



***High Speed Rail:***  
**woods, trees and wildlife**  
**A toolkit for communities**



**WOODLAND**  
TRUST

# High Speed Two route

The Government's proposed national High Speed Two (HS2) rail link has three distinct phases:

- Phase 1 – the southern section of the route from London to the West Midlands (Birmingham).
- Phase 2a – one part of the northern section of the route from Birmingham to Crewe
- Phase 2b – this comprises two sections of the northern route:
  - Phase 2b West is Crewe to Manchester
  - Phase 2b East is Birmingham to Leeds

HS2 Ltd has released indicative routes for Phases 2a and 2b; however we expect them to be subject to a number of alterations and refinements.

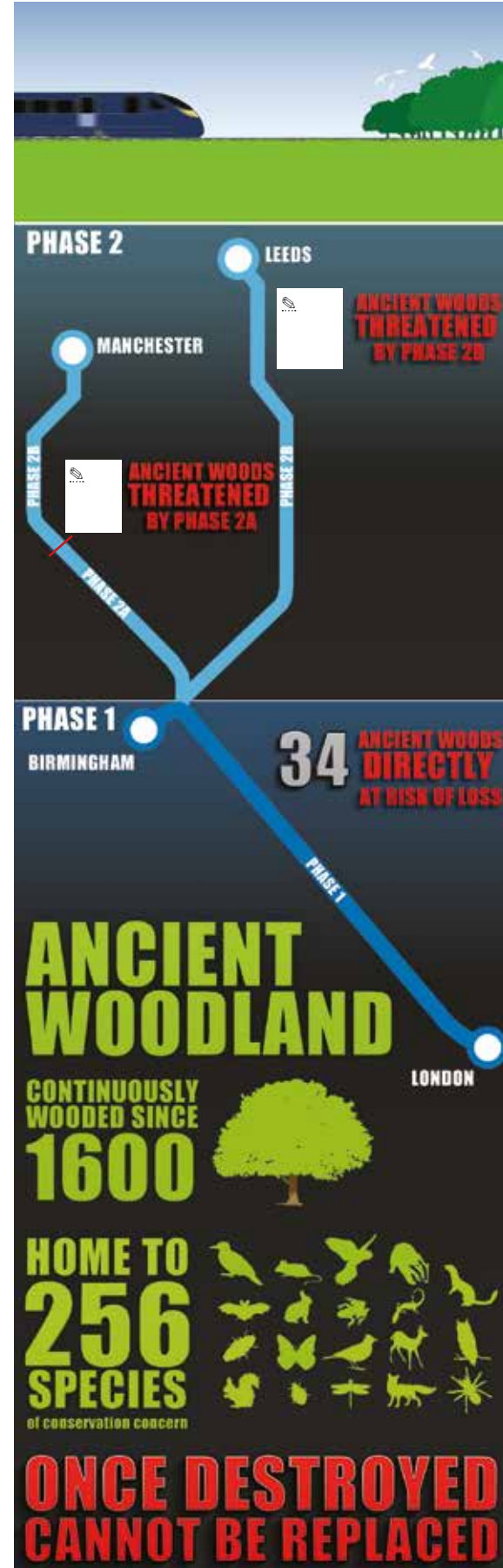
Parts of the proposed route will be new and some sections will be an upgrade of, or run alongside, existing railway lines. The width of the route appears to vary from 25m to 60m, with a vegetation-free buffer (to stop leaves falling on the line, for example). Some parts of the route will be tunnelled or put into cuttings, whereas other parts will be raised on viaducts.

## Impact

A significant number of ancient woods may be bisected or reduced in area due to HS2 and many more will be near enough to the route to suffer secondary effects from disturbance, noise and pollution. The route will also damage other woods, trees and many more important habitats, breaking links and isolating wildlife.

**“Transport simply cannot be called ‘green’ if it results in the destruction or damage of precious ancient woodland”**

Beccy Speight



# Our work

The Woodland Trust opposes every phase of the proposed HS2 rail link because of its impact on woods and trees. Since 2011 the Trust has lobbied to ensure ancient woodland is fully recognised and recorded, and that route changes are made to avoid this irreplaceable habitat. We are also working to ensure HS2 Ltd is transparent about its methodologies for proposed compensatory planting, both in relation to loss of woodland and to mitigate the scheme's impact locally and nationally.

If you live near to the proposed HS2 route and you're concerned about the impact it could have on the landscapes and wildlife you treasure, this toolkit shows you some of the ways you can stand up for woods and trees. How you use our advice is up to you and will of course depend on the wishes and priorities of you and your community.

# Why care about woods and trees?

- Woods and trees work hard for you. They clean the air we breathe, help to improve water quality and flood defences, provide shelter, shade and a buffer against noise, and are vital homes for wildlife.
- Ancient woodland is rare and irreplaceable. No amount of new planting can recreate this habitat. Avoidance is the only way to save it.
- Planting more woods and trees as part of the scheme is important to help compensate for other negative effects of HS2. With an imaginative approach, new planting could enhance not only areas close to the railway line but the wider landscape, making it function better for both people and wildlife.

The toolkit is not static and additional factsheets will be produced as things evolve. These will be downloadable at [woodlandtrust.org.uk/get-involved](http://woodlandtrust.org.uk/get-involved)



# What is ancient woodland?

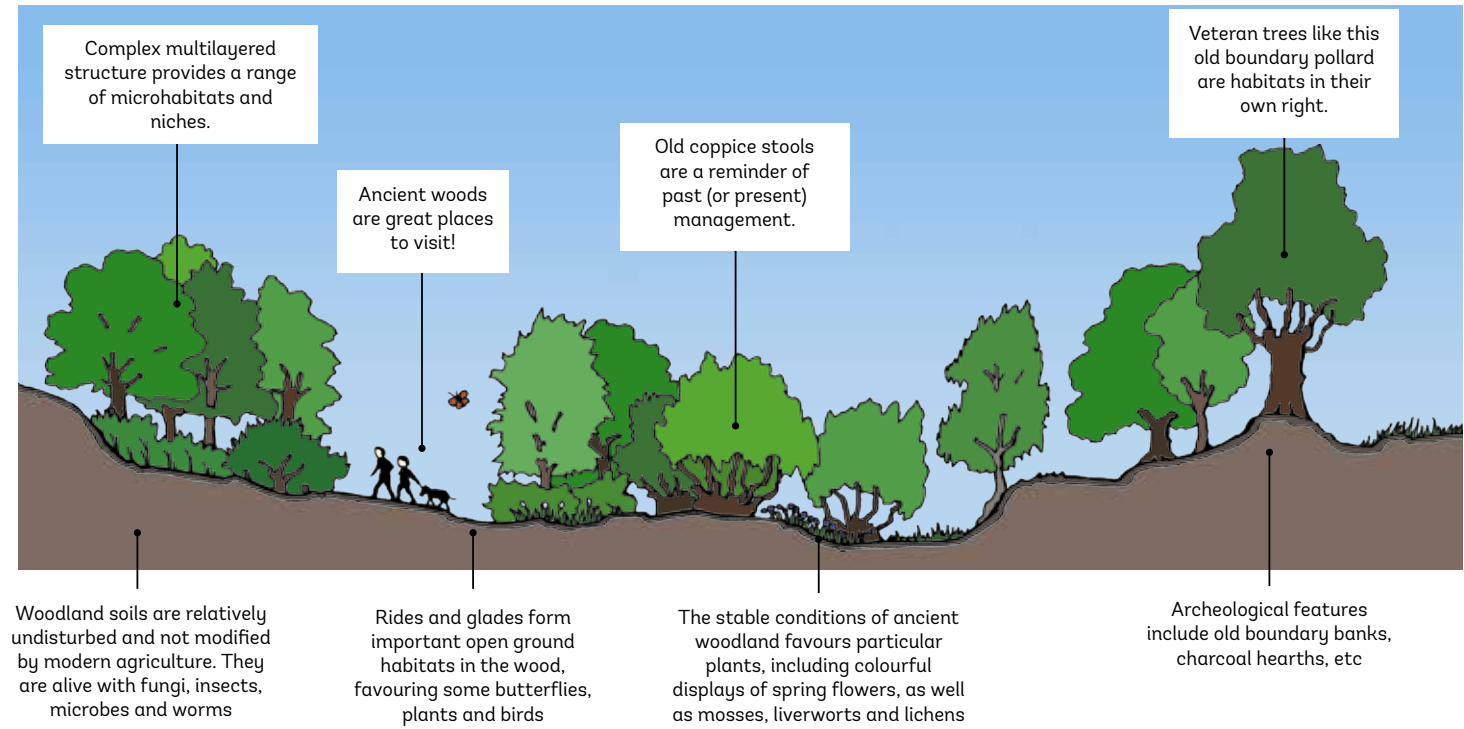
Ancient woodland is land that has been continuously wooded since at least 1600. The undisturbed soils in ancient woodland support complex and diverse ecological communities of plants and animals. It is our richest land-based habitat, home to many rare and threatened species. Each ancient wood is unique with its own local soil, environment, wildlife and cultural history. They are archaeological treasure troves, living records of past land use, and are some of our most beautiful places to visit.

# Why is saving ancient woodland so important?

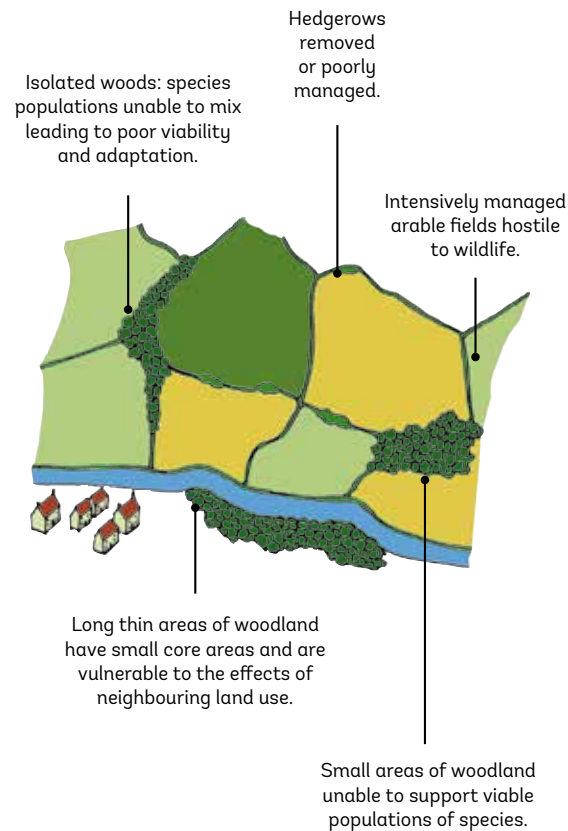
Ancient woods are irreplaceable. Although newly planted woodland will develop some value for wildlife, it will never develop all of the natural characteristics of an ancient wood, or the same cultural value.

Over time ancient woodland has been cleared for farming, development and other land uses. Its value is recognised to some extent in planning policy but this can be overridden by economic considerations. It is regularly threatened by development proposals. Threats range from direct loss of woodland to damage caused by proposals for changes to neighbouring land use.

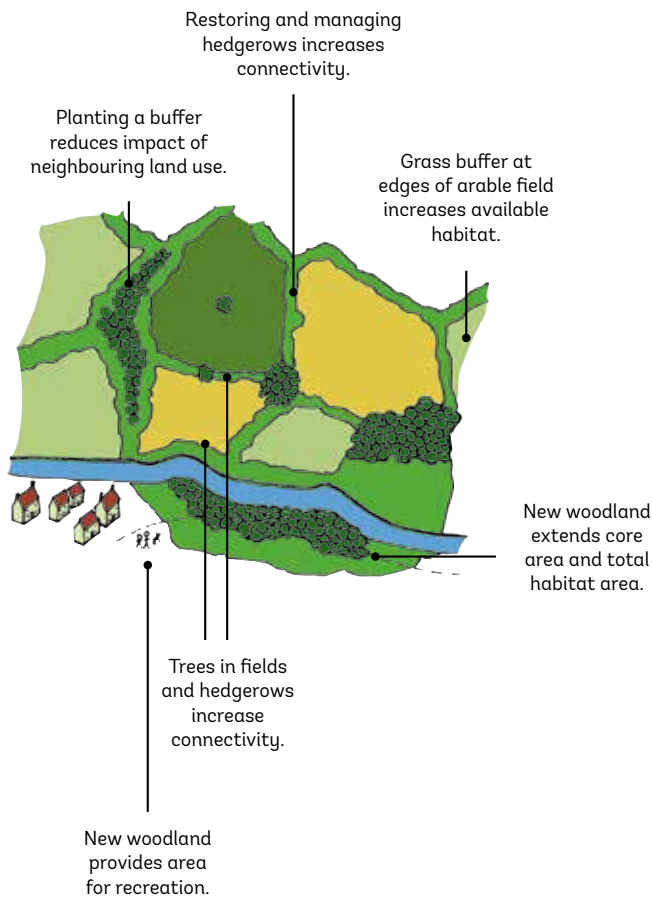
Ancient woodland now covers just 2 per cent of the UK's land area. Most remaining ancient woods are very small, and often exist as islands within a sea of built development or intensive farmland, both of which can be inhospitable for wildlife.



# Fragmented woodland



# Measures to reverse fragmentation



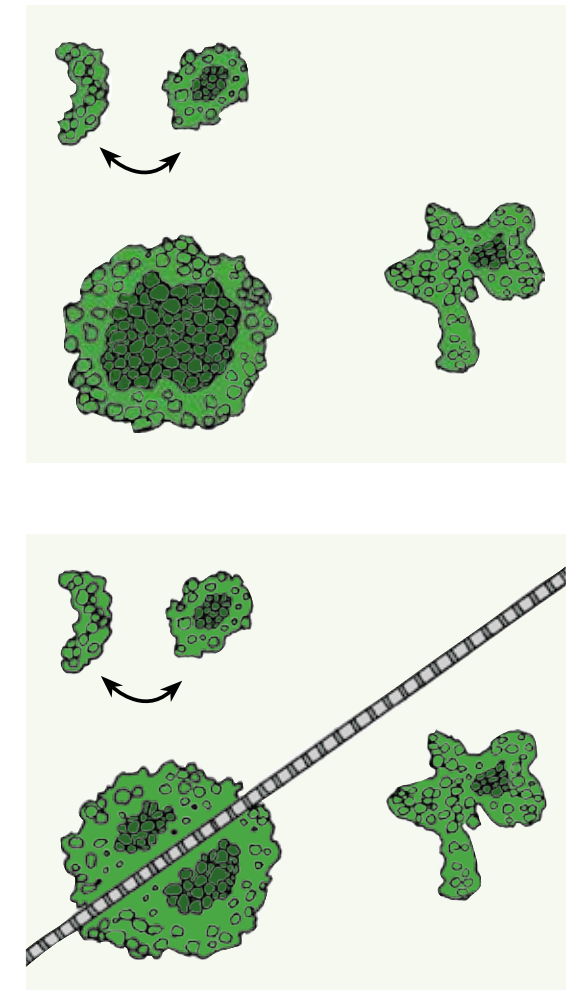
Fragmentation of ancient woodland (and other important natural habitats) threatens wildlife. It reduces the total amount of the habitat, increasing its isolation and making it vulnerable to detrimental effects of neighbouring land use. Reduction in total area means local extinction of rare and vulnerable species is more likely, and increased isolation means less exchange between populations, reducing their viability and ability to adapt to change.

Both the area and shape of remaining fragments of habitat is important. Large areas are better able to support viable populations of a wide variety of species. Patches of habitat with a more compact shape, and thus a larger 'core' area, (that's the area that is far enough away from the edges to be unaffected or little affected by pollution, noise, and other impacts of neighbouring land use) are better for species that need more stable, interior areas, many of which are of conservation concern.

Smaller areas of habitat are more vulnerable to negative impacts from surrounding land use. Large areas of intensive land use between habitats form a barrier to species movement. Landscapes with bigger and better quality areas of natural habitat, and greater connectivity, are generally better for wildlife. The Lawton Review in England proposed that we need to make our network of wildlife habitats 'bigger, better, and more joined-up', and the Government took this on board in its Natural Environment White Paper.

HS2 will further increase fragmentation by removing areas of ancient woodland and other habitats. Read more about the Lawton review and what it means for woodland at [woodlandtrust.org.uk/get-involved](http://woodlandtrust.org.uk/get-involved)

# Core area and proximity



# The bigger picture

Ancient and other native woods are just one component in a wider network of natural spaces and habitats. It is increasingly recognised that these wider ecosystems perform a range of vital functions that underpin our own survival as well as that of wildlife.

They are fundamental to helping people cope with challenges such as the effects of climate change and pollution.

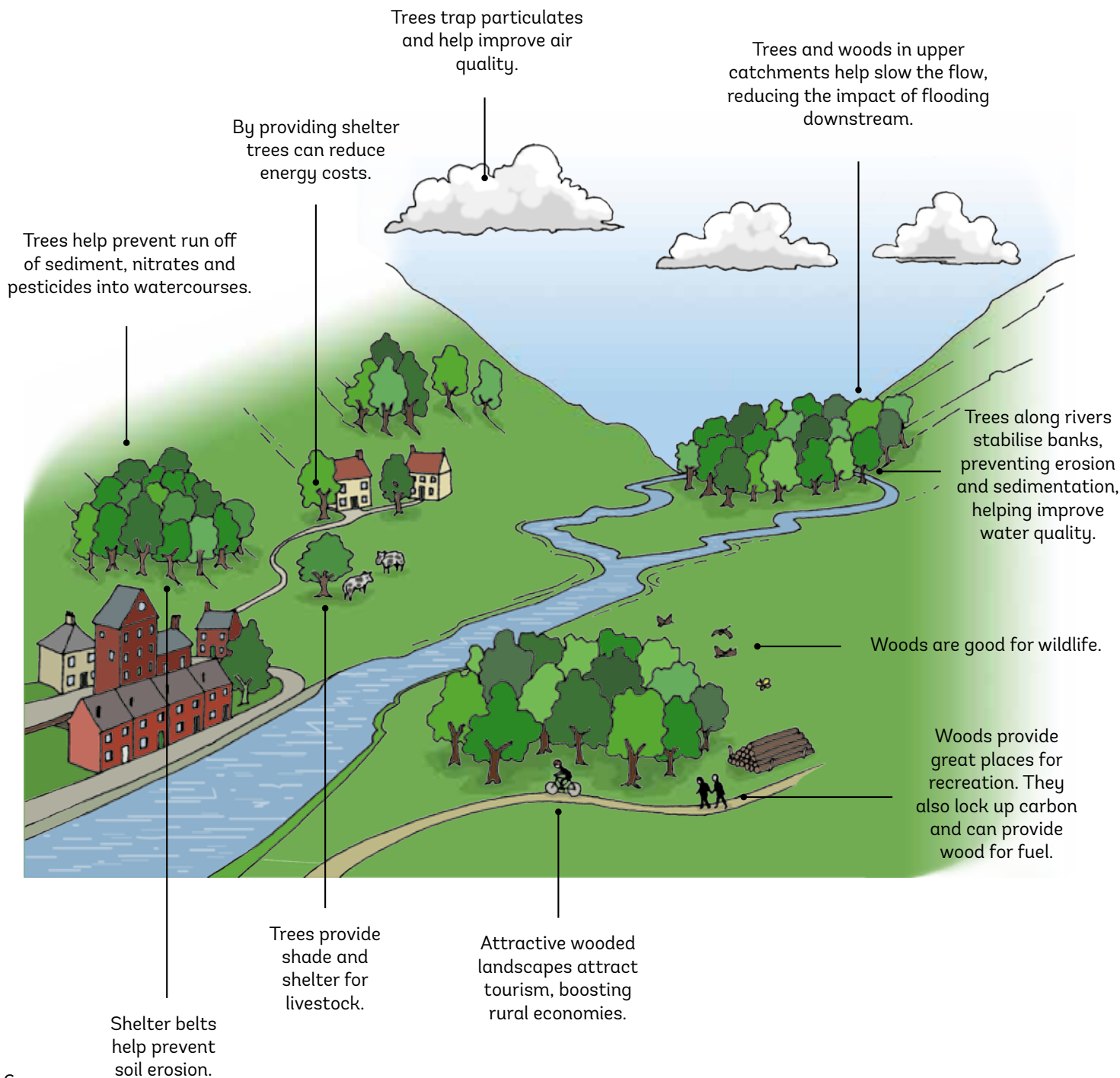
Trees and woods store carbon and provide low-carbon alternatives to fossil fuels and modern building materials. They help to improve water quality by increasing infiltration of water into soil, reducing run-off and erosion and thus sedimentation of rivers and streams. They absorb pollutants from the air and water, and act as windbreaks, reducing wind erosion. Trees planted

upstream can delay and stagger the release of flood water, reducing the scale of flooding events.

Woods are great places to visit, where people can experience wildlife first-hand, and exercise for their physical and mental health.

Attractive landscapes including natural habitats bring economic benefits through increased tourism, attracting inward investment by businesses, and increasing property values.

Protecting and expanding natural habitats, including woodland and trees, and making our landscapes more wildlife friendly is not a 'nice-to-do' – it's essential for our survival.



# Impacts, mitigation and compensation

Natural England is responsible for recording ancient woodland on the Ancient Woodland Inventory. However, not all of it is currently mapped, particularly smaller areas under 2 hectares in size. The Woodland Trust identified 14 areas of unmapped ancient woodland along Phase 1 of HS2 that HS2 Ltd assessors missed. Therefore, the best way to protect ancient woodland and the wildlife that depends on it is to fully assess any nearby wooded areas and ensure ancient woodland is mapped by Natural England so that appropriate steps can be taken to avoid it.

Mitigation proposals can be used to ensure that impacts on ancient woodland are minimised, i.e. the planting of new wooded areas between ancient woodland and development acts as a buffer.

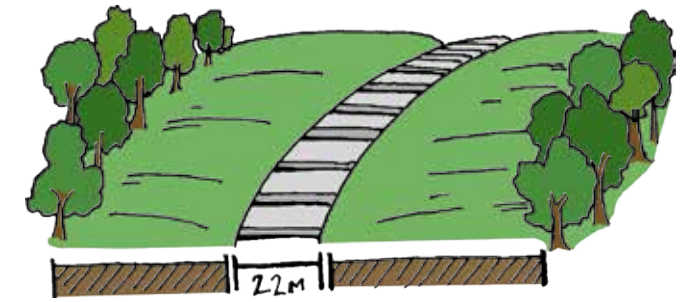
Loss of ancient woodland cannot be mitigated for. However, where we are unable to prevent the loss of this irreplaceable habitat, we look to ensure that substantial and appropriately located woodland planting is guaranteed. These types of proposals are called 'compensation' and should be bespoke.

## Cuttings and tunnels

Cuttings and embankments created through woodland can increase the amount of land-take required for the railway. If the sides of the cutting or embankment are kept clear of trees, as is likely to aid management of the railway, this means permanent loss of woodland.

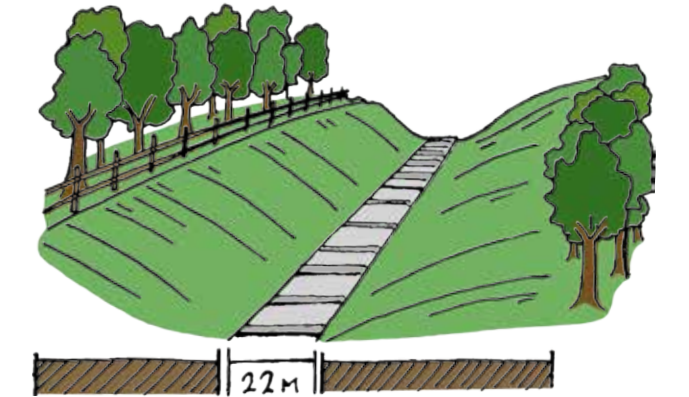
Tunnels can mean less land loss, particularly if the entrance and exit are outside the wood, though any ventilation shafts created might impact on the woodland.

"Cut and cover" tunnels still mean the same loss of ancient woodland. Depending on how the tunnel roof is created and managed, some species may be able to travel from one side of the tunnel to the other more easily than without the tunnel, but for others the wood has still been fragmented.



## Embankments

As with cuttings, embankments multiply the loss of ancient woodland habitat. Disturbance caused by the construction of both cuttings and embankments may also be irreparable.



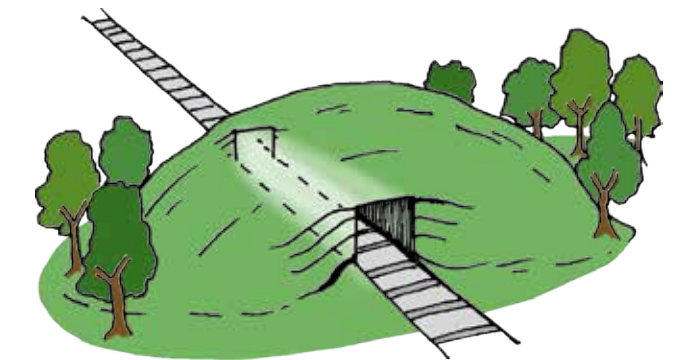
## Cuttings

The railway trackbed in this cutting is 22 metres wide but the total loss of woodland is considerably wider. The deeper the cutting, the greater the destruction.



## Tunnels

Probably the least destructive method of traversing a sensitive natural habitat, a tunnel still needs ventilation and construction is not possible without serious disturbance.



## 'Cut and cover' tunnels

Superficially a better method, the removal and replacement of the soil still means the unique interrelationships between species are lost forever over the same wide area.

## Buffering

Development adjacent or near to ancient woodland or other sensitive habitats can have a number of negative impacts. For example, pollution can cause changes to woodland flora, impact on the health of trees, and lead to loss of soil micro-organisms, affecting the natural recycling processes within the wood. Disturbance and noise can affect individual species by increasing predation, and reducing breeding success and the viability of populations. Disturbance on adjacent land may also alter soil structure and hydrology.

The edges of the habitat are particularly vulnerable to these effects, but they can also penetrate to a greater or lesser degree into the interior. Natural buffers around important habitats can help reduce these impacts and protect wildlife from these effects. Buffers may be new woodland, or could also include a 'transition' habitat with shrubs and open grassland.

The width of buffer required will depend on the nature and impact of the development, the nature of the habitat to be protected, and the nature of the buffer itself. There is relatively little research into this area, but what there is suggests that to be effective, buffers need to be designed on a bespoke case-by-case basis to protect species from the impacts of development. Natural England recommends a buffer width of 15m as an absolute minimum and we would expect buffers planted for HS2 to be wider than this. Dense, shrubby edges may help to protect species from some effects more than open areas.

## Translocation

Sometimes 'translocation', or moving elements of a habitat, is suggested as a way of compensating for its loss. The term 'habitat translocation' may be used, but this is misleading; an ancient wood is a unique habitat, the product of a complex range of factors including its geology, soils, aspect, microclimate, and centuries of history including both natural events and human intervention. It would be impossible to successfully translocate such a habitat.

Some evidence suggests that moving elements of the habitat such as soils or trees to a new planting site enable it to accumulate some wildlife value more quickly. However, this is not always successful, and even when it is, it can only be a salvage operation providing limited compensation (not 'mitigation') for the loss of ancient woodland.



## New planting as compensation or mitigation

Ancient woodland is irreplaceable and this is recognised by HS2 Ltd. However, our experience with Phase 1 has shown that HS2 will suggest planting new woodland to compensate for loss of ancient woodland (as well as non-ancient woodland), claiming it cannot always be avoided. No amount of planting can ever recreate ancient woodland and therefore any compensation proposed must be significant.

When deciding how to compensate for ancient woodland loss, we advocate a ratio of woodland loss to new woodland creation in line with Natural England's recommended ratio of 30:1 hectares. As a community you may be looking at possible measures to lessen the impact of HS2. Planting new woodland or trees could form a key part of this and can bring a number of benefits for people and wildlife.

To maximise benefits to wildlife, new woodland should be created with a mix of native species appropriate to the site. If public access is possible, designing good pathways from the start is essential.

It is particularly important to think about how much new woodland is needed, and about the best location for it, to maximise benefits.

In drawing up or commenting on a proposal, think about whether the new woodland can:

- help to expand or buffer existing areas of ancient woodland (or other important habitats)
- increase connectivity between natural habitats in the wider landscape
- provide opportunities for public access, recreation and community involvement
- deliver wider functions such as flood mitigation, reducing erosion, shade and shelter.
- Help screen the community directly from the development



HS1: construction at Ashenbank Wood, Kent (WTPL/John Tucker)

# New woods and trees to buffer communities from impacts of HS2

Trees and shrubs may provide a degree of visual screening from new rail development, and some protection from noise. However, research suggests the latter is likely to be small; the degree of noise attenuation varies with noise frequency, and isn't as effective in the range of frequencies associated with rail noise. The denser the woodland, and the wider the shelter belt, the greater the effect. Evergreens and shrubs are more effective than deciduous trees alone.

However, trees and shrubs can add value to noise mitigation provided by other methods such as artificial barriers, by adding height if planted on top of earth banks or providing visual screening, for example. They will be most effective if planted near the railway, or near the people to be screened, rather than halfway between.

In addition, trees and shrubs can help reduce run-off of pollutants, and trap airborne particulates and other pollutants.

## Woodland restoration

Creating wildlife friendly landscapes and functioning ecosystems is also about improving the habitats we already have. In the case of woodland, one of the priorities is restoration of ancient woods that were planted with non-native conifers during the last century. The process of replanting and the dense shade that resulted has severely impacted specialist plants and animals that depend on these ancient woods. Restoring such Plantations on Ancient Woodland Sites is the only way we can increase the area of ancient woodland with semi-natural characteristics in the UK, thus providing scope for the local populations of these species to expand. Woodland restoration should be considered as part of a package of mitigation/compensation proposals, with the agreement of the landowner.

## Compensation

HS2 Ltd has to compensate for the environmental damage caused by HS2. The Woodland Trust has been and will continue to lobby for the approach laid out in this booklet to be recognised as a necessary area of funding within the programme. We will also be pushing for the fund to be accessible to communities along the route, enabling you to make decisions at a local level for your community, and your trees and woods.

Further factsheets related to the issues covered in this toolkit will be produced as things evolve, and will be available at [woodlandtrust.org.uk/get-involved](http://woodlandtrust.org.uk/get-involved)



## References/ further reading

Blakesley, D., and Buckley, P. (2010) *Creating new native woodland for wildlife and people in a changing climate: principles and practice*. Pisces Publications.

Corney, P.M., Smithers, R. J., Kirby, J. S., Peterken, G. F., Le Duc, M. G., and Marrs, R. H., (2008) *Impacts of nearby development on the ecology of ancient woodland*. Woodland Trust.

Ryan, L., (2013) *Impacts of nearby development on the ecology of ancient woodland: addendum*. Woodland Trust.

Rodwell, J., and Patterson, G., (1994) *Creating new native woodland: Bulletin 112*. Forestry Commission.

## Our trees need your help

It's not just HS2 threatening our irreplaceable ancient woods.

Now covering only 2% of the country, ancient woodland – our richest habitat – remains under pressure throughout the UK. 85% has no legal protection from further damage and destruction by new roads, quarries, housing and other developments.

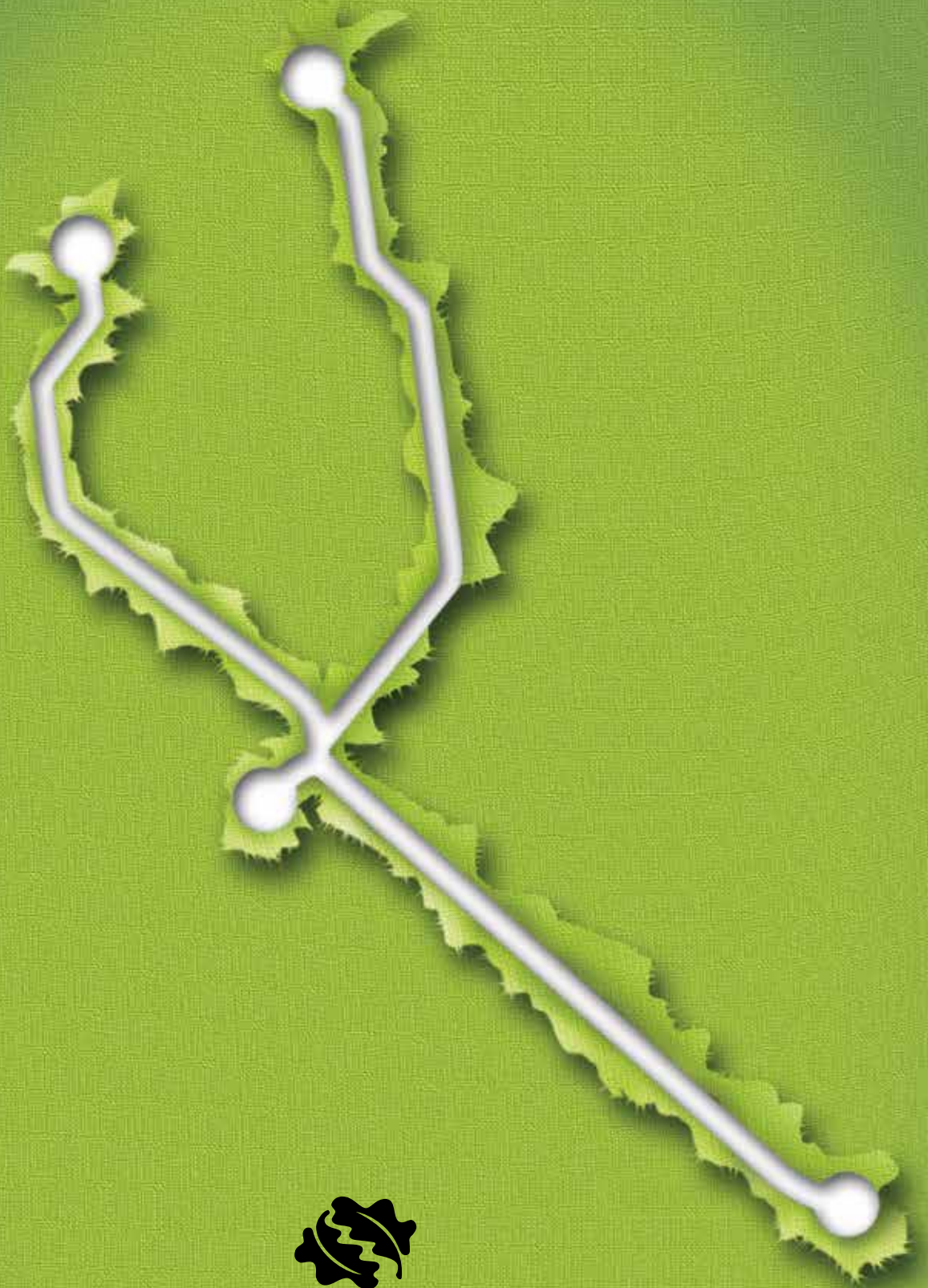
Since 1999 we have fought to protect more than 1,512 threatened ancient woods and we continue to lobby government to raise issues like protecting ancient woodland up the political agenda.

It only costs £3 a month to join the Woodland Trust and the more members we have, the louder our voice.

Without your help, our ancient woodland and the wildlife it supports could be lost forever.

To join today call FREE on 0330 333 3300 or visit us online at [woodlandtrust.org.uk/support-us](http://woodlandtrust.org.uk/support-us)





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