10.9 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 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 fairy 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 Wildlife Site.

Mh1 Sites of 0.5 ha or more in size that support a combination of two or more individual habitats that are of borderline Wildlife Site quality.

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 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 5 ha or more in size that support a mosaic of habitat types from those listed in Table 5a that collectively have a habitat diversity score greater than 8 and make a significant contribution to the local biodiversity value of the Natural Area in which they are situated.

Application

This guideline should be applied to any area supporting semi-natural vegetation in combination with artificial habitats. 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 Natural 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 Wildlife Site quality for individual habitat types.

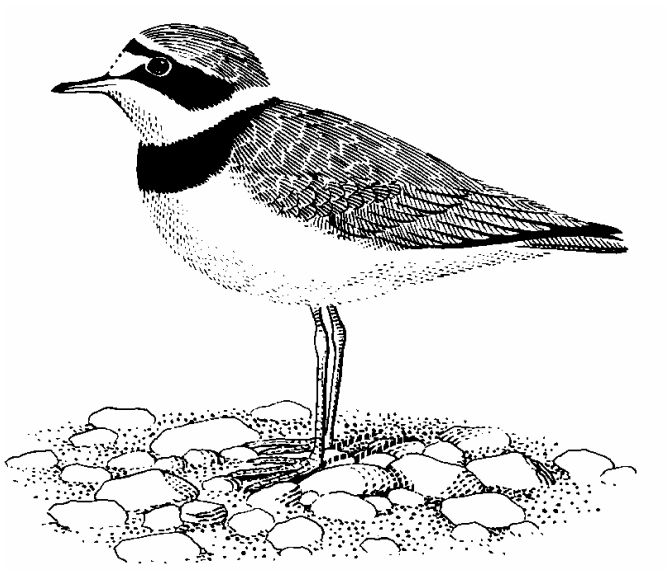
Mh3 Sites of 5 ha or more in size that support features indicating high structural diversity as shown in Table 5b and make a significant contribution to the local biodiversity value of the Natural Area in which they are situated.

Application
This guideline should be applied to any area that supports a mosaic of habitats of varied structure. Reference should be made to the relevant Local Biodiversity Action Plan to identify whether the site makes an important contribution to the Plan's targets. Sites of borderline quality should support at least two habitat types that meet at least 80% of the relevant selection guidelines for the habitat types. This guideline should be considered in respect to the invertebrate assemblage guidelines to determine whether one or both are applicable. These sites will be identified in conjunction with an experienced invertebrate ecologist.

Justification
Varied vegetation structure is important to invertebrates in every aspect and at every scale (Kirby, P. 1992). This is often not recognised as a valuable component of the nature conservation resource. Large, complex and varied sites are likely to support a significant invertebrate fauna.

Table 5a 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
Dry heath	3
Marsh or fen (species-rich)	3
Rough grassland and/or rush-pasture	2
Scattered scrub	1
Open water/and or swamp (running or standing)	2
Semi-improved grassland (acid, neutral or calcareous)	2
Secondary semi-natural woodland	2
Marsh or fen (species poor)	1
Ruderal/bare ground communities	1
Single species dominated scrub	1
Other habitat types covered by these guidelines	1

Table 5b Features indicating structural diversity	
Dead wood	Scattered scrub
Old coppice stools	Grass tussocks
Woodland rides	South-facing slopes
Pollards	Steep slopes on banks
Sap runs on trees	Hummocky ground in old disused quarries
River shingle	Earthworks
Loose hard substrates (e.g. rubble, brick)	Varied sward heights from short open turf to bare ground or mud
Coarse tussocky grassland	Springs, seepages or pools
Temporary pools	Seasonally wet/damp area
Ditches	Water margins (marginal mud, silt or sand)
Rock faces / screes	Presence of ant hills
Ruts and hoofprints (with continuity over several years)	



Little Ringed Plover