Arable Plants

Introduction

Often overlooked, arable plants are the fastest declining and most threatened group of plants in Britain (Wilson and King, 2003). Arable plants thrive on the disturbance associated with arable farming but have been lost from many areas. The arable plant community remains the least studied of any major habitat in Britain (Byfield and Wilson, 2005) and there is lots still to discover. The Bedfordshire, Cambridgeshire and Northamptonshire area is really important for these beautiful plants due to the wide variety of soils present in the area and history of arable farming.

Dense-flowered fumitory *Fumaria densiflora* is an arable plant of free draining, usually calcareous, soils. This species has become less frequent due to agricultural intensification. Photo © Ryan Clark

Arable plant ecology

Arable plants thrive on disturbance and could be better characterised as 'disturbed land plants'. Far from being ubiquitous 'weeds', many of these species are very specific about where they grow. The communities are diverse with over 150 plant species characteristic of arable areas in Britain. These fall into 48 different arable communities or subcommunities (Still and Byfield, 2007). Fields with the longest history of arable cultivation are often home to the richest communities of arable plants.

Although some species do contribute to a decreased crop yield through competition with crops and could be considered problem species, other plants are actually beneficial to the farmed environment. Arable plants are attractive and important in their own right, but also are important for other species. They are the foodplants for a wide variety of insects and provide nectar and pollen for a range of pollinating insects. The invertebrates and other wildlife they support are also a form of integrated pest control. As the majority of arable plants have an annual life cycle, they produce large amounts of seeds which in turn feed a variety of birds and small mammals.

Arable plant conservation

Arable farming has been a feature of the British landscape for some 8000 years. Even though 30% of the landscape is under cultivation (Byfield and Wilson, 2005), arable plants are in trouble. 121 plant species in Britain are classified as important arable plants (Byfield and Wilson, 2005). Of these, 54 species are rare or threatened and seven are now extinct in the arable setting (Still and Byfield, 2007). Twenty-three species of arable plants are noted as being of conservation concern and are therefore listed on Section 41 of the Natural Environment and Communities Act 2006 (Plantlife International, 2015). Species listed on this act are "of principal importance for the purpose of conserving biodiversity". Britain's arable plant communities are particularly important as they occupy the north-western edge of the range of communities spreading across Europe and into Asia. Most have declined across their entire European range during the last century.

The factors that have contributed to the decline in arable plants are an all too common story familiar to conservationists. The use of broad-spectrum herbicides means that farmers have become more efficient at removing these weeds from their fields. There is now a greater proportion of autumn-sown cereals compared with the historical spring-sown cereals; this is not as suitable for arable plant germination. Seed cleaning (removing the seeds of unwanted species) has become more efficient, and

fertiliser use has increased. Modern crop varieties can take-up large quantities of nutrients and grow faster than the arable plants that lived alongside them (Plantlife International, 2015).

Historically there were low-intensity periods of agriculture, such as during crop rotation cycles, that enabled arable plants to establish. As more pressure was put on the land to deliver more food, these periods were lost. Many farms now cultivate using minimum tillage, which may not create enough disturbance for some arable plants to establish, while others can do better under this management.

Arable areas themselves have been lost as farms convert to pastoral systems and maize or are lost to development. The best areas for arable plants now are in the field edges, the metre or so where the crop is not planted or sprayed/fertilised so intensively, or not cultivated every year. This provides an occasional bare fallow for arable plants to grow and set seed.

Some other arable plants have declined as the season of cultivation has changed (Wilson and King, 2003). Changing from spring to autumn cultivation affects spring germinating arable plants adversely. Some of the species that have declined dramatically have relatively short seedbanks ad once lost from a site it is difficult to get them to re-establish without reintroductions (e.g. Field cow-wheat *Melampyrum arvense*). Several species, including some of the rarest arable plants in Britain, respond well to sympathetic management (Still and Byfield, 2007).

Ground pine *Ajuga chamaepitys* has a long-lived seedbank so can sometimes weather unfavourable conditions and appear again when conditions are favourable. It is a case of providing the right type of management in the right place. This management often benefits other species such as invertebrates, lichens and bryophytes.

Fields like this one, full of arable plants alongside crops, would have been a common sight before agricultural intensification pushed the arable plants to the margins or off the site completely. Photo © Ryan Clark

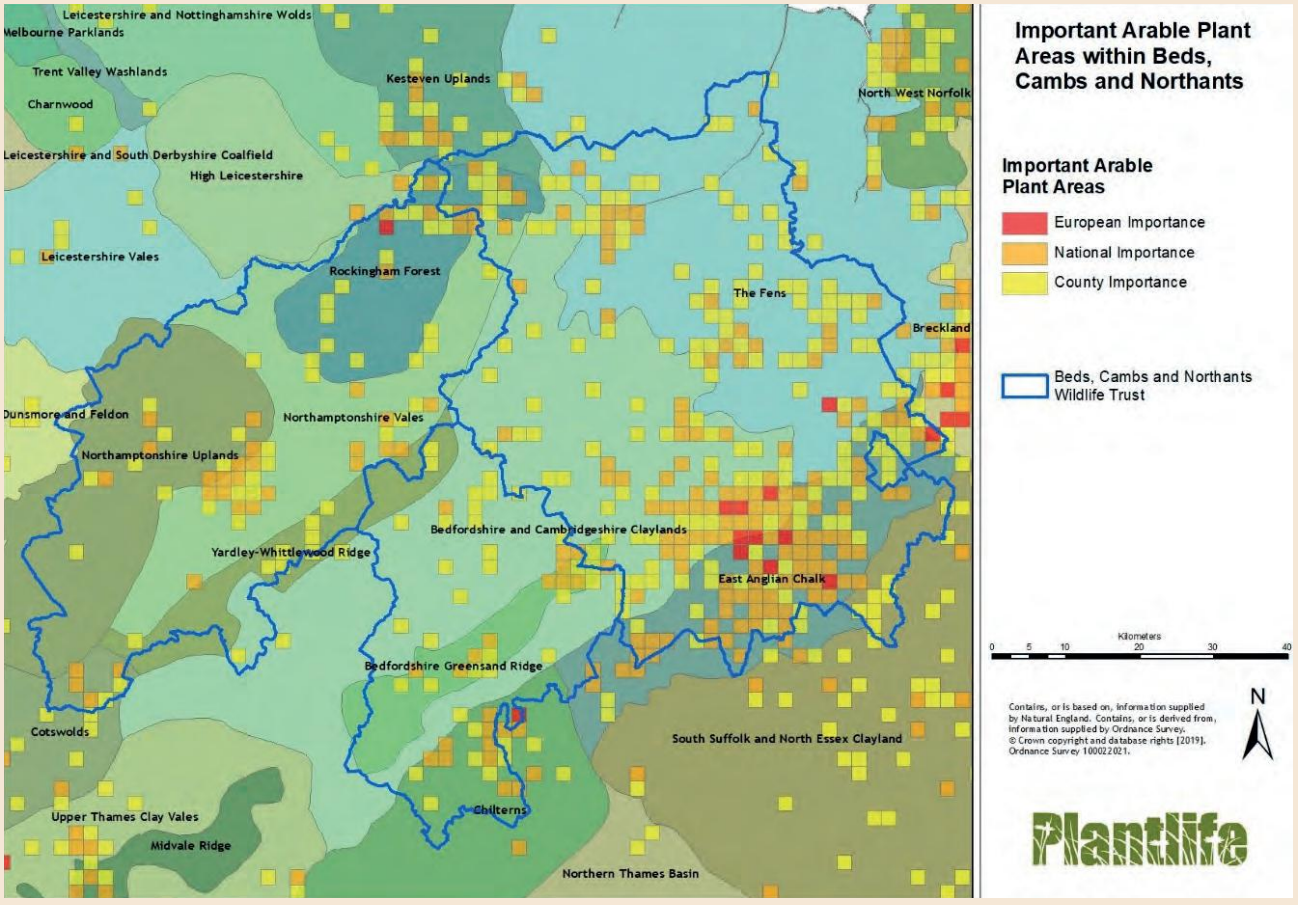
BCN arable plants

Cambridgeshire is the seventh richest vice-county and Bedfordshire the 15th richest vice county for arable plants in Britain (Still and Byfield, 2007). Southern and eastern counties of Britain score most highly, demonstrating the species richness of the areas, at least in terms of rare and/or declining species (Still and Byfield, 2007). Most arable plant areas fall outside of nature reserves so our work in the wider landscape is important.

A study in Bedfordshire carried out in 2007 found that the county holds 16 sites of national importance for arable plant assemblages (Bedfordshire & Luton Biodiversity Partnership, 2007b; Byfield and Wilson, 2005). These are known as Important Arable Plant Areas. Each broad soil type - defined as calcareous soils, clay and slowly permeable soils and sandy and shale free-draining soils - has different thresholds using a scoring system ranking rare and threatened arable plant species between 1-9 on a scale of increasing threat of extinction.

Thresholds have been applied to indicate the importance of the arable plant community in each area, to give an IAPA score. Approximately half of the National Important Arable Plant Areas in Bedfordshire are located on the shallow chalk soils of the Chilterns in the south of the county. A quarter are located on clay soils, and the remaining quarter on the sandy soils of the county's rivers and the Greensand Ridge (Bedfordshire & Luton Biodiversity Partnership, 2007b). Thirty-four sites were found to be of county importance (Bedfordshire & Luton Biodiversity Partnership, 2007b).

This map shows the Important Arable Plant Areas within our three counties



These are strongly associated with the natural character areas shown below. The Chilterns, East Anglian Chalk and Greensand Ridge are especially important for arable plants in our area. Several sites in our area are of European importance for their arable plants. Data provided by Plantlife.

In 2019, an arable field near Scaldwell in Northamptonshire was designated as a Local Wildlife Site in Northamptonshire and is thought to represent the best arable plant flora in the county. Several of the arable flowers in the field are listed in the Northants rare plant register; annual knawel *Scleranthus annuus*, corn marigold *Glebionis segetum*, corn spurrey *Spergula arvensis*, field woundwort *Stachys arvensis* and Venus's-looking-glass *Legousia hybrida.* This designation ensures that the value of this area is recognised and ongoing discussions with the landowner will ensure that this site continues to be managed effectively for these amazing plants.

Field woundwort *Stachys arvensis*, corn marigold *Glebionis segetum* and Venus's-looking-glass *Legousia hybrida.* These three plants are listed on the Northamptonshire rare plant register and were recorded in an arable field near Scaldwell, the first Local Wildlife Site designated for arable plants in the area., Photos © Ryan Clark

Some of the arable plants for which our area is particularly important:

Ground-pine *Ajuga chamaepitys*
This member of the dead nettle family is found on only 32 sites in Britain, 3 of which are in Bedfordshire. It is a species that needs disturbed areas on calcareous soils. One of the sites for this species is our Barton Gravel Pits reserve.

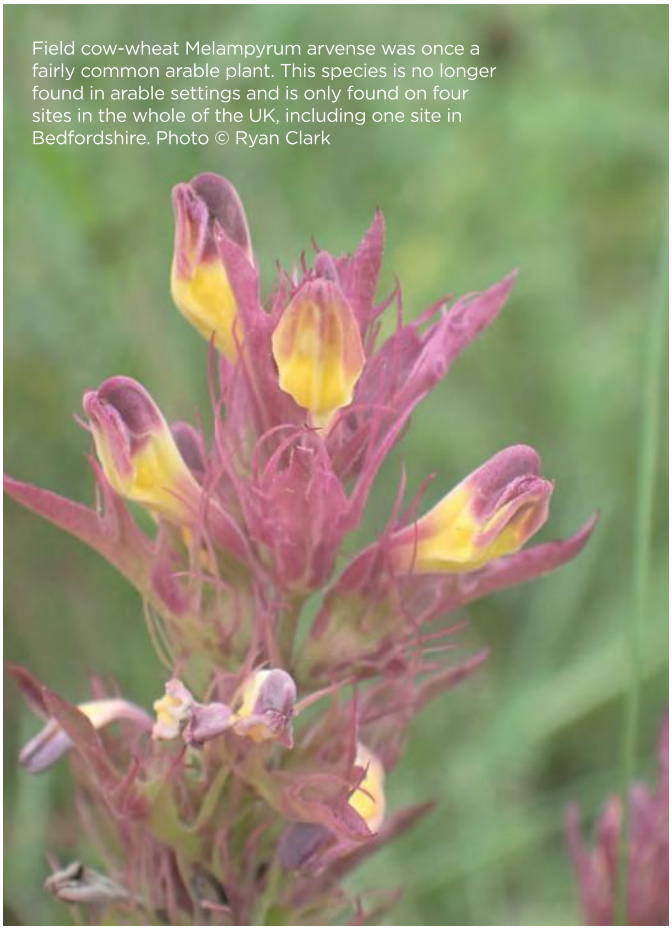
Wild candytuft *Iberis amara*
This is a species of bare, open ground on chalk. The populations of this species in chalk grassland are stable, but the populations in arable margins are declining drastically and this species is therefore listed as Vulnerable. There are good populations of this species in the calcareous parts of our area.
Field Gromwell Lithospermum arvense
This is a species of disturbed, dry calcareous areas. This is an uncommon species but there are lots of records for our area.

Grass-poly *Lythrum hyssopifolium*
This species is an annual of disturbed ground that is flooded in winter, including hollows and ruts in arable fields. Cambridgeshire is one of only a few places where this species occurs now.

Field cow-wheat *Melampyrum arvense*
This species is now found only on four sites in the whole of the UK, including a site in Bedfordshire. This species used to be a fairly common arable plant but has been completely lost from arable areas and is only present in other disturbed habitats.

Spreading hedge-parsley *Torilis arvensis*
Once frequent, this species had already been lost from nearly half its sites by 1930, and since then its accelerating decline has been one of the most dramatic shown by any arable plant. This is a species most often associated with calcareous clays. It has been successfully reintroduced to our Pegsdon nature reserve.

Ground-pine Ajuga chamaepitys – This species is found on only 32 sites in Britain, 3 of which are in Bedfordshire. It is a species that needs disturbed areas on calcareous soils. One of the sites for this species is our Barton Gravel Pits reserve. Photo © Brian Eversham



Field cow-wheat Melampyrum arvense was once a fairly common arable plant. This species is no longer found in arable settings and is only found on four sites in the whole of the UK, including one site in Bedfordshire. Photo © Ryan Clark

Local Wildlife Sites

Local Wildlife Sites (also known as County Wildlife Sites) are the most important areas for wildlife outside of legally protected sites such as Sites of Special Scientific Interest (SSSI) and National Nature Reserves (NNR). Across the three counties, there are over 1600 Local Wildlife Sites. These areas are designated for the special habitats or species that they contain. Alongside nature reserves, NNRs and SSSIs, they form part of a network of sites for wildlife to thrive in and move between.

The Wildlife Trust BCN established and now maintains the LWS system in the area. We provide free advice and information to landowners on managing these sites. We also run a monitoring programme that aims to visit each site periodically to find out what wildlife is there. We can also help landowners with information about sources of grant aid for nature-friendly management. We are extremely proud of our Local Wildlife Site system and it forms a key part of our work in the wider countryside.

Find out more
wildlifebcn.org/local-wildlife-sites

Further information on Arable Farmland
https://www.plantlife.org.uk/uk/discover-wild-plants-nature/habitats/arable-farmland
https://naturebftb.co.uk/the-projects/colour-in-the-margins/

Acknowledgements

Our thanks go to Cath Shellswell from Plantlife International for significant information for this case study. We would also like to thank Graham Bellamy for information about arable plants in Bedfordshire.

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