Biodiversity at Treborth Botanic Garden

Treborth Botanic Garden is a haven for biodiversity, from native plant species in our woodland and meadow plots, 165 species of fungi, many species of marine, woodland and garden birds, breeding red squirrels and a heronry in the woodland, a plethora of small mammals and orders of invertebrates.

Meadow Plots

A lack of agricultural disturbance since the fifties whereby the 6 acres of Treborth's grounds **had experienced no artificial fertiliser, nor herbicide nor plough,** began an important tradition continued to the present day of managing much of the field area at Treborth as meadow plots, cut just once or twice per year and in the meantime yielding an attractive floral display with all its attendant insect and other animal life. These plots contain over 150 native plant species as well as hundreds more taxa of fungi and invertebrates and as such are one of the most diverse parts of the botanic garden.

This focus on meadows reflects conservation concern for natural grasslands throughout Wales, and indeed the British Isles. The decline of the traditional hay meadow has been widely highlighted and here in Wales has resulted in significant losses of diversity in plants, fungi, birds and insects. One of the prettiest grassland plant species, Meadow Clary (*Salvia pratensis*) is now officially extinct as a wild plant in Wales, dying out in its final site, in Monmouthshire, this year. Through Trevor Dines, PlantLife Officer for Wales, Treborth acquired seed a few years ago from the SE Wales site and the resulting plant, which flowers reasonably strongly on the rock garden, is one of the most precious specimens we have in our conservation collection. We also grew 24 seedlings on which were transported down to their original site in Monmouthshire in 2015 as part of the *Salvia pratensis* conservation project with National Botanic Garden of Wales, Bristol Zoo and Natural Resources Wales.

Woodland & SSSI

The woodlands at Treborth Botanic Garden cover approximately 16 hectares and occur at altitudes ranging from High Water Mark to 40 metres asl. The site is notable for the extent of shoreline (1.5k) which is directly fringed with high canopy forest, an uncommon landscape feature in Wales.

There are at least eight distinct plant communities represented in the woodlands at Treborth including an ancient woodland mixed ash-oak SSSI, a fragment of ash woodland atop a limestone outcrop, 1950's mixed conifer plantation, mixed oak-ash-sycamore woodland, calcareous birch-willow and high canopy mature oak with birch, ash and willow and an area of birch regeneration, including yew and whitebeam.

Approximately one third of the botanic garden woodland is a Site of Special Scientific Interest (SSSI), of which just over one hectare is regarded as Ancient Woodland comprising mature, 30 metre high oak (*Quercus petraea*) and ash (*Fraxinus excelsior*) forming a distinct square block bounded by well-defined banks and ditches several centuries old. This area of woodland appears on the first edition (1837) of the Ordnance Survey maps of the area and contains a moderately rich woodland flora including early purple orchid (*Orchis mascula*), wild spindle (*Euonymus europaeus*), primrose (*Primula vulgaris*), sweet woodruff *(Galium odoratum*), dog's mercury (*Mercurialis perennis*), large expanses of wood anemone(*Anemone vulgaris*), bluebell (*Hyacinthoides non –scripta*), great wood-rush (*Luzula sylvatica*) and soft shield fern (*Polystichum setiferum*.) Happily this woodland is also free of invasive alien species

Red Squirrels

Red squirrels were first discovered in the gardens having crossed from Anglesey in 2009. There is evidence that they have bred in the gardens - and in 2013/14 we obtained some lovely pictures of a lactating female in the woodland. There have been some student projects focussed upon hair tubes as a means of monitoring red squirrel distribution in the garden and also investigating what types of disease risk squirrels may face from other rodents. With such geographical proximity to Anglesey, it is imperative that the gardens are kept grey squirrel free. The new EU funded Life 14 project, Red Squirrels United will give us a three year window within which to try and eradicate grey squirrels from Bangor.

Biodiversity Conservation Projects

Wych Elm Project

Natural Resources Wales (NRW) has commissioned Treborth Botanic Garden (TBG) to propagate material from mature wych elms on and adjacent to the Allt y Benglog National Nature Reserve (NNR) in Meirionydd. The mature elms support a rare lichen: *Biatoridium monasteriense,* which is currently the only known site for the species in Wales.

The purpose of the project is to try to ensure that a suitable substrate continues to be available within the NNR for the lichen to colonise in the future. The 'mother tree' for the lichen blew down several years ago and has been righted and continues to support the lichen, but is vulnerable in the medium to long term. Two further trees downstream have been identified as supporting the lichen. Only two other mature wych elms are known to exist within the site, but they do not currently seem to support specimens of *B. monasteriense*.

TBG proposes to propagate material from the mature elms using several appropriate techniques:

- Hardwood cuttings — to be collected in winter
- Softwood cuttings — to be collected in summer
- Air layering — summer
- Seed — seed to be collected when ripe (probably May)

The preferred techniques are cuttings / layering as these will produce trees genetically identical to the parent trees, increasing the likelihood of producing a suitable substrate for the lichen.

Wild Cotoneaster (*Cotoneaster cambricus)*

Wild Cotoneaster (*Cotoneaster cambricus)* is also known as the Great Orme Berry or reigafal (rock apple). It has attractive grey-green oval leaves that are woolly beneath and measure 15-40mm. Pink-white flowers around 3mm in diameter appear from April to June in clusters of 2-4. The berries are small (5-8mm across) and bright orange-red in colour, resembling a miniature apple. The Great Orme is the only known locality for this plant in the UK where it grows on isolated and exposed cliff ledges.

It was originally thought that this plant may be *Cotoneaster intergerrimus*, which may have been introduced to the UK. However recent genetic evidence from Royal Botanic Gardens, Kew has shown it to be a native species in its own right, *Cotoneaster cambricus*. When the plant was first recorded in the eighteenth century, it was described as being widely distributed at the locality but by 1978 it had declined to six individuals. Today the population has since been supplemented by the introduction of new plants grown in cultivation.

As well as being listed as a species in the Conwy Local Biodiversity Action Plan *Cotoneaster cambricus* is also designated as a UK Biodiversity Action Plan species – highlighting the need for action to conserve this species.

Wild Cotoneaster plants have been sent to Kew, Ness and Treborth Botanic Garden to maintain specimens of the plant outside of the Great Orme. Our specimens are located on the top limestone end of the rock garden where is grows in free-draining, calcareous substrate.

Click here to find out more about Cotoneaster cambricus Species Action Plan:

http://www.conwy.gov.uk/upload/public/attachments/48/WildCotoneasterv2.pdf

Great Orme Conservation Project

Great Orme Plant Conservation Project initiated by STAG in 2012 was established to conserve and celebrate some of the Great Orme's most special flora. The predominant vegetation of the Great Orme is limestone grassland. However, pockets of heathland exist where soil of glacial origin has accumulated. Areas of limestone pavement, scrub and woodland occur as well as high sea cliffs. The grasslands, heathlands and sea cliffs are both nationally and internationally important and support rich communities of plants, insects and birds. Several species are of national significance. A number of Priority Species and Habitats of the UK Biodiversity Action Plan are found on the site.

Most of the Great Orme is designated a Special Area of Conservation (SAC) as it contains habitats and species which are considered to be rare or threatened within Europe. It is also a Site of Special Scientific Interest (SSSI) and is included in both the Nature Conservation Review and Geological Conservation Review, indicating its national importance.

By carefully upgrading the plant husbandry of all the relevant taxa we presently grow we have constructed a large limestone pavement within the present rock garden to accommodate some of the Orme's special lime-loving calcareous grassland species.

Welsh Heritage Fruit Trees

We have recently planted a Welsh Heritage Fruit orchard, to teach and inspire the general public about native fruit trees in Wales. These include Denbigh Plum, Bardsey Apple and Cariad Cherry. These are rare and special varieties that have a long interesting history in Wales. Especially the Bardsey apple that if found nowhere else in the world. This variety of apple is believed to date back to the 13th Century when it was grown by monks.