



Managing Aggregate Sites for Invertebrates Andrew Whitehouse

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Buglife - The Invertebrate Conservation Trust

Aggregates and Biodiversity

The aggregates extraction industry can play an important part in conserving habitats and species. Many of the UK's best nature conservation sites are on old extraction sites (including over 600 SSSIs), and as active sites come to the end of their working lives they present great opportunities for creating habitats of high value invertebrates and other wildlife.

The processes of extracting aggregates can create valuable habitats such as bare ground and wildflower-rich open vegetation. These habitats can support many rare and scarce species, including many which are listed on the UK Biodiversity Action Plan (BAP) such as the Five-banded weevil wasp (*Cerceris quinquefasciata*), the Heath tiger beetle (*Cicindela sylvatica*), and the Dingy skipper butterfly (*Erynnis tages*).

The features that make aggregate sites so attractive for wildlife such as bare ground, wildflower-rich grassland, and ponds were once common in the wider countryside. Over time our intensified management of the countryside has resulted in these habitats being lost. This has led to many very rare and scarce invertebrates becoming increasingly restricted to aggregate sites.

The aggregate and mineral extraction industries can make a significant contribution to the UK Biodiversity Action Plan (UKBAP) through the sensitive management and restoration of sites. The UKBAP identifies over 1000 species and 65 habitats which are considered to be under threat in the UK or of particular conservation importance. Species and Habitat Action Plans (SAPs and HAPs) focus and guide the work required to address their decline. There is enormous opportunity to deliver UKBAP targets through the aggregates industry; however the full potential of sites is often missed.

Invertebrates are biodiversity!

Invertebrates are perhaps the group that has benefited the most from the activities of the aggregates industry, but are also the most neglected when it comes to aggregates planning and site management. If we are going to conserve biodiversity we must give invertebrates a higher profile. Invertebrates comprise over 65% of all species on the planet; and there are more than 32,000 terrestrial and freshwater species in the UK alone - many of which are of conservation concern.

Opportunities

Site restoration post-extraction provides a major opportunity to achieve UKBAP targets for habitat creation. Restoration is most effective where the primary end use is nature conservation; however, through careful planning wildlife can be provided for alongside other end-uses such as public amenity and conserving geodiversity.

There are plenty of opportunities to accommodate wildlife within active sites. Many invertebrates readily colonise sites, especially if areas are left undisturbed for sufficient periods. Invertebrates can benefit from relatively small patches of suitable habitat within sites. Making space for wildlife need not be high cost or inconvenience normal operations.

Bare ground is good

One of the more neglected and under-appreciated habitats of high value to invertebrates are open mosaics of bare ground and early-successional vegetation which develop naturally following extraction. Bare ground is essential to thermophilic (warmth-loving) species such as tiger beetles, and provides nesting sites for mining bees and wasps. Super-abundant wildflowers are characteristic of early-successional habitats – these provide nectar and pollen for bees, shelter and food for phytophagous (plant-eating) invertebrates, and prey for predators such as wasps. This habitat type has recently been adopted as a UKBAP Priority Habitat 'Open mosaic habitats on previously developed land'. Unfortunately these habitats are often not recognised as being of high biodiversity value and are destroyed through site restoration; perhaps most disappointing is when this happens in the name of nature conservation. Where possible these open mosaics should be retained and left to natural colonisation and succession by plants and animals.

Important groups/species: ground nesting bees and wasps, flies (inc. robberflies, bee-flies), ground beetles and tiger beetles, spiders, butterflies and moths (UKBAP species: Dingy skipper, Grizzled skipper, Small blue, Grayling, Silver-studded blue, Chalk carpet moth).

Do less, achieve more

There is a perception within the industry, planning, and amongst the general public that site restoration should be intensive and provide instant results. But nature takes time, the best results for biodiversity are achieved when working with nature, not forcing it or attempting to leapfrog stages of habitat succession. Natural regeneration from bare mineral soils can provide habitat of much higher ecological value, and which is more appropriate and suited to the site. It should be noted that this is also a low cost option; restoring a site by regrading slopes, adding topsoil, seeding or tree-planting, requires considerable investment of time, effort and money. From a purely conservation perspective, there is no justification expending scarce resources on restoration unless the outcome is going to be significantly more advantageous for biodiversity than if a site is left to natural regeneration. Current evidence suggests that this is the case for the majority of sites.

Of course, abandonment is not a realistic option - some restoration work and landforming may be necessary, for example to mitigate for health and safety risks. However, quarry restoration should aim to retain 'untidy' features like cliffs, hummocks and hollows, and provide continuity of the early-successional habitat conditions for invertebrates at the same time as managing landscape and safety issues.

All sites are different, and there is often a case for some management, perhaps to guide natural regeneration towards a target habitat, to control non-native or invasive plants, or where natural colonisation is unlikely due to the isolation of a site. The key is to work with natural processes rather than forcing them to late successional habitat like woodland.

Dig ponds

Another new UKBAP habitat of high value to invertebrate conservation are ponds. As a general rule, good ponds for invertebrates tend often to be small, shallow (< 2m deep), and not infrequently seasonal. Unfortunately, ponds dug for conservation in aggregate sites tend to be large, deep and permanent.

Some general principles of pond creation:

- Clean water is key.

- Complexes of many small ponds are better than single large ones.
- Variations in depth and shape will increase habitat complexity and biodiversity.
- Wide, shallow, convoluted margins provide further interest.
- Planting is not necessary, but some management may be (for example, to control bullrush).
- No fish!

Important groups/species: flies (inc. soldierflies, crane flies), water beetles, aquatic bugs (heteroptera), snails, dragonflies and damselflies.

Best Practice Guide

In March 2008, Buglife will be publishing a best practice guide to managing aggregate sites for invertebrates. This guide will provide information on how to manage sites both during and after extraction to maximise their biodiversity potential. It aims to establish some basic principles for site restoration, and highlight habitats of high value to conserving invertebrate biodiversity.

This guide is aimed at all stakeholders including: minerals planners, restoration or estates managers from industry, ecological consultants, statutory bodies and non-governmental organisations.

For more information and to order a copy please visit our website:

<http://www.buglife.org.uk/conservation/currentprojects/bringingagsitestolife.htm>

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