Three Hagges Woodmeadow

Recent research has highlighted the importance of appropriate approaches to woodland planting and management to avoid negative consequences to biodiversity and carbon sequestration. If we are to address this along with our dwindling domestic food supply, we need to think differently about how we farm our land. The Farming the Future A-Team Foundation-funded National Network of Agroforestry Farms project was formed largely on this premise and aims to promote agroforestry as a way of farmers and landowners simultaneously and sustainably growing food, transitioning into the new ELM Scheme and contributing to 'public goods.' Part of that is showcasing farms and initiatives to share knowledge and evidence of the value of agroforestry. One of these initiatives is the Woodmeadow Trust, whose flagship site Three Hagges, based at Escrick just outside of York, is focused on this perhaps lesser-known area of agroforestry - that of combining woodland and meadows.

Once farmland, Three Hagges is a 10-hectare plot that is part of the Escrick Estate. Until 2012, it had been intensively farmed with arable crops (barley having been grown last). It came into being with the help of a team of volunteers and a grant from the Forestry Commission and is now a nature reserve and education centre that is open to the public and very much engages the local community. The core of their vision is focused on ecological and community benefits, but they are also keen to explore how the same principles can be applied to farming systems and adopted in a way that is commercially viable for farmers.

The podcast features Agricology's editor Janie Caldbeck talking to Woodmeadow officer Dan Carne and one of the three founders of the project, Rosalind Forbes Adam. They describe what a woodmeadow is, the potential relevance to farmers, the layout of the site, how it was created and is now managed, tips and suggestions for famers and landowners who might be interested in putting some land over to a combination of woodland and meadow, and thoughts about wider scale adoption of woodmeadows and agroforestry. It features footage from Janie's visit to the site in June 2021. Below is a summary of key points...

Features of woodmeadows

One of the richest habitats in temperate Europe - mosaics of trees and grassland which can be extremely botanically diverse, containing 60-76 plant species per square metre and the edges are particularly diverse. They comprise a mosaic of grassland and trees and traditionally consist of timber trees, fruit trees, shrubs, pollarded trees and coppice, with meadows providing hay and pasturage.

Today, they're recognised particularly as being extraordinarily species-rich attractive habitats and places of recreation. The richness is derived from a variety of ground conditions, constant presence of two habitats in various stages of growth, and the transitional edge between the woodland and species-rich grassland habitats; with a constant flux in conditions caused by waxing and waning of woodland and herbage. Some traditional orchards, wood-pastures, wooded commons and deer parks may fall within the broad category of woodmeadow, but in a narrower sense they are working landscapes maintained by agriculture with ground flora cut for hay and used for grazing and trees used for timber, fodder (as tree hay) or fruit.

Relevance to farmers

Opportunities to use 'unproductive' or marginal land, boost farmland biodiversity and pollinator benefits and enhance pest and disease control, capacity to help reduce flood risk, improve soil and air quality, sequester carbon, and provide health benefits for livestock - through providing shade and browse, enabling them to access extra minerals and reducing the parasite load. A woodmeadow compliments the historic idea of having a 'hospital field' for livestock, where varied herbage provides a richer supply of vitamins, minerals and nutrients than 'improved' pastures, which are typically dominated by a small number of grass species. Furthermore, the combined vegetative productivity in a woodmeadow system is greater than an equivalent area of either woodland or grassland considered in isolation.

Layout of the site

10 hectares divided into areas of grassland and woodland in the form of small copses - 60% is planted with trees, 40% is open meadow space (created in 2012 with EWCS funding). The entire site was sown with a species rich grassland mixture similar to flood plain meadow community plants that would have been present in the area historically. Groups of native trees and shrubs were planted in combinations that reflected local woodland types. The seed was established in May 2013, trees planted in November 2013. The trees were planted in rows 2.5 m apart with trees spaced between 1.5 - 5 m within the rows. Shrubbier trees were planted along the edges - all planted in sinuous lines to give natural effect whilst allowing easy management access.

Establishment & tree & plant species

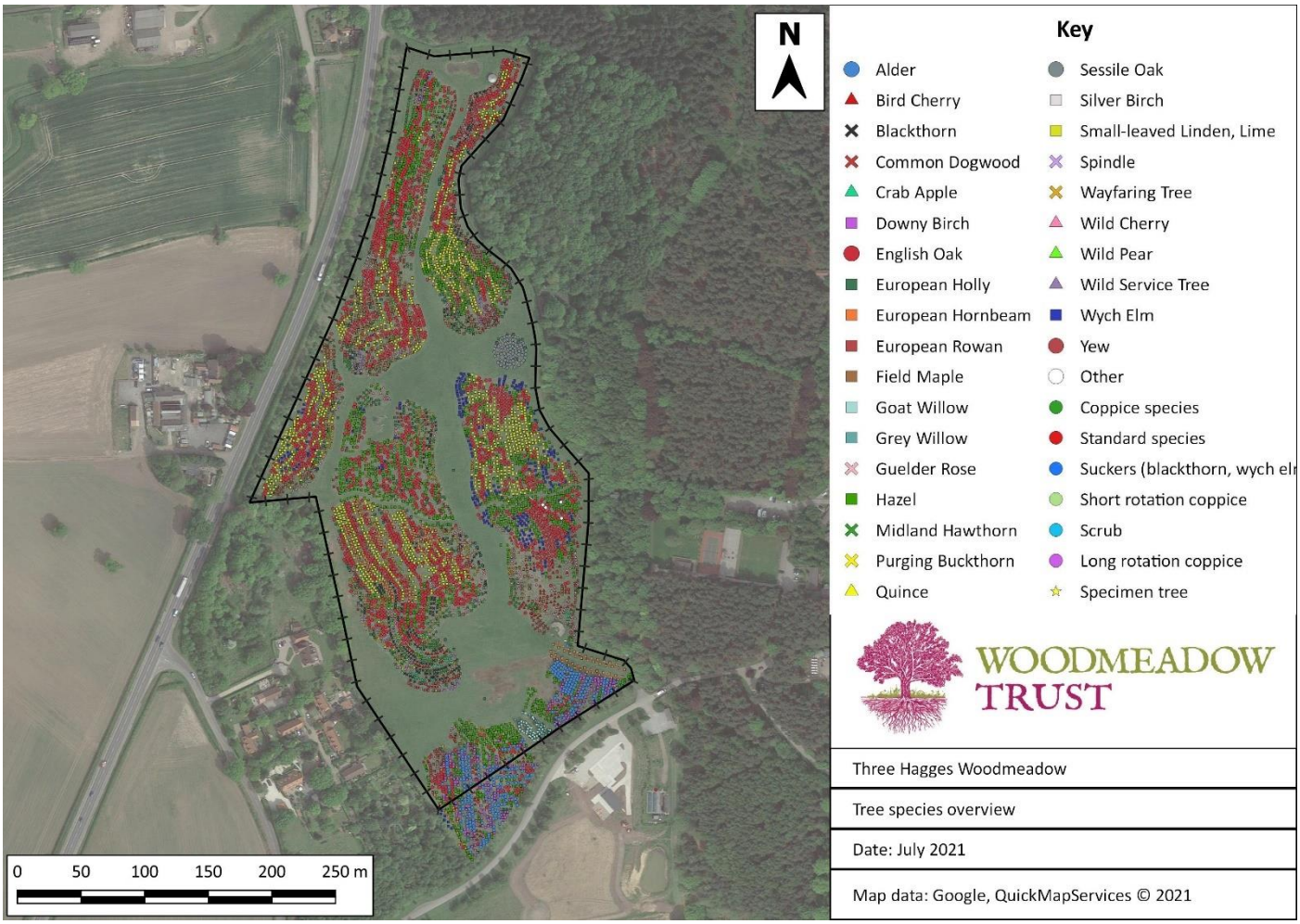
A stale seed bed was established after the last arable crop was harvested. The ground was ploughed, harrowed, and rolled, and the seed bank was allowed to germinate naturally so weeds had opportunity to grow, then sprayed off with a herbicide, left a few weeks to allow weeds to grow, then sprayed off again. A seed mix was then surface sown using an Opico drill to avoid bringing up viable weed seeds from deeper in the soil. After sowing, the area was rolled to promote seed-soil contact and germination. Without this treatment, the field layer of secondary woodlands planted on ex-arable land would typically be dominated by ruderal species characteristic of recently disturbed ground that thrive in nutrient-rich soil such as thistle, nettle, dock etc. Once established, this undesirable plant community often persists for decades.

An MG4 grassland mix was sown in the wet areas, MG5 grassland mix in the dry areas. Fast growing annual agricultural weeds i.e. poppy, corn chamomile, cornflower, corn marigold, served as nurse crops for slower growing fine grasses and meadow perennials. The nurse crop annuals gave little room for potentially dominant species to gain hold and the mix of fine grasses and robust perennials was designed to even out competition. There are now about 164 plant species growing on the site (after having sown originally about 24), with about 16 different species of plant found per square metre (on average).

10,000 trees and shrubs representing about 28 native British species were planted (shrubs were planted around edge of the copses) - a large proportion of oak, hazel (major understory species) and small-leaved lime; with the idea of oak and lime forming the main canopy (and ultimately being able to generate income), and the hazel to be coppiced every 6 or 7 years to produce marketable products. The standards (being full sized canopy trees) are managed on a much longer rotation.

Many other species have also been planted - largely for the wildlife benefits from having such diversity, particularly at the interface between grassland and woodland. There are a lot of smaller light demanding shrub species i.e. dogwood, rowan, hawthorn, blackthorn, crab apple, bird cherry - one main aim being to produce a longer season of blossoming and fruiting, to satisfy the needs of a wider variety of living things. Other species include spindle, dogwood, holly, yew, wayfaring tree, bullace, guelder rose *(see below)*...

Overview of tree species



Management

Meadow areas are cut once a year (mid-July) then after-grazed with sheep in the autumn - currently mob grazed - moved around with the use of electric fencing, to avoid heaving browsing of the trees whilst they are still establishing. A local farmer feeds the hay to his cattle.

Wooded areas are divided into several units - each year one area of the site is coppiced - cut down to ground level and allowed to regrow for several years. Most of the woodland management is done by volunteers.

Copses are managed by regular coppicing, leaving some trees as standards. Some trees are very lightly trimmed to encourage them to promote a leader - then ultimately thinned to coppiced standards. The small amount of pruning for the standard trees is needed to ensure they'll make good timber in the future.

The cut material from the first cut of coppicing is used for dead hedging.

The shapes of the copses were designed to allow for agricultural machinery to be able to manoeuvre around the site in all areas of open space and some glades/meadows over 30 metres wide - to ensure of sunshine reaching the site even when the trees reach full height.

There is a perimeter fence around the site, largely for protection from deer and rabbits. 50cm vole guards were used, as shorter guards were found to be ineffective. Overall, the site has experienced minimal tree mortality, requiring no 'beating up' to maintain the target stem density required by the Forestry Commission.

This year (2021), some areas of meadow have been left unmown, but mowing between tree rows has initially been needed - to enable sufficient light to penetrate and manage the development of the field layer in preparation for future introductions of woodland shade specialist flora. Cut material has not been collected within copses, and contrasting botanical communities are developing in the meadows and wooded areas of the site.

There is a plant nursery *(see below)* for seedlings and cuttings, which gives a great focus for volunteer work.

Costs

Some initial costs were covered by the Forestry Commission's English Woodland Grant Scheme but there were limitations that required planting to fit within designated areas. Further integrating, or 'blurring' the boundaries between wooded areas and open space could be an effective way to maximise ecological value and ease of management access.

Looking forward

Good step forward with Defra saying they will now permit planting of trees in areas of grassland or cropland receiving stewardship payment for something other than trees. It is still difficult to take advantage of the current grant systems if integrating two habitats - easiest way currently is to have a patchwork where there are separate areas of woodland and grassland. Could fund via other ways - i.e. the new biodiversity net gain system which will be formalised following the passing of the Environment Bill when it becomes the Environment Act could provide more opportunities.

FARMER TIPS

- Bear in mind that there isn't a single way of doing things - your approach needs to be guided by products you're looking to produce. Are you focused purely on doing something with areas of marginal land for biodiversity and pollinator value? Looking to offset carbon footprint? Or farm diversification to generate income?
- Management is key - consider management costs when choosing your funding source.
- Know your soil - understand the fertility, pH and hydrology of the site.
- Make sure you consider your strategy to extract timber, and if harvesting grass, make sure that as the trees grow, they won't become barriers to easy vehicle access around the site.
- Tree protection is key (from deer, voles, livestock…)

Visit the hugely informative website for the Woodmeadow Trust and find out more about Three Hagges Woodmeadow here

All photos above taken by Janie Caldbeck at Three Hagges Woodmeadow in June 2021 (All Rights Reserved). All photos below taken by Dan Carne (All Rights Reserved)

'Tree Species Overview' courtesy of Three Hagges Woodmeadow

Many thanks to Ros Forbes Adam and Dan Carne

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