Landscape Buffer Strips

How close is too close? Proximity of brookside shaw and housing on a recent development in Sussex

for the protection of trees
woods and other wildlife habitats

Landscape buffer strips for the protection of trees, woods and other wildlife habitats

Sussex Wildlife Trust is frequently asked to comment on Landscape Buffer Strips, and to provide guidance on their sizing and implementation. This document provides answers to such questions.

The purpose of Landscape Buffer Strips is to protect trees and ecologically sensitive habitats from a wide variety of risks (see fig 2 on p3). Landscape Buffer Strips are frequently confused with BS5837 Tree Protection Zones, but their purposes and sizing are very different (see fig 4 on p4).

Sussex Wildlife Trust has an established policy published in its Vision statement a decade ago that "There should be no further loss of wildlife sites of county or national importance to development". This requires that development does not cause (either directly or indirectly) the continuing loss of environmental assets.

We welcome the UK Government's publication of PPS1 "Delivering Sustainable Development". This sets out the overarching national planning policies on the delivery of sustainable development through the planning system.

However, development must be sustainable in operation as well as construction.

Planning rules insist on the inclusion of open and green spaces, and areas of protected woodland and meadows will also remain within and around the development. Unless they are suitably protected and interconnected these isolated patches will not continue to exist as viable ecological habitats.

Greenfield sites, particularly within historic landscapes, may have seen little change for centuries. To ensure such a habitat is sustained, it must be linked to other adjacent habitats, and buffered to protect it from the new development.

Landscape buffer strips must be wide enough to protect the habitats from development (and the converse is true). But excessive buffers would cause development to overspill onto yet further greenfield sites.

So the question is, how wide should buffers be? Pages 4 and 5 answer this question; pages 6 and 7 illustrate their application.

To protect woods: Rules already exist to protect tree-roots from construction damage. This is *all* they do. Such narrow strips do not protect the wood-edges, which form a unique habitat, and a vital part of the life of a wood. Many woodland creatures need this sunlit edge at some period of their development, and it is always a source of food. An ideal woodland edge has a graded profile rising from rough grass and herbs, through shrubs to small trees.

To protect meadows: Hedges and strips of woodland have traditionally been buffer zones for meadows. They provide food, shelter and shade for both creatures and plants. A hedge in an ancient landscape has probably stood for hundreds of years. It should have its own ecotonal zone of grass and taller plants between it and the development.

To protect connectivity: Many creatures forage widely, and cannot survive in a small, isolated patch of woodland. Some plants are slow to colonise and need suitable connecting vegetation. This means that connecting links must be retained between remaining patches of wood and meadow. These must be wide enough to provide food and shelter.

To protect from buildings: These must be far enough from the wood edge to prevent shading of the wood (especially on the south side), and to ensure that foundations and hard surfaces do not cause water run-off problems.

To protect from human activity: A small wood close to houses is at risk from overuse. It is also likely to suffer pollution from fly tipping, both of rubbish and garden waste. The latter can introduce alien species which may upset the natural balance of the wood. A wide buffer zone, with restricted points of access to the wood, will help avoid these hazards, as will connecting footpaths providing walks *outside* the canopy edge of the woods.

To protect people: Houses built too close to trees may suffer leaf and branch drop, shading, and root penetration into drains.

To protect local biodiversity: Buffer strips need to be *retained* features, and not re-created after the established habitat has been stripped away to allow construction. "Translocation" - replacing soil, turf and plants - is never desirable. Buffers should be fenced off to their full width prior to development. They will also need appropriate management *after* completion of the work to ensure their continued viability.

Fig 1. Roles of Landscape buffer strips

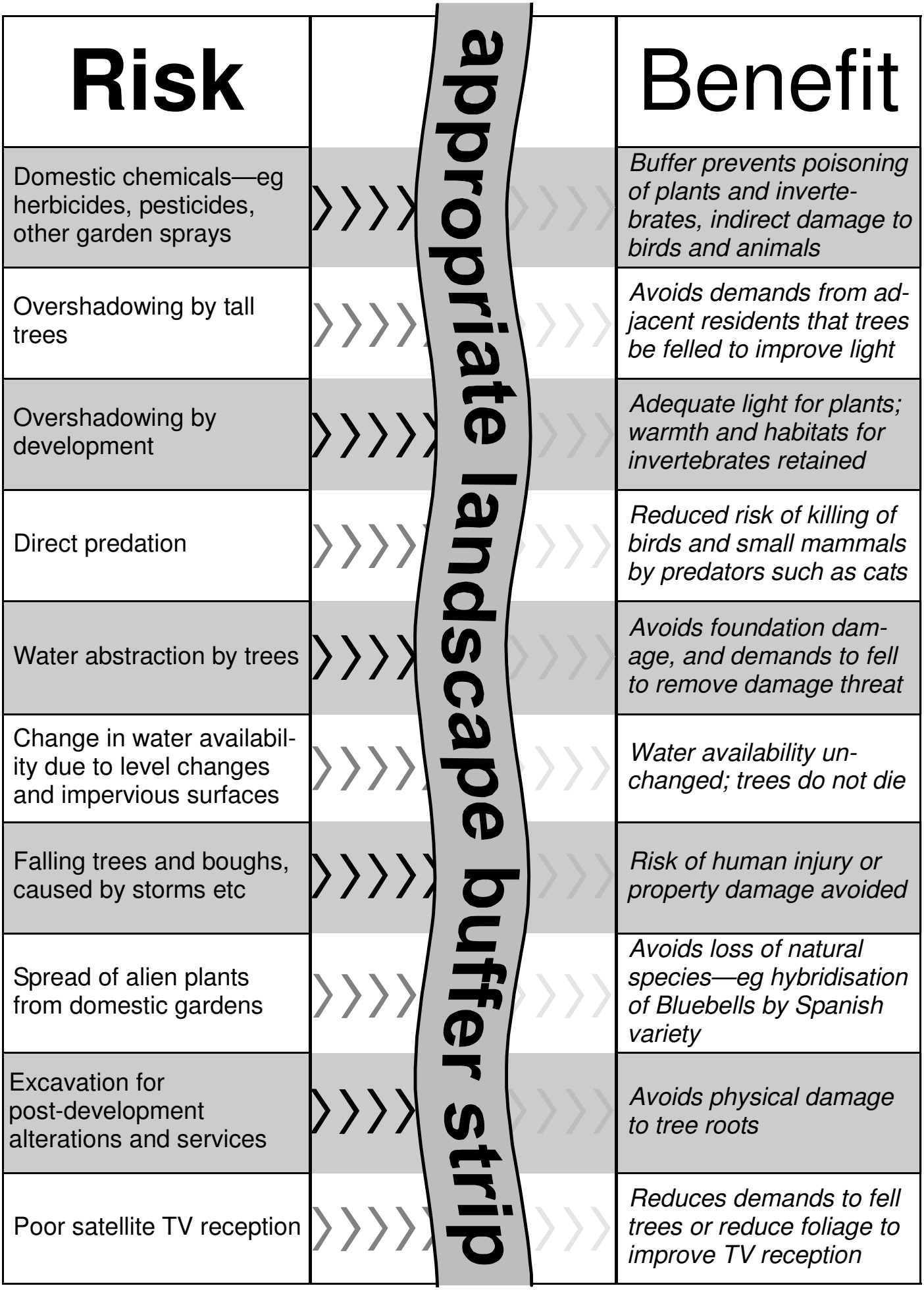


Fig 2. Risks mitigated by adequate landscape buffer strips

Landscape Buffer Strips—assessing space requirements

Landscape Buffer Strips perform different roles to BS5837 Tree Protection Zones ("TPZ"). The space allocated for TPZs is rarely adequate for the wider range of risks mitigated by Landscape Buffer Strips (fig 2). So how should their sizing be assessed?

In the past, Sussex Wildlife Trust has used a 'rule of thumb' of a 'safe' 30 metres for buffers around the most sensitive and valuable areas such as ancient woodland, and 20 metres in other cases.

However Doncaster Metropolitan Borough Council has recently published a methodology (see Fig 3) that allows a buffer width to be calculated for a tree (or group of trees) using a more rigorous criteria based system.

This document links the Doncaster methodology to woodland and hedges, and considers the needs of Veteran trees, and the buffers themselves.

A. Woodland and ancient woodland

The minimum distance a new property should be sited from an existing tree = sum of definitive and variable scores, allowing 1 linear metre per point

DEFINITIVE *: based solely on species see fig 5, eg Oak = 9, Beech =8, Yew =7, Ash = 6, Birch = 4 etc, see fig 6 and 7*
VARIABLE
Type of development (eg Dwellings = 2)
Orientation, from 1 to 4, see p6 introduction
Special factors requiring a judgement (from 0 to 5 or in special cases, more)

Fig 3 : Doncaster Methodology

Woods, and particularly ancient woodland, support a diverse range of animals and plants in addition to their trees. Protecting a tree helps protect its ecosystem, and Doncaster recognises that tree groupings need additional space over solitary trees. Ancient Woodland requires the highest level of protection. A Doncaster 'Special factor' of 5 should be used, while a factor of at least 2 should be used for other woodland.

B. Hedges

Continuing management of a hedge is likely to control its size and hence its water demand. Both are factors in the Doncaster methodology. As a result of hedge management a smaller buffer may be required than for a tree of the same species

A reducing factor can be applied; as a rule of thumb, a buffer depth must be not less than 2/3s the buffer calculated for the species as a tree.

C. Veteran Trees

A small proportion of trees have survived to a great age of hundreds, or in the case of Yews, sometimes thousands of years. Of all trees, veterans have the most complex and valuable ecosystems.

Conservation of veteran trees is a specialist discipline, developed through the Veteran Trees Initiative of English Nature. Landscape Buffer Strips for veteran trees need to reflect their extraordinary size, maturity and sensitivity.

As a rule of thumb**,** *the buffer around a veteran tree should never be less than 1.5 times the TPZ depth—so development should be no nearer the canopy than half its spread..*

D. Height of development

Woodland edges are critical to the health of the whole wood, and adequate sunlight must reach the landscape buffer strips.

Adjacent development outside the buffers must not be so high as to overshadow the woodland, particularly on south facing aspects. The height of development should reflect this, taller buildings being sited further from the wood-edge.

	Tree Protection Zone	**Landscape Buffer Strip**
Duration	Temporary, during construction work	Permanent, primarily after construction
Applies to	Trees only	Trees, woods, hedges, meadows and other habitats. Also applies for other purposes eg watercourse protection, not dealt with here
Basis	Existing trees	All habitats; anticipatable mature size of trees (allowing for future growth)
Protects	Roots and limbs of trees	Trees shrubs and the wildlife they support
Primarily protects from	Construction vehicles, activity and construction chemicals (eg cement)	People, their chemicals and animals
Size	Based on the existing trees	Based on potential tree growth, and the threats to and from ecological habitats

Fig 4 : Tree Protection Zones (as in BS5837) *versus* Landscape Buffer Strips

D.(continued) Height of development

As a rule of thumb, no southerly development should be closer to woodland at any point than twice its own height at that point.

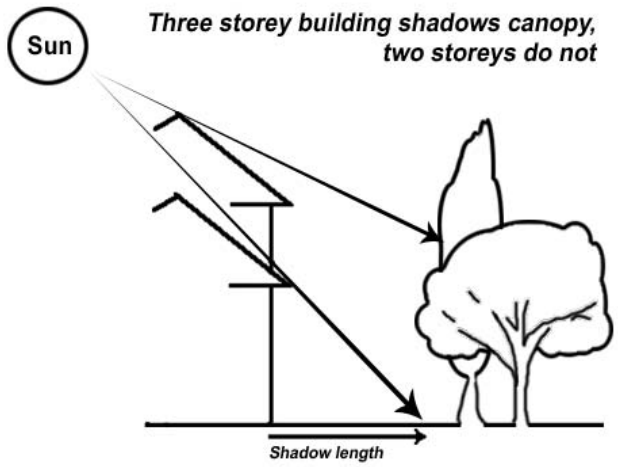


Fig 5 Overshadowing

E. What goes into the buffer?

Landscape buffer strips provide protection to habitats, and also act as intermediate habitats.

Invertebrates and birds in woodland need adjacent access to open 'green' habitats. This is provided by an 'ecotonal' zone which replaces open habitat lost to the development.

The ecotone consists of grasses, shrubs and small trees stepping up from the ground towards the woodland.

Sometimes part of the buffer is used for paths and access. These should predominantly be *unsurfaced.* If surfaced, they must be built above the existing ground level and use a compaction absorbing base and a permeable surface. Such surfaces should not be used for motor vehicles or suffer runoff from motor vehicle pollution.

F. Conserve! Not re-instate.

Landscape buffer strips need to be *retained* features, and not re-created after the established habitat has been stripped away to allow construction.

"Translocation" - replacing soil, turf and plants - is never a desirable option. Buffers should be fenced off to their full width prior to development, in the same manner as Tree Protection Zones (indeed the TPZ fence is not normally then required). Landscaped buffer strips will also need appropriate management *after* completion of the work to ensure their continued viability.

Species	*Water demand*	*Ultimate size*	*Density of foliage*	*TOTAL*
Alder	*2*	*2*	*2*	*6*
Ash	*2*	*3*	*1*	*6*
*Aspen ***	*3*	*3*	*2*	*8*
Beech	*1*	*4*	*3*	*8*
Birch	*1*	*2*	*1*	*4*
Cherry (wild)	*2*	*3*	*2*	*7*
Crab Apple	*2*	*1*	*2*	*5*
Hawthorn	*3*	*1*	*2*	*6*
*Hazel ***	*3*	*1*	*2*	*6*
*Holly ***	*1*	*2*	*3*	*6*
Hornbeam	*2*	*3*	*3*	*8*
Horse Chestnut	*2*	*4*	*3*	*9*
Lime	*2*	*4*	*2*	*8*
Maple	*2*	*3*	*3*	*8*
Oak	*3*	*4*	*2*	*9*
Pine	*2*	*2*	*2*	*6*
Plane	*2*	*4*	*3*	*9*
Plum	*2*	*1*	*3*	*6*
Poplar	*3*	*4*	*2*	*9*
Poplar (Lombardy)	*3*	*3*	*2*	*8*
Robina	*2*	*2*	*1*	*5*
Rowan	*2*	*1*	*2*	*5*
*Sweet Chestnut ***	*2*	*4*	*3*	*9*
Sycamore	*2*	*4*	*3*	*9*
Whitebeam	*2*	*2*	*3*	*7*
Willow	*3*	*3*	*2*	*8*
Yew	*2*	*2*	*3*	*7*

Fig 6 : Species data (dimensions in metres)

1) Water demand for each species can be found in the National House Building Council Standards Chapter 4.2 - Building Near Trees. In this publication trees are identified as having high, medium, low water demand.
Score: 3 for high
2 for medium
1 for low

2) Ultimate size is found by multiplying the ultimate crown spread of the species by the normal height of the species in an urban situation (based on Arboriculture Research Note 84/90/ARB - The Ultimate Size and Spread of Trees Commonly Grown in Towns).

The result in square metres is intended to reflect not only the size of the crown, but a zone of influence cast by a tree over the garden and/or property.
Score: 4 over 400m2 – very large
3 251-400m2 – large
2 101-250m2 – medium
1 0-100m2 – small

3) Density of foliage is a measure of shade likely to be cast by the species. Based on table 5 of British Standard BS5837: 1991 Trees in Relation to Construction (as amended) there are 3 categories: light, moderate and dense.
Score: 3 for dense
2 for moderate
1 for light

All data collated by Doncaster MBC *except* species identified by ** which are estimates derived by Sussex Wildlife Trust

Fig 7 : Calculation of Definitive Scores

Landscape Buffer strips in practice

This single field, embedded in ancient woodland, is allocated for housing.

Details below illustrate application of the methodology set out on pages 3 and 4.

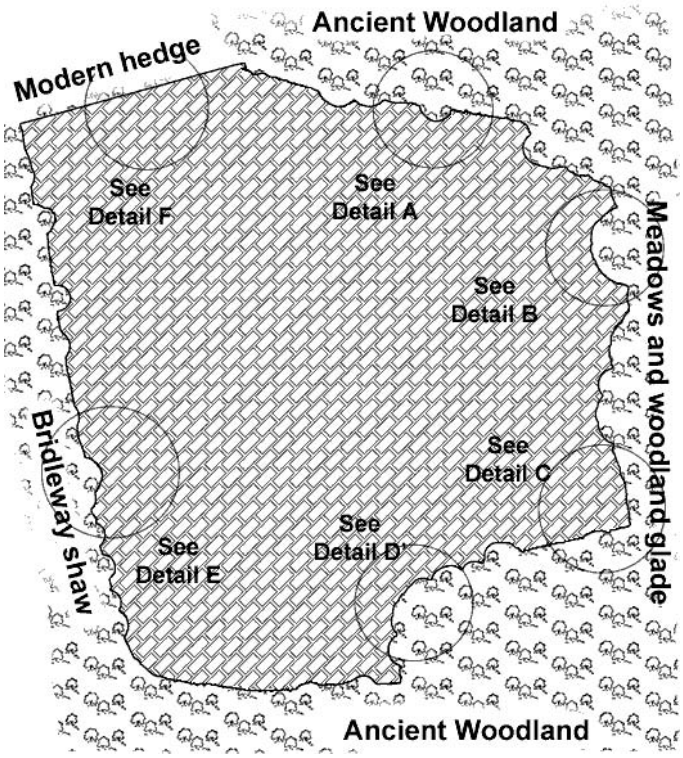
The site is surrounded predominantly by oak woodland, with a wide variety of other species including Hornbeam, Beech, Wild cherry, Aspen etc.

To the north of the site, an ancient woodland area will be connected to other ancient woodland to the west and south by hedges, meadows, shaws and woodland glades.

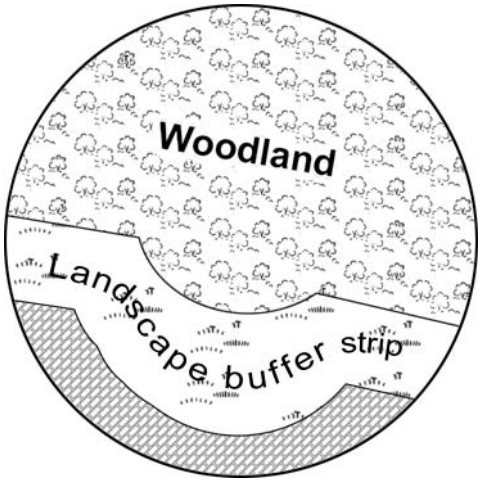
The importance of ancient woodland requires a 'special factor' of 5; generally, a factor of 2 is appropriate for woodland, while on this site parts of the east and west boundaries have long established importance for wildlife for which a factor of 3 is appropriate.

Housing carries a factor of 2 under Doncaster rules. The 'orientation' factor varies around a development :

Trees to south : 4 (heaviest shading)
Trees to west : 3
Trees to east : 2
Trees to north :1 (lowest shading)



Detail A



South facing ancient woodland edge, marked by a medieval woodland bank.

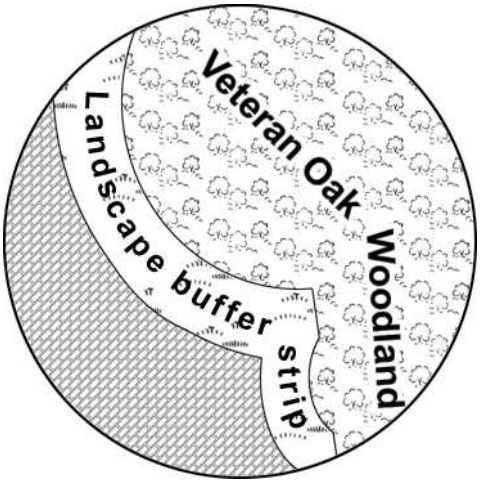
Woodland is predominantly Oak , with other species, including Aspen, Holly, Field Maple, Hawthorn, Hazel etc.

Housing type requires factor of 2, orientation of one, and 'Special Factor' of 5 for ancient Woodland.

Landscape buffer width for boundary Oak of 17 metres (9+2+1+5), for a Hornbeam of 16 metres (8+2+1+5) and for Birch of 12 metres.

Buffer width is measured from the bole of the tree, so that major species within the wood may dictate width rather than the immediate edge trees. Depth of buffer visible results from tall narrow habit of these particular trees.

Detail B

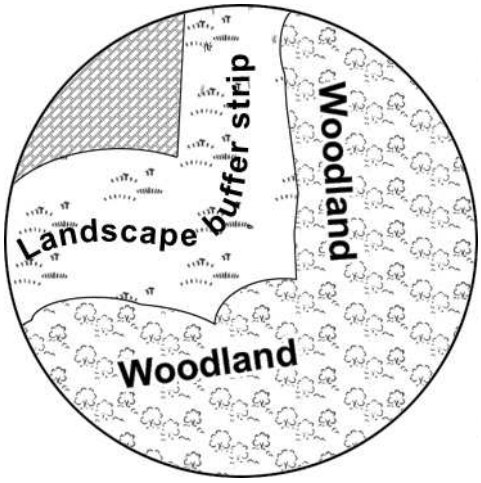


On eastern Boundary, a veteran oak sits on the edge of woodland, spanning up to 17 metres, with a canopy area of 750 m2 (much larger than the normal Doncaster provision, see fig 7).

As a veteran tree, adequate space should be allowed beyond the canopy to avoid overstressing a sensitive specimen. This will need a buffer up to 25m deep (150% of TPZ depth). Much of the buffer runs under the canopy due to the great spread.

NB A roadway is planned to the north of this tree, and measures will be needed to ensure the root plate is adequately protected from compaction and changes in water table levels.

Detail C



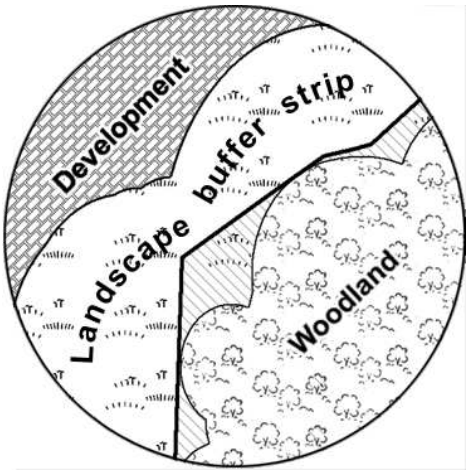
South east corner, ancient woodland to south, ancient woodland glade to east

Species very varied, including modern supplementary planting of beech and conifers (which are protected by TPOs).

Housing type requires factor of 2, orientation of 2-4, and 'Special Factor' of 5 for ancient Woodland, and of 3 for woodland reflecting ancient connectivity.

Landscape buffer width for Oak (on south side) 20 metres (9+2+4+5), for a conifer (on east side) of 15 metres (6+2+2+5). Narrow canopies extend only a short distance over landscape buffer strips.

Detail D



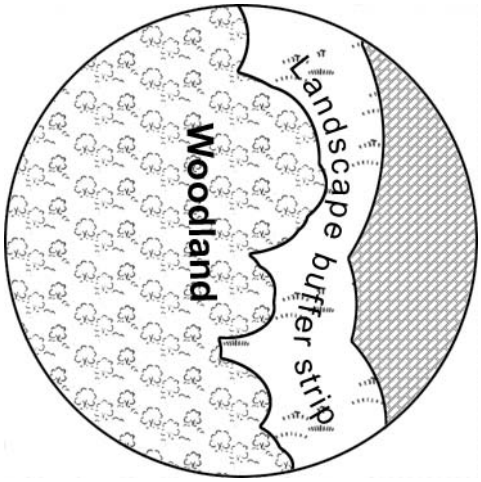
West of detail C, the margin of the ancient woodland is marked by very tall (25 metre +) narrow beeches.

Housing type requires factor of 2, orientation of 4, and 'Special Factor' of 5 for ancient Woodland.

Landscape buffer width for Beeches 19 metres (8+2+4+5)

Note inadequacy of developer's proposed buffer (marked by diagonal hatching).

Detail E



On the western boundary, a bridleway runs under the canopy of a long established woodland shaw separating the path from the development site.

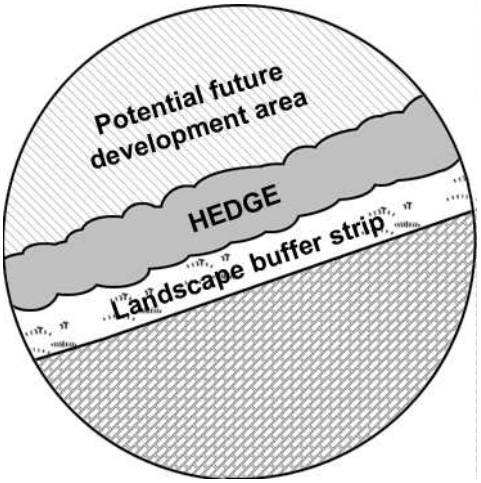
Housing type requires factor of 2, orientation of 3, and 'Special Factor' of 3 reflecting long established connectivity.

Landscape buffer width for Oaks 17 metres (9+2+3+3)

Note that buffer strip is partly under the canopy (as is frequently the case) and partly outside it

A road is planned close to the shaw, which will need to be wholly outside the landscape buffer strip

Detail F



Modern hedge, marking north west boundary of present site. Garden to north is allocated for more housing in the future. The hedge acts as a wildlife corridor for small mammals between woodland at each end.

Housing type requires factor of 2, orientation of one, and 'Special Factor' of 0.

Hedge buffer should be based on 2/3rds of tree factor : Hawthorn hedge, 6m buffer. (2/3rds of 6+2+1+0)

Our aim is simple: Taking Care of Sussex

Sussex Wildlife Trust (SWT) is the leading conservation organisation covering East and West Sussex together with Brighton and Hove.

The aim of SWT is to conserve the Sussex landscape, wildlife and its habitats, and to use its knowledge and expertise to help the people of Sussex to enjoy, understand and take action to this end.

With the support of over 17,000 members, and the numerous corporate supporters listed below, we care for over 3,000 acres of downland, woodland, wetland and heath. We manage 36 nature reserves, including Woods Mill, Henfield - our Headquarters.

Our many activities include environmental education, working with landowners, companies and local communities to conserve Sussex wildlife and habitats.

The Trust is a registered Charity, based at Woods Mill near Henfield in Sussex.

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