CONSERVATION IN ACTION - HABITAT CREATED & ENHANCED FOR SCARCE BROWNFIELD INVERTEBRATES IN THE TEES VALLEY

Brownfield sites are increasingly being recognised as being important for their flora and fauna. The UK Biodiversity Action Plan (UK BAP) lists habitat types and species which are of priority for conservation. One of the priority habitat types, interestingly titled 'open mosaic habitat on previously developed land', is a type of grassland with a short, open structure. It is associated particularly with brownfield sites. In the Tees Valley there are many currently operating industrial sites which have significant amounts of open mosaic habitat in areas which are relatively undisturbed. There are also two Tees Valley Wildlife Trust nature reserves (Gravel Hole, near Norton and Maze Park, beside the A19 flyover at Middlesbrough) where this habitat type is present.

Open mosaic habitat is very important, particularly for the range of invertebrate species which benefit from the variety of microhabitats which exist in such areas, ranging from open, bare areas where the adults bask in the sunshine to flower-rich areas where they feed. Groups such as bees, beetles, butterflies, flies, moths, spiders, snails and wasps are well represented on sites which have good quality open mosaic habitat. These groups are very important as environmental indicators, because they are often very sensitive to changes in their habitat, both positive and negative. Consequently having a healthy environment is beneficial to animals such as bats, birds and small mammals which use invertebrates as prey species. Many invertebrate species are also in decline nationally, such as the Dingy Skipper and Grayling butterflies, for which brownfield sites are becoming an increasingly important haven.

Dingy Skipper

Grayling

A project which aims to create and enhance habitat for brownfield invertebrates over a total area of around eight hectares on four sites in the Tees Valley is now well underway. This project is being managed in partnership between Buglife (the Invertebrate Conservation Trust); the Industry Nature Conservation Association (INCA); the Tees Valley Wildlife Trust; Lucite International and BP CATS. Two of the sites (BP CATS at Seal Sands and Lucite in Billingham) are industrial sites, while the remaining two are the Tees Valley Wildlife Trust reserves.

Some parts of the four sites already have excellent areas of open mosaic habitat, however, there are significant parts which have a dense cover of species-poor grassland that is dominated by competitive grass species. Although these areas offer good cover for species such as the Brown Hare and Grey Partridge, the project aims to enhance them to enable a greater diversity of flora and fauna to flourish.

Key to the project is the soil type, as it is this which determines the flora which can be supported. A well-drained soil with a low nutrient content encourages growth of a profusion of different and often interesting wild flower species, many of which are a food source for the larval and adult stages of a variety of insect species. Such soil also discourages growth of large tracts of competitive tall grass species which soon swamp the more interesting plants.

Rank grassland

Weathered slag

Weathered blast furnace slag has been extensively used in industrialised areas across the Tees estuary to create areas of hard-standing. Such areas, if left undisturbed, can become very valuable for wildlife. This is because the slag contains calcium silicate which behaves a little like limestone. In areas where the substrate is rich in slag plant communities often develop which comprise of a diverse range of lime-loving species. These in turn support a range of invertebrates.

In light of this knowledge several approaches were used over the four sites to enhance existing out of condition habitat or to create new habitat. This took place during glorious weather in February and March of 2011. The approaches were:

- **BP CATS**: Years of ungrazed accumulation of vegetation have formed a nutrient rich surface layer over the low nutrient sandy soil which is present over much of the site. This has allowed competitive grass species to take over. The technique used was to strip back the top layer comprising of 15 - 20 cm depth of enriched soil to expose the low nutrient soil.

Starting habitat enhancement at BP

Undulating sandy surface created at BP

The stripped material was fashioned into a series of south-west facing crescent-shaped bee banks. These warm up quickly in the morning sun and are excellent as habitat for specialised solitary bees and wasps which use it to form burrows. In addition to the bee banks the stripped areas have been deliberately moulded using a mechanical digger to create an undulating surface. This provides a wide range of microhabitats for invertebrates, with a range of slope and aspect. Ironically mechanical diggers might not at first glance appear to be an essential tool for a conservation project such as this, but a skilled digger operator works wonders in creating the surface required!

- **<u>Lucite and Maze Park</u>:** Several ecologically poor areas on these sites where a dense cover of tall grasses prevailed were chosen for work to take place. The soil in much of these areas was clay-based. Enhancement took the form of habitat creation, again by mechanically scraping away the top 20cm layer of enriched soil, using this material to construct an undulating surface (with bee banks at Lucite) before filling the stripped area with 20cm depth of locally sourced weathered blast furnace slag. At Lucite sand was used to dress the slag-covered bee banks to make them more suitable for use by a range of specialised solitary bee and wasp species which construct their individual burrows in this material. Other plots using sand and pulverised fly ash were trialled at Lucite. These substrates, which were also locally sourced, are recognised as being highly beneficial in habitat creation projects. They have a different composition which will result in a variety of plant communities developing, giving rise to a range of different microhabitats available for invertebrates to use.

Habitat creation at Lucite

Newly created habitat with bee bank at Lucite

The Work Team at Maze Park

At BP CATS, Lucite and Maze Park the newly managed and created areas will be allowed to vegetate naturally with the range of wild flowers that already occur on more ecologically diverse parts of each of the sites. As nature often takes its time this may take several years, but it is hoped that the final result will very much enhance the sites for their value to biodiversity.

- **<u>Gravel Hole</u>:** The Tees Valley Wildlife Trust's reserve near Norton used to be a gravel quarry. The site is no longer a working quarry and has since been in filled with a well-drained low substrate which over a number of years has produced some lovely grassland containing a range of different wildflowers. The work here involved removing hawthorn scrub which was starting to encroach these areas. This should enable more habitat to be available for interesting brownfield invertebrates and plants such as orchids to continue to flourish.

Common Spotted Orchid

The work carried out across the four sites will help to create a network of habitat ‘stepping stones’ across the lower Tees Valley area which will allow previously isolated pockets of habitat to become interconnected and therefore to be more ecologically healthy. This landscape-level approach to conservation is very important in today’s world and in the case of the Tees estuary allows both economic needs and the needs of biodiversity to be satisfied.