practised in the open field system. As a result, Parliament enacted a series of laws (mostly between 1760 and 1830) called the Enclosure Acts, to consolidate land holdings and to specify that the enclosed land was surrounded by hedges and ditches.

The more than 5,000 separate Enclosure Acts enclosed more than 7 million acres of open fields and common land. Oliver Rackham estimated that more than 200,000 miles of new hedge were planted between 1750 and 1850. The percentage of open field land enclosed varied considerably across the country, which suited wealthy landowners with sporting interests. As examples, in Northants, 51% of open fields were enclosed, whereas in Shropshire this figure was approximately 7%.

The speed and scale of hedge establishment in this period led to the creation of large commercial nurseries specialising in the supply of hedging material, mostly Hawthorn, to create the new network of hedges.

The spread of Enclosure, particularly in the open field systems of the Midlands, led to the creation of many new, often very straight, Hawthorn hedges which divided up the countryside geometrically. These hedges were 'quickset', a word which indicates both the hedge itself and the act of planting it. They cut across the open field ridge and furrow system, and many of the fields that had previously been ploughed were converted to arable pasture. As the landscape changed, foxhunting began to spread, especially in the Midland areas of Rutland, Leics, Northants, and Buckinghamshire. This had a knock-on effect on hedge management, as dense low growing 'walls' of vegetation were desirable as jumps for riders. These tidy, well-managed hedge 'jumps' are still a feature of many hedges today.

### Exotic importations

The 18th and 19th centuries also saw great collaborations of plant hunters, botanists, nurseries and private collectors. The huge array of trees on the west coast of North America still lay untapped until the remarkable efforts of David Douglas brought two of Britain's prime timber trees – the Douglas Fir and the Sitka Spruce – as well as several other maples, firs and pines.

In Ireland, during the 18th century, large houses were built, and their grounds were often planted with these new tree species, and as in Britain, Douglas Fir and Sitka Spruce were used, as were Lodgepole Pine and Western Red-cedar.

Archibald Menzies had brought the first Monkey-puzzles from Chile in 1795, but it was William Lobb who, in 1841, reintroduced the tree, and Veitch's nursery of Exeter popularised it. The Monkey-puzzle and the Giant Redwood (introduced by Lobb in 1853) became two of the most sought-after specimen trees for impressive centrepieces of many formal gardens.

The author with one of the first Giant Redwoods planted in Great Britain at Errol, Perthshire.

In the midst of all these exotic importations, the great landscapers, such as Charles Bridgeman, William Kent and Capability Brown, were busily transforming parks and gardens into vast rolling landscapes employing man-made 'natural' hills and vales, meandering rivers and tastefully distributed spreading specimen trees or picturesque clumps. Naturally occurring native species were the order of the day, and the new trees were virtually ignored for this manufactured countryside. A theory suggests that many of the larger specimen trees of parkland were hedgerow trees which were retained for the new schemes, when all signs of hedged farmland were obliterated. The linear alignments of many of these trees today may bear out this theory.

## The 20th century

From 1870 until 1940, agriculture hit a period of recession, as America began to flood European markets with a glut of cheap grain. Farming neglected the poorer land, and the countryside reverted to a wilder state than it had been for many centuries. Hedges were managed less frequently, and there was a significant emergence of hedge trees as hedge management declined.

In Ireland by the end of the 19th century, more woodland clearance occurred, and by 1918, woodland cover was as low as 1% of Ireland's land mass. This started to be reversed following the Irish 1946 Forestry Act.

In Britain, from 1940 to the end of the 1990s, agriculture fortunes changed again with a period of expansion, enhanced by entry into the EEC in 1973. Arable farming and its intensification led to the development of larger machinery, making much bigger fields an economic necessity. As a result, hedges suffered, and estimates suggest that between 1946 and 1970 some 4,500 miles of hedge were removed every year.

During the 1960s and 1970s, there was a resurgence of Dutch elm disease, and, due to the importation of a more virulent strain from North America, most of the countryside's significant elm trees in hedges were lost.

In Ireland by 1951, woodland cover in the Republic of Ireland had grown to 1·8% and consisted mostly of exotic conifers. To improve the tree cover, in 1960 a national planting target was introduced which had pushed the percentage woodland cover up to 4·8% by 1983.

## Trees in the 21st century

Climate change is bringing global temperature increases resulting in extreme weather events including drought, flooding and storms which plants will have to endure on a more regular basis in coming years. Climate modelling research by the Royal Botanic Gardens, Kew, suggests that London's climate by 2050 may be comparable to present-day Barcelona.

The first instinct is to see how our native trees will fare. Beech and birch both suffer in droughts, as does the naturalized Sycamore. Beech, being shallow-rooted and often growing on light soils, will probably become stressed in the southern counties. Sycamore, an important tree of northern Britain, might also struggle in the south. If the cover of some of our native species shifts to more northern climes it will be interesting to see what happens in the spaces they vacate. A mixture of natural succession and intervention planting to adapt to a changing climate may well create whole new treescapes. This will be at its most marked in towns and cities, where treescapes are needed that provide valuable cooling and shading benefits to cope with the changing climate.

There are numerous other concerns for future trees which affect commercial foresters and the conservators of ancient woodland, drawing together potential problems such as plant competition and an increased range of insect pests and pathogens. We are already aware of the predations of longhorn beetles, numerous fungi and *Phytophthora* water moulds which may be poised to tip some of our tree species into similar declines reminiscent of that seen from Dutch elm disease, and as is happening with Ash dieback.

However, there will be some positive aspects to the changes, and one, concerning our native Small-leaved Lime, has already been observed. Hotter summers are causing the species to set viable seed more often, which might mean limes will extend their range after several hundred years of standstill.

## Current state of our treescape

Currently Britain & Ireland's treescape is expanding. In Great Britain in 2024, 13% of the total land area in the UK is woodland, 19% in Scotland, 15% in Wales, 10% in England, and 9% in Northern Ireland. In the Republic of Ireland, the current woodland cover is 11%. Recent data also show that in Britain, non-woodland trees make up another 3·2% of our landmass, although there is no equivalent number for Ireland.

Despite being significantly lower than many European countries, in Britain & Ireland these are the best tree cover numbers for many decades, and the current targets are to expand our tree cover further. Along with our wide range of native trees, over the past 500 years, trees from all over the globe have been brought into our islands, giving us a wealth of commercial timber trees and a startling collection of beautiful amenity trees.

Now there is little excuse not to plant trees. However, we also must remember the old maxim that 'We need to plant the right tree, in the right place' – and now add the extra thought – 'for the right reason'. If we do this, using a suitable palette of native and introduced species, the opportunities for tree planting have never been better.

Our treescape consists of a wide variety of woody habitats, from orchards to hedges, copses, scrub and woodland plus many more– some of which are on view here in Northern Ireland.

## Introduction

The biological value of trees and tree habitats to our wildlife is enormous. However, one of the most widely asked questions is, which of the native species is the most valuable for wildlife?

Answering this question is surprisingly difficult. In 1961, Professor Southwood compared the numbers of insect species feeding on the foliage of various trees and shrubs and in 1984 updated the paper to include newly available data.

These papers showed that oaks, willows and birches supported the greatest number of plant-eating insects and mites: five native willows supporting 450 other species, two native oaks supporting 423 species, and two native birches supporting 334 species.

At the other end of the spectrum, he showed that the lowest diversity of insects was found on Juniper (32 species), Holly (10), and Yew (6).

Southwood showed that the factors which impacted the number of insects feeding on a tree were:

- the abundance and distribution of the tree or shrub
- the length of time the species had been in Britain & Ireland
- whether the leaves were evergreen.

However, leaf-feeding insects are only one part of the species mix that uses our native trees, as there are many other organisms associated with trees, including:

- birds and animals that feed on the trees (including fruits and berries) or use them for breeding
- insects that feed on dead wood, pollen, nectar, fruits and seeds
- invertebrates which live on decomposing fallen leaves and organisms like nematodes and bacteria that live in the soil around the roots
- fungi that live on tree roots (mycorrhizal communities) or within the structure of the tree, like those that decompose wood
- lichens, mosses and liverworts that live on the bark and wood of the tree.

When the full range of species above is studied, the increase in species can be significant. For example, with the two native oaks, it was found that in fact more than 2,300 species of mammals, birds, invertebrates, fungi and mosses used oaks (as opposed to the 423 insects that feed on the leaves).
Of these, 326 species have come to rely solely on oak, including moths such as the Dark Crimson Underwing.

Unfortunately, the full range of species using our other tree and shrub species has not been studied to the same extent, so it is therefore very difficult to decide which tree species are 'best for wildlife',

Dark Crimson Underwing

Oak Eggar

although it is obvious that some tree species support a wider range than others. However, it is the diversity of tree species and tree habitats that is often more important than the tree species alone.

## The importance of dead and rotting wood

Another important factor which influences the number of species using any individual tree is the age of the tree, and especially the presence or absence of dead wood. Rotting wood in living and standing dead trees is especially important for providing habitats for species, such as the Lesser Stag-beetle. These specialist species which depend on dead and decaying wood are known as saproxylic invertebrates, and more than 650 British beetle species use decaying wood, especially in large old native broadleaved trees in wood pasture and parkland (see *p. 30*).

So specialised are some of these species, they even have preferences on the specific type of dead wood they need; from fallen branches to standing dead trees, the location and aspect of dead wood matters. The species of tree is also important, as for example the Violet Click Beetle lives only in ancient Ash or Beech, whilst the Variable Chafer survives only in dead wood in ancient oaks, Beech and Sweet Chestnut.

Holes in rotting trees provide nesting and sheltering opportunities for birds, including some rare and declining species such as the Tree Sparrow. Certain bats also use holes in trees, and two rare species (Barbastelle and Bechstein's Bat) are associated with ancient trees.

Unfortunately, our treescapes now have a serious lack of dead wood, as it is often 'tidied up' by overzealous tree managers, which means that many of the species associated with this invaluable habitat have become rare. This makes unique places like the New Forest in Hampshire vital, as here dead wood is still relatively abundant due to policies which leave dead and fallen trees in situ, wherever possible.

Violet Click Beetle

Variable Chafer

Tree Sparrow

## Treescapes and biodiversity

Within Britain & Ireland, as well as the species of tree and the presence of dead wood, the environment created by the treescape also significantly impacts species diversity. One of the most important factors which increases the number of species is the availability of light, with the edges of woodlands usually supporting a wider and more diverse species mix than the woodland interior.

The impact of light is perhaps best illustrated with hedges, which are essentially managed, thin woodlands, with plenty of light on either side. Here the 'edge effect' (as it is known) is most obvious, with large numbers of moths, including Small Eggar, plus nearly half of the 46 butterfly species found in lowland areas of Britain & Ireland (*e.g.* Gatekeeper), breeding in hedges.

Over large stretches of intensively managed farmland, hedges and their trees are an essential refuge for many plants and animals and can also act as corridors, allowing wildlife to move between habitats. Certain uncommon trees are also found growing in hedges as they like the light open situations created in this treescape, for example, the Plymouth Pear, which grows only in a few hedges in south Devon and Cornwall, the endemic Devon Whitebeam which also grows in hedges in the south-west of England and southern Ireland, and rare woodland-edge plant species such as Crested Cow-wheat which can be found in hedges in eastern England.

The beautiful Crested Cow-wheat, in a Cambridgeshire hedgerow.

The growth form of the tree (see *p. 18*) also impacts the range of species that live on any individual tree, with open-grown ancient trees providing the widest range of opportunities for any colonising species. Mature and ancient trees growing in any habitat, but particularly where there is light, have been described as 'keystone structures' for local biodiversity. This is because they have a range of features which support other species, including hollow trunks, partially dead canopies (stag-headed trees – see *p. 49*), holes in the rotting wood and dead wood itself. These features have been shown to increase if the tree grows in the open, rather than in a wood, presumably because of the impact of the weather – particularly the wind – which can cause non-fatal damage to the tree, opening up these new micro habitats.

Red-horned Cardinal Click-beetle

One interesting finding concerning the deadwood saproxylic beetles is that they are sensitive to the width of the tree's trunk and the exposure of the trunk to sunlight. Researchers have shown that individual trees in sunny habitats were selected by these insects in preference to shaded trees in darker woodlands, including many of the rarer click beetles. Species richness of rare lichens on ancient oaks in closed woodland is also half that compared with oaks growing in open conditions.

The importance for biodiversity of open grown, free-standing old and 'ancient' trees which benefit from sunshine cannot therefore be overstated. It is vital therefore that we make significant efforts to protect our current population of these special trees, whilst also striving to create the next generations of these ancient trees.

## History of Ancient Trees

Our islands have a remarkable collection of ancient trees growing on their shores. Indeed, it has been said that there are more ancient oaks in Britain than in the rest of Europe combined. This is a by-product of our land and tree management history, and in particular the role of Royal Forests which were set up during The Middle Ages by, amongst others, King William I in the 11th century.

These medieval 'Forests' were a designation used for an area where the King or other eminent people had the right to hunt deer. 'Forest' was a legal term and did not mean that the whole area was wooded; indeed, there was no direct reference to trees or woodland. It was rather that the King had taken it upon himself to use the land to protect deer and, by default, other wildlife and trees for the royal hunt.

More than 130 different forests have been recorded through history, some large and famous like the New Forest in Hampshire, Sherwood Forest in Nottinghamshire and the Forest of Dean in Gloucestershire, the boundaries of which are still known and where much of the original landscape still remains. Others, like the Forests of Buckholt, Sapley and Chute (Hampshire), have been lost and remain only as small woodlands. At one point, it is thought that nearly 25% of England was covered by a 'Forest' which gave our trees a form of protection not found elsewhere in Europe.

Another route to the development of ancient trees was our national network of hedges. One of the main management techniques for hedge trees throughout history has been 'pollarding' – cutting the crown off a young tree at a height of 1·8–4·5 m (6–15 feet) from the ground, leaving a permanent trunk called a 'bolling' (see *p. 22*). This trunk then sprouts a range of shoots, at a height that keeps them away from grazing animals.

A beautiful 'stag headed' old tree in Hampshire (see *p. 49*).

The effect of pollarding on a tree is curious, as it often allows the tree to reach a much greater age than if it were left to grow into its normal mature shape. Pollarding also appears to retain the tree in a state of greater vitality, by interrupting the normal aging process and, since the crown of branches and leaves is smaller, also reduces the likelihood of storm damage. Pollarding trees has therefore allowed many to grow for several hundred years and some for much longer.

During the second half of the 18th century, these ancient, pollarded hedge trees were also used by the great landscape designers of the time. To allow grand new landscapes to be created, which carried with them a feeling of age and continuity, the designers – Humphry Repton, Lancelot 'Capability' Brown and others – used these old trees to their advantage. To create an 'instant park' which had the feeling of antiquity, these designers carefully removed the hedges from around the ancient trees, leaving them free-standing in the landscape, many of which still exist.

## What is an 'ancient' tree?

The term 'ancient tree' is one that is not capable of precise definition, but it encompasses trees in three categories:

- trees of interest biologically, aesthetically, or culturally because of their age
- trees in the last stage of their life
- trees that are old relative to others of the same species.

One of the complications of ancient trees is that some tree species simply live longer than others. Since one definition of 'ancient' is that a tree must be old for its species, this means that an 'ancient' Yew may be 2,000 years old; an 'ancient' oak may be 1,000 years old, whilst an 'ancient' birch can be only 150 years old.

An ancient pollarded Hornbeam in Kent.

Birch trees have a shorter lifespan than many species – so become 'ancient' earlier.

There is also often confusion between the terms 'ancient' and 'veteran' trees. The term 'veteran' has been coined to describe the wildlife or habitat quality of trees which are not yet ancient (old) but have a range of 'ancient' features such as dead wood in the crown or signs associated with wood decay in ancient trees, like holes in the bark, root, trunk and branches.

In practice, the terms are often used together, with 'ancient and veteran' trees being used as a catch-all, to describe some of the most amazing trees in the country. To return to the claim that Britain has the largest collection of ancient oaks in Europe, research by the Royal Botanical Garden at Kew and the University of Oxford has shown that more than 115 oak trees with a girth of more than 9 m are known in Britain, compared with only 96 trees of similar girth across the remainder of Europe. Britain therefore does have an internationally important collection of ancient trees that need our care and protection.

## Why do ancient and veteran trees matter?

As a tree ages, it creates valuable habitats for a wide range of species. An ancient oak, for example, can support hundreds or possibly thousands of other species which take advantage of the cracks, rot holes and cavities that can exist in a single ancient tree.

One of the characteristics of ancient trees is that they begin to lose the heartwood at the centre of the trunk, which is decomposed by a range of fungal species and eaten by a range of beetle and other insect larvae. This leads to many ancient trees becoming hollow, which we have come to realise over the last 30 or 40 years is an important part of healthy aging in many trees. This hollow tree trunk reduces the tree's mass, and recent exceptional storms have shown that hollow trees are blown down less frequently than 'solid' ones.

As a tree gets older, it can also begin to create dead wood in the upper canopy, which is described as 'stag-headed' (like a deer's antlers). These stag-headed trees can be produced when an old tree 'cuts off' water and nutrients to certain branches which die, giving the characteristic 'stag-headed' form. This does not mean that the whole tree is about to die, it is a condition that can persist for many decades or even centuries.

The ecological value of old trees is that they retain large quantities of decaying wood within the structure of the tree which provides valuable habitats for rare and endangered fungi, lichens and invertebrates plus roosting and nest sites for bats, birds and other small mammals. Even a single ancient tree can host rare and endangered species, providing a huge range of micro-habitats, as can be seen in the picture.

There are more than 2,000 invertebrate species in Britain and 650 in Ireland which are dependent on decaying wood, about 7% of the entire British invertebrate fauna.

For these creatures, a large standing living tree with columns of decay in the heartwood is a crucial resource. In the early stages of decomposition, rotting heartwood provides food for the larvae of species such as the Lesser Stag and Rhinoceros Beetles, whilst rare colourful insects like the red Cosnard's Net-winged Beetle can feed on the rotting heartwood of Beech and Ash.

Beautiful stag-headed oak in Suffolk.

As the tree further decomposes a different fauna develops, including the Hairy Fungus Beetle and the larvae of the rare Noble Chafer, which can occasionally be found developing in hollowing fruit trees, oaks and willows.

Rhinoceros Beetle

In rotting trees, the decomposing wood accumulates in the bottom of the hollow trunk. Some of our rarest insects develop in this environment of relatively constant temperature and humidity, protected from the outside world by the surrounding living trunk tissues. The Darkling Beetle is one of the most widespread specialists, while the rare Violet Click Beetle is one of Britain's very few legally protected beetles.

The adults of many insects that develop in decaying wood need nearby blossom on which to feed before they can start to reproduce. Blossom provides nectar – an energy-rich food – and pollen, which provides the energy needed for egg production. Blossom can be important throughout the spring, and species such as sallows, Holly, Wild Privet, Rowan, Crab Apple, Wild Pear, Guelder-rose and brambles are all beneficial.

Flowering trees and shrubs are by far the most important sources of nectar and pollen to these creatures. Insects in ancient trees have easy access to a whole range of species, especially Hawthorn, which provides the ideal insect blossom, due partly to its flowering in late spring when so many wood-decay insects are in the adult stage.

Unfortunately, as an old tree becomes 'ancient' or 'senile', it continues to decline and decay. Many ancient trees grow along roadsides and highways, where falling dead wood or limbs may become a hazard to passing traffic or pedestrians.
These trees need careful management to ensure public safety whilst retaining them and their unique ecological value.

## Is it good to leave a dead ancient tree standing?

From the point of view of the environment, yes. Standing dead trees are home and feeding station for many animals and birds and numerous insects. Some of the great historic landscape designers such as Humphry Repton recognized the importance of trees with decay, and William Kent (in the early 18th century) was known to import dead trees to create an immediate 'air of antiquity' in his landscape gardens. From a health and safety perspective, leaving a dead tree standing may not be such a good idea. Much depends upon the situation and amount of public access. A compromise may be to leave a safe stump and a pile of dead wood on the ground. A totally dead tree is unlikely to spread disease to live trees unless the adjacent trees are under stress already from some other cause.

Dead standing oak at Windsor Great Park.

# Tree identification

## Getting started

It is quite common to find tree identification difficult to begin with. Why this is the case remains a little unclear, although it may be simply because it is hard to figure out which part of the tree to use when starting an identification, and that the available features change with the seasons. An identification might use flowers in the spring, leaves during the summer, fruit in the autumn, and twigs and buds throughout the winter. This shifting set of features can make tree identification tricky at some times of the year, particularly in winter until twig and bud features have been mastered.

Fortunately, many of our native trees have a single useful feature, or simple combination, which will help you to identify that species through the seasons. Learning these should enable a quick and confident identification of some of Britain & Ireland's commonest trees, and will also provide a good knowledge base from which to compare other tree species.

Getting to know ones trees is about practice and perseverance, and this book should enable identification to be reached for most trees you will encounter either through the 'one-step' method or by using the more detailed illustrated keys and species accounts. However, the trickiest species, such as willows and rare whitebeams, and those groups that readily hybridize, may prove impossible to identify and may require accessing specialist information that is beyond the scope of this book. Don't be put off as even with lots of practice, it is still possible to get it wrong!

## One-step identification

On the next five pages, we will show you a few easy examples of this 'one-step' method of tree identification, as a way of confidently learning a base set of species which can be used as a starting point from which to compare other species.

## Park and street trees and varieties

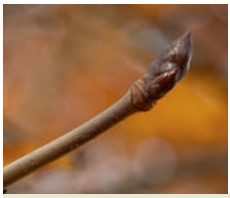
The nature of the British & Irish landscape is that there are many different species of exotic planted trees: those deliberately planted in parks as examples of their type and those amenity-planted en masse *e.g.* in business parks. In addition, cultivated varieties of even well-known species can look very different in form, and the colour and shape of the leaves and flowers. Only those that are relatively common, or may be found naturalized or self-seeding, are included in this book. Given the hundreds of species and varieties that have been planted, it is likely that trees will be found that are not in this book. Nonetheless, those that are most likely to be encountered are included in their own section, ***Park, street & garden trees and shrubs*** starting on *p. 338*.

**Author's note – identification using bark** | Speaking from personal experience, frankly, some species are next to impossible to identify from their bark alone without years and years of practice, and even then, it is easy to get it wrong. However, there are a few species where it is possible to use bark and others where a combination of bark, twigs and buds allow a quick and accurate identification. Consequently, although the vast majority of the species accounts include images of the bark, these are included for comprehensiveness and rarely referred to as identification features.

Bark varies in many species with age and environment – these are all examples of Wild Service-tree (*p. 142*)

## 'One-step' ID – using different features at different seasons

Species may have one season during which they are easier to identify than at other times. Others are readily identifiable throughout the year using differing features – Horse Chestnut (*below*) is a good example of such a species, although there are two other much rarer similar species to be aware of.




In **winter**, Horse Chestnut twigs (*p.290*), with their large leaf-scars and **sticky buds**, are obvious if a close look is taken. Horse Chestnut can be readily identified during the remainder of the year: in **spring to autumn** by the large **'hand'-like leaves** with **unstalked** leaflets; in **spring** by the white **'candelabra' flowers** (which are highly distinctive, even at distance); and, in **autumn** by the characteristic **spiky fruits**.

**Similar species** | The leaf-shape rules out any other British & Irish tree except **Indian** and **Red Horse Chestnuts** (*p.291*) which both have stalked leaflets and almost smooth fruit; **Red Horse Chestnut** also has red flowers. Confusion with **Sweet Chestnut** (*p.216*) is possible, but that has narrowly oval single leaves.

## Trees easily identified all year

For a few species it is possible to make a quick and easy identification all year-round using bark and/or twigs and buds alone or in combination.




**Smooth grey bark like an elephant's skin**; buds **away from** twigs

Beech (*p.214*)

**Smooth grey bark but with 'stretch marks'**; buds **pressed to** twigs

Hornbeam (*p.278*)

**Conifer with salmon-pink upper trunk contrasting with a darker lower portion**

Scots Pine (*p.96*)

**Whitish bark with black vertical cracks and 'diamonds'**

Silver Birch (*p.268*)

**Downy Birch** (*p.268*) has horizontal cherry-like 'rings'; planted **ornamental birches** have bark that peels in strips

**Reddish brown to grey bark with distinctive 'rings'**

Cherries (*pp.176, 177*)

Most likely a **Wild Cherry** in woodland and an **ornamental cherry** in parks and streets

## Four evergreen species easily identified all year

**Prickly leaves**

Holly (*p. 302*)

A few **Evergreen Oak** (*p. 223*) can have some holly-like leaves

**Sharply pointed unbranched needles**; arranged in **threes**

Juniper (*p. 118*)

**Sharply pointed branched spines** yellow flowers

Gorses (*p. 318*)

Identify to species by flower details

**Unmistakeable form**; large triangular needles

Monkey-puzzle (*p. 129*)

## Trees easily identified in winter

It is often thought that winter is a tricky time for identifying trees, but there are a number of species, including all the ones covered above that can be done quite easily in winter.

Twigs and buds can be used, with some attention to detail, to identify most species in winter.

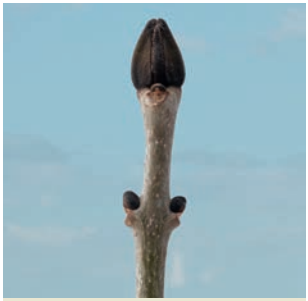
▶ **see p. 78 for a key to winter twigs**

**Long, bright yellow catkins present all winter**

Hazel (*p. 276*)

**Purplish orange-brown twigs are distinctive even at a distance**

Bog Myrtle (*p. 314*)



**End-bud black and sharply pointed; side-buds on twigs arranged oppositely**

Ash (*p. 298*)


**Purplish at a distance; with small woody 'cones'**

Alders (*pp. 272, 274*)

In a river or wetland, it will most likely be **Common Alder** – but non-native varieties are planted in other places

## Trees easily identified in spring

Flowering starts as early as February and other than Hazel, the first flowers of the year are the massed white blossom of Cherry Plum usually seen in early to late March, followed by Blackthorn.

In April many other species will appear in flower, most of which need a closer look and/or other features to identify.

▶ **see *p. 68* for a key to flowers**

**Masses of white blossom before the leaves appear**

| large flowers; **early–late March** | smaller flowers; **late March–early April** |
|---|---|
| **Cherry Plum** (*p. 172*) | **Blackthorn** (*p. 171*) |

Later in the season check for plum, apple and pear (see *p. 70*)


**Yellow 'pussy willow' ♂ catkins; grey-green ♀ catkins**

**Goat and Grey Willows** (*pp. 232–235*)


**Long pendent catkins (Aspen and Grey Poplar grey hairy); ♂ red; ♀ yellow-green**

**Aspen and other poplars** (*pp. 256–264*)

There are many **willow** and **poplar** species with similar flowers and these require examination of the leaves later in the year for confident identification (see *p. 228*). The long, pendent yellow ♂ catkins of **alders** and **birches** (*p. 68*) are somewhat similar but both have much smaller buds and different leaves to poplars.

**Clusters of winged seeds in late spring are diagnostic of elms as a group**

**Elms** (*pp. 197–212*)

Taxonomy is complex – see *p. 202*

**The earliest maple to flower (before the leaves) standing out against other bare trees**

**Norway Maple** (*p. 288*)

Other maples (*pp. 284–289*) flower with their leaves

**Flat clusters of small white flowers with a honey-like aroma; pinnate leaves**

**Elders** (*p. 306*)

Other white clustered species have different leaf shapes

## Trees easily identified in summer

Summer is the prime time for trees. Many species have finished flowering and are developing fruits but there are some distinctive later-flowering species. Leaves are the main identification features, and although many are similar there are some that are distinctive.

▶ **see *p. 58* for a key to leaves**

**Domed clusters of small white 4-petalled flowers; oval leaves with 2–5 pairs of veins**

Dogwoods (*p. 304*)

Other **planted dogwoods** have leaves with 6–7 pairs of veins

**Flat clusters with flowers of two very different sizes; lobed leaves**

Guelder-roses (*p. 308*)

The **planted American Guelder-rose** has minor leaf differences

**Pinnate leaves with oval, untoothed leaflets; 'furniture polish' aroma if crushed**

Walnuts (*p. 196*)

**Black Walnut** has pointed leaflets

**Pinnate leaves with narrowly oval, untoothed leaflets;** arranged alternately

Rowan (*p. 140*)

**Ash** (*p. 298*) has opposite leaves

**Leaves with an uneven base**
NOTE: a huge range of shapes and sizes between taxa

Elms (*p. 197*)

**Toothed, narrowly oval leaves; distinctive clusters of very long, yellow ♂ catkins**

Sweet Chestnut (*p. 216*)

**Evergreen shrub; leaves oval, shiny; white flowers in cylindrical spikes**

Cherry Laurel (*p. 178*)

**Semi-evergreen shrub; leaves narrowly oval; white flowers in pyramidal clusters**

Wild Privet (*p. 312*)

**Garden Privet** has broadly oval leaves

## Trees easily identified in autumn

The fruits and seeds of some trees and shrubs are highly distinctive. Very few woody plants are in flower, but those that are can be readily identified.

▶ **see *p. 74* for a key to fruit**

**Conical spikes of purple flowers can remain into late autumn**

Butterfly-bush (*p. 328*)

**Softly spiny fruit**

Sweet Chestnut (*p. 216*)

Not to be confused with **Horse Chestnut's** (*p. 290*) spiked capsule

**The long papery bracts are diagnostic of limes**

Limes (*p. 292*)

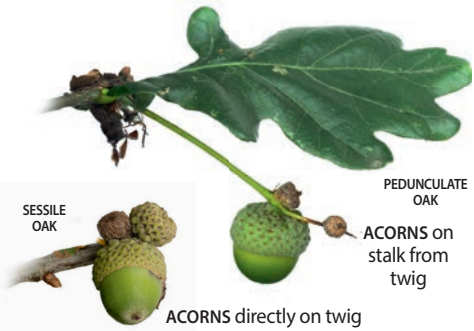
Identify to species by the number of fruit and whether they are pendent or erect

**Pink seed pods and orange seeds are unmistakable**

Spindle (*p. 280*)

**Red 'berries' that are actually soft flesh partially surrounding a hard seed are diagnostic**

Yew (*p. 116*)




**Acorns in scaly, hairless cups and leaves with rounded lobes**

Native deciduous oaks (*pp. 218–221*)

Identify to species by seeing whether the acorn sits directly on the twig (**Sessile Oak**); or on a thin stalk (**Pedunculate** (English) **Oak**). Non-native oaks are evergreen, have pointed lobes, or 'hairy' acorn cups.


**Red berries, spiny twigs and/or lobed leaves are distinctive**

Hawthorns (*p. 186*)

Identify to species by squishing the fruit and counting the stony seeds inside – one = **Common Hawthorn**; two = **Midland Hawthorn**.

# Tree identification

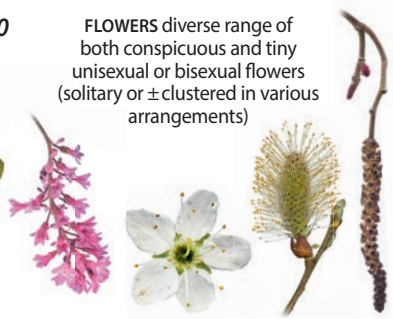
The following pages contain visual keys to the naturally occurring (rather than street or park planted) trees and shrubs in this book. The keys cover the leaves, flowers, fruit and winter twigs as separate sections. In the field it is highly likely that more than one feature will be used in an identification.

The keys indicate the pages where the relevant species account can be found or, in some cases, to additional keys.

## The first distinction is to determine whether a tree is a broadleaf or a conifer

### Broadleaf trees ▶ *p. 130*

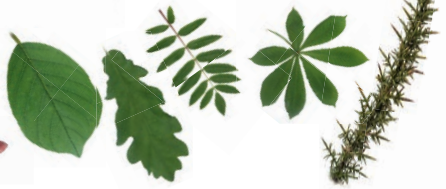
**FLOWERS** diverse range of both conspicuous and tiny unisexual or bisexual flowers (solitary or ±clustered in various arrangements)



**FRUIT** diverse range of hard and soft fruits and cases that enclose and protect the seed

MAR–NOV

**LEAVES** typically broad (plus needle-like gorses) in a wide range of structures, outlines and shapes



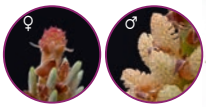
**HABIT** most species lose their leaves in winter (deciduous), a few evergreen

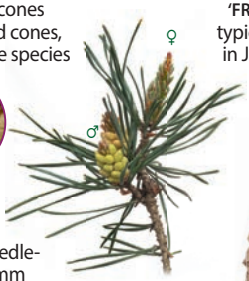
NOV–APR


Key to leaves ▶ *p. 58*
Key to flowers ▶ *p. 68*
Key to fruit ▶ *p. 74*
Key to winter twigs ▶ *p. 78*


### Conifers ▶ *p. 88*

**'FLOWERS'** ♂pollen cones (sporangia) and ♀seed cones, both very small in some species





**'FRUITS'** mature ♀seed cones, typically scaled and woody (soft in Juniper); Yew with berry-like aril with exposed seed

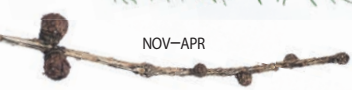
ALL YEAR

**LEAVES** typically needle-like and thin (<8 mm across), or scale-like

**HABIT** most species evergreen, a few deciduous

MAR–NOV

NOV–APR




Key to conifer leaves ▶ *p. 91*
Key to conifer cones ▶ *p. 94*

# Key to leaves

**Using leaves for identification** | The leaf feature terms used for identification are illustrated on these two pages. This book tries to avoid detailed botanical terms – technical terms for the descriptions used are given in *italic text*.

**Leaf structure, shape and margin** are of prime importance in identification: whether the leaf is a single continuous leaf-blade or comprises a number of separated smaller leaflets; the outline of the leaf blade and the shape of any lobes; and whether the edge of the leaf is smooth, with teeth or spines. The categories with page numbers below relate to the groupings used in the key.

## Leaf or leaflet shape | see *Distinctively shaped leaves* (*p. 60*) for those that do not fit these categories.

**simple** — leaf-blade that, although it may be lobed or deeply divided, is an entire, single piece

UNLOBED

**triangular**

**heart-shaped** (*cordate*) **to ± circular**

**broadly oval** (*ovate*)

**oval** (*ovate*)

**narrowly oval** (*ovate, lanceolate*)

**needles** **scale-like**

NOTE: oval leaves with tips that are obviously pointed are referred to as 'pointed-oval'

▶ *p. 64* ▶ *p. 64* ▶ *pp. 65–67*

▶ **Conifers** *p. 91*

NOTE: the deciduous **Tamarisk** (*p. 326*) has scale-like leaves – see *p. 60*

LOBED

**spiny** broad or narrow spines on leaf-margin

**lobed** lobes irregular (includes spiny leaves)

**pinnately lobed** lobes arranged ± regularly and oppositely

**palmately lobed** lobes spreading radially from a single point

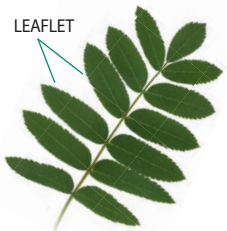
▶ *p. 63* ▶ *p. 63* ▶ *p. 62*

### Leaf-margin

**untoothed** (*entire*) smooth-edged (not divided, lobed or toothed)

**toothed** (*entire*) serrated leaf-margin; the shape of the teeth is useful for identification (see *facing page*)

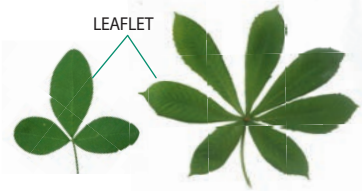
**compound** — **LEAFLETS** arising from a single point




NOTE: closely spaced simple leaves (especially those arranged oppositely) can look compound

▶ *p. 61*

**LEAFLETS** arising from multiple points




**trifoliate** 3 **LEAFLETS**

**palmate** >3 **LEAFLETS**

▶ *p. 60*

NOTE leaf shape is the primary feature to observe; leaves are not scaled accurately



## Choosing the right leaf

For most species any leaf will do, but for some it is important to look at the 'right' leaves for identification. Factors such as leaf age, whether it is on a vegetative (long shoot) or flowering twig (short shoot), and whether it is in sun or shade can be very important. Generally it is best to avoid those leaves on suckers. Those cases for which it is crucial to examine particular leaves for identification are highlighted.

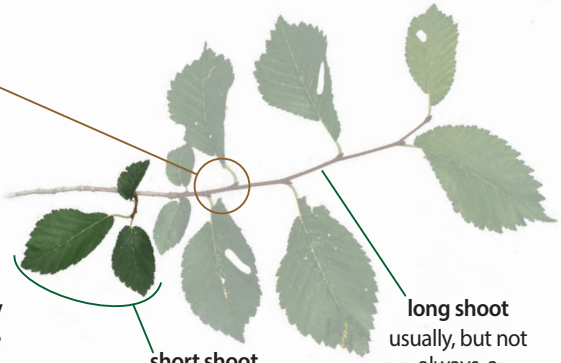
**suckers –** new shoots produced from the roots of the parent tree

## Leaf arrangement and growth

**Arrangement** is used as an identification differentiator and also applies to buds

**arranged oppositely** leaves (and buds) are attached to the stem directly opposite each other

**arranged alternately** leaves (and buds) are attached to opposite sides of stem some distance apart, giving a stepped appearance

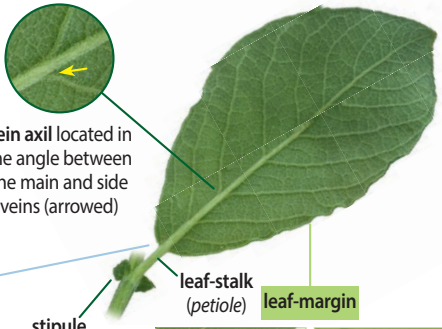


**short shoot** usually, but not always, a flowering shoot; also referred to as a **side-shoot** or **spur-shoot**

**long shoot** usually, but not always, a vegetative shoot; also referred to as a **leading shoot**

## Leaf parts and their shapes

The shape of a leaf's **base**, **tip** and **margin** can be helpful in identification



**vein axil** located in the angle between the main and side veins (arrowed)

**leaf-base**

**stipule**

**leaf-stalk** (*petiole*)

**leaf-margin**

**leaf-tip** (*apex*)

**pointed** (*acute*)

**drawn out point** (*acuminate*)

**tapered**

**straight**

**rounded**

**untoothed** (*entire*)

**wavy** (*undulate*)

**indented** (*cordate*)

**asymmetrical**

**toothed** (*serrate*)

**double-toothed** (*biserrate*)

**spiny**

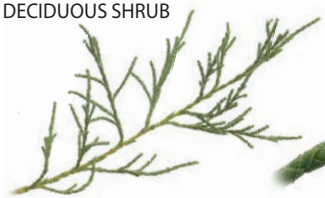
# Key to leaves

PALE GREEN NAMES INDICATE PARK, STREET & GARDEN SPECIES

## Distinctively shaped leaves which do not fit elsewhere

### tiny; scale-like

DECIDUOUS SHRUB



**Tamarisk** *p. 326*

alternate

CONIFEROUS TREES

**Cypresses** *p. 93*

opposite

alternate

**Giant Redwood** *p. 123*

### needle-like – see Conifers *p. 91*

### spiny; leaves apparently absent / not obvious

SHRUBS

**Broom** (*p. 320*) is not spiny but the trifoliate leaves are not always present

branched spines

**Gorses** [3 spp.] *p. 318*

**Spp. ID** – flower + fruit

needles in whorls of 3

**Common Juniper** *p. 118*

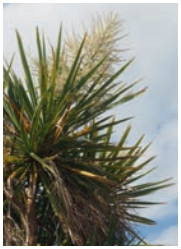
'leaves' are modified branches

**Butcher's-broom** *p. 315*

**Spanish-dagger** *p. 339*

TREE

**Monkey-puzzle** *p. 129*



**Cabbage-palm** *p. 339*

## Compound leaves: leaflets from a single point

### trifoliate (3 leaflets)

SHRUB OR SMALL TREE

**Laburnums** [2 spp.] *p. 330*

**Spp. ID** – flower-cluster, flower and leaf underside details

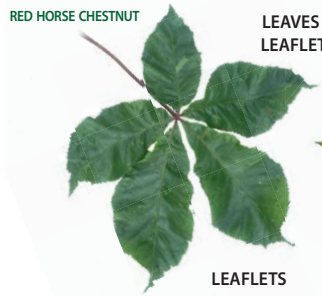
SHRUBS

**Broom** *p. 320*

NOTE leaves not always present

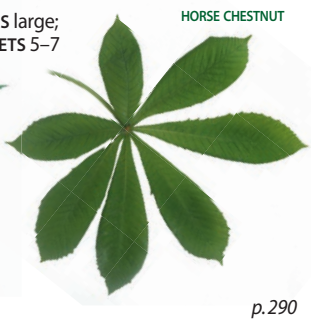
### palmate (>3 leaflets)

RED HORSE CHESTNUT



LEAVES large; LEAFLETS 5–7

HORSE CHESTNUT



LEAFLETS

| | | |
|---|---|---|
| **Horse Chestnut** | unstalked | *p. 290* |
| **Red Horse Chestnut** | very shortly stalked; red flowers | *p. 291* |
| Indian Horse Chestnut | **stalked**; narrowest of the three species | *p. 291* |

NOTE leaf shape is the primary feature to observe; leaves are not scaled accurately



## Compound leaves: leaflets from multiple points — Leaves opposite

LEAFLETS 3 or 5

**Ash-leaf Maple** *p. 289*

**Elders** [2 spp.] *p. 306*

**Spp. ID** – leaf-stalk + fruit

LEAFLETS 5 or 7

LEAFLETS 7–13

**Ashes** [3 spp.] *pp. 298, 340*

**Spp. ID** – bud + leaflet

MOCK-ORANGE

BOX

**Mock-orange** (*p. 334*) and **Box** (*p. 313*) have closely spaced opposite simple leaves which could be mistaken for leaflets

## Compound leaves: leaflets from multiple points — Leaves alternate

SPINY TREES

FALSE-ACACIA

LFLTS oval; tip rounded

| | | |
|---|---|---|
| **False Acacia** | **LEAF** L 15–30 cm; **LFLTS** 5–25 | *p. 300* |
| Honey-locust | **LEAF** L to 20 cm; **LFLTS** 14–32 | *p. 343* |
| Pagoda Tree | **LEAFLETS** tip pointed | *p. 343* |

SHRUBS

LEAFLETS spiny

**Oregon-grape** *p. 331*

TWIGS very hairy

**Stag's-horn Sumach** *p. 337*

TREES

LEAFLETS toothed

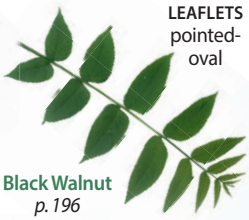
**Rowan** *p. 140*

**Rare, localized *Sorbus*** *p. 138*

**Spp. ID** – leaflets + fruit

LEAFLETS ±oval

**Walnut** *p. 196*



LEAFLETS pointed-oval

**Black Walnut** *p. 196*

LEAFLETS with large basal teeth

**Tree-of-heaven** *p. 340*

# Key to leaves

PALE GREEN NAMES INDICATE PARK, STREET & GARDEN SPECIES

## Simple leaves: LOBED 1/2

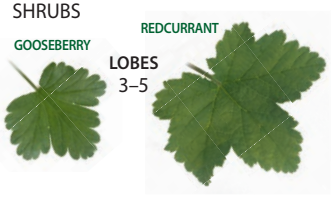
**palmately lobed** – lobes radiating from a single point; NOTE also check lobed leaves (*opposite*)

SHRUBS

GOOSEBERRY

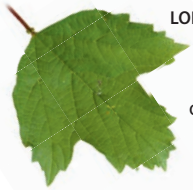
REDCURRANT

LOBES 3–5



**Currants** [6 spp.] *p. 322*

**Spp. ID** – leaf, flower, fruit



LOBES usually 3 (a few 5); LEAVES arranged oppositely

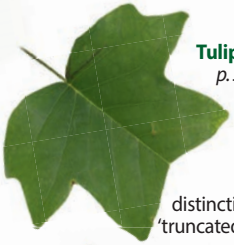
**Guelder-roses** [2 spp.] *p. 308*

**Spp. ID** – leaf, flower, fruit

shiny; deeply lobed

**Fig** *p. 337*

TREES; LEAVES ARRANGED **ALTERNATELY**



**Tulip-tree** *p. 339*

distinctive 'truncated' tip

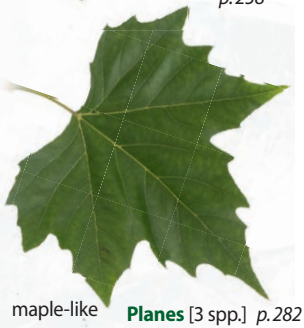
**Ginkgo** *p. 338*

distinctive 'fan' shape

UNDERSIDE pale grey; at least slightly hairy

**White Poplar** *p. 260*

**Grey Poplar** *p. 258*



maple-like

**Planes** [3 spp.] *p. 282*

**Spp. ID** – leaf, bark, fruit

TREES; LEAVES ARRANGED **OPPOSITELY** (**Maples**)

LOBES variable; typically 3 main + 2 smaller basal

**Field Maple** *p. 284*

LOBES 5–7; untoothed

**Cappadocian Maple** *p. 289*

LOBES 5; no bristles; irregularly toothed

**Sycamore** *p. 286*

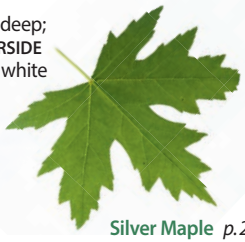
LOBES 5–7; bristle-pointed; a few teeth

**Norway Maple** *p. 288*

LOBES 3 large (±2 tiny basal); margins toothed

**Red Maple** *p. 289*

LOBES deep; UNDERSIDE silvery white



**Silver Maple** *p. 289*

NOTE leaf shape is the primary feature to observe; leaves are not scaled accurately



## Simple leaves: LOBED and/or spiny 1/2

### lobed and pinnately lobed

**Wild Service-tree** *p. 142*

**Swedish Whitebeam** *p. 146*


Some rare, localized ***Sorbus*** (***p. 136***) have similar leaves

**Spp. ID** – leaflets + fruit


**Hawthorns** *p. 186*

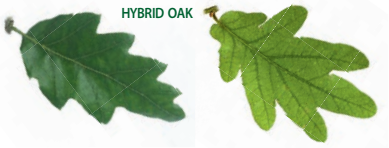
**Spp. ID** – leaves, flowers + fruit

DECIDUOUS OAKS WITH ROUNDED LOBES


**Oaks (widespread)** [6 spp.] *pp. 218–222*

**Spp. ID** – leaf, fruit

**Hybrid Oak** (*p. 219*), the common hybrid between **Sessile** and **Pedunculate Oaks** has variably shaped leaves, even on the same tree in some cases




OAKS WITH POINTED LOBES


**American oaks** [3 spp.] *p. 224*

**Spp. ID** – leaf shape

### evergreen; with spines

All can have leaves that lack spines


**Cork Oak** *p. 225*


**Evergreen Oak** *p. 223*


**Highclere Holly** *p. 303*

**Holly** *p. 302*


**Barberries** (*pp. 316–317*) Native **Barberry** (oval leaves) has inconspicuous fine spines; some other **planted barberries** have ± spiny leaves

# Key to leaves

PALE GREEN NAMES INDICATE PARK, STREET & GARDEN SPECIES

## Simple leaves: ±CIRCULAR, HEART-SHAPED TO TRIANGULAR;

also check **BROADLY OVAL** (*facing page*) + **OVAL (POINTED)** leaves (*p. 66*)

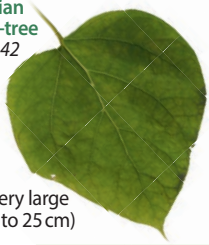
### arranged oppositely

TREES

**Katsura** *p. 342*

distinctive toffee aroma in autumn

**Indian Bean-tree** *p. 342*



very large (L to 25 cm)

SHRUBS

**Wayfaring-tree** *p. 310*

**Lilac** *p. 329*

**FLOWER-CLUSTER** conical spike

**FLOWER-CLUSTER** flat-topped

**'Snowberries'** [3 spp.] *p. 332*

**Spp. ID** – leaves

### arranged alternately

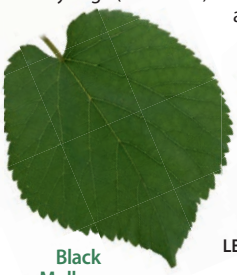
**Limes** [4 spp.] *p. 292*

**Spp. ID** – flower-cluster, leaf underside details

**Hazels** [3 spp.] *p. 276*

**Spp. ID** – bract shape, leaves

very large (L to 23 cm)



**Black Mulberry** *p. 342*

**TREE** with catkins and/or cone-like fruit

**Italian Alder** *p. 274*

wider than long

**Judas-tree** *p. 342*

**LEAVES** variable in size and leaf + leaf-base shape

**BALM-OF-GILEAD**

**BLACK POPLAR**

**Silver Birch** *p. 268*

**LF** typically with longer point than in Downy Birch

**Downy Birch** *p. 268*

**LF** typically with shorter point than in Silver Birch

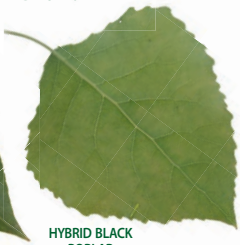
**Himalayan** and **Paper Birches** (*facing page*) have more pointed-oval leaves

**Aspen** *p. 256*

very thin

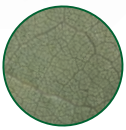
**Grey Poplar** *p. 258*

**WESTERN BALSAM-POPLAR**



**HYBRID BLACK POPLAR**

**UNDERSIDE** slightly paler green



**UNDERSIDE** typically grey hairy

**UNDERSIDE** paler than upperside

**UNDERSIDE** ±same as upperside

**Black poplars and Balsam-poplars** [8 spp.] *pp. 261–264*

**Spp. ID** – leaf details, twig + sucker form

NOTE leaf shape is the primary feature to observe; leaves are not scaled accurately



## Simple leaves: BROADLY OVAL TO OVAL

also check **HEART-SHAPED** (*facing page*) + **OVAL (POINTED)** leaves (*p. 66*)

### arranged alternately

SHRUBS AND SMALL TREES

**TWIGS** with sharp spines in groups

**Barberries** [6 spp.] *p. 316*

**Spp. ID** – leaves

**TWIGS** dark; with sharp spines

**Blackthorn** *p. 171*

**Plums** (*below*) have larger leaves and **TWIGS** sparsely spiny at most

**LEAVES** pointed-oval; variable in size by species

FRANCHET'S COTONEASTER

BULLATE COTONEASTER

**Cotoneasters** [7 spp.] *pp. 189–192*

**Spp. ID** – leaves + flowers

**Dwarf Birch** *p. 271*

CREEPING WILLOW

**Willows** range in size from low shrubs to tall trees. In leaf they will have characteristic catkins (*p. 68*) or '1-scaled' buds (*p. 81*) present. Leaves have a wide variety of leaf shapes, from broadly oval to very narrow.

GOAT WILLOW

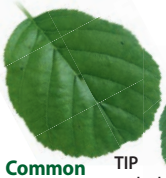
▶ **Willows** *p. 226*

TREES

**Alder Buckthorn** *p. 192*

**Buckthorn** (*p. 193*) has leaves arranged ±oppositely

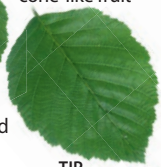
**Wild Plum** *p. 173*



**Common Alder** *p. 272*

TIP rounded

**TREES** with catkins and/or cone-like fruit

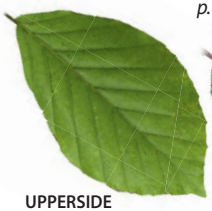


TIP pointed

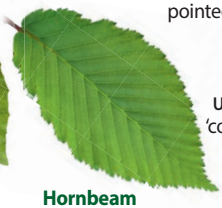
**Grey Alder** *p. 274*

**Himalayan + Paper Birches** *p. 270*

**Silver** and **Downy Birches** (*facing page*) have more triangular leaves



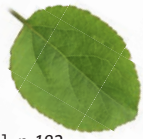
UPPERSIDE 'flat'; **MARGIN** untoothed **Beech** *p. 214*



**Hornbeam** *p. 278*

UPPERSIDE 'corrugated'; **MARGIN** toothed

**Apples** more coarsely toothed than **Pears**



**Apples** [2 spp.] *p. 182*

**Pears** [3 spp.] *pp. 183–185*

**Spp. ID** – leaves, flowers, fruit

**MARGIN** finely toothed

**Cherry Plum** *p. 172*

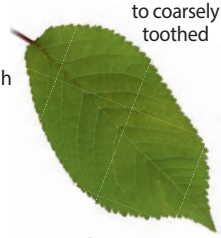
**Bird Cherry** *p. 174*

**UNDERSIDE** usually whitish hairy

**Whitebeams** [44 spp.] *p. 136*

**Spp. ID** – leaf details

**MARGIN** finely to coarsely toothed



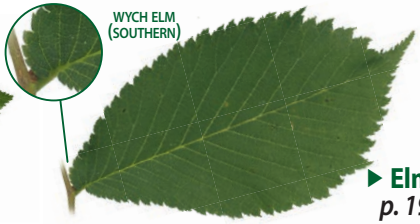
**Cherries** [4 spp.] *pp. 176, 181*

**Spp. ID** – leaves

**Elms** are a complex group taxonomically; leaves can be found in a wide range of sizes and shapes but, as a group, can be recognized by their asymmetrical leaf-bases, albeit small in some. **Limes** (*p. 292*) could be confused for elms.

FIELD ELM (ENGLISH ELM)

WYCH ELM (SOUTHERN)



▶ **Elms** *p. 197*

# Key to leaves

PALE GREEN NAMES INDICATE PARK, STREET & GARDEN SPECIES

## Simple leaves: BROADLY OVAL TO NARROWLY OVAL

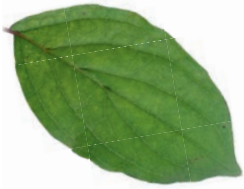
### arranged oppositely

**FLOWERS** clustered around twig; **TWIGS** grey to dark brown

**Buckthorn**
*p. 193*

leaves can be arranged slightly alternately

**FLOWERS** in conspicuous round-topped clusters; **TWIGS** red



**Dogwoods** [3 spp.] *p. 304*

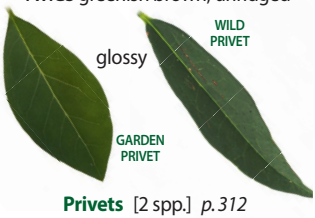
**Spp. ID** – leaf vein count

**Butterfly-bush (Buddleia)**
*p. 328*

**Purple Willow**
*p. 238*

**TWIGS** greenish brown; unridged

glossy

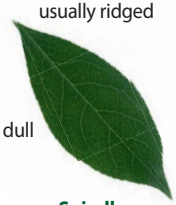



**Privets** [2 spp.] *p. 312*

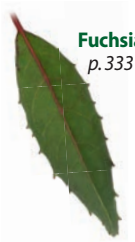
**Spp. ID** – leaf + twig details

**TWIGS** green; usually ridged

dull



**Spindles**
*p. 280*



**Fuchsia**
*p. 333*

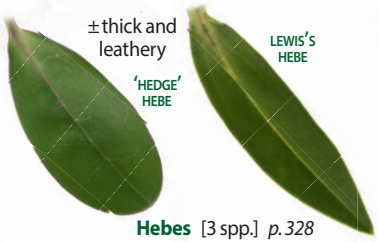
thick, evergreen leaves in close arrangement

**Box**
*p. 313*

**Mock-oranges**
*p. 334*

**Spp. ID** – leaf + flower details

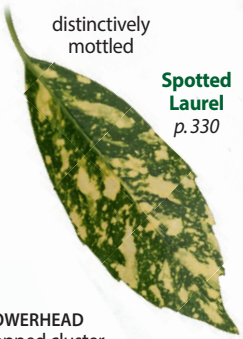
±thick and leathery




**Hebes** [3 spp.] *p. 328*

**Spp. ID** – leaf details

distinctively mottled



**Spotted Laurel**
*p. 330*

**UNDERSIDE** lacking glands *cf.* Escallonia (*facing page*)

**Weigelia**
*p. 341*

**FLOWERHEAD** flat-topped cluster

**Wrinkled Viburnum**
*p. 335*

**Laurustinus**
*p. 335*

NOTE leaf shape is the primary feature to observe; leaves are not scaled accurately **5/5**

## Simple leaves: NARROWLY OVAL also check OVAL (*facing page*) + TRIANGULAR leaves (*p. 64*)

### arranged alternately

TREES

Medlar *p. 336*

Sweet Chestnut *p. 216*



**Evergreen Oak** *p. 223*

young leaves can be spiny (*p. 63*)

WYCH ELM (NORTHERN)

LEAF-BASE asymmetrical

FIELD ELM (PLOT'S ELM)

▶ **Elms** *p. 197*

**Willows** range in size from tall trees to low shrubs. They will have characteristic catkins (*p. 68*) or '1-scaled' buds (*p. 81*) present. Leaves occur in a wide variety of shapes, from broadly oval to very narrow.

BAY WILLOW

ALMOND WILLOW

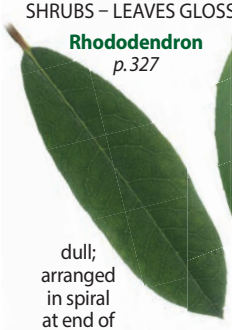
CRACK-WILLOW

OSIER

▶ **Willows** *p. 226*

**Purple Willow** (*facing page*) has at least some leaves arranged oppositely

SHRUBS – LEAVES GLOSSY TO ± SHINY

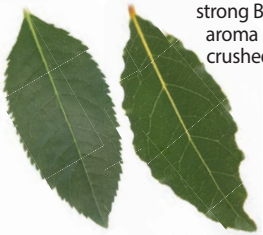


**Rhododendron** *p. 327*

dull; arranged in spiral at end of stem

**Cherry Laurel** *p. 178*

glossy



strong Bay aroma if crushed

**Strawberry-tree** *p. 301*

**Bay** *p. 331*

SHRUBS – LEAVES DULL

Eucalyptus aroma if crushed

**Bog Myrtle** *p. 314*

**Brideworts** *p. 329*

**Spp. ID** – leaves

UNDERSIDE with glands *cf.* Weigelia (*facing page*)

**Escallonia** *p. 341*

**Highclere Holly** *p. 303*

waxy

leaves can have a few spines (*p. 63*)

TWIGS with single or clustered spines

GAGNEPAIN'S BARBERRY

HEDGE BARBERRY

some **planted barberries** (*p. 317*) have ± glossy, ± spiny leaves

TWIGS spiny

**Firethorn** *p. 334*

**Spurge-laurel** *p. 325*

**Mezereon** similar but dull

FLOWERS/FRUIT pea-like/pods

**Dyer's Greenweed** *p. 321*

**Sea-buckthorn** *p. 194*

**Teaplants** *p. 333*

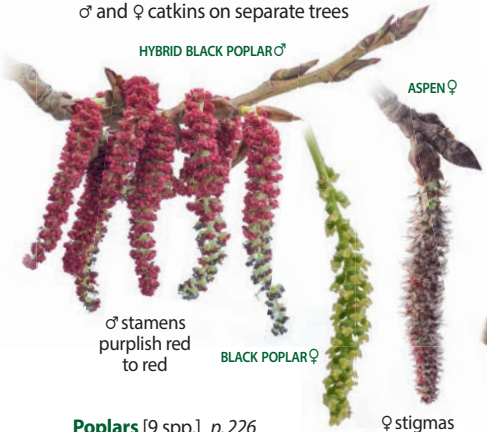
# Key to flowers

PALE GREEN NAMES INDICATE PARK, STREET & GARDEN SPECIES

## Catkins and catkin-like flower-clusters

Poplars have **long, pendent catkins** but are generally not identifiable to species by their catkins alone

♂ and ♀ catkins on separate trees




**Poplars** [9 spp.] *p. 226*
**Spp. ID** – leaves, form

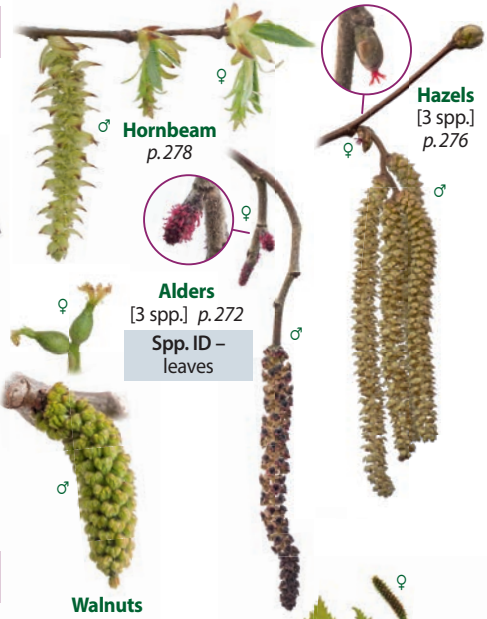
Willows have **pendent to erect catkins** but are generally not identifiable to species by their catkins alone

♂ and ♀ catkins on separate trees

LONGER ± 'CYLINDRICAL' CATKINS


SHORTER ± 'EGG-SHAPED' CATKINS

**Willows**
[20 spp.] *p. 226*
**Spp. ID** – leaves




**Alders**
[3 spp.] *p. 272*
**Spp. ID** – leaves

**Walnuts**
[2 spp.] *p. 196*
**Spp. ID** – leaves, twigs


**Birches**
[5 spp.] *p. 266*
**Spp. ID** – leaves, bark


**Bog-myrtle**
*p. 314*


Conifer 'flowers' are not generally identifiable to species – they are all broadly similar; ♂ cones are egg-shaped, either clustered or solitary; ♀ cones are a tiny version of their mature self ▶ *p. 90*

## Catkins, catkin-like flower-clusters, inconspicuous and/or yellowish green flowers

**Sweet Chestnut** *p.216*

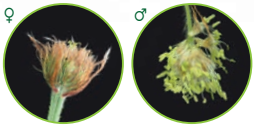
**Planes** [3 spp.] *p.282*

**Spp. ID** – leaves, bark

**Oaks** [8 spp.] *pp.218–221*

**Spp. ID** – leaves

**Beech** *p.214*

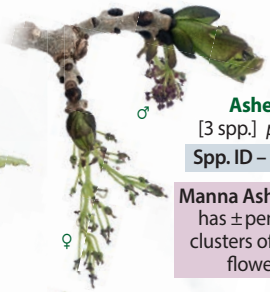


**Maples** [7 spp.] *p.284*

**Spp. ID** – leaves

**Limes** [4 spp.] *p.292*

**Spp. ID** – leaves, flowers



**Ashes** [3 spp.] *p.298*

**Spp. ID** – leaves

**Manna Ash** (*p.340*) has ± pendent clusters of white flowers

**Sea-buckthorn** *p.194*

♂ and ♀ (L > 4 mm); on separate shrubs

**Elms** *pp.197–212*

**Spp. ID** – leaves

**Currants** [4/6 spp.] *p.322*

**Spp. ID** – leaves, flowers

**Box** *p.313*

# Key to flowers

PALE GREEN NAMES INDICATE PARK, STREET & GARDEN SPECIES

## 5-petalled white flowers – petals separated (Rose Family – *p. 131*)

**Blackthorn + Plums** [3 spp.] *p. 170*

**Spp. ID** – flower details, flowering time, leaves

generally flowering earlier (Feb–Apr) than other roses


PETAL-TIPS SLIGHTLY NOTCHED

**Cherries I** [3 spp.] *pp. 176, 179*

**Spp. ID** – flower details, flowering time, leaves

flowers in clusters


PETAL-TIPS ROUNDED

**Cherries II** [3 spp.] *pp. 174, 178*

**Spp. ID** – flower details, flowering time, leaves

flowers in spikes

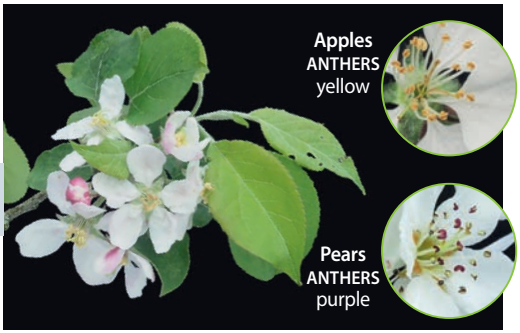


PETAL-TIPS ROUNDED

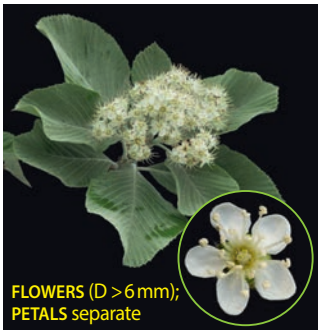
**Apples and Pears** [5 spp.] *pp. 182–183*

**Spp. ID** – flower details, leaves

flowers in loose clusters




FLOWERS IN DOMED CLUSTERS (*cf.* Wayfaring-tree (*facing page*))




**Whitebeams, Rowans, Service-trees** [44 spp.] *p. 133*

**Spp. ID** – leaves

TWIGS SPINY; LEAVES LOBED

**Hawthorns** [2 spp.] *p. 186*

**Spp. ID** – leaves, flowers

**Medlar** *p. 336*

**Juneberry** *p. 336*

(continued...)

# Index

This index contains the English and *scientific* names of all tree and shrub species mentioned in the species accounts (*pp. 88–344*).

**Bold black** page numbers indicate species that are afforded a full account.

*Italic* page numbers indicate species that are mentioned and are depicted with at least one illustration.

Regular text page numbers indicate species that are mentioned in the text only.