Urban Biodiversity: Successes and Challenges: Biodiversity on bings

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ABSTRACT

The West Lothian oil-shale bings are important havens of biodiversity at both a local and a national (UK) level. They are examples of true primary succession and provide a refuge for locally rare species, both plant and animal, in an urban/ industrial/ agricultural landscape making them important to conservation and increased local biodiversity.

THE SITES

The oil shale bings of West Lothian are piles of industrial waste; a by-product of Scotland's first oil industry in the 1850s. Historically they are of great importance (Harvie, 2010) and given their history it is perhaps not surprising that Greendykes and Five Sisters are now protected as designated Scottish Industrial Heritage Sites. Other bing sites are protected for more remarkable reasons. Addiewell North is a Scottish Wildlife Trust Nature Reserve, Oakbank is part of Almondell Country Park and all of the bings together make up a major habitat in West Lothian's biodiversity plan (Harvie, 2005a).

THE FLORA

The West Lothian shale bings are of great ecological and scientific importance. They are examples of a distinctive and rare type of post-industrial waste that is unique within Britain. They are also examples of sites of primary succession. Primary sites are only found naturally on sand dunes, glaciers and volcanoes; all of which are very uncommon in Britain. Habitats within the bings vary from almost bare substrate to semi-natural grassland, heather scrub and pioneering birch woodland. Differences in the age and size of the bings, how they have been managed, available seed sources, substrate type and soil chemistry all contribute to the habitats and their vegetation. They provide refuges for a wide range of animals and plants that are under increasing pressure in the surrounding area from farming and urban development. The diversity of plant species on the bings is considerable and the sites are home to more than 350 plant species (Harvie, 2005b). This is more than have been recorded on the Ben Nevis SSSI

Some of the bings support several plant species not found elsewhere in the county. *Buxbaumia aphylla* Hedw. is a rare moss in Britain that has been recorded in sizeable populations at Addiewell bing for more than 35 years. A small population of the montane lichen *Stereocaulon saxatile* is found on Addiewell bing and extensive colonies of three related and locally rare species *S. leucophaeopsis*, *S. nanodes* and *S. pileatum* are found on Philpstoun bing. Faucheldean bing is noted for colonies of stag's-horn clubmoss and alpine clubmoss (*Lycopodium clavatum; Diphasiastrum alpinum*), species that are more usually associated with montane habitats, and renowned for a diverse orchid population including broad helleborine, great butterfly orchid and early purple orchid (*Epipactis helleborine; Platanthera chlorantha; Orchis mascula*). On the plateaued summit of Greendykes a species poor calcareous grassland has established from self seeding species above the bare steep sides of the bing. Genetically distinct birch (*Betula pendula*) woodland has established naturally at the base of the tiny bing at Mid Breich, complete with many of the associated ground flora and bryophyte species of long established native woodlands. There are also exotics in the form of garden escapes that are well established on many bing sites. Opium poppies (*Papavar somniferum*) grow in profusion on more than one bing. Old elder trees growing on many of the bings are an astounding source of epiphytic lichen and moss diversity. Almost half of all the bryophytes that are recorded in Britain are present in the Lothians and shale bing habitats are identified as important to the bryophyte flora (Harvie, 2007).

THE FAUNA

Locally rare animals are also often seen, especially on early morning visits. These include hares, red grouse, badgers, sky larks and common blue butterflies (*Lepus europaeus; Lagopus lagopus scotica; Meles meles; Alauda arvensis; Polyommatus icarus*). The bings are home to foxes (*Vulpes vulpes*), often seen in family groups, suggesting that many unobserved smaller fauna are also inhabiting the sites. Insect records from Addiewell bing include ringlet butterfly (*Aphantopus hyperantus*), very rare in central Scotland, and a first recording of ten-spot ladybird (*Adalia decapunctata*) in the county. Additional butterfly species recorded at Faucheldean include green-veined white, small heath and common blue (*Pieris napi*; *Coenonympha pamphilus; Polyommatus icarus*). Forty seven species of bird were recorded at Addiewell during 1997, including 30 species with permanent breeding territories and nine local habitat indicator species, such as the bullfinch, kestrel and yellowhammer (*Pyrrhula pyrrhula; Falco tinnunculus; Emberiza citrinella*) (Harvie, 2007).

VULNERABILITY

The destruction and landscaping of shale bings is a severe threat to some of the rarer plant species, both locally and nationally. Of the 27 bings extant when shale extraction ceased in 1962 only 19 remain.

Many of these are slowly being demolished and the continued, recent loss of sites like Philpstoun (to industry) and Niddrie (to housing development) can only be detrimental to the biodiversity of the county of West Lothian.

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