

We created a great butterfly meadow from an unpromising beginning

Is it possible to create a species-rich meadow on an area of relatively fertile grassland? The short answer to this question is yes, but it has taken 10 years to achieve the desired outcome at Ness Botanic Gardens in South Wirral. Species-rich wildflower grassland has been created as a habitat for butterflies, moths, wild bees, honey bees and a wide range of other invertebrate fauna plus habitat for birds, small mammals and larger mammals such as rabbit, hare, fox, stoat and badger, that use the meadow as a foraging area.

The Ness Gardens wildflower meadow sprang into life in April 2008 when the majority of an area of species-poor rough grassland overlooking the Dee Estuary, more than 1.5 hectares in area, was ploughed to a depth of up to one metre (inverting the whole soil profile) bringing infertile sandy subsoil to the surface. A Bovlund mouldboard forestry plough was hired from Landlife at the National Wildflower Centre to do the job. Ploughing was undertaken in order to create a suitable habitat for the establishment of meadow wildflowers that would thrive for decades to come. This was successful because soil inversion revealed a soil low in phosphate and mineral nitrogen which reduced the competitive dominance of vigorous grasses such as perennial ryegrass, cocksfoot and Yorkshire fog.

Before ploughing commenced an expert archeological study was undertaken and this concluded that there were not any significant artifacts present.

The newly established species-rich grassland, in summer 2008, provided a spectacular display of cornfield annuals such as cornflower, corn marigold and corn chamomile. In subsequent years a much wider variety of plants have established, flowered and dispersed seeds and a total of 125 species have been recorded by an enthusiastic group of volunteers. Important pollen and nectar source plants present include red and white clover, common knapweed, musk mallow, bird's-foot trefoil, yellow rattle and ragwort (not allowed to become too abundant).

The meadow is now a valuable habitat which supports a wide range of insects such as wild and honey bees, butterflies, moths, spiders and beetles. Our volunteers have recorded 20 different species of butterfly including the scarce wall brown and also small copper, small skipper and common blue. The most abundant species in our meadow over 10 years are typical grassland butterflies, gatekeeper, meadow brown and small skipper. Relatively common are small white, orange tip, speckled wood and common blue. The meadow is adjacent to an old diverse hedgerow (the field boundary is the same as in the 1846 Tithe map) and also a small copse which accounts for the frequency of Speckled Wood. Abundance of common blue has increased in recent years probably helped by a parallel increase in the abundance of yellow rattle (seed originally introduced from a mix of Wirral SSSI hay meadow and Shropshire SSSI hay meadow sources) which has considerably suppressed the

growth of grasses and created large patches of short vegetation in which bird's-foot trefoil thrives.

Also recorded regularly but less abundant, are green veined white, large skipper, comma and red admiral. Small tortoiseshell and peacock are frequently seen nectaring on fringing patches of bramble and creeping thistle when flowering and patches of nettle feed larvae of these species.

We were excited when we first recorded ringlet in 2015 which was the year when there were other sightings in Wirral for the first time. A few individuals of ringlet appeared again in 2016 and 2017 (5 recorded) in the same local patch of the meadow which suggests that we may have a small breeding population. Close to the meadow in 2012 we planted five trees of alder buckthorn with the intention of encouraging a breeding population of brimstone and so far have been rewarded with three records in 2015 and three in 2016 but no finds of larvae to date.

The wildflower meadow grassland strongly enhances the existing key role of Ness Botanic Gardens as an important high biodiversity hot spot in South Wirral. The meadow is sustainable because it is managed annually with a hay cut and baled in mid to late August and this is followed by one or two passes of a disk harrow in September, sufficient to cut up the grassland and simulate aftermath grazing by cattle which creates sites for the establishment of wildflower seedlings. Monitoring of butterflies and wild bees is undertaken regularly by our volunteer group between April and October on a fixed route.

The creation of the meadow was possible due to a generous gift of £10,000 from the Friends of Ness Gardens which covered the cost of inversion ploughing and British native wildflower seeds which were sown on the area. This year the group has commenced meadow creation on a new half-hectare site at Ness with a thin, more acidic soil (pH 4.9 to 5.7) but without soil inversion ploughing. Time will tell whether we can create a meadow flora which will support much greater diversity of butterflies.

This Case study is reported by the Volunteer Wildlife Conservation team at Ness Botanic Gardens.