Bulletin of the Dipterists Forum

Feature

Fallen beech, Lion's Mouth, Felbrigg Woods SSSI. Photo Darwyn Sumner

Deadwood and Diptera

Darwyn Sumner

Within the timber industry which manages woodlands as a resource, it is generally acknowledged that "*deadwood is an important part of the woodland ecosystem*" (Rodney Helliwell in Woodland Heritage Journal 2017.) The June 2019 edition of Woodworking Crafts magazine even made mention of the "Log-jam hoverfly" (*Chalcosyrphus eunotus*) amongst a top ten of most interesting species of wildlife living in woodlands. Unfortunately this was one for which they were unable to source an image. We can surely do better, here's a bunch of saproxylic Diptera for which we are able to source images:

Hoverflies

1 *Chalcosyrphus eunotus*
2 *Pocota personata*
3 *Caliprobola speciosa*
4 *Callicera rufa*
5 *Myathropa florea*

Craneflies

6 *Ctenophora pectinicornis*
7 *Ctenophora ornata*

Micropezids

8 *Rainieria calceata*

Tanypezids

9 *Tanypeza longimana*

Soldierflies

10 *Xylophagus ater*
11 *Choerades marginata*

Clusiids

12 *Clusia tigrina*

Pocota personata Breeds in rot holes in Beech (New Forest) Photo Rob Kemp

Woodland Heritage.

Visit their website for free copies of their journal and details of work that this charity is undertaking to ensure the survival of British woodlands and tree species.

Sumner, D. P. (2019). Deadwood and Diptera. Dipterists Forum Report, B(1), 8.

Habitat inventories

Habitat Action Plans (JNCC, 1995)
The following HAPs may contain trees:
- Wood pasture & parkland
- Wet woodland
- Upland mixed ashwoods
- Lowland beech & yew woodland

Biodiversity Action Plans

UK counties began to adopt BAPs many years ago when the concept was first introduced, HAPs being the habitat component. The Wildlife Trust and Local Environmental Records Centre partnerships chose the habitats that were present in their counties, began to relate them to their previous field by field survey work and then prioritise conservation work and survey of those they had selected. The focus changed however with the publication of the **UK Post-2010 Biodiversity Framework**

Then, following a Natural Environment White Paper in 2011, UK government published **Biodiversity 2020: A strategy for England's wildlife and ecosystem services**, which has a mission "*to halt overall biodiversity loss, support healthy well-functioning ecosystems, and establish coherent ecological networks, with more and better places for nature for the benefit of wildlife and people*."

So whilst the overall strategy changed, the core list of HAPs did not much, JNCC publish an updated list: **UK BAP list of priority habitats**.

In 1992 the UK also adopted the **Habitats Directive**, an important piece of European legislation, now much discussed by various organisations (Buglife, Guardian)

You are still able to find accounts of each counties BAPs on their respective partnership websites and of course the work is still highly relevant. If you have an interest in a particular habitat in a county then check their HAPs first.

Some LERCs have added "Mature Trees" to their lists so there may be an inventory of those on their websites.

Additionally, Tree Preservation Orders are legislative measures which ensure the protection of trees with significant local amenity value. Thus some trees are subject to a degree of regular attention and some measure of protection. Planning guidance for ancient woodland and veteran trees by UK Government also affords some level of local protection.

Deadwood may be a different matter though.

Alan Stubbs, Yardley Chase, 2017. Photo Darwyn Sumner

Ancient Woodlands and Statutory Sites

In addition to the above local inventories there are a number of other tree-rich areas contained within sites which have a measure of statutory protection. Sites of Special Scientific Interest are one example.

A visit to Natural England's MAGIC website map will reveal a whole host of such sites. Each SSSI found has its own document and may require some reading to discover likely habitats. The Ancient Woodland layer is less informative but can be further explored via the Woodland Trust.

Chalcosyrphus eunotus Log-jam Hoverfly. Newent Lake, April 2001
Photo David Iliff

Deadwood is our most threatened and least protected habitat

Flies in Wood

Each stage that a tree passes through, from early growth through to maturation, injury, decline, death and decay offers a range of distinct and different opportunities for a wide variety of wildlife. For the range of habitat features see Lonsdale (2013), Fig.5.2.

Over 10% of our entire Diptera fauna depends in some way on trees. Alexander (2002) lists 730 species within 68 Families in Great Britain. Many are at risk.

The term **Saproxylic**, defined as "feeding on dead and decaying tissues" is used to describe many such species, 7% of all invertebrates in fact.

Dry wood is about 30% lignin and only the fungi have ever evolved the enzymes to break this down, so fungi are involved in everything.

The wood habitats studied by naturalists fall into several different categories, each of which is subject to different investigative methods:

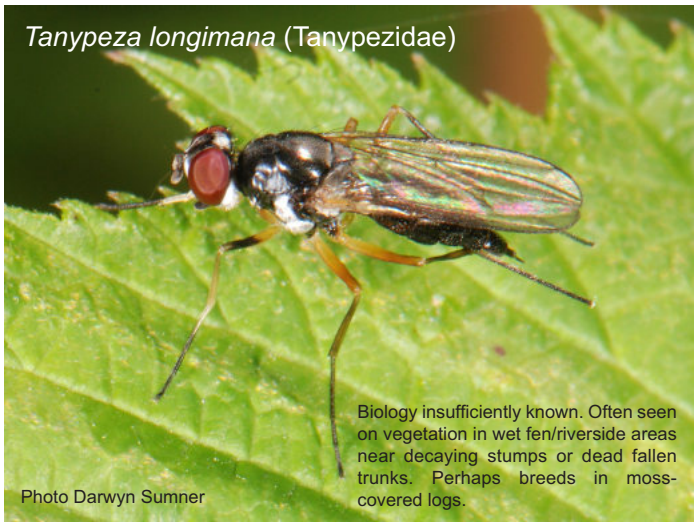
1
2
3
4
5

A. Deadwood

This wood habitat is as dead as your roof joists but still attracts its natural inhabitants. The kinds of creatures depend upon many factors such as water, temperature, situation, time since death and scale. Read Lonsdale (2013) for details of this on ancient trees, Rotheray et al., (2009) for an account of processes and Muller-Using & Bartsh, 2009) for time-scales.

Coarse Woody Debris (CWD)

This refers to dead wood with a diameter of more than 2.5cm. It's often called this when found lying in watercourses, the wood that is, not you.



B. Rot Holes

These can occur in many situations and a large proportion of them are on living trees, even healthy ones. A typical rot hole forms when a lateral branch breaks off and fungi begin to break down the exposed dead heartwood. The bracket fungus *Polyporus squamosus* is a typical cause but a whole range of microorganisms set up home in these microhabitats, amongst which may be Diptera and other invertebrates. It's a good home as it's full of food & water and is insulated from thermal extremes.

Recording & surveying

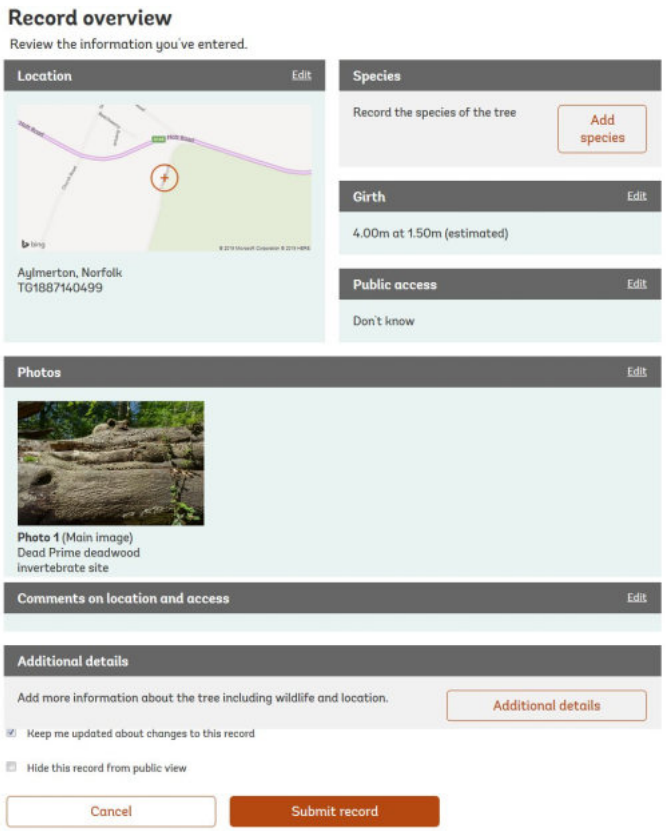
Woodland Trust

Ancient Tree Inventory

The Woodland Trust are conducting an online survey which is becoming increasingly valuable as a resource for conservation. Anyone with a tape-measure and an ability to record geospatial coordinates (map, GPS) can take part.

The survey accepts a wide range of trees: ancient, veteran and notable, any of which categories may also include "dead". One feature of their survey database is that a tree can be recorded as "lost" if it is cut down. How close we can come to directly recording fallen trees?. The tree illustrated on the title page was processed as follows:

Determine exact location (TG 18871 40499 from GPS),
Take one or more pictures (including any flora & fauna on it),
Reduce image file size (unspecified, but 600px width works, big images don't),
Register with Woodland Trust.
Add details as indicated by the summary below:



After posting a record, there is a delay "*Until a verifier has visited and checked ...*" so I seem to have set some local expert the task of visiting that site.

C. Sap runs Scheduled for Part 2 of this Feature.

Don't forget to record any flies you find too. Dipterists Forum is formed from many different Recording Schemes who will deal with records and help with identification.

The deadwood guide

Most entomologists are familiar with deadwood habitats, they are attractive to a wide range of interesting and unusual fauna. If your interest is not primarily insects (e.g. Lichens, Fungi) and you are wielding a camera then approach slowly so as not to scare anything off. And be safe, log piles are very dangerous.
Literature on the subject of deadwood is widely scattered and takes a bit of hunting down. The following list should provide a useful background to the topic:

Ten top reads

1 A **Dipterists Handbook** for Ivan Perry and Graham Rotheray's account and tips on looking for and rearing dead wood and sap run diptera and Peter Chandler's chapter on diptera in Fungi.

2 Ancient and other veteran trees: further guidance on management (Lonsdale, 2013) - a free book

3 Woodland Trust's "Practical Guidance" guides:
1: Trees and farming
2: Trees in historic parks and landscape gardens
3: Trees and development
4: What are ancient, veteran and other trees of special interest
5: Trees and climate change
6: The special wildlife of trees
7: Ancient trees for the future
8: Trees and events

4 Keith Alexander's "**The invertebrates of living and decaying timber in Britain & Ireland**" . This gives you a list of species and known ecology of each.

5 Any or all of the "**A Review of the Scarce and Threatened**" (JNCC) and Natural England's **Species Status Reviews** for more details of individual species:
1: Acalypterate Flies 3: Hoverflies 5: others
2: Calypterate Flies 4: Soldierflies
Natural England also publish many relevant reports on **Parkland, trees and woodland inventories and action plans**

6 Mason, Nardi & Tisato (2003). **Dead Wood: A Key to Biodiversity**. International Symposium bundle full of interesting accounts on many topics.

7 Other Diptera books which feature saproxylic diptera such as "**British Hoverflies**"

8 Robinson, Kirby, et al. **Veteran Trees: A guide to good management**. English Nature.

9 Rotheray, et al., (2001). **The Biodiversity and Conservation of Saproxylic Diptera In Scotland**.

10 Saproxylic Insects. Just the chapter **Saproxylic Diptera** by M.D. Ulyshen which is £23.94 as a download. Reviewed by Peter Chandler in Bulletin 87.

All the above except 1, 7 & 10. are free downloads

Exploring Rot Holes

The life-history of many species is a mystery. Much knowledge has been gained in recent years by looking for larvae in rot holes

Rob Wolton explores a rot hole, discovering a rat-tailed larva. Meathop Moss, Lancashire, 2013.
Photos Phil Brighton

... more than likely it will be *Myathropa florea*

Photo Darwyn Sumner

... or possibly the scarce *Callicera rufa*, though perhaps that rot hole should be in pine

Photo Rob Kemp

If an ancient tree is destroyed or allowed to die for want of suitable care and protection, the planting of new trees cannot replace all the aspects of its value that have thereby been lost (Lonsdale 2013)

Xylophagus ater [Xylophagidae], Woburn Safari Park, 2015. Photo Alan Outen

< *Xylophagus ater* lays eggs on freshly cut broadleaf logs, larvae predate other insect larvae under the bark, stabbing them with a fierce awl - hence the name “awl-flies”

Log piles and cut stumps are always worth checking out Shavington Park, 2018. Photo Darwyn Sumner

Rainieria calceata (Micropezidae) ...

... and its ovipositing site on Beech in Windsor Great Park

Though capable of dispersing over considerable distances on occasion, suitable habitats are scarce. Felbrigg Woods in North Norfolk is one, according to its SSSI citation, its beeches are an outlying native population at the edge of its range. Whilst there may be sufficient habitat there, this species is unlikely to reach it in one “hop”, it would need to establish intermediate populations in suitable habitats - which do not exist. Far less likely would be a westward dispersal to the New Forest beeches.

Photos Steve Falk

Although the processes of decay and aging are vital for biodiversity, they eventually lead to the death of any ancient tree. When this happens, the tree remains a valuable habitat for wildlife for many years or even decades thereafter and should always be retained (after being made safe if necessary) (Woodland Trust)

Saproxylic Diptera


Cranefly *Ctenophora ornata* (Tipulidae)

Photo Martin Harvey


Clusia tigrina (Clusiidae)

Photo Martin Harvey


Cranefly *Ctenophora pectinicornis* (Tipulidae) and its Birch rot hole.
Ulverscroft, Leicestershire.

Photos Darwyn Sumner

Inside the box

People's Trust for Endangered Species is also conducting an online survey, specifically on **Woodpasture & Parkland**. As they point out "*there are no reliable statistics on their extent, loss or fragmentation*" **Buglife**'s initiative is their "Ancients of the Future Project" which seeks to establish habitat continuity by filling the age gap between current ancient trees and more recent plantings.

Other UK groups with an interest in deadwood:

- British Lichen Society,
- British Mycological Society,
- Bees, Wasps & Ants Recording Scheme,
- UK Beetle Recording,
- Buglife

Many associated specialist species are already rare and becoming rarer. It is vital that we retain and care for our ancient and veteran trees, even when they are dead, to ensure the survival of the species that depend upon them (Woodland Trust)

Hoverfly *Caliprobola speciosa*

A fallen beech tree will take about 35 years to decay down to the point where it is hard to distinguish from humus, thinner brash half that time. Four decay classes, each supporting different communities, are recognised (Muller-Using & Bartsh, 2009).
Caliprobola speciosa with its strongholds in Windsor Great Park and New Forest, seems to favour the last class (D4) which begins at 16 years (or equivalent decay in the base of living trees.) Larvae occur in rotting heartwood, deep down into the roots.

Photo David Iliff

Photo Paul Brock

Golden-Haired Robberfly *Choerades marginatus*.
Whitwell Common, Norfolk, 2019

A predatory robberfly. Larvae occur in stumps and decayed deciduous wood where they are probably also predatory on other wood-dwelling larvae.

A good deadwood indicator species, a map of its distribution is a map of potentially good deadwood regions. Easily spotted on woodland rides even with close-focus binoculars.

Photo: Darwyn Sumner

Outside the box

The uses to which dead wood is put are as innovative as the material is versatile. From crafts through construction and pharmaceuticals to fire. The following websites will prove informative:

- Woodland Heritage
- Woodland Trust
- Forestry Commission
- Community Wood Recycling
- **Which** guide to wood-burning stoves

Veteran trees should be recorded and valued as such after death, even though dead trees are sometimes paradoxically deemed not to be trees, according to certain aspects of planning and other procedures (Lonsdale, 2013)

Threats

The following statements regarding the threats to all our "at-risk' saproxylic species feature frequently in the Species Status Reviews:

- "Clearance of woodland for agriculture or intensive forestry and removal of old or diseased trees with sap runs"
- "Removal of old or diseased trees and dead wood."

Management

The management of this most valuable of resources is highly variable. At one end of the scale deadwood on sites well known to be of value is managed extremely sensitively and allowed the scores of years to decay down through all its natural processes (New Forest, Windsor Great Park), at the other it's rubbish.

Even on well-protected SSSIs management may be questionable or poor. In view of recent threats of tree extinctions (e.g. Ash, Alder), traditional management systems require reappraisal (Alexander, Green & Morris in British Wildlife. Vol 28, Issue 1).

Development

In the case of large-scale developments such as highways, there is a legal obligation for developers to investigate before carrying out any work. The investigations may be complex but however they are carried out, any recorded important wildlife features will be revealed and mitigation measures taken. Local Plans and Local Environmental Records Centres are at the core of such consultations, the government agency Natural England are only brought in when high level statutory sites (SSSIs, NNRs) are involved.

Responses & responsibility

A simple enquiry to a local Planning department or LERC is all it takes if you have concerns. Local Authorities have a legal obligation under the Environmental Information Regulations to respond to such enquiries.

For example, the destruction below is on an Ancient Woodland (Priority Habitat Inventory.) Care of this is the responsibility of the Local Authority under Section 40 of the NERC Act, 2006 via the 2019 National Planning Policy Framework (170a). However, it's amongst the 31% of Priority Habitats which fall outside the protection of all formal schemes and thus not even monitored by Natural England (but see Biodiversity 2020.)

Saproxylic home to many species for many years, now their funeral pyre. Rothley Park (Ancient Woodland), Leicestershire. May 2019.

Perception

Alexander & Green (2018) discuss the problem of landowner perception, indicating that there has been no progress in changing "tidiness" ideas over the past 25 years. In the comic victorian novel Cold Comfort Farm the heroine opines "*Nature is all very well in her place but she must not be allowed to make things untidy*". Make that 125 years.

Deadwood dipterists Rob Wolton, Roger Morris & Alan Stubbs

I am indebted to the help provided by Keith Alexander, advice from Iain MacGowan and Peter Chandler, observations from Chris Palmer and Paul Brock, tips from David Iliff, Martin Harvey, Matt Shardlow, Alan Stubbs and Barry Warrington and to the many photographers who have provided images for use in the Dipterists Forum Bulletin