

11.10 MIXED HABITAT AND STRUCTURAL MOSAICS

In many places habitats occur as mosaics and contain structural variation in the vegetation. Sites may contain habitats that are individually or collectively of conservation value, but do not necessarily satisfy specific habitat selection guidelines. Sites may also support an excellent and/or highly varied structure between different habitats or within the same habitat that provides a range of micro-habitat niches that are valuable for invertebrate groups. These sites can make an important contribution to the local biodiversity value of an area. These guidelines aim to address:

- ❖ Sites containing a variety of habitats which individually fail to meet the relevant thresholds for Local Wildlife Site designation or which are not covered by specific guidelines elsewhere, but which are none the less important for their floristic or faunal value.

These habitats are often important for the range of habitat types, physical conditions and structural variation they provide.

Mixed habitat and structural mosaics may occur in a variety of semi-natural and artificial situations including,

1) Post-industrial sites on the following land types: -

- a) Railway cinder beds/tracks
- b) PFA Settlement lagoons
- c) Quarries and Mines
- d) Sewage works
- e) Derelict land
- f) Spoil tips and landfill sites

2) Former agricultural land, urban fringes or river corridors.

In many cases the animals and plants that appear on post-industrial sites are characteristic of early-successional vegetation communities but over time the vegetation can be expected to succeed to more permanent communities such as grassland, underscrub and/or scrub and woodland (Shaw, P.J.A. 1992). However, in some cases these successional processes may be very slow due to a combination of the extreme physical conditions imposed by the substrates of some sites and/or the activities of grazing animals such as sheep and rabbits.

Post-industrial sites often become quite floristically and faunally diverse within a relatively short time. Plant communities commonly include a range of typical grassland species together with pioneer and ruderal plant species. Orchid species can sometimes become a significant feature.

In some localities, especially where the substrate is calcareous, the communities can over time approximate to ones of recognised nature conservation importance and make a significant contribution to the extent of those habitats in the county.

Post-industrial and semi-natural mosaic sites are often very important for lower plants (post-industrial especially), invertebrates, birds and small mammals. Invertebrates in particular can often require different parts of vegetation mosaics and structure at different stages of their life cycles or for daily feeding or cover. Such variation for invertebrates is important to their survival. Structural heterogeneity can be considered on different scales. The more complex the vegetation structure, the greater the niche diversity and therefore, the greater the number of insects likely to be present (Speight. M.R *et al*, 1999). This includes neglected or unmanaged habitats, which can also be of conservation importance for invertebrates.

Invertebrate ecologists are aware that if a site supports varied structural features then it is worthy of survey for its invertebrate fauna and is likely to support a more diverse range of species than a site with homogeneous vegetation. For example, a rough possibly unmanaged grassland supporting tussocky grasses, bare ground, scrub and varied sward height is likely to be more diverse for invertebrates than a grassland that is grazed so that sward height is constant. At a smaller scale, spiders, for example, use specific features of vegetation for web spinning, construction of cocoons, hunting and aerial dispersal. It is the combination of niches or microhabitats and structure within a localised area that is important for invertebrates as opposed to large uniform habitat blocks. This variation can be equally or more important than the juxtaposition of different habitats within a site.

Structural complexity is generally a function of vegetation architecture, although it may also refer to substrate architecture. Complex vegetation architecture may be an attribute of a dominant plant species (e.g. the densely woven structure of *Chara* beds in open water). It may also be as a result of different species growing together, for example where small sedges, spike rushes, rushes and mosses form a close mosaic in some types of fen and water margin vegetation. In almost all standing water habitats the vast majority of macro-invertebrate biomass is associated with richly vegetated shallow water margins.

General application

A habitat mosaic can broadly be defined as an area where a range of contiguous habitats occur in transition with one another often displaying considerable ecotone habitat gradients and often at a fairly fine scale. By this definition a habitat mosaic cannot be formed by the presence of distinct habitats that happen to occur adjacent to each other i.e. an area of woodland adjacent to a field and a stream.

Habitat Mosaic Selection Guidelines

Sites that meet one or more of the following guidelines will be eligible for designation as a Local Wildlife Site.

Mh1 Sites of 0.25 ha or more in size that support a combination of two or more individual habitats that are of borderline Local Wildlife Site quality and which occur in transition with one another .

Application

This guideline should be applied to any area that supports a mosaic of semi-natural vegetation. Sites should support at least two habitat types that meet at least 80% of the relevant selection guidelines.

Justification

Typically mixed habitat sites will support different stages in vegetation succession. Often the individual habitat types that are part of the mosaic do not qualify as Local Wildlife Sites in their own right either because they are too small or because they do not support a sufficient number of indicator or character species. In combination, however, these habitat types can support a significant diversity of habitats and species that can make a significant contribution to local biodiversity and nature conservation objectives.

Mh2 Sites of 0.25 ha or more in size that support a mosaic of habitat types from those listed in Table 5 that collectively have a minimum habitat diversity score of 8 (or 6 in the Derby area).

UKBAP Habitat Action Plans – Open mosaic habitats on previously developed land

Application

This guideline should be applied to any area supporting semi-natural vegetation in combination with artificial habitats. For sites outside of the Derby area, reference should be made to the relevant Local Biodiversity Action Plan to identify whether the site makes an important contribution to the Plan's geographical area or National Character Area.

Justification

The combination of different habitat types in close proximity to each other and the gradation from one habitat to another often provides a much a higher diversity of niches for plants and animals than other sites that may be dominated by one particular habitat. These sites are particularly valuable for species that utilise more than one habitat type throughout the day and night for feeding, roosting and protection. The juxtaposition of some of these habitats can also be important for the survival of particular animal species that require two or more habitats at different times during their life cycle such as amphibians and a range of invertebrates. These habitat mosaic sites are often important reservoirs of biodiversity particularly in areas of the county where there is intensive land-use and/or a lack of sites of Local Wildlife Site quality for individual habitat types. Habitat mosaics are of particular significance within the Derby area. The lower threshold score for the Derby area sites reflects their often small size and the consequent limitations for a diversity of features within these sites.

Mh3 Sites which meet the definition and criteria for field recognition of the UK BAP Priority Habitat - Open Mosaic Habitats on Previously Developed Land

Application

This guideline should be applied to any area which meets the published criteria for this UK BAP Priority Habitat (JNCC, 2010) including any subsequent updates.

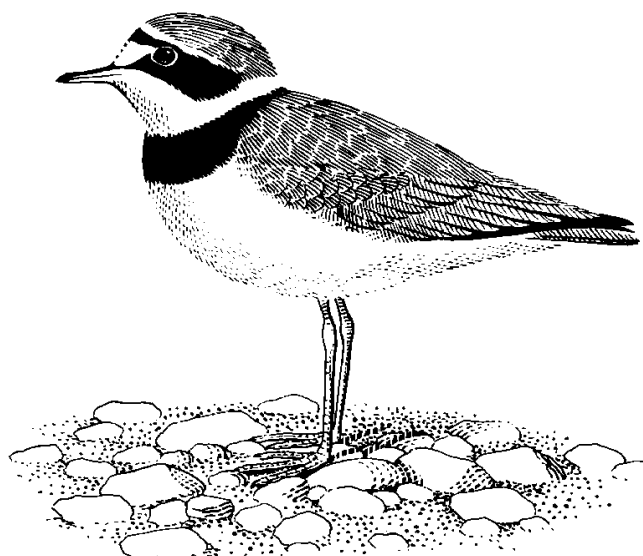
In summary the 5 criteria are as follows:

1. The area of open mosaic habitat is at least 0.25 ha in size.
2. Known history of disturbance at the site or evidence that soil has been removed or severely modified by previous use(s) of the site. Extraneous materials/substrates such as industrial spoil may have been added.
3. The site contains some vegetation. This will comprise early successional communities consisting mainly of stress-tolerant species (e.g. indicative of low nutrient status or drought). Early successional communities are composed of (a) annuals, or (b) mosses/liverworts, or (c) lichens, or (d) ruderals, or (e) inundation species, or (f) open grassland, or (g) flower-rich grassland, or (h) heathland.
4. The site contains unvegetated, loose bare substrate and pools may be present.
5. The site shows spatial variation, forming a mosaic of one or more of the early successional communities (a)–(h) above (criterion 3) plus bare substrate, within 0.25 ha.

Justification

The 2005-08 review of the UK BAP resulted in the inclusion of this habitat on the list of UK BAP Priority Habitats. The Local Wildlife Site selection guidelines aim to capture all UK BAP Priority Habitats.

Table 5 Habitat Mosaics	
Habitat	Score
Unimproved neutral grassland	4
Unimproved calcareous grassland	4
Unimproved acid grassland	4
Ancient semi-natural woodland	4
Wet heath or mire	4
Marsh or fen (species-rich)	4
Swamp	3
Dry heath	3
Open water (running or standing)	2
Temporary water	2
Semi-improved grassland (acid, neutral or calcareous)	2
Secondary semi-natural woodland	2
Ruderal/bare ground communities	2
Rush-pasture	1
Rough grassland	1
Marsh or fen (species poor)	1
Scrub	1
Tall herb open vegetation	1
Other habitat types covered by these guidelines	1



Little Ringed Plover