

**TREFTADAETH** YNG NGHYMRU  
**PERLLANNAU** A  
GWNEUD SEIDR



**THE HERITAGE** IN WALES  
**OF ORCHARDS &**  
**CIDER MAKING**

## Managing Orchards for Biodiversity

For the Welsh Cider & Perry Society

December 2017



Dr Deborah Sazer

16 Church Lane

Penclawdd, Abertawe SA4 3JH

01792 851050 / 07703 343 597

[ecoleg.sazer@gmail.com](mailto:ecoleg.sazer@gmail.com)



ecoleg sazer ecology

'More than 60% of the area of traditional orchards in the UK has declined by over 60% in the last 50 years. Once a common sight in the British countryside, they have now become rare...With the loss of the traditional orchard habitat we also face the potential loss of the 1800 species associated with orchards. ..just one apple tree can support over 1000 different invertebrates.'  
(North East Wales Orchard Recovery Project, 2012).

The traditional orchard is a UK Biodiversity Action Plan (UKBAP) habitat which supports many UKBAP, Nationally Rare and Nationally Scarce species. A traditional orchard is not just a collection of fruit trees; it is in fact a mosaic of habitats with the potential to support a huge range of wildlife. The spacing of trees in traditional orchards is usually wider than that found in commercial orchards. This open spacing allows orchards to function as traditional 'parklands' or 'wood pastures', with species-rich grassland below and between the trees. This grassland is managed by grazing or occasionally cut as a hay meadow, while commercial orchards tend to manage their grassland with frequent cuts and/or herbicides. Diverse additional habitats such as hedgerows, scrub and wet areas in and around traditional orchards further enhance their value. New orchards can be planned and planted to emulate this rich habitat mix. The vital point is low-intensity and sensitive management, with little or no use of pesticides, fungicides, herbicides or inorganic fertilisers.

Invertebrates and animals require food and shelter throughout the year, and well-managed and diverse orchards can provide a continual supply of these resources. Fruit trees, along with native hedgerow shrubs such as **blackthorn** (*can you take this out as blackthorn is known to harbour fireblight and therefore should not be recommend to plant near an orchard- or at least state that it can harbour fireblight*) and hawthorn, supply vital nectar and pollen for pollinators such as bees and hoverflies in the spring, before there are many other flowers available. Well-managed species-rich grassland beneath the trees will continue to supply nectar and pollen through the summer, along with invertebrate nesting sites in the longer grass and stems. Ivy flowers provide late nectar and pollen, and all fruiting trees and shrubs can provide shelter and food for mammals and birds well into the winter.

As trees mature and age into 'veteran' trees, new ecosystems develop. For example, nationally declining 'saproxylic' (dead-wood) feeders move in, to break down the dead and dying wood, as do characteristic species of fungi. The wide tree spacing means that the trees receive plenty of sun and warmth, which benefits the ageing process, as well as most of the associated invertebrates. The grassland below provides habitats and resources for other groups of species, including generalist and specialist invertebrates and colourful waxcap fungi. All of these niches and species then provide habitat and food for plants, birds, mammals, amphibians, reptiles lichen and mosses. When linked to the surrounding landscape by hedgerows, woodland and grassland, they form a key part of a wildlife landscape.



Scarlet waxcap *Hygrocybe coccinea*

## Steps to increase and maintain orchard wildlife diversity

### Trees

- **Plant 'standard' trees**
- **Most of our community orchard will have planted MM106 trees' ie semi dwarfing due to Health and safety and ease of maintenance, as this is aimed primarily at this audience are you able to tweak it a little, so that they know what to do best for what they have, as to be honest only farmers will plant standards now.**

Standard trees grown on robust root-stocks are longer-lived than those grown on dwarfing stocks. Since they are longer-lived, standards can develop into valuable veterans which provide a range of decaying habitats, such as rot holes that are used as nest sites for birds and as bat roosts. As they age they develop hollow trunks which make them more stable for many years. The decomposing wood is exploited by organisms such as fungi and beetle larvae. The deadwood invertebrates in turn provide forage for woodpeckers and other birds.

Dwarfing and semi-dwarfing trees have shorter lifespans and a different pattern of age decay which does not provide such a wide range of habitats and resources. They are also too small to allow easy management of the grassland beneath, e.g. by grazing or managing for hay.

If you don't want full-sized fruit trees you can prune them to restrict their height and shape. They will still develop veteran features with all the ecosystem services that these provide.

- **Plant a mix of early-, mid- and late-flowering and fruiting trees**

Different fruit varieties flower throughout the spring, while fruits of different cultivars ripen at different times. The wider the mixture you plant, the more resources you provide to sustain a wider range of pollinators and fruit eaters for longer.

In general, plums flower in March, pears in April and most apples in May. Make sure that each cultivar is near at least one other tree that flowers at the same time. This will ensure cross-pollination and thus good fruit set. Even self-fertile varieties will benefit.



©Steven Falk

The spring-flying Early Bumblebee *Bombus pratorum*

- **Maintain a range of tree ages and stages of decaying wood**

As your orchard matures, aim for a mixed aged structure by planting new trees as the older ones age. Veteran fruit trees, most of which have disappeared from our landscape, are home to a seriously declining range of species, especially deadwood invertebrates. When the last veterans finally die, these invertebrates are left homeless and become locally (if not regionally and nationally) extinct. That is why it is essential to plant new replacements in plenty of time, so that the orchard always has veterans and ‘candidate veteran’ replacements.



AJ Cann, Nature Spot

*Rutpela maculata*, a longhorn beetle whose larvae feeds on rotting wood

As trees decay, a myriad of new habitats develop, such as cracks, rot holes, sap runs and even underground decaying roots. Trees naturally die back and begin to hollow out as they mature, ensuring their long-term survival. Decaying and dead wood does not necessarily indicate disease. Decaying trees

can survive and be productive for a long time, while they continually provide valuable habitat for many species, including insects, birds, dormice, bats, fungi, liverworts and lichens. Because so many trees are removed from orchards and woodlands before they can age, many of the species that rely on decaying wood have become endangered, such as the larvae of the stag beetle, rhinoceros beetle and the rare noble chafer. When you plant new trees as old ones die, it is not recommended to plant in exactly the same site as an old tree, so you can allow the old or dead tree to remain in-situ as well.

The greater the size, type and position of deadwood and the greater variety of ages, the more species can be supported. For example, standing wood remains dry and decomposes in a different way to fallen trunks and branches.

### **Standing dead wood**

Standing decaying and dead wood is one of the most valuable resources that orchards can provide. Hollow trees are very stable and do not need to be removed unless they clearly become dangerous. At the least, retain as much of the main trunk as practicable. If you are concerned about safety, you can remove boughs to within a foot or two of the trunk to reduce their weight and thus the likelihood of them breaking. Ensure you cut them at an angle that will allow rainwater to run off. Correctly pruned branches should heal by themselves, with no need to paint them to seal the wounds. Careful pruning can revitalise your trees and extend their lives, while creating new cavities and niches for wildlife. Pruning during bird nesting season (March to September) should be avoided.

### **Fallen dead wood**

Fallen dead wood, or unsafe decaying branches that need removing, all provide habitat for a different range of species. Ideally, leave dead wood near to where it falls, but if possible ensure that wood is lying in a variety of positions: full sun, shade, dry, wet, etc. Brash and small branches can be used for wood piles. The invertebrates, amphibians, etc. that colonise wood piles provide food for foragers such as shrews, voles and birds. Small rodents in turn feed owls and other birds of prey. Log piles also provide summer shelter and overwintering sites for frogs, toads, beetles and hedgehogs.

- **Nest sites**

As discussed above, veteran trees, standing dead wood, hedgerows and scrub provide vital nest sites for many birds. It will take time for these features to develop in new orchards, so bird and bat boxes can provide interim nest or roost sites.

- **Mistletoe and ivy**

The semi-parasitic plant mistletoe is an important addition to any orchard. Healthy trees can easily support mistletoe, although too much may damage the apple trees which it favours. Large clumps in treetops can act as sails in strong winds, and so you may want to remove these if your orchard is in an exposed site. But mistletoe supports its own ecosystem, with specialist insects that can only live on the plant; this is in addition to the birds that feed on the fruit and spread the seeds.

Ivy is not a parasite and does not weaken trees, it only uses the tree for support. The only threat is when the extra weight of a strong growth of ivy may sometimes damage a weak or damaged tree. Ivy is a critical source of pollen and nectar for late flying insects in autumn, when just about all other plants have finished flowering. Look at open ivy flowers on a sunny autumn day and you may be surprised by the number of hoverflies and bees feeding on it - possibly including the recent colonist ivy bee, which feeds exclusively on ivy. Ivy also provides essential shelter and fruit for invertebrates, birds and mammals through winter and into spring.

### **Windfall fruit**

Leaving windfalls where they lie, as well as some fruit on the trees, provides a vital source of food over the autumn. If you juice your fruit, leave the leftover 'scrat' for foraging wildlife. Overripe fruit attracts fieldfares, redwings, thrushes and blackbirds as well as such as badgers, hedgehogs, hares, foxes and other mammals which all need to put on fat to survive the winter. Butterflies, moths and other insects are strongly attracted to the sugar in decomposing fruit, at a time when most flowers have stopped producing nectar.

- **Plant, enhance and manage hedgerows and scrub**

Hedgerows and areas of scrub with native species will greatly enhance your orchard's biodiversity, and will function as windbreaks. They will link the trees to the wider landscape, providing transport routes for insects, small mammals and bats. Hedgerows provide nectar, pollen, fruit, nest sites and shelter. Once again, the greater the diversity of hedgerow species and structures, the more diverse will be the wildlife. It is important to manage hedgerows and scrub sensitively. There is no need to cut more than once every three years at a minimum, and try to cut no more than one third of the hedge/scrub in any one year. Species such as bramble can be invasive, but remember that they are one of the most important sources of nectar and pollen from June, fruit in the autumn as well as providing year-round shelter, nesting and roosting sites. A huge range of invertebrates, birds and mammals rely on bramble.

## The grassland

Due to the relatively wide spacing of fruit trees, the grasslands wildlife habitats are as important as the trees. Grasslands need management, to ensure that they are not overtaken by bramble, scrub and/or bracken. However, longer grass and scrub (along hedge bottoms or in rotated parts of the orchard) provides a valuable transition habitat, with nectar, pollen, shelter and food. Traditional orchards were often grazed by cattle, geese and sheep, especially spring lambs. They are also managed as haymeadows, which are cut in summer (usually no earlier than mid-July), after the flowers have been allowed to set seed. This contrasts with commercial orchards, where the grass is often cut frequently or even herbicided.

Avoid the use of inorganic fertilisers, herbicides, fungicides and pesticides in the orchard, as these will greatly reduce the diversity of the grassland wildlife. Native wildflowers are adapted to cope with low nutrients; they cannot compete against the more vigorous coarse grasses that thrive following the application of fertilisers. For the same reason, if the grass is managed by mowing, it is important to remove grass cuttings to reduce the fertility and encourage wildflowers. Pile cuttings in the least species-rich boundary to rot down, or compost them. Make sure that the cuttings are not placed somewhere where the nutrients will run back onto the grassland. Also avoid rolling and harrowing, which can damage the shallow roots of the trees, along with soil invertebrates and ant hills. The use of any heavy machinery also risks damaging the soil structure – a healthy open structure is vital to the health of the orchard and its wildlife.

As with the ages and structures of the trees themselves, the more varied the orchard grassland is, the greater diversity of species it can support. If practical, stagger mowing so that both tall and short areas are always present. If the entire area is mown at once, all of the species that rely on the herbs and tall grasses will be suddenly left with no habitat. You can rotate the tall areas, so that they do become scrubby. Many 'weeds' are vital for the pollinators that fruit trees rely on. For example, dandelions are one of the most important pollinator plants, since they begin to flower early and continue to provide nectar and pollen throughout the season. A patch of nettles in a sunny position supplies essential food for the caterpillars of red admiral, peacock, comma and small tortoiseshell butterflies.

Short grass is favoured by species like ground-nesting solitary bees and colourful waxcap fungi. However, many invertebrates, small mammals, reptiles and amphibians prefer tall grass. The larvae of

many butterflies such as meadow brown, speckled wood and ringlet only feed on coarse grasses. A number of insects such as bees and ladybirds overwinter at the base or below tall vegetation, and others hibernate in hollow stems.



Peacock butterfly *Inachis io*

Traditional orchards were often grazed by livestock. Light grazing is recommended to maintain a species-rich habitat and also to avoid trampling of the tree roots. Too much grazing, especially by sheep, will lead to the loss of flowering herbs.

If livestock do graze the orchard, it is essential to protect the trees from damage, and to remove any boughs low enough for the stock to reach (pollarding). Young trees also require guards to protect from species such as rabbits and badgers.

### **Pest management**

Diversity strengthens the orchard ecosystem, rendering it less vulnerable to population explosions of 'pest' species. At the same time, they are more likely to house the natural predators and parasites of problem species.

Regular tree inspections can catch any pest or disease problems early, prompting quick action before the problem grows. If it is felt that there is no alternative to chemicals, you can minimise the damage by using a minimum and localised application. Remember that pesticides and fungicides kill indiscriminately. Removing other invertebrates not only reduces pollination, it throws the ecosystem out of balance. It impacts all the species that prey on invertebrates, including natural enemies that also control the pests (e.g. ladybirds and hoverflies, whose larvae feed voraciously on aphids). It is said that red spider mite rarely becomes a problem in un-sprayed orchards, and large outbreaks only occur in commercial orchards where their natural predators have been removed.

## References

Maddock, A. ed. (2008) UK Biodiversity Action Plan; Priority Habitat Descriptions. BRIG

Opal, Orchard Biodiversity

<https://www.opalexplorenature.org/sites/default/files/7/file/orchard-biodiversity-final.pdf>

North East Wales Orchard Recovery Project, 2012, An introduction to orchard management

<http://www.flintshire.gov.uk/en/PDFFiles/Countryside--Coast/Biodiversity/An-introduction-to-orchard-management.pdf>

People's Trust for Endangered Species, Orchard Biodiversity Tips

<https://ptes.org/campaigns/traditional-orchard-project/orchard-biodiversity/orchard-biodiversity-tips/>

Red Apple Ecological Consultancy Bureau, Orchard Biodiversity Toolkit

<http://www.ijsselboomgaarden.nl/SiteFiles/1/files/Toolkit%20Advice%20biodiversity%202017.pdf>