

STUMPED?  
THE IMPORTANCE OF TREE STUMPS FOR BIODIVERSITY

Dr C J Betts

Some see tree stumps as an eyesore. That is a pity because they have great interest, ecological value and even beauty, so it is worth setting aside what I would say are misplaced conceptions of tidiness and looking a little deeper. I hope this short paper will help to explain.



*Figure 1:* A fine old stump of a *Prunus avium* wild cherry felled a couple of decades ago. It is about a metre high. The robust yellow-green moss on its top is *Brachythecium rutabulum* with some of the finer *B. velutinum*.

People often wonder why we leave tree stumps after a tree is cut down on land that we manage. Sometimes we cut the trunks off at or near ground level, when we need to mow over them for example, or sometimes at 30–100cm above ground, or higher to leave a tall standing trunk, but we don't dig stumps out as a general rule. This is not, as some have rather unkindly suggested, to save costs or because we are lazy! Stumps provide islands of biodiversity richness, features that significantly multiply the nature conservation value of an area. They are part of the decomposition cycle.

The breaking down of a dead stump is a complex but vital process mediated by the decomposers of the ecosystem, mainly the fungi, micro-organisms (especially bacteria) and various detritivores. It is not an end but a biological circle because the nutrients from waste and dead tissue are recycled and returned to the soil or other elements of the ecosystem and its web of food chains.

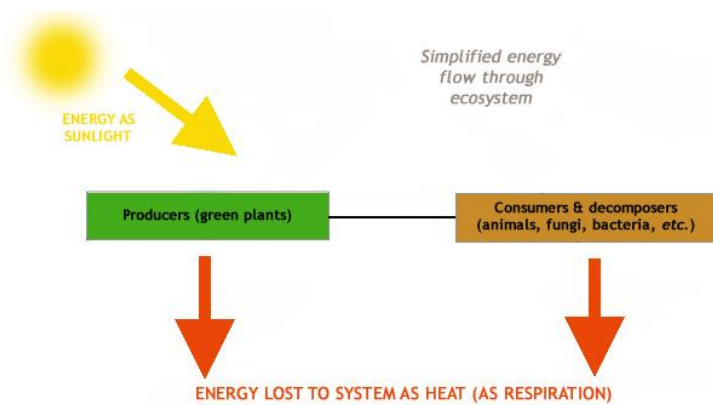


Figure 2: An indicative diagram of how energy flows through an ecosystem.

But for the decomposers, entropy would rule, ecosystems could not function so would collapse, nutrients would not cycle, and energy would not flow.

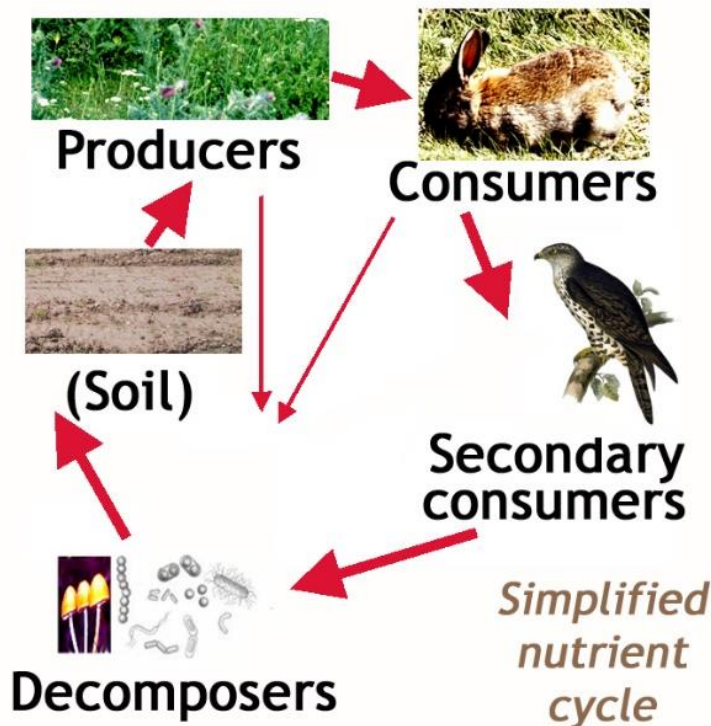


Figure 3: Whilst energy flows through ecosystems ultimately escaping as heat, nutrients cycle through them.

Food chains are driven by energy from the sun that is captured by plants through photosynthesis. As in the simplified diagram above, primary consumers eat plants,

and secondary and tertiary consumers feed on the primary consumers. The decomposers consume dead material and wastes.

The community of organisms associated with any particular stump will vary considerably and depend on many factors: the tree species, age, degree of decay, size, whether any living tissue remains, aspect, exposure, amount of shade, local climate, stochastic colonisation, ecological connectivity, predator–prey dynamics, *etc.* That is true of many communities in nature, a contribution to fascination and the endless rewards of studying natural history.

The lists of species associated with tree stumps below are intended as a guide to what you might be likely to observe. They are not in any way exhaustive! I am not a fan of vernacular names for bryophytes, lichens, fungi or invertebrates but I have included a few of those in more common use for the fungi at least. Scientific names are up to date at time of writing but please be aware that advances in taxonomy mean name changes are frequent.

#### NONVASCULAR PLANTS, BRYOPHYTES ETC.

##### Algae

*Desmococcus viridis* (*D. vulgaris*) s.l.

*Trentepohlia* spp



Figure 4: The dense bright green alga *Desmococcus viridis* that grows on stump bark and other surfaces in an intensively farmed area where there is high atmospheric nitrogen.

*Dicranum scoparium*

*Homalia trichomanoides*

*Hypnum cupressiforme*

*Isothecium alopecuroides*

*Isothecium myosuroides*

*Kindbergia praelonga*

*Neckera complanata*

*Orthodontium lineare*

*Orthotrichum affine*

*Orthotrichum lyellii*

*Plagiothecium denticulatum*

*Plagiothecium nemorale*

*Pseudotaxiphyllum elegans*

*Rhynchostegium confertum*

*Syntrichia laevipila*

*Tetraphis pellucida*

*Ulota bruchii*

*Ulota crispa*

*Ulota phyllantha*

##### Mosses

*Amblystegium serpens*

*Aulacomnium androgynum*

*Brachythecium rutabulum*

*Brachythecium velutinum*

*Bryum capillare*

*Campylopus pyriformis*

*Ceratodon purpureus*

*Dicranella heteromalla*

*Dicranoweisia cirrata*



Figure 5: *Orthotrichum affine*, a common moss forming tufts on stumps and branches.

Liverworts

- Frullania dilatata*
- Frullania tamarisci*
- Lophocolea cuspidata*
- Lophocolea heterophylla*
- Metzgeria furcata*
- Microlejeunea ulicina*
- Radula complanata*

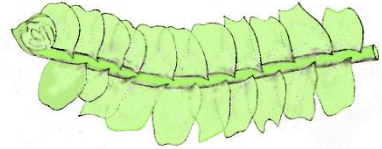


Figure 6: *Lophocolea heterophylla*

LICHENS & FUNGI

Lichens

- Amandinea punctata*
- Arthonia punctiformis* & *A. radiata*
- Arthopyrenia* spp
- Candelariella reflexa*
- Cladonia coniocraea*
- Cyrtidula quercus*
- Evernia prunastri*
- Flavoparmelia caperata*
- Fuscidea lightfootii*
- Graphis elegans* & *G. scripta*
- Hypogymnia physodes* & *H. tubulosa*
- Hypotrachyna* spp
- Lecanora conizaeoides* & several other  
*Lecanora* spp.
- Lecidella elaeochroma*
- Lepraria incana*
- Lobaria pulmonaria*

- Melanelia* spp
- Opegrapha atra*
- Parmelia perlata*, *Parmelia saxatilis*  
(crottle) & *Parmelia sulcata*
- Parmelina pastillifera*
- Parmeliopsis ambigua*
- Pertusaria* spp
- Physcia adscendens*, *P. tenella* & *P. aipolia*
- Physconia distorta*
- Platismatia glauca*
- Punctelia subreducta*
- Ramalina farinacea* & other spp
- Scoliosporum chlorococcum*
- Usnea* spp.
- Xanthoria parietina* & *X. polycarpa*



Figure 7: *Lepraria incana*, a very common but tine lichen that can nonetheless cover large areas.

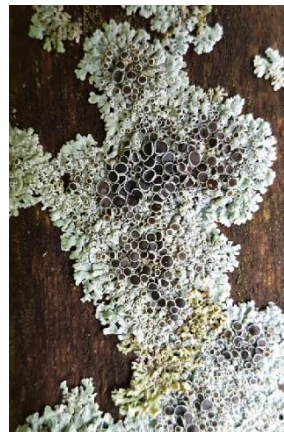


Figure 8: *Physcia aipolia*, a common foliose lichen in areas of clean air.

## Fungi

There are numerous fungi associated with tree stumps in various stages of decay, an enormous number if small and tiny species are included – far too many to list here, but below are some of the more noticeable ones. Their occurrence may depend on many factors such as how old or tall the stump is; some will only persist while the stump still has some live woody tissue. Some may be underground and there is a complex, ecologically important web of mycorrhizal fungi among and between trees in the rhizosphere.

*Armillaria gallica*  
*Armillaria mellea* (honey fungus)  
*Auricularia auricula-judae*  
*Bjerkandera adusta* (smoky bracket)  
*Daedalea quercina*  
*Daldinia concentrica* King Alfred's  
 cake  
*Fistulina hepatica* (beefsteak fungus)  
*Fomes fomentarius* (hoof fungus)  
*Fomitiporia robusta*  
*Fomitopsis betulina* (birch polypore)  
*Fomitopsis pinicola* – on pine  
*Ganoderma applanatum* (artist's  
 bracket)



Figure 9: *Ganoderma applanatum* (artist's bracket)

*Ganoderma australe* (southern  
 bracket)  
*Ganoderma lucidum* (reishi)  
*Ganoderma resinaceum*  
*Grifola frondosa*  
*Inonotus dryadeus*

*Inonotus hispidus* (shaggy bracket)  
*Inonotus radiatus* (alder bracket)  
*Kretzschmaria deusta*  
*Laetiporus sulphureus* (chicken-of-  
 the-woods)  
*Meripilus giganteus*  
*Oxyporus populinus*  
*Phellinus pomaceus*  
*Pholiota squarrosa*  
*Pleurotus ostreatus* (oyster fungus)  
*Polyporus* (syn. *Cerioporus*)  
*squamosus* (dryad's saddle)  
*Pycnoporus cinnabarius*  
*Stereum rugosum*  
*Trametes suaveolens*  
*Trametes versicolor* (turkey tail)  
*Tremella mesenterica*  
*Xylaria polymorpha* (dead man's  
 fingers)



Figure 10: *Laetiporus sulphureus* (chicken-of-the-woods)

## PHANEROGAMS (seed-producing plants)

*Hedera helix* ivy

*Lonicera periclymenum* honeysuckle.

Other climbers that may use stumps for support are *Clematis vitalba* traveller's-joy and *Humulus lupulus* hop.

*Rubus fruticosus* agg. bramble (often germinates in stump crevices)

On taller stumps *Viscum album* mistletoe may still be present if there is live tissue remaining.

In the later stages of decay, many vascular plants will start to colonise and overgrow the stump.

Stumps of broadleaved trees (not conifers) that are not dead/have not been killed will re-grow from epicormic buds in the trunk or sprout from the base (which is how coppicing works).

## INVERTEBRATES

The list of micro- and macro-invertebrates associated with stumps is enormous and includes those that feed on living or dead wood as well as other invertebrates that prey on them. There are protozoa, various worms, molluscs, woodlice, millipedes, centipedes, springtails, earwigs, beetles, several butterfly and moth larvae, flies, bees, wasps, ants, spiders and mites. Beetles are of particular interest as there are several notable and rare species associated with old rotting wood.



Figure 11: Stag beetles *Lucanus cervus* (Linnaeus, 1758) are associated with rotting tree stumps on which the larvae feed. Especially the parts below the soil surface.

## VERTEBRATES

### Herpetofauna

Old stumps, especially large, old ones, can provide places of shelter or basking sites for several reptiles and amphibians including *Anguis fragilis* slow-worm, *Natrix*

*helvetica* barred grass snake, *Zootoca vivipara* common lizard, frogs, newts and common toad.

### Birds

Birds of many species may be attracted to tree stumps for nesting sites or food. Amongst those you are most likely to see are woodpeckers, tree creeper, blue and great tits and nuthatch.



Figure 7: Woodpeckers like to make nest holes in taller dead trunks like this one in my garden. I think grey squirrels have enlarged it to get at the eggs/fledgelings!

### Mammals

Small mammals such as mice and voles shelter in suitable holes in or under stumps, and shrews may search for invertebrate prey. Dormice sometimes build nests in stumps and hedgehogs may hibernate in large, hollow stumps; badgers will sometimes tear at the wood to reach food such as the larvae in a wasp nest or other grubs. Taller standing trunks with holes or crevices may offer roosting sites to bats.



Figure 8: Hedgehogs use hollow stumps for shelter and hibernation. This one came out for a snack!

EXAMPLES OF STUMPS IN VARIOUS DEGREES OF DECAY





The heartwood of some trees can endure for centuries. This is all that remains of an ancient Worcestershire oak dating from *circa* 1750.

© Betts Ecology February 2019 [www.bettsecology.com](http://www.bettsecology.com)