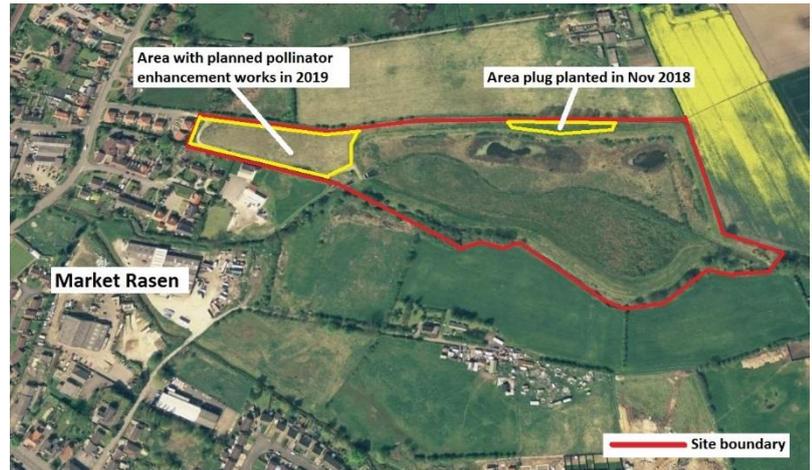


Market Rasen pollinators demonstration site

Pollinator projects in Lincs & Northants area

Project objective: To improve site for pollinators within 5 years starting in Autumn 2018.

Site: This washland, situated at the north-east margin of Market Rasen, (national grid reference TF11588931) is a new washland created in 2000. Conservation seed mixes were used to create the wet grassland (centre of the site) which is now designated as a County Wildlife Site. Please note there is no public access to this site.



Market Rasen washland site (looking east) showing wet grassland to centre of site and grass flood banks

Background: A pollinators survey in 2018 identified important existing habitat features acting as nectar sources and as shelter. These included wet grassland and swamp communities (centre of site) and rough grass banks (southern margin of site). However, it was recommended that the site could be improved for pollinators by adding a scrub belt, bramble tower, bee banks, scrapes, a pollinator hedge and hibernacula. The combination of these features will introduce greater habitat structure to the site (for nesting and hibernation) as well as providing a nectar and pollen source for longer period through the year. In addition, it was recommended that marginal grassland could be improved by plug planting with native flowers and by changes to the existing mowing regime (i.e. reducing the number of annual cuts to allow greater flowering of key plants such as clovers and vetches).

An area of grassland (adjoining the northern boundary) was selected for plug planting in Nov. 2018 and a second area of grassland (west section of site) was selected as a suitable location for the other enhancement works (to be completed by Spring 2019).

Plug planting method: A botanical survey of the site was undertaken in July 2017 to highlight native flowers already present. Based on the findings of this survey, 1,350 plugs of native flowers (refer to species list below) were planted in one area towards the northern boundary of the site in November 2018. Plugs were thoroughly watered in their trays on arrival at site, emptied into a large container to allow mixing up of the different species and then planted at a density of two plugs per square metre. Plugs were planted to a measured depth (2cm) using dibbers to allow them remain moist during establishment over the winter months and so that regular grass cuts could be continued without affecting them. The location of a small sample of planted plugs have been recorded with white plastic markers in order to monitor success in establishment. Plug species are of proven native provenance and appropriate to the local area based on local surveys and records. In the same area yellow rattle has also been spread as an experiment to see if it will reduce the vigorous growth of the grass.



Area plug planted in Nov. 2018

Plug planted species:

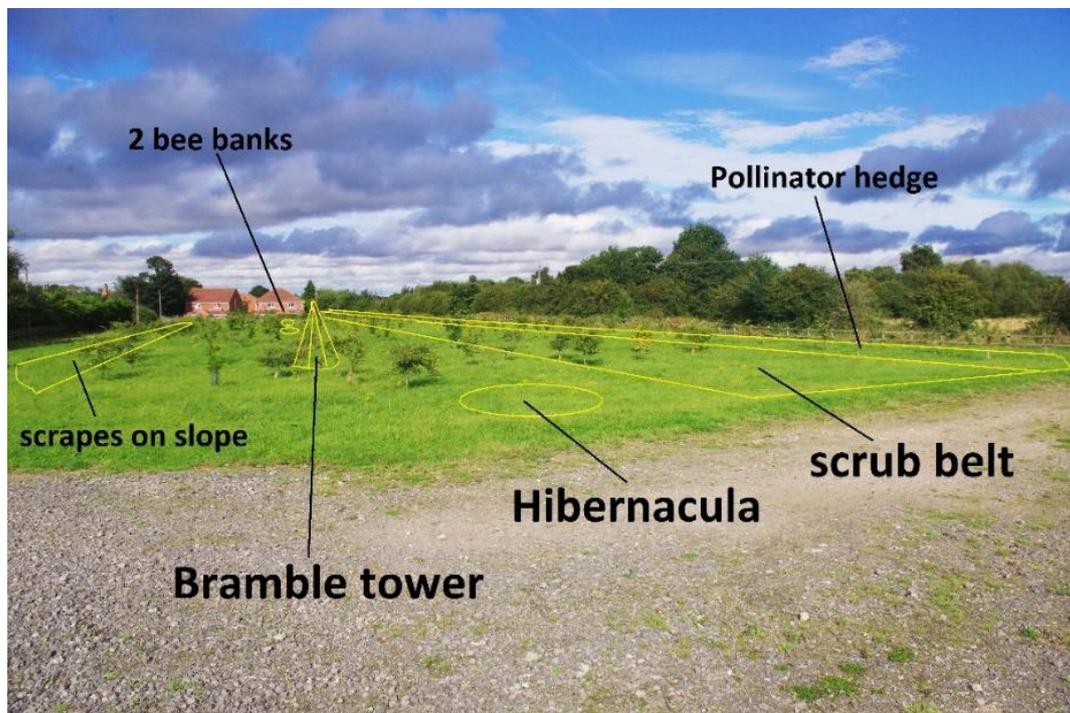
- Autumnal Hawkbit *Scorzoneroides autumnalis*
- Bird's-foot Trefoil *Lotus corniculatus*
- Common Agrimony *Agrimonia eupatorium*
- Cowslip *Primula veris*
- Daisy *Bellis perennis*
- Foxglove *Digitalis purpurea*
- Germander Speedwell *Veronica chamaedrys*
- Hedge Woundwort *Stachys sylvatica*
- Knapweed *Centaurea nigra*
- Lady's Bedstraw *Galium verum*
- Meadow Buttercup *Ranunculus acris*
- Ox-eye Daisy *Leucanthemum vulgare*
- Red Campion *Silene dioica*
- Red Clover *Trifolium pratense*
- Self-heal *Prunella vulgaris*
- Tufted Vetch *Vicia cracca*
- Yarrow *Achillea millefolium*



Nov. 2018 plug plant (red clover) with marker

Yellow Rattle: In addition to plug plants, 100g of yellow rattle seed was spread by hand over a 650m² area as a 1:10 ratio of seeds to sharp sand to facilitate dispersal. At 270 seeds per gram, this equates to approximately 42 seeds per square metre, We have since learned that a rate of around 80 seeds per square metre is likely to increase success, which will be considered for future seeding at the site. Seeds were spread in mid-December 2018 to allow natural vernalisation.

Pollinator enhancement works planned for 2019



Indicative locations of pollinator enhancement works planned for 2019 (west end of site)

Bee bank method: Excavate 15 x 5 m crescent-shape pit (to 50 cm depth), import soil of suitable texture to fill pit and create crescent-shaped c10 x 3 m wide soil mounds (to 1m high above ground), scatter capping material (6 m³ of builder's sand or crushed limestone per bank) on top of the soil mound and cut 1-2 low clifflets into the sides of the crescent.

Bramble tower method: Design discussions ongoing. Aim is to have a near vertical patch of bramble flowering in direct sunlight for pollinators.

Scrub belt and pollinator hedge method:

2,100 tree species were planted, comprising:

- Goat Willow *Salix caprea*
- Wild Plum *Prunus domestica*
- Wild Cherry *Prunus avium*
- Crab Apple *Malus sylvestris*
- Hawthorn *Crataegus monogyna*
- Native Dogwood *Cornus sanguinea subsp. sanguinea*
- Holly *Ilex aquifolium*
- Elder *Sambucus nigra*
- Dog Rose *Rosa canina*
- Cherry Plum *Prunus cerasifera*
- Field Maple *Acer campestre*
- Alder Buckthorn *Frangula alnus*
- Buckthorn *Rhamnus cathartica*
- Hazel *Corylus avellana*



Planted pollinator hedge (February 2019)

Trees were planted in two areas:

- A 450m hedge along the northern boundary of the washland, planted in two staggered rows 50cm apart at five trees per metre
- A 120m scrub belt parallel with the hedge in the western end of the site, planted approximately 2m apart in a non-uniform arrangement. The wider spacing will allow trees to more fully develop to increase the yield of nectar-filled flowers as well as producing more fruits.

Each tree was protected with a 60cm Tubex Easywrap guard supported by a 90cm bamboo cane to protect against rabbits and hares, and application of herbicide at the base.

Scrapes in slopes method: Steep-backed scrapes will be dug out and material placed at the back of the scrape on top of the slope to increase surface area of steep bare bank. Scrapes to be 2m wide (2m deep into slope) and to a maximum height of 2m.

Hibernacula method: Excavate two approx. 0.6 m³ pits, fill with stone and form mound so that stone depth below ground is equal to height of stone pile above ground. Cap stone with excavated soil and create a dome shaped mound but leaving access to crevices around the edges.

Project outcome: To substantially improve the washland for pollinators in 5 years whilst maintaining its use as a Flood Storage Reservoir and its existing County Wildlife Site interest. Phase 1 (2018) complete and phase 2 started in February 2019. It is hoped that many of the plug plants and sown yellow rattle will flower in summer 2019. This increased diversity of flowering plants will directly benefit pollinators and some of the established trees are likely to flower by the following spring.