SHERWOOD FOREST
WHERE LEGENDS GROW

THE MAJOR OAK

The Major Oak is one of the most iconic trees in the UK. Aside from its great age, size and importance to nature, its cultural legacy is unmatched.

For many, many visitors from all over the world it is part of the legend of Robin Hood and the outlaws of Sherwood Forest.

Believed to be somewhere between 800 and 1,200 years old, the Major Oak was already an ancient tree by 1710, when St. Paul's Cathedral was completed using timber harvested from Sherwood Forest.

Why is this one tree so important?

As well as the cultural and symbolic importance of the Major Oak to anyone who knows about Sherwood Forest, it is one of a few hundred living Ancient Oak trees remaining in the county of Nottinghamshire.

Every one of these green monuments matters because they provide a rare and vital habitat for myriad special species, many of which are under great threat.

Once an ancient tree dies, the decaying wood habitat it provides for those species becomes finite. If left unaided, our oldest Oaks will die out before the next generation reaches that golden 400-year mark denoting their 'Ancient' status.

It is so important that we slow the loss of living Ancient and Veteran trees to keep a sustained decaying wood resource and reduce the threat of disruption to the entire ecosystem.

If more people understand the importance and value of Veteran and Heritage trees, such as the Major Oak, the Sycamore Gap tree and the Whitewebbs Oak among others, more protections and policies can be put in place to safeguard them and reduce the risk of losing them altogether.

RSPB

Sherwood Forest is cared for and protected by the RSPB

Supporting the tree in the past

The Major Oak has been recognised as a significant tree for centuries, gaining its present name from Major Hayman Rooke, who first documented the Oaks of Sherwood in the late 1700s. For more than 100 years, and due to its enduring popularity, the Major Oak has been the subject of many attempts to retain its emblematic and exceptional form.

Edwinstowe War Camp. *Photo Credit Edwinstowe Historical Society*

Historic photos show the iron rods and braces still visible in the crown of the tree were installed by at least 1904. This bracing, along with wooden props, aimed to take the weight of its huge spreading limbs and prevent it splitting apart. The supports were replaced by metal poles in the early 2000s when it was already too late to remove the embedded metalwork without damaging the tree.

Coupple at the Major Oak in 1885. *Photo Credit North East Midlands Photographic Records*

Over 120 years ago, lead sheets were fitted to the tree to prevent water getting into wounds on the trunk and branches, thinking that this would slow the decay process, when any rot was considered bad. The lead was replaced by fibreglass sheeting, which you can still see today. Both of these techniques were once standard arboricultural practice, but are now no longer used. Other outdated methods used on the Major Oak in the past include filling basal holes with concrete, and painting cuts to seal wounds with toxic materials such as fire-retardant paint.

Other now less visible methods used in the past include mulching around the base of the tree and various types of branch pruning. While they are still used successfully elsewhere, in this context they have not aided the tree and potentially even added further complications.

Lemonade stand for visitors to Sherwood Forest. *Photo Credit Unknown*

All of these interventions were designed to prolong the life of the tree, but we now understand they have in fact created added challenges to its survival. If nothing else, the techniques used to keep the Major Oak alive have taught the world an enormous amount about veteran tree management, especially compared to the amazing ability trees have to re-engineer themselves in old age without human interference. The RSPB has taken on the responsibility and privilege of caring for this tree, and we are committed to giving it the best chance to continue living in the most natural way it can, given its long and complex history.

The Major Oak today

19th Century visitors to the Oak. *Photo Credit North East Midlands Photographic Records*

No one can definitively say how long the tree will live for, but the Major Oak is in visible decline, with fewer leaves on the tree than ever, so its end may be sooner than we had hoped. This is extremely upsetting for our team, as it is to our local community and the many visitors to Sherwood Forest.

The reason for its decline is complicated and not the result of just one thing.

The combination of past interventions not allowing the tree to adapt naturally, the changes to its wider surroundings over a thousand years, along with being very, very old, are all significant challenges to its vitality. Climate change is also having a visible and devastating effect. Consecutive summers of drought and record temperatures of 40°C have added considerable stress to an already precarious situation. On the advice of the UK's leading tree and soil health specialists, and the results of detailed testing and monitoring, if there is any chance of restoring health to the Major Oak we need to focus our efforts underground.

Major Haymann Rooke's sketch of the Major Oak.

Soil compaction

For decades it has been recognised that soil compaction has badly affected the Major Oak. Many years of millions of people walking up to and around it has caused the naturally acidic sandy soils to become as hard and impenetrable as concrete. This has made it harder for rainwater and vital nutrients to reach the tree's roots, for oxygen to flow around them and essential biological activity to interact with them.

In the mid-1970s, a fence was installed around the tree to help the ground recover by restricting access to it. This stopped further pressure on the ground, but the damage remained an unknown threat.

In 2018, just before the RSPB took over custodianship of the site, Nottinghamshire County Council (NCC) acted on guidance from the arboricultural experts who have been involved with the Ancient Oaks of Sherwood for many years and commissioned a root radar survey. This non-invasive survey theorised the extent and condition of the Major Oak's root system and suggested that feeder roots extended out to 40 metres from the trunk, and down to 2 metres below the surface.


Chlorophyll testing. *Photo Credit Rob James*

Work to ground-truth this and fully assess the condition of the roots and soil was necessary, and in 2022, after the global pandemic, the RSPB began working with UK leading soil consultancy, SoilBioLab, along with our longstanding arborists Treescapes Consultancy Ltd and Urban Forestry (Bury St Edmunds).

The soil sampling and root analysis has unearthed key facts that have helped shape and prioritise our work to help the tree, because the results have shown a different and distressing picture to that depicted by the root radar map. It has confirmed that the soil remains solid and sterile around a now very much reduced, constricted and unhealthy root system. The soil around the tree where the feeder roots would normally grow has been found to be heavily compacted up to at least 1.2m depth.


Dendrometer device. *Photo Credit Andy Hirons*

SoilBioLab found there is an absence of roots, even the remnants of dead ones, where we would expect them to be, as well as minimal biological activity and mycorrhizal colonisation. The poor state of the root system, the sterile condition of the soil and the lack of interaction between them has manifested in the condition of the tree's crown we see today.

What are we doing?


Surveying from a MEWP. *Photo Credit Rob James*

In 2023 RSPB began a root restoration initiative, delivering work to restore vitality to the Major Oak's roots and soils, and address the critical findings. A method was agreed by the project team and Natural England (NE), which involves decompacting the soil around sections of root system each year.

It was agreed that we needed to begin our restoration work close to the tree, given what we have found out about the extent of the living root system, and the condition of the tree itself. Staff and volunteers began carefully removing, aerating and then replacing the soil around the roots, focusing on areas where there is thought to be the most benefit, as guided by the arborists and soil scientists.


Major Oak Root under microscope. *Photo Credit SoilBioLab*

Other techniques used in arboriculture, such as air spading and vertical mulching, or using heavier machinery to do a quicker job, were considered but ultimately deemed too risky, given what we had discovered about the perilous condition of the very shallow root system.

We continue to carry out annual testing of the soil and root health to give indications of the impact of the work, so we can tailor our approach and make plans beyond an initial 5-year programme.

Leaving vegetation to grow naturally and encouraging biological activity


A Soil station in. *Photo Credit Mark Powell*

Because of the history of management to the ground beneath its boughs you may expect to see something different to the wildflowers that are now being left to grow, bloom and fade naturally there each year.

Following advice from the soil scientists and arborists, we are allowing grasses and other plants around the tree to grow naturally through their entire life cycle, instead of mowing it short like the amenity green opposite the enclosure.

By giving them the chance to flower and go to seed we are enabling their roots systems to develop and naturally break up the soil as well as increasing biodiversity and vital complexity in the enclosure. It provides cover to retain moisture and keep the soils cool. The increased variety of plant species in the enclosure, including wildflowers such as Bee orchids, attracts a range of insects, including bees, butterflies and grasshoppers – much more reminiscent of the natural forest floor.

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We aren't worried about the competition for water and nutrients from the ground flora for a tree with an 11-metre girth. But we do need to strike a balance between shelter and dominance around our Ancient and Veterans. A small Oak tree has been removed from nearby to give light and space to another more ecologically valuable tree and laid on an area of remediated ground under the Major Oak.

Decaying wood is integral to Sherwood's ecological cycle, and we are using it to try and kickstart biological activity in the soil. This young Oak will gradually decay and transfer nutrients into the earth, while also creating conditions to host invertebrates and other organisms, reintroducing flora and fauna to a place where it has been missing for a long time.

Painting the fibreglass shields. *Photo Credit NCC*

Measuring the effect of our work

It is vital we accurately monitor the impact of the work that we do and adapt accordingly. One of the good things about technological advancement is we can now get some of our data in real time.

Thanks to part-funding from our partner the Woodland Trust, we have installed dendrometers on the tree. These devices measure growth and shrinkage of the tree, relative to water uptake, aiming to give us an indication of how the root system is functioning.

Installing the metal props. *Photo Credit NCC*

We have also trialled the use of soil sensors, which can tell us how much moisture is available in the restored and unrestored areas of the soil, and compared with another magnificent Ancient Oak as a 'control tree' close by.

They show temperature, pH, and indicate nutrient levels at shallow and deeper profiles. All this can inform how and when we act, such as deploying our special TREEIB watering system when the tree is under threat from drought stress.

Foliar sampling has given us an insight into the make-up of the leaves including the mineral and chlorophyll content. This allows us to better understand how the roots are transporting food and water up the massively contorted structure, and converting them to energy for growing.

Longhorn Beetle (Saperda scalaris). *Photo Credit Tom Hibbert*

The legacy of the Major Oak

The Major Oak will continue to be celebrated for its iconic aesthetic, and ecological and cultural identity, with a symbolic and unbreakable connection to the legend of Robin Hood and the county of Nottinghamshire.

Its biological legacy will be safeguarded as plans are developed to build on the work started by NCC and NE to connect Sherwood to the wider landscape and beyond. This will include a bigger piece of work to understand the current distribution of Major Oak saplings and how we can connect ancient trees across the region by planting more of them, with our partners including Sherwood Forest Trust and Woodland Trust.

Root restoration work. *Photo Credit Laura Turner*

We are grateful for the knowledge that caring for the Major Oak has provided to us about the management of Ancient and Veteran Oaks, which will benefit other incredible trees not just here in Sherwood, but elsewhere in the UK and across the world.

When it eventually dies, its legend will live on. It will remain standing as a focal point of the forest for visitors, its natural history forever intertwined with the stories of Robin Hood.

Bee Orchids around the Major Oak. *Photo Credit Chloe Ryder*

Scan the QR code to read more on our website and watch videos of our work

FREQUENTLY ASKED QUESTIONS

Is the Major Oak dead?

No. The Major Oak is still producing leaves, although fewer this year than in recent times, so it is still living. Dendrometer devices measuring growth and shrinkage show activity, although decreased since 2024, which experts have confirmed means it is still living – for now!

Is the Major Oak dying? What's the difference between dying and declining?

It is in decline and has been for many decades, which is all part of the natural process the majority of Ancient Oaks get to go through in their lifetime. The decline is a gradual reduction in function and ability to grow at a sustained rate once the trees have reached old age, often resulting in a loss of branches and leafy area and an increase in heartwood decay. Although not as vibrant as younger Oaks, the ones that live for centuries will often re-engineer themselves to keep living in a way that is sustainable, like shedding large lengthy limbs to grown a leafy crown lower down. In the period of senescence (deterioration with age), Oak trees begin to provide a new range of habitats and conditions for species, and are equally - if not more - valuable and integral to the woodland habitats as younger trees.

Over the years, some of our Ancient Oaks have died suddenly, without any indication of ill health or from physical activity around them; likely due to climactic stress but we aren't 100% sure. The Major Oak, despite all of the additional challenges it faces, has continued to come into leaf.

Isn't it just getting too old? Isn't it ready for dying according to the 300, 300, 300 rule?

The Major Oak is a very old tree; no one knows for sure the exact age, but it's thought to be between 800 and 1,200 years using some of the ways to estimate the age of old trees. One way is to measure the girth of a tree at chest height. One metre of girth is said to equate to 100 years in age. The Major Oak's girth at that height is just over 11 metres.

Many old and Ancient Oaks will adapt their form beyond a few hundred years, so they won't be as vibrant, but they continue to live and contribute to the surrounding network of trees in ways that we are only beginning to comprehend. The '300 years to grow, 300 years to live, and 300 years to die' adage is part of the folklore of the forest, akin to Robin Hood and the Outlaws. It harks back to a time when people understood and valued an oak tree through all the phases of its vast life cycle.

Based on age alone, there's no reason why it shouldn't continue to live for many more years. The effect of the soil compaction due to its enduring popularity and work carried out in the past to protect and conserve the great tree are more likely to be major factors in its current condition.

These past interventions which have drastically altered the tree's natural behaviour and function were already evident by the 1900s, and have continued through changes to standard tree management practices to where we are today. Work to it includes installing rod and chain bracing, wire cable bracing, and propping, which have affected how the tree can naturally adapt to stress – something it had potentially already been attempting to do considering the historical evidence of lost limbs. Various methods of pruning have been applied through the century, further artificially altering its form.

Concrete and lead have been used in the past to block holes and stop water getting in, and concrete blocks remain in the ground from when they were laid as foundations in 2001 to support the transition from wooden to metal props.

Decades of human activity beneath its boughs and the consequences of vandalism have also played their part. The recreational nature of the destination has meant a tendency to manage the area around the tree for the benefit of people, rather than the tree's health. Unfortunately it has also been the target of deliberate vandalism. Large pieces have been forcibly removed from the trunk, carvings have been hacked into the bark and even arson attempts made, resulting in the application of toxic fire-retardant paint as a prevention.

The weather has also been an increasingly impactful pressure. In recent years we have experienced drought during three key growing periods for the Major Oak, including record 40-degree temperatures in 2022, when the leaf buds for 2023 will have been formed.

The acidic and sandy soils of the Sherwood landscape are naturally free draining with few nutrients (one the reasons our forest here is so special). In hot dry summers, the trees will all be under drought stress, but for the Major Oak, which is already struggling to take water up through its roots, this is a huge challenge. And yet, it has still put out leaves in 2025.

Why is it important to keep it alive?

The Major Oak is one of nearly 400 Ancient Oak trees we care for, and one of many more in the Sherwood landscape. Each one is vitally important to wildlife, providing a rare home for many threatened species. There aren't very many of the Next Generation of Ancient Oaks to replace them, which is a problem we are addressing in many ways.

Each Ancient and Veteran tree provides decaying heartwood inside its vast trunk; when a tree dies, this habitat will be used up and it will cease to exist. If the tree lives, even with a fraction of the healthy crown it once had, it will continue to replenish the invaluable heartwood, as well as the other wonderful niche micro habitats only a very old oak can. We have so few Ancients left across the UK and even the world, that each one matters.
By keeping them alive, and as stable and intact as possible, for as long as possible, we can bridge the age gap between generations until the Ancients of the future have caught up.

Do you just keep it alive to make money from tourists?

No. Every Ancient and Veteran tree matters in terms of ecology (see previous Q). But the Major Oak is more than that; it is a symbol of the county and interwoven with the rich history and cultural heritage of Sherwood Forest. Even in death, that won't change. If remarkable trees like the Major Oak and the amazing wildlife of Sherwood Forest is to remain for new generations to enjoy, it must be cared for by everyone.

Land management is very costly, so as a charity, income is very important to achieve our mission to save nature, and the RSPB is always very grateful to the people who help us with that goal; if people enjoy and benefit from the forest, they should feel proud to contribute to its care.

What's the difference between and Ancient and Veteran tree?

The Ancient status depends on the species of tree. For an Oak, it's generally considered to be over 400 years old. All Ancients are Veterans, but not all Veterans are Ancients! An Ancient Oak will typically be very large and have visible features of decay and dysfunction that come with living through lots of large events. This might include the loss of or damage to branches, visible cavities and cracks, evidence of fungi and pathogens, and decaying wood throughout. A Veteran tree is one assumed to be younger than an Ancient but showing some of those valuable 'battle scar' features. Generally, they are around 200-400 years old.

What are you going to do when it dies? Will the Major Oak be cut down?

No. Even when the Major Oak does eventually die, it will continue to provide a vital decaying wood habitat for wildlife and as the mythical home to Robin Hood, the focal point for the thousands of visitors who come to Sherwood each year. It will remain a 'living museum', a testament to both good and not so good ancient tree management, so lessons can continue to be learned and shared for the betterment of many other ancient trees. It will continue to be periodically assessed, along with other dead Ancients, to ensure it remains stable and as intact as possible as it decays, to provide for wildlife and the wider woodland network.

Why don't you spend the money and effort on other things, like other trees or Robin Hood?

The Major Oak is one of many Veteran Oaks we care for, and their health is a core objective for the RSPB and as directed by the legal protections covering the land. It is also a focal point for the stories of Robin Hood to be told and interpreted. The survival of the Major Oak is intrinsically linked to understanding the best management for other Ancients, and as long as it continues to show signs of life, we will continue to work to keep it that way, especially with funding and support from partners like Woodland Trust and Natural England who share our goals.

How do you know you're not harming it?

We understand more now than we ever have done, but there are still no guarantees that what we are doing now won't evolve in the future. Technology and technical expertise from working with leading soil and tree health specialists from across the UK and Europe gives us the best chance to act in ways with the least risk, because we understand from scientific evidence collected from tree management shared across the globe.

As a science led charity, the work the RSPB embarks on is based on lots of testing and data, which constantly shapes the work as the results get interpreted. In the world of ancient tree management, work can often be pioneering, carefully testing out theories based on decades of experience and monitoring. Here at Sherwood, we are privileged to be able to work with some of the most experienced and knowledgeable tree specialists.
We continue to monitor the condition of the Major Oak with both technology and field expertise, and carefully assess the results of our work to decompact the soil and feed the leaves.

Why don't you do the work more quickly?

We act in a timeframe guided by best practice, as advised by the experts. It's a balance between urgency and risk.

Carrying out work all at once, or using much more aggressive methods, is likely to cause even more stress to the tree and potentially cause more damage. It is a time-consuming method to find the roots and restore the soils by hand, but other methods like air spading or using heavier machinery have been considered too risky at this stage, as they may damage the few healthy roots left.

We carry out all of our work at the least impactful time of year for wildlife, so much of the more intensive activity has to be done in the autumn and winter months. This avoids disturbing the growing and breeding seasons for plant and animal species.

It's why we're also being advised to let nature assist with the decompaction in the summer months – by letting the grasses and other plants grow around the base of the tree so their roots and the microorganisms that come with them can begin to restore health to the soil naturally as well.

What else have you tried, like using an air spade, mulching or applying fertiliser?

Since 2022, we've been developing the approach, guided by the expert consultants and shaped by the results of all the testing. The team working to help the Major Oak consist of some of the most qualified and knowledgeable tree and soil consultants in the UK and equate to over two centuries of experience in the sector. Many techniques successfully used in forestry or tree management elsewhere have been discussed, with the risk of use versus the risk of no action being considered extremely carefully.

Air spading, terraventing, vertical mulching or similar are not appropriate in this context due to the fragile state of the very reduced root system remaining. Applying mulch around the base, scarifying, and standard applications of fertilisers are also not appropriate, because of the soil conditions. Options for ways to improve the health of the tree continue to be developed and discussed, in light of the most up to date information we gather.

I can't see what you've actually done. Where is the evidence?

You can see the technology, but we intentionally carry out work to leave no evidence and blend naturally. We are trying to restore a much more natural environment around the Major Oak, so it doesn't look like a manicured garden and is instead more connected to the rest of the forest.

We carry out much of our more intensive activity, like the root and soil restoration work during the autumn and winter months, so by spring and summer, there often isn't much to see on the ground, because it quickly becomes vegetated. The vegetation is mostly left wild by design, upon advice of soil scientists.

You can see the technology we've installed in recent years, and the watering systems we're deploying, as these systems alert us. The different types of surveying occur throughout the year, and are minimally disruptive, although you may witness people and equipment in the area when the work is in action.

If you aren't lucky enough to see our work as it happens, you can watch videos and get more info on our website or ask the team any questions.

Why do you still have events and a picnic area if the roots extend beyond the fence?

Up until very recently, it was thought that the root system stretched all the way out across the amenity green. Soil and root testing, including DNA analysis by Cambridge University have confirmed that this is not the case. The results of the testing told us that we had to focus on the area closest to the tree with some urgency.

Further work we would consider includes moving the fence line, or altering the path network and furniture in the area. These are costly and complex changes to make, which can take time and considerable funding to achieve.

What are the black things on the tree?

They look a bit like spotlights or cameras, but they are dendrometers. They measure the growth and shrinkage of the tree in relation to water uptake. The placement of them aims to show us how the roots are supplying the still living 'functioning units' of the tree, all the way up to its leaves via the network of active xylem.

What are the solar panels in the enclosure for?

They are soil stations, which monitor the acidity, temperature and moisture content of the soil, as well as oxygen levels and give an indication of nutrient availability in the ground. Find out more here.

Why has a branch from the tree been left in the enclosure?

This isn't a branch – it's just supposed to act like one. It's actually a young Oak tree which has been felled as part of our selective woodland thinning work to benefit other trees. By deliberately laying it on the newly decompacted soil, it is slowly decaying and stimulating biological activity in the soil.

Have you tried watering it?

Yes. We are using a special watering system placed in the enclosure and monitoring the moisture levels in the soils as well as how the tree is responding to it. When the sensors have indicated drought stress is looming, we have been irrigating the soils with around 3,000 litres of untreated water a day.

Why can't you just leave it to nature?

Fortunately - and unfortunately - the Major Oak hasn't been left to its own devices for over 200 years. Had that been the case, who knows how it would look today. But all of those loving interventions to keep it upstanding and intact have shaped its past and future. As with many cases in land management, once the decision was made to 'help' or begin to change natural processes the cycle can't simply be broken without severe consequences. This is an iconic tree for so many reasons, and the work we are doing is teaching us so much about caring for Ancient Oaks here in Sherwood and elsewhere. Nature will ultimately have the final say, but we will support the Major Oak until it is clear it is no longer bringing any benefit to the tree.

What if nobody had ever intervened?

Nobody can say for sure; it could have taken the same route as some of our other Ancient Oaks and eventually restructured itself to a more sustainable stumpy form. Or it could have collapsed from the great weight of its massive limbs, or been battered by extreme weather events, or just stopped living and crumbled away. We just don't know, and there's little else we can do now except wonder 'what if...?'

What about saplings or cuttings? Can you plant a new one?

The RSPB is developing work with partners to ensure the genetic legacy of the Major Oak continues. This is something that will require careful planning and agreement with a large number of land managers and organisations to ensure we can grow and plant new generations of Ancients in the right place for nature and people for many years to come.

Will you continue monitoring on any other Ancient Oaks?

Yes, understanding how Ancient and Veteran trees function is integral to how we can ensure they are managed to live as long and healthily as possible. We already carry out independent tree health assessments on all our Ancients every 18 months, with work to benefit them being carried out and monitored each year. Evolving and sharing this type of work will be a core purpose for the team at Sherwood.

Is this information available to everyone?

Yes, there's also loads more on our website. We will be updating it as things develop, and as we build up the historical picture. It is absolutely always our intent to provide as much understanding about our work, as well as the wildlife and heritage of Sherwood. There is, however, a huge amount of information to share, so finding the best ways to do that can be a challenge!

If you ever have any questions, please contact us directly at sherwoodforest@rspb.org.uk