

WILD SERVICE TREES IN A NEW FOREST WOOD PASTURE

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The Wild Service Tree *Sorbus torminalis* (L.) Crantz has been the subject of a number of studies over recent years. These have included a review of its status in the British Isles (Roper 1993) and its value as an indicator of ancient woodlands (Peterken 1974). An account of the tree and its association with ancient woodlands including wood pasture in Essex has been produced by Oliver Rackham (1980).

THE NEW FOREST

The New Forest is recognised as supporting the greatest extent of actively grazed wood pastures in the lowlands of North Western Europe. There are estimated to be some 3671 ha of wood pasture in the unenclosed Forest (Tubbs 1986). Silvicultural plantations managed by Forest Enterprise enclose an area of at least 344 ha supporting stands of ancient wood pasture trees (Flower & Tubbs 1982; Sanderson 1995) together with an unknown quantity of isolated ancient trees and other wood pasture relics. There are additional areas of wood pastures lying outside the current common grazings of the New Forest in the private lands. These private wood pastures include parts of Langley Wood NNR, Whiteparish Common, Roydon Woods NR and the Franchise and Lyburn Woods. The total area is estimated in the order of 500 ha. A small proportion of these private woodlands continues to be grazed.

Whilst once considered rather rare in the Forest (Flower & Tubbs 1982) the Wild Service Tree is now regarded as 'occasional to locally frequent' (Brewis *et al* 1996) where it is found in over 40 tetrads. The tree is scattered throughout the east of the Forest with the most northerly stands being in

Whiteparish Common (Wiltshire) (Gillam 1993) and the southernmost in the estuary edge copses of the Beaulieu River. The tree is strongly associated with woodland soils overlying tertiary clays (Oligocene and Eocene) notably the Headon Beds, Barton Sands and Clays, Bracklesham Sands and London Clays. As yet no specimens have been found on soils overlying the Bagshot Sands which outcrop in the north-east of the Forest between the Bracklesham and London Clay formations.

The woodlands supporting Wild Service Trees tend to be in the gently undulating clay country of the Forest, rather than the gravel-covered plateaux or the riparian woods of the flood plains. The catchments in which these woodlands lie drain into the western Solent, Southampton Water and the contiguous Lower Test Valley. These are the Lymington River, the Beaulieu River, Bartley Water and Black Water. The tree is unknown from those parts of the Forest draining westwards into the Hampshire (Salisbury) Avon River.

Within the New Forest the Wild Service Tree is associated with areas of wood pasture containing an abundance of glades but limited areas of closed canopy high forest. Wild Service Trees are usually found growing on the edges of glades with the tree rooted in amongst other trees and shrubs, but the canopy extending into the open areas. This growth form, combined with the lack of leaves and branches below the browse line has resulted in a very distinctive 'lop-sided' shape. A limited number of trees are free growing in small glades, resulting in a columnar, rounded crown tree of between 15 and 20 m in height. Trees of a similar height are occasionally present in closed canopy high forest. In these circumstances they are often found in amongst relatively young oak and beech. These Service Trees in the canopy tend to have

Table 1 Vascular Plants and Bryophytes recorded from under the canopy of Wild Service Trees; Busketts Wood, New Forest

<u>Tree, shrubs and climbers</u>	<u>Forbs</u>
<i>Crataegus monogyna</i>	<i>Anemone nemerosa</i>
<i>Fagus sylvatica</i>	<i>Viola riviniana</i>
<i>Corylus avellana</i>	<i>Luzula pilosa</i>
<i>Rubus</i> spp.	<i>Veronica chamaedrys</i>
<i>Rosa</i> spp.	<i>Lysimachia nemorum</i>
<i>Quercus robur</i>	<i>Potentilla anglica</i>
<i>Ilex aquifolium</i>	<i>Veronica montana</i>
<i>Sorbus torminalis</i>	<i>Ajuga reptans</i>
<i>Hedera helix</i>	<i>Ranunculus flammula</i>
<i>Lonicera periclymenum</i>	<i>Juncus bulbosus</i>
<i>Ruscus aculeatus</i>	<i>Taraxacum ruderalis</i>
	<i>Prunella vulgaris</i>
	<i>Potentilla erecta</i>
<u>Bryophytes</u>	<i>Senecio aquaticus</i>
	<i>Ranunculus repens</i>
<i>Leucobryum glaucum</i>	<i>Agrostis capillaris</i>
<i>Dicranum scorparium</i>	<i>Juncus bufonius</i>
<i>Thuidium tamariscinum</i>	<i>Carex panicea</i>
<i>Polytrichum formosum</i>	<i>Carex nigra</i>
<i>Euchynchium praelongum</i>	<i>Melampyrum pratense</i>
<i>Mnium hornum</i>	<i>Vaccinium myrtillus</i>
	<i>Scutellaria minor</i>
	<i>Succisa pratensis</i>
	<i>Pteridium aquilinum</i>

small crowns and appear to be at risk from over topping and eventual crowding out by the more vigorous, and eventually taller, neighbours.

The Service Tree is absent from the more park like areas of wood pasture. Here the incomplete canopy of open grown or ancient pollard trees

risks over open grasslands with little shrub cover. Similarly, the tree is absent from recent (post 1700) silvicultural plantations made on open ground, but is persistent in recent plantations made on wood pasture sites. The tree may survive as a relic of former wood pastures as is the case of the boundary hedge of the former Fletchwood Common, abutting the study site. The tree is also found in ancient enclosed woods with a history of coppice management around the Forest including the formerly grazed coppices of Langley Wood NNR. In the vicinity of the Lymington River, in Roydon Woods Nature Reserve, the tree is present as a colonist of 19th century fields within a wood pasture matrix.

BUSKETTS WOOD STUDY SITE

In 1995, members of Hampshire Wildlife Trust Flora Group undertook a study of Wild Service Trees in the Busketts Wood area of the New Forest. This is an area of wood pasture subject to all year grazing from Forest livestock. Busketts Wood lies on soils overlying Barton clays which forms a gentle ridge, rising from 25 to 35 m above sea level, acting as a watershed between two minor tributaries of the Bartley Water. The study area only covered part of Busketts Wood, being an area of some 1,000 by 300 m centred on NGR SU 315111. The site is bounded to the south by a silvicultural plantation on a former wood pasture site, fields to the north and further wood pastures to the east and west. Lying within the study area is a former enclosure of 200 m square where in c. 1958 the Forestry Commission felled extensive areas of wood pastures, purportedly to assist their regeneration. This damaging and controversial practice is documented in Tubbs (1986). This 'regeneration' enclosure is now open to Forest livestock.

Associated Plants and Plant Communities

Whilst New Forest woodlands tend to vary very little in terms of woodland canopy, with oak and beech usually being dominant in various proportions, the shrub and field layers form distinct communities. The woods of the study area may be

Table 2 Trees shrubs and climbers in stands containing Wild Service Trees; Busketts Wood, New Forest. Stands are within the study area comprising a 30 m radius from *S. torminalis* trees. Outside the study area, but within Busketts wood, *Acer campestre* is found as a rare associate

	<u>Dominant to Frequent</u>	<u>Occasional to Rare</u>
Canopy 10 m +	<i>Fagus sylvatica</i> <i>Quercus robur</i>	<i>Sorbus aria</i> <i>Sorbus aucuparia</i>
Sub-canopy trees 5–10 m	<i>Crataegus monogyna</i> <i>Corylus avellana</i> <i>Ilex aquilifolium</i>	<i>Malus sylvestris</i> <i>Fraxinus excelsior</i>
Shrub Layer	<i>Crataegus monogyna</i> <i>Corylus avellana</i> <i>Ilex aquifolium</i> <i>Ruscus aculeatus</i>	<i>Frangula alnus</i> <i>Prunus spinosa</i>
Climbers	<i>Rubus spp.</i> <i>Rosa spp.</i> <i>Hedera helix</i> <i>Lonicera periclymenum</i>	

described as National Vegetation Classification woodland type transitions between W11 and W10, with a tendency towards W8 in more flushed soils. The plants recorded beneath the canopies of Wild Service Trees are recorded in Table 1. A description of various trees and shrubs in the immediate vicinity of Wild Service Trees is set out as Table 2. These are typical associates of heavy clay woodlands on the open Forest.

Epiphytes

Wild Service Trees are generally regarded as being poor trees for epiphytes (Harding & Rose 1986), as in common with other woody *Rosacea* their bark is smooth, sheds water rapidly, peels frequently and the trunks rarely reach any size, producing poor conditions for epiphyte growth. The epiphytic bryophytes found on Wild Service Trees in the study area are listed in Table 3. A more detailed examination would no doubt reveal other epiphytic bryophytes. None of the recorded

Table 3 Bryophytes epiphytic on Wild Service Trees; Busketts Wood, New Forest

<i>Lejeunea ulicina</i>	<i>Hypnum cupressiformis</i>
<i>Lophocolea heterophylla</i>	<i>H. mammillatum</i>
<i>Metzgeria furcata</i>	<i>Mnium hornum</i>
<i>Dicranum scoparium</i>	<i>Ulota crispa</i>

species are uncommon, and all of them occur at least frequently on other trees and shrubs. They are all common in the New Forest, where, however, a more extensive range can be found on other trees, particularly the older specimens. The relatively rich assemblage of bryophytes on Wild Service Trees in Busketts is probably attributable to the pasture woodland conditions, providing the right combination of humidity and partial shade (as well as a more or less pollution free environment); this compares with the high forest

Table 4 Lichen NIEC indicator Species recorded as growing on Wild Service Trees; Busketts Wood, New Forest

<i>Arthopyrenia ranunculospora</i>	<i>Thelotrema lepadinum</i>
<i>Schimatomma quercicola</i>	<i>Lecanora jamesii</i>
<i>Schimatomma nivium</i>	<i>Pertusaria multipuncta</i>
<i>Stenocybe septata</i>	<i>Phaeographis dendritica</i>

conditions and drier habitats more generally found in Southern England.

The lichen flora was rather different; a total of 37 species was recorded including several species characteristic of ancient old growth woodlands (Rose 1992). For the younger trees that make up the bulk of the Wild Service Tree population here the perception of this species as a poor substrate for lichens proved to be true. These had only common species of lichen at a low cover with much bare bark. These include typical lichens of smooth young bark such as *Graphis scripta*, twig species including *Arthonia punctiformis*, *Evernia prunastri*, *Hypogymnia tubulosa*, *Parmelia subaurifera* and *Platismatia glauca* and species of acid bark on the trunks such as *Hypogymnia physodes* and *Parmelia revoluta*. Notable exceptions were two of the older trees which carried more diverse communities.

The largest tree seen, at 2.45 m girth at breast height, carried a well developed example of a undescribed community of acid barked trees in sheltered ancient woodland in southern England provisionally named the *Cladonia-Thelotrema* community in Sanderson (1994). This included a characteristic mixture of old woodland species including *Arthopyrenia ranunculospora*, *Schimatomma nivium*, *Schimatomma quercicola* and *Thelotrema lepadinum* with species typical of strongly acidic bark such as *Cladonia coniocraea*, *Dimerella pineti*, *Micarea*

prasina and *Trapeliopsis flexuosa*. The second tree is a hollow tree which has lost its top and has developed rain tracks. These rain tracks support a community referable to the *Pyrenuletum nitidae* association with species such as *Pyrenula chloraspila*, *Acrocordia gemmata*, *Bacidia rubella*, *Enterographa crassa*, *Lecanora chlorotera*, *Lecanora jamesii*, *Opegrapha vulgata*, *Pertusaria hymenea* and *Pertusaria multipuncta* present. The most unexpected recorded, however, was the discovery of *Stenocybe septata* on the branches of the large Wild Service Tree, a species normally confined to Holly. In total eight ancient woodland indicator species listed in Rose (1992) in his New Index of Ecological Continuity (NIEC) were recorded from Wild Service Tree in the study area (Table 4).

The relative richness of the Wild Service Tree lichen flora here is explained by the unusual number of ancient trees with more diverse niches for lichens than found in more typical Wild Service Tree populations, and by the exceptional richness in lichens of the ancient old growth woodland in which they are found. The Busketts area is one of the richest woodlands in lowland Britain for epiphytic lichens.

Population Structure

Where possible, individual Service Trees in the study area were mapped. Only specimens large enough to be considered trees, i.e. 1 cm or more girth at breast height were included. As each re-visit resulted in new specimens being discovered, the 77 mapped trees are almost certainly an under-estimate of the population. Forty-eight specimens were measured for girth at breast height. The size of the trees can be tentatively used to draw some general conclusions as to their age (Table 5).

Stems of Wild Service Trees, apparently regrown as coppice from felled trees, were measured

Table 5 Relative size, by girth, of Wild Service Trees; Busketts Wood, New Forest

Girth at breast height in cm	1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-200	201 +
No. of trees	5	6	7	4	11	5	1	2	2	1	3	1

within the regeneration enclosure of c. 1958. These stems were all in the range of 39 to 42 cm girth and thus may be tentatively dated at about 37 years old. While this may be the age of the stem, the age of the tree itself may be distinctly different. From experience elsewhere the size class 60 to 70 cm girth was estimated to be in the order of 50 years old, and the largest tree at 245 cm girth over 200 years old.

Seedlings and suckers below measurable girth were not counted individually as they were far too abundant. These seedlings and suckers were concentrated around particular trees which tended to be the larger (50 cm+ girth) specimens. Seedlings, confirmed as such by the presence of cotyledons and true leaves, were present concentrated under the larger trees where they stood in relatively open ground as well as scattered individuals throughout the wood. The progress of seedlings exposed in open ground under one tree was monitored through 1995 with 50 seedlings present in April, a single seedling persisting until July being 15 cm tall, but by October all seedlings had apparently gone. The seedlings were presumably lost to grazing and browsing. Individual, isolated, very young trees elsewhere in the wood indicate there is successful regeneration where that seedling grows within the cover of thorn, holly or bramble cover.

Suckers were more abundant and persistent than seedlings. Those trees generating suckers were often surrounded by tens and sometimes hundreds of suckers present under the tree canopy, and extending several metres beyond into open glades. The suckers exposed to grazing seldom exceeded 30 cm height. Those suckers growing in the cover of open bracken, bramble or thorn scrub reached the same height as the available protection from browsing, this rarely exceeded one metre. The majority of young trees in Busketts are found in the immediate vicinity of older trees, suggesting that the development of suckers is the principal source of recruitment to the tree population. There were, however, no very young trees or saplings found which could be clearly identified as from suckers.

A single dead tree was identified. This was 153 cm girth and stood as a single unbranched trunk to c. 3 m. The trunk retained sufficient remnants

of bark to identify it with confidence. The structure of this tree suggests it had a narrow crown having grown in relatively closed canopy conditions.

DISCUSSION

Wild Service Trees are an integral component of Busketts Wood. The range of age classes present indicate the species has been present over recent (1700 onwards) history and the tree is capable of sustaining its population in the presence of continuous grazing by large herbivores.

Unlike some other tree species in Busketts Wood, the Service Tree population includes very old trees. Whilst ancient Oak and Beech trees are relatively widespread in Busketts no ancient Field Maples, Hazel, Ash, Crab Apple, Birch, Whitebeam, Mountain Ash, Hawthorn or Blackthorn have been identified. The presence of relatively young specimens of all of the above species in the wood suggest they are either short lived in this area, or are relatively recent colonists.

Two models have been suggested for tree and shrub regeneration in the New Forest. The older model of Peterken & Tubbs (1965), Flower (1980) and Tubbs (1986) suggests that significant regeneration only occurred when levels of browsing were low and proposed that this regeneration occurred in three distinct phases (the A, B & C generations). Morgan (1987a; 1987b; 1991), however, failed to find any such clustering of in the age structure of the woodlands by random sampling suggesting that there was no simple relationship between browsing pressure and regeneration. He suggests a more complex interaction with three main factors: the tree species present, gap formation and the presence of sheltering cover such as Holly scrub and fallen dead wood interacting with the level of browsing pressure.

A cautious interpretation may be based on the premise that there is a general relationship between the relative girth of trees and their age. The size class data for Wild Service Trees in Busketts Wood indicate trees have been continually recruited to the population. It is possible

that the high numbers of Wild Service Trees in the 41–50 cm class represent part of the C generation of Tubbs (1986), but the continuous recruitment of trees to the population would tend to favour Morgan's model (Morgan 1987b).

Continuous recruitment occurs when the niches required to convert the regeneration of seedlings and suckers into established young trees are consistently present. Wild Service Trees regenerate in Busketts Wood where there are glades present. Glades may be relatively short lived, being an open phase in an otherwise closed canopy woodland. They similarly may be relatively stable over longer periods of time with colonisation by high forest and glade edge species occurring at a rate no

greater than senescence and decay of other trees adjacent to the glade. Relatively short lived glades probably account for Wild Service Trees of a high forest structure with a clean unbranched bolings. Longer term glades account for ancient open grown trees with a wide crown and broad branching structure.

Map evidence indicates a progressive reduction in the number, and extent, of longer term glades in the Busketts Wood area of the New Forest (Small & Haggett 1972). Whilst the Busketts Wood area has experienced a reduction in the number and extent of glades they are still well developed and offer many future opportunities for recruitment of Wild Service Trees.

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