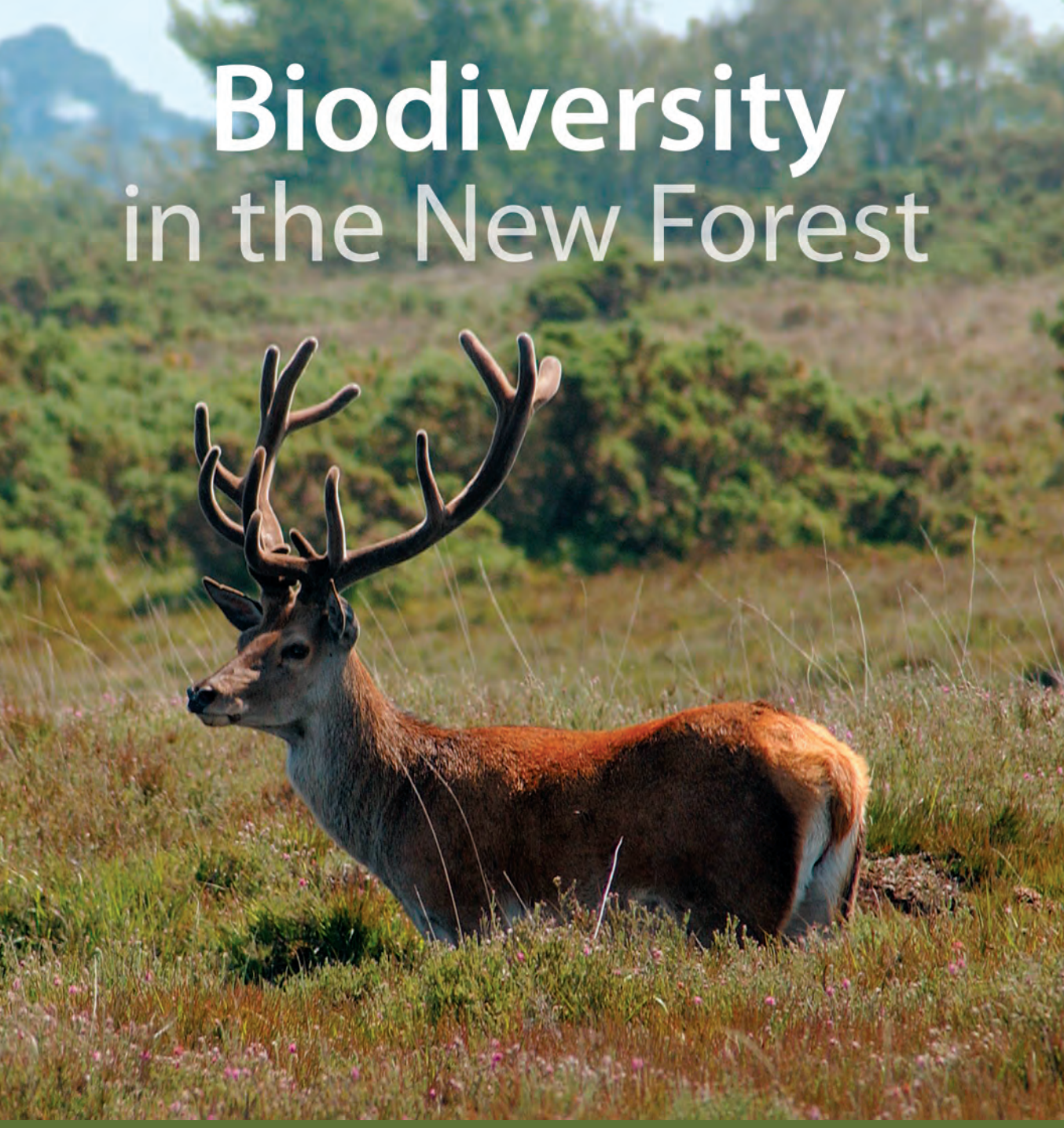
Biodiversity in the New Forest



Edited by Adrian C. Newton

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Centre for Conservation Ecology and Environmental Change,
School of Conservation Sciences,
Bournemouth University,
Poole,
Dorset,
United Kingdom

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Dedicated to the memory of
Muriel Eliza Newton (1929–2009),
who loved the New Forest,
especially the donkeys.

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Front cover: Red deer *Cervus elaphus* (Isobel Cameron / Forest Life picture library, Forestry Commission); noble chafer *Gnorimus nobilis* (Matt Smith); Dartford warbler *Sylvia undata* (David Kjaer); wild gladiolus *Gladiolus illyricus* (Adrian Newton)
Back cover: Wood Crates (Adrian Newton)

The maps in this book are for illustrative purposes only, and do not represent the legal definition of National Park boundaries or any other feature

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Contributors

Keith Alexander, 59 Sweetbrier Lane, Heavitree, Exeter, Devon EX1 3AQ.

Patrick D. Armitage, Freshwater Biological Association, Moor House, Field Station, Garrigill, Alston, Cumberland DL12 0HQ.

Andrew J. Barker, 13 Ashdown Close, Chandler's Ford, Eastleigh, Hampshire SO53 5QF.

Ian Barker, New Forest National Park Authority, South Efford House, Milford Road, Everton, Lymington, Hampshire SO41 0JD.

Samantha Broadmeadow, Forest Research, Alice Holt Lodge, Farnham, Surrey GU10 4LH.

Libby Burke, Forestry Commission, The Queen's House, Lyndhurst, Hampshire SO43 7NH.

Elena Cantarello, Centre for Conservation Ecology and Environmental Change, School of Conservation Sciences, Bournemouth University, Poole, Dorset BH12 5BB.

Clive Chatters, c/o Hampshire and Isle of Wight Wildlife Trust, Beechcroft, Vicarage Lane, Curdridge, Hampshire SO32 2DP.

Greg Conway, British Trust for Ornithology, The Nunnery, Thetford, Norfolk IP24 2PU.

John Davy-Bowker, Centre for Ecology and Hydrology, c/o Freshwater Biological Association, East Stoke, Wareham, Dorset BH20 6BB.

Sarah Douglas, Centre for Conservation Ecology and Environmental Change, School of Conservation Sciences, Bournemouth University, Poole, Dorset BH12 5BB.

Maxine Elliott, Environment Agency, Solent and South Downs Office, Colvedene Court, Colden Common, Hampshire SO21 1WP.

Naomi C. Ewald, Department of Biology and Environmental Science, School of Life Sciences, University of Sussex, Falmer, Brighton, Sussex BN1 9QG.

David Green, Butterfly Conservation, The Cottage, West Blagdon, Cranborne, Dorset BH21 5RY.

Rachel Green, Natural England, 1 Southampton Road, Lyndhurst, Hampshire SO43 7BU.

Sue E. Hartley, Department of Biology and Environmental Science, School of Life Sciences, University of Sussex, Falmer, Brighton, Sussex BN1 9QG.

Timothy Holzer, Environment Agency, Solent and South Downs Office, Colvedene Court, Colden Common, Hampshire SO21 1WP.

John G. Jones, Centre for Environmental Sciences, School of Civil Engineering and the Environment, University of Southampton, Highfield, Southampton, Hampshire SO17 1BJ.

Terry Langford, Centre for Environmental Sciences, School of Civil Engineering and the Environment, University of Southampton, Highfield, Southampton, Hampshire SO17 1BJ.

Colleen Mainstone, Hampshire Bat Group, 42 Saxon Way, Halterworth, Romsey, Hampshire SO51 5QY.

Gillian Myers, Centre for Conservation Ecology and Environmental Change, School of Conservation Sciences, Bournemouth University, Poole, Dorset BH12 5BB.

Adrian C. Newton, Centre for Conservation Ecology and Environmental Change, School of Conservation Sciences, Bournemouth University, Poole, Dorset BH12 5BB.

Martin Noble, New Forest Ecological Consultants, Keepers Cottage, Holmsley, Burley, Ringwood, Hampshire BH24 4HY.

Andrew Page, Forestry Commission, The Queen's House, Lyndhurst, Hampshire SO43 7NH.

Bryan J. Pinchen, 7 Brookland Close, Pennington, Lymington, Hampshire SO41 8JE.

Rory Putman, Keil House, Ardgour by Fort William, Inverness-shire PH33 7AH.

Martin Rand, South Hampshire Vice-county Recorder, Botanical Society of the British Isles, email: vc11recorder@hantsplants.org.uk.

Neil A. Sanderson, Botanical Survey and Assessment, 3 Green Close, Woodlands, Southampton, Hampshire SO40 7HU.

Peter Shaw, Centre for Environmental Sciences, School of Civil Engineering and the Environment, University of Southampton, Highfield, Southampton, Hampshire SO17 1BJ.

Jane Smith, Forestry Commission, The Queen's House, Lyndhurst, Hampshire SO43 7NH.

Rod Stern, British Bryological Society, 15 Selham Close, Chichester, West Sussex PO19 5BZ.

Alan J. A. Stewart, Department of Biology & Environmental Science, School of Life Sciences, University of Sussex, Falmer, Brighton, Sussex BN1 9QG.

Natalia Tejedor, Centre for Conservation Ecology and Environmental Change, School of Conservation Sciences, Bournemouth University, Poole, Dorset BH12 5BB.

David J. Thompson, School of Biological Sciences, University of Liverpool, Crown Street, Liverpool, Lancashire L69 7ZB.

Stephen Trotter, New Forest National Park Authority, South Efford House, Milford Road, Everton, Lymington, Hampshire SO41 0JD.

Lena K. Ward, 53 Miles Avenue, Sandford, Wareham, Dorset BH20 7AS.

Phillip C. Watts, School of Biological Sciences, University of Liverpool, Crown Street, Liverpool, Lancashire L69 7ZB.

Diana Westerhoff, Natural England, 1 Southampton Road, Lyndhurst, Hampshire SO43 7BU.

Simon Wotton, Royal Society for the Protection of Birds, The Lodge, Sandy, Bedfordshire SG19 2DL

5 Saproxylic beetles

Keith Alexander

Introduction

The New Forest has long been known to be one of the richest parts of Britain for saproxylic beetles, i.e. those species that are dependent on the fungal decay of dead woody tissues (see below). This importance has been recognised at a European scale (Speight 1989). The earliest records date back to the early 19th century and perhaps earlier – Stephens (1830), for example, makes frequent reference to the New Forest as the source of many rare click beetles (Elateridae). Remarkably, the beetle fauna of the Forest remains poorly documented – a manuscript list (in the possession of R. C. Welch) was compiled by A. E. Gardner (d. 1976) and others, but has never been published or even updated. Harding (1978) compiled records of key species known from the Forest and drew on the Gardner manuscript. The Harding compilation formed the basis of subsequent site assessments (Harding and Alexander 1993, Alexander 2004). The New Forest LIFE Project provided new impetus for beetle recording, which resulted in a large effort covering the period 1999–2002 (M. Salmon, pers. comm.).

The following analysis is based on data on British saproxylic beetles accumulated by the author over many years, particularly formally published information but also records made available through the Invertebrate Site Register (Nature Conservancy Council and more latterly English Nature) and the New Forest LIFE project.

What are saproxylic beetles?

The term saproxylic is used to describe the community of species that are dependent on the process of fungal decay of wood and the products of that decay (Speight 1989, Alexander 2008). It encompasses the full spectrum of situations from undecayed wood through to the debris left after decay, which may effectively be indistinguishable from soil rich in organic material. It also includes the species which feed on the mycelium and/or fruit bodies of the decay fungi, plus the predators and parasites which specialise on that species. Decay may occur within a wide variety of situations within otherwise living trees as well as in dead trees, fallen wood, stumps and dead roots within the soil.

The succession from undecayed wood through to the end debris is exploited by a different suite of invertebrate species at each stage. The early successional species are unique to saproxylic situations but decaying wood is increasingly colonised by species more typical of organic-rich soil as breakdown reaches the more advanced stages. Similarly the early successional saproxylic invertebrates include species specific to particular tree species or groups of tree species, while decaying and decayed wood is more characterised by saproxylic invertebrates associated with particular decay fungi species or the main types of decay – white-rot or red/brown-rot. Thus there is a trend from tree associates through fungi associates eventually to soil associates. Other important factors influencing the species composition are moisture and temperature.

How many saproxylic beetles are known from the New Forest?

There are currently 781 saproxylic beetle species known to have been breeding in the wild in Britain and Ireland at some stage during the past 150 years (Alexander 2002, plus updates). This total includes so-called natives as well as accidental introductions and recent colonists. Unfortunately there appears to be no complete list of which of these has been found in the New Forest. However, the Site Quality Index (SQI) website (http://thasos.users.btopenworld.com/sqi.htm) includes a total of SQI qualifying species for the Forest of 326, using data complete to 2000. The SQI species are a listing (Fowles *et al*. 1999) of species that aims to confine itself primarily to long-established native species – although it is by no means complete. The full SQI list is of 598 species and so the New Forest is known to support 55% of these species. It seems reasonable to extrapolate that this represents slightly more than half of the saproxylic beetles known from Britain. Only one other British site has a longer list: Windsor Great Park and Forest, with 364 species, i.e. 61%.

How important is the New Forest for saproxylic beetles?

Two indices have been devised for site assessment of saproxylic communities, both based on beetles alone: the Index of Ecological Continuity (IEC) and the Site Quality Index (SQI). These measure two different aspects – species-richness of relict old growth species (IEC) and proportion of rare species present (SQI). The IEC (Alexander 2004) is a cumulative index and so provides a minimum figure for a particular site. Indices of 80 or greater are suggested as indicating European significance – the IEC value for the New Forest is 194, considerably exceeding this threshold. Only one British site has a higher IEC value: Windsor Great Park and Forest (249) (Table 11). The SQI (Fowles *et al*. 1999), being based on the proportion of rare species known from the site, may increase or decrease with additional recording, which makes interpretation

Table 11
The top British sites for saproxylic beetles as assessed using the Index of Ecological Continuity and the Site Quality Index.

Index of Ecological Continuity		Site Quality Index	
Windsor Great Park & Forest	249	New Forest	856
New Forest	194	Windsor	847
Richmond Park	140	Langley Park	757
Moccas Park	125	Silwood Park	685
Bredon Hill	120	Richmond Park	641
Sherwood Forest	100	Moccas Park	638

difficult. European significance is set at an SQI value of 590 or greater. The New Forest currently has the largest SQI of any British site at 856 but is closely followed by Windsor at 847 (Table 11).

Both indices agree that the saproxylic beetle fauna of the New Forest is of European significance. This is in agreement with Speight (1989) who listed the top sites in Europe based on representation of a more restricted list of species, although following the IEC approach rather than SQI.

The New Forest and Windsor Great Park and Forest are clearly the two best sites in Britain. The variation between IEC and SQI partly reflects a key difference between the fauna of these two sites. Windsor is especially rich in relict old growth species confined in Britain to this one area, and hence is favoured by the IEC. The New Forest is, in contrast, notable for its exceptional representation of rare and threatened species characteristic of central and south-eastern England. At least 53 species known from the Forest are given Red Data Book (RDB) status in the British Coleoptera Review (Hyman 1992, 1994), and hence the New Forest is favoured by the SQI. Only two of these rare species have only ever been found in Britain in the New Forest – *Anthaxia nitidula* (Buprestidae) and *Endophloeus markovichianus* (Colydiidae) – and these are both almost certainly now extinct here.

Fifty-one of the RDB species are listed in Table 12 together with the date of the most recent reports of sightings – the *Anthaxia* and *Endophloeus* are omitted as these are believed to be extinct in the Forest. This immediately demonstrates that more than 50% of these species (27) have not been reported during the past 25 years, with at least four not reported in the past 100 years. Although not confined to the New Forest, ten of the RDB species have very restricted ranges in Britain with the New Forest remaining a potentially key area. These are indicated by an asterisk.

The above species are all considered to potentially still be present within the New Forest today. The species represented only by very old records are retained in the list as these are very difficult species to find on demand and could conceivably remain overlooked for a very long time. The LIFE project rediscovered many species that had not been reported for many decades. However, at least five apparently native species known from the New Forest historically are thought to be extinct throughout Britain (Table 13, and see later).

Table 12
Saproxylic beetles with British Red Data Book status (Hyman 1992) known from the New Forest, with dates of most recent reports. * Species for which the New Forest is potentially a key area in Great Britain. N.B. Two species are excluded as almost certainly extinct (see text).

Species	Not recorded for 25 years	Most recent records
*Aderus brevicornis**	Pre 1892	
Aeletes atomarius		1999–2002 (LIFE)
Amarochara bonnairei	1915	
Ampedus cinnabarinus		1999–2002 (LIFE)
Ampedus nigerrimus		1999–2002 (LIFE)
*Anoplodera (Leptura) sexguttata**		1999–2002 (LIFE)
Colydium elongatum		1999–2002 (LIFE)
Cryptophagus micaceus		1985
Diaperus boleti		2005
Epierus comptus		1999–2002 (LIFE)
Epuraea neglecta	1966	
*Eucnemis capucina**	1973	
Euplectus tholini	19th century	
Eutheia formicetorum	1964	
Eutheia linearis	1977	
Euryusa optabilis	1964	
Gnorimus nobilis noble chafer*		2000
Grammoptera ustulata		1999–2002 (LIFE)
Gyrophaena munsteri		1999–2002 (LIFE)
Gyrophaena pulchella		1999–2002 (LIFE)
*Hylis cariniceps**	1966	
Ischnomera caerulea	1934	
Lymexylon navale		2002
*Megapenthes lugens**	1971	
*Melandrya barbata**		1992
Mesosa nebulosa		1999–2002 (LIFE)
Microrhagus pygmaeus		1999–2002 (LIFE)
Microscydmus minimus	'post 1970'	
Mordellistena neuwaldeggiana	?	
*Orthocis coluber**	1917	
Paracorymbia (Leptura) fulva	?	
Paromalus parallelepipedus	1910	
*Pedostrangalia revestita**	1917?	
Phyllodrepa nigra	1917?	
Platydema violaceum	1901	
Procraerus tibialis		1999–2002 (LIFE)
Ptenidium turgidum		1999–2002 (LIFE)
Ptinella limbata	19th century	
Scraptia fuscula	?	
Scraptia testacea		1984
Stenichnus godarti		1999–2002 (LIFE)
Stichoglossa semirufa	1969	
Tachinus bipustulatus	Old?	
Trichonyx sulcicollis		1981
Trinodes hirtus	1911	
*Triplax lacordairii**		1999–2002 (LIFE)
Tropideres niveirostris	1831	
Tropideres sepicola	1967	
Velleius dilatatus		1999–2002 (LIFE)
Xyletinus longitarsus	1962	
Zyras cognatus	1970	

Table 13
New Forest saproxylic beetles believed to now be extinct in Britain.

Species	Assemblage	Last date
Ampedus sanguineus	Heartwood	1830
Anthaxia nitidula	Sapwood	1954
Cardiophorus gramineus	Heartwood	19th century
Endophloeus markovichianus	Sapwood	1927
Oxylaemus cylindricus	Sapwood	19th century

Three of the New Forest key species feature in the UK Biodiversity Action Plan as Priority Species: noble chafer *Gnorimus nobilis* has been a BAP species from the very beginning (UK Biodiversity Group 1999), while *Megapenthes lugens* was included as a member of a Grouped Species Statement. The bearded false darkling beetle *Melandrya barbata* is proposed for addition in 2007 (Biodiversity Reporting and Information Group 2007). A fourth species which is known from the forest – the stag beetle *Lucanus cervus* – is also an existing BAP Priority Species.

Ecological requirements of key species

With the New Forest known to support so many different saproxylic beetles, and so many rare ones, the fauna might be considered too unwieldy – too complicated – to cope with at a species conservation level. Standing back from the species level, and focusing at the assemblage level instead, appears to offer a workable way forward. A new system for undertaking Common Standards Monitoring for terrestrial and freshwater invertebrates is under development within English Nature/Natural England (Webb and Lott 2006). A new assemblage classification forms the basis for the site condition assessments. The present author has led on saproxylic assemblages and the fauna has been split on the following basis:

- heartwood decay specialities;
- bark and sapwood specialities;
- fungal fruit body specialities, i.e. species developing within or on the fungal material (as opposed to adults feeding casually);
- more generalist saproxylic species.

Table 14
Key New Forest saproxylic beetles classified by assemblage type.

Assemblage type	Saproxylic beetle species
Heartwood decay	*Aderus brevicornis* *Eucnemis capucina* *Gnorimus nobilis* *Hylis cariniceps* *Megapenthes lugens* *Melandrya barbata*
Bark and sapwood decay	*Anoplodera sexguttata* *Pedostrangalia revestita*
Fungal fruit bodies	*Orthocis coluber* *Triplax lacordairii*
More generalist species	*Lucanus cervus*, wood within soil

The intention is to facilitate surveying as well as analysis, as the second and third specialist assemblages are more readily surveyed than the first.

If this approach is applied to the four BAP Priority Species and the other key species identified in Table 12, then it becomes very clear which assemblage is the most important for saproxylic beetles in the New Forest (Table 14).

Heartwood decay is the most significant specialist saproxylic habitat for rare and threatened beetles throughout Britain and the rest of Europe, so this result is not surprising. The succession of habitats provided as fungal decay of heartwood within living trees proceeds requires the affected trees to be at least of mature age, to have been colonised by specialist heartwood decay fungi, and for that decay to proceed right through to final trunk hollowing and accumulation of composted debris in the base of the tree. For trees to survive through to this stage they generally need to be in open-grown situations, as canopy competition from neighbouring younger trees is likely to cause premature death of the older tree through overshading. There is therefore a requirement both for time and space, and the probability of the tree surviving to provide suitable habitat for the key species is therefore low in the modern countryside, with so many conflicting demands – particularly the all-too-common ill-informed paranoia about 'dangerous' trees and forest hygiene. It is easy to understand why heartwood decay species are rare and threatened in Britain today.

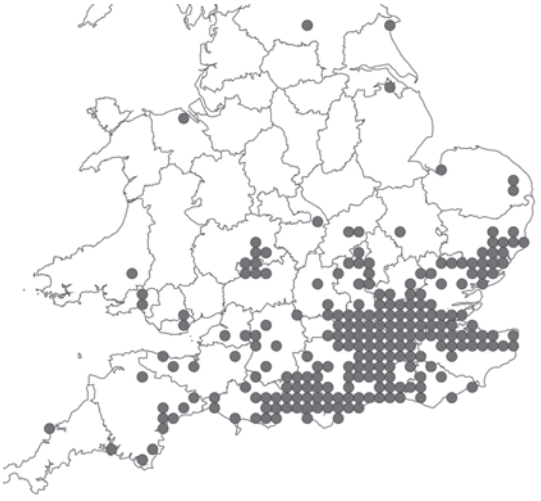
Which are the most significant species?

The most sensible guide to which of the many rare and threatened New Forest saproxylic beetles are considered to be the most significant species for nature conservation action is the UK Biodiversity Action Plan (www.ukbap.org.uk). Four species have been identified for Species Action Plans: stag beetle *Lucanus cervus*, noble chafer *Gnorimus nobilis*, bearded false darkling beetle *Melandrya barbata* and the click beetle *Megapenthes lugens*. These will be discussed in the following sections. The stag beetle is listed on Annex II of the EC Habitats and Species Directive and has been used to propose the New Forest for Special Area of Conservation (SAC) status. It is the only one of the four species with any legal protection in Britain, it being illegal to sell or exchange.

Stag beetle *Lucanus cervus*

The larvae of the stag beetle develop in moist decaying wood near or below the soil surface, including old decaying stumps and roots but also the bases of fence posts (Alexander 2002). The People's Trust for Endangered Species (PTES) are the UK Lead Partner for the Stag Beetle Species Action Plan (SAP); they initiated a National Stag Beetle Survey in 1998 (Napier 2002) with the aim of promoting deadwood conservation amongst the general population, while at the same time generating fresh data on its British

Figure 31
Distribution of stag beetle records 1998–2002 (source: People's Trust for Endangered Species).



distribution. Expert opinion had suggested that the species had suffered a significant decline and range contraction in the latter part of the 20th century. Survey returns confirmed the previously recorded distribution of the stag beetle in Britain as a predominantly south-eastern species with three main population centres, focused on the lower Thames basin, the coastal plain between Colchester and Ipswich, and the Solent basin (see Figure 31). The records revealed an apparent association with areas on light free-draining soils, typically composed of sands and gravels, as well as following river corridors. The national survey has been repeated in 2002. The Hampshire Wildlife Trust reported that 725 sightings were made in and around the New Forest (New Forest LIFE Partnership 2000).

No evidence for any significant range contraction has been demonstrated but it is known that local populations are under continued threat, mostly from loss of larval habitat through development and tidiness. It has become too easy to remove old stumps; stump-grinding equipment is now readily available and heavy construction equipment makes the removal of trees and buried wood a relatively easy process. A methodology for quantifying populations is urgently needed in order to prove that populations are in decline owing to human activities. Researchers are actively investigating the potential for using chemical attractants for estimating adult population sizes.

Noble chafer *Gnorimus nobilis*

Larvae of the noble chafer develop within accumulations of moist wood-mould in tree cavities and especially in the base of hollow old trees (Smith 2002). The PTES are again the UK Lead Partner for this species. The species is known to develop in a wide range of broadleaved trees within its European range but British populations appear to have a more restricted palate, particularly favouring woody Rosaceae and especially old orchards. PTES survey work has revealed that there remains just one very extensive population associated with the traditional orchard landscape of Gloucestershire, Herefordshire and Worcestershire, plus at least three more restricted populations: New Forest (in old oaks), south Chilterns (in old cherry trees in woodland boundaries) and Kent (in old plum orchards). One oak site is also known in Herefordshire. The larval faecal pellets (frass) are very distinctive and can be used by experienced surveyors to identify host trees.

The British range was formerly much wider (Figure 32) and it is clear that we are currently dealing with serious fragmentation and isolation of the surviving populations. Old records came from as far afield as Devon, Cumbria and Norfolk (Smith 2002). The New Forest population was first discovered by G.C. Champion in 1894 (Whitehead 2002) but the precise locality was not documented. It has subsequently been reported from Mallard Wood (1970s and 1996), Matley (1982 and 1996), and Whitley Wood (1988); details in Smith (2000). PTES survey work has resulted in a sighting of a single female in 2000, at hogweed blossom along the A35 east of Lyndhurst (Smith 2000), i.e. towards Mallard Wood. No trees with developing larvae have so far been identified and so the precise breeding areas within the Forest continue to be unknown.

A captive colony established by Owen (1989) from a pair found in the Forest in 1986 is still viable and is

Figure 32
Distribution of noble chafer (all positive records since 1966). (Source: People's Trust for Endangered Species).

now in the possession of M. N. Smith. The female found in 2000 was kept in captivity for a number of days before being released back into the Forest. Eggs were laid in crumbled rotten cherry wood provided and have formed additional material for the captive rearing programme, which is continuing. It is hoped that this material can be used to start a new colony within the historic range.

Until trees are found supporting larval development it is impossible to assess the extent of the New Forest population or to begin to identify trends. There is a clear need to expand the recording effort in the New Forest but this effort needs to focus on the potential host trees themselves, at least initially. Maps are needed which show the locations of older generation oaks with the potential for advanced heartwood decay, and hence the potential to support developing larvae. This will help target follow-up larval surveys and ensure that host trees are properly documented and their conservation needs assessed and acted upon.

The click beetle *Megapenthes lugens*

Megapenthes is a speciality of the New Forest and Windsor Forest, with older records reported from Epping Forest and various sites in Middlesex, Surrey and Norfolk, where it is presumed to now be extinct. The New Forest population is however very poorly known, with only three areas named in the literature. It was first discovered near Lyndhurst in 1915 (one adult at holly blossom), then found at Ashurst (two at hawthorn blossom in 1946) and Mallard Wood (an adult on a beech tree in 1971 – the most recent reported record). Some details are provided in Allen (1964). The adults and larvae are found within the decaying heartwood of various broadleaved trees – especially elm and beech – and are thought to be specialist feeders on the larvae of cossonine weevils. The adults have been found active on the trunks of host trees after dark and are attracted to the blossom of hawthorn and holly. Most information on the species comes from Windsor where it has been studied by Owen (1990). No methodology for surveying or monitoring this species has been determined other than targeted searching by knowledgeable surveyors.

Bearded false darkling *Melandrya barbata*

Knowledge of this beetle tends to mirror that of *Megapenthes*. It is a speciality of the New Forest but there are also odd records from elsewhere, most notably Chiddingfold Woods in Surrey (1971 – see Allen 1972) but also older ones from Stratfield Turgis, north Hampshire (1914) and Darenth Wood in Kent (19th century). It was discovered in the New Forest in 1823 and has been reported widely since then, although apparently not since 1992. Adults have been found on standing and felled oak and beech trees, and in flight but never from blossom. It is presumed that they develop within decaying heartwood of older generation trees. Named localities are: Brockenhurst (1823 and 1902), Burley Lodge (1923), Denny Promontory (old), Denny Wood (1935), near Pondhead Inclosure and Jones' Inclosure (old), Queen's Bower (1901), Rhinefield (1896) and Whitley Wood (1990). As with *Megapenthes*, no methodology for surveying or monitoring this species has been determined other than targeted searching by knowledgeable surveyors.

Extinct species

It is notoriously difficult to prove that an insect with such a cryptic lifestyle as a saproxylic beetle is genuinely extinct at a national level, let alone a local level. The definition of 'extinct' used by the Joint Nature Conservation Committee in the series of national status reviews is 'native species not recorded since 1900' (Hyman 1992). In some cases, however, it may be reasonable to assume extinction in the absence of sightings over a 50 year period.

The most famous extinct beetle in the New Forest is the jewel beetle *Anthaxia nitidula* (Buprestidae). The larvae develop beneath sappy bark on freshly dead or dying trunks and twigs of various woody Rosaceae, usually in open sunny situations. The adults are attracted to the flowers of *Ranunculus* spp., hawthorn, guelder-rose, etc. The precise larval requirements in terms of age, size and condition of the host stems is not documented. The New Forest formerly supported a colony on blackthorn by Balmer Lawn and which was well known from the 19th century up until 1954. It has not been seen anywhere since the Forestry Commission removed the Balmer Lawn blackthorn stands in the late 1950s. This work is reported to have been carried out on the behalf of the Ministry of Agriculture to improve the grazing on the lawns (C. Chatters, pers. comm.).

Another relatively recent extinction is the beetle *Endophloeus markovichianus* (Colydiidae). This beetle was discovered in the Forest in 1862 (Fowler 1889) and was last seen in 1927 (Hyman 1992). It is a very distinctive species and readily found within its main European range beneath loose bark on dead beech trees standing in sunny situations. It would seem very unlikely that it could be present in the New Forest and have escaped notice for 80 years. Its loss most probably reflects past forestry and commoning practices of removing standing dead beech trees.

Both of these species were only known in Britain from the New Forest and so their local extinction was also national extinction. The probable cause of extinction of the jewel beetle seems undeniably due to grazing improvement works, although it has often been blamed on beetle collectors! The removal of dead trees is the most likely cause of the extinction of the *Endophloeus*. Other important factors that may be causing extinction of saproxylic beetles include increasing shade in the woodlands, and continued loss of natural tree regeneration through the continued scrub clearance by the Forestry Commission on and around the lawns. This is apparently a statutory requirement for grazing maintenance but one that demands review and development of a more sensitive approach.

What needs to be done for saproxylic beetle biodiversity in the New Forest?

Two key issues arise from this review of the saproxylic beetle fauna of the New Forest and both relate to poor knowledge of:

- the key beetle species themselves, both in terms of knowledge of where their breeding sites are and also their detailed habitat requirements, especially structure and composition of the host tree population;
- the natural population dynamics of the host trees and shrubs, including the locations of the older generation trees which are currently supporting the key beetle species, but also positive management of thorn scrub for natural regeneration of the host trees.

In many ways the second issue, the tree demographics, is the highest priority for action.

There is a clear polarisation in the Forest between the common grazings and forestry, between pastures and woodlands, but this is a false division as the two are not separate in reality. The saproxylic beetles are very clearly associated with trees rather than woodland and their conservation demands a tree ecology approach and not conventional woodland ecology. The key factors which determine which saproxylic beetles may or may not be present are:

- age structure of the tree and shrub populations;
- the density of the trees and shrubs, and hence shade levels and the scope for open-grown trees and shrubs;
- the total numbers of trees, with implications to the viability of dependent species such as saproxylic beetles.

A fourth key factor – continuity of suitable habitat conditions in time – can be taken as read in the New Forest. These factors are crucial to determining the fauna which can be supported and yet they do not feature in most woodland ecology textbooks, if any at all. Woodland ecology is basically about managing shade conditions whereas saproxylic beetles require management for light. Woodland ecology is only a small part of tree ecology!

Newton *et al.* (Chapter 13, this volume) have shown that the findings of Mountford *et al.* (1999) with regard to the impacts of grazing on forest structure and composition need to be placed in the context of the whole Forest and not taken in isolation. Denny Wood – the study site of the latter authors – has now been shown to be atypical of the rest of the Forest, representing an extreme case. The conclusions of Mountford *et al.* (1999) are not necessarily generally applicable, and perhaps reflect thinking based on the 'high forest hypothesis', rather than the 'Vera hypothesis' (Vera 2000). Oak regeneration in the Forest takes place amongst thorn scrub in the open areas and not in the woods; exactly as stated by Vera (2000). A landscape-scale approach is therefore needed, not a stand-scale one.

Although 'natural processes' are often seen as the ultimate solution to managing wild habitats, this approach needs to be very well informed by knowledge of species' ecology. There are many ways forwards using 'natural processes' – decisions need to be taken about how 'natural' the processes actually are and whether or not they are actually desirable in relation to other objectives. The Forest is not a natural site – it is a cultural landscape – and so-called 'natural processes' reflect varying levels of human impact. They are not identical to the natural processes that occurred in the prehistoric Wildwood of pre-Neolithic Britain and should not be assumed to be so. Although grazing by large herbivores is a natural process, human management of the herds may or may not be considered so. Mechanical clearance of thorn scrub – along with the natural tree regeneration it has nurtured – is less likely to be considered a natural process. 'Natural processes' can be applied simplistically but the result may be disastrous. Well-informed decisions are vital to the conservation of the Forest's special features.

In the case of saproxylic beetles, there are certainly too many species to deal with effectively individually, but an assemblage type approach is feasible, as outlined above. Knowledge of the Forest's tree demography is vital to the conservation of the Forest's saproxylic beetles. It is essential that the tree population structure is documented and analysed, at local and whole Forest levels (and throughout the Forest, not just in defined 'woodland' or isolated and unrepresentative long-term study sites). This is essential in order that informed decisions can be made on the adequacy or not of tree recruitment rates, and the many factors influencing variations in tree density across the Forest. Mapping of older generation trees will greatly facilitate successful surveying of the Forest's key saproxylic beetle species. A strategic approach involving the gathering of adequate data on the trees as well as their dependent organisms needs to be developed if conservation management is to be at all successful.

Conclusions

Over 300 species of saproxylic (wood-decay) beetle have been reported from the New Forest. This represents more than half of the native fauna of Britain. Site quality is very high and the Forest has been shown to be of European importance for these beetles. The Forest is of especial importance for its sheer abundance of British Red List species – with over 50 species known – including many for which the New Forest is a key core site in a central southern England context. Four species have been identified as priorities under the UK Biodiversity Action Plan. However, about 50% of the Red List species have not been reported in the past 25 years and some are almost certainly now extinct within the Forest.

The analysis presented here has demonstrated that the saproxylic beetle fauna of the New Forest continues

to be poorly documented and poorly understood. There is an enormous knowledge gap. Trends in abundance can only be dreamed about – methodologies do not yet exist, let alone any suitable data. A special recording effort as part of the LIFE Project certainly generated a large amount of new information but few of the key species were found. These key species require a more targeted approach and one which is informed by knowledge of the locations of the older generation trees across the Forest. This knowledge is not yet available other than as generalised maps of old growth areas.

Conservation of such a rich and diverse fauna needs to be well-targeted and guided by the known ecological requirements of the species. The majority of the key species require heartwood decay and hollowing of the host trees. This suggests that tree biology and tree demography should be the focus of the conservation plan, rather than conventional concepts of woodland ecology. It follows that the first priority for saproxylic beetle conservation is actually detailed survey work on the tree populations across the Forest. The key factors that require attention are: age structure of the tree population, tree density (open-grown trees provide better quality habitat), and total numbers of trees. A strategic approach is suggested which requires mapping of the older generation trees throughout the Forest, to provide baseline information on tree demographics and to facilitate targeted survey and monitoring of the key beetle species. Recognition of the vital role of thorn scrub in tree regeneration is also required.

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