Ecological Impact Assessment and Habitat Mosaics

Richard Bickers, from Chris Blandford Associates, highlights some challenges for evaluating open mosaic habitats on previously developed land as part of ecological impact assessments in England

In line with Commitment 5 of the IEMA EIA Quality Mark Scheme (which requires practitioners to undertake a “robust analysis of the relevant baseline”), good quality survey of existing site conditions are critical to the accurate assessment of ecological value within the EIA process.

In England, a core principle of the National Planning Policy Framework is to encourage the effective use of land by reusing land that has been previously developed (‘brownfield land’), provided that it is not of high environmental value. This means that planning needs to take account of issues such as the biodiversity value, which may be present on a brownfield site before decisions are taken. The National Planning Policy Framework aims to prevent harm to biodiversity assets from development by delivering at least no net loss of biodiversity, and achieving a net gain in biodiversity wherever possible.

Brownfield land can often have high ecological value despite the apparent limited environmental interest and neglected appearance of such sites. This is recognised in their identification as a Biodiversity Action Plan ‘Priority Habitat’ (or Habitat of Principal Importance) called ‘Open Mosaic Habitats on Previously Development Land’.

Whilst the distribution and nature of habitats within a potential development site can vary widely, some sites may support relatively few and homogenous habitats, comprising blocks of single habitat types (e.g. woodland or arable). However, some sites support mosaics of habitats, where a number of habitat communities occur together in close proximity, often with transitional habitats (ecotones) between them.

These can vary in scale from large or coarse grained to small or fine grained. This article is concerned primarily with finer grained mosaics, such as may occur within or adjacent to a development site. Such mosaics tend to reflect variation or heterogeneity in soils or substrate, topography, hydrology and/or management. Reflecting their intrinsic diversity, habitat mosaics tend to be species rich and can support a wide range of notable species.

For example, brownfield sites that have a history of industrial activities (such as quarrying and the tipping of waste materials) may support a wide range of fine grained habitat mosaics such as; bare or sparsely vegetated areas and other exposures; communities of mosses and lichens and of annual, ephemeral or other short-lived species, flower-rich grasslands; scrub and trees; and permanent or seasonal wetlands. These habitat mosaics often support species rich invertebrate assemblages, including rare or scarce species, as well as notable bird and plant species and reptile populations. However, habitat mosaics may also exist under more natural or semi-natural conditions where there is similar environmental heterogeneity or as a result of patchy disturbance events and successional processes.

During the Ecological Impact Assessment process, evaluation of habitat mosaics can present a number of particular challenges that are worthy of careful consideration as this tends to be less straightforward than for single habitat types. Although some general guidance is available, there is limited specific guidance on evaluating habitat mosaics (e.g. guidance for designating Sites of Special Scientific Interest or Local Wildlife Site do not provide specific criteria for evaluation of habitat mosaics). Evaluation based on the component habitats and species may not meet the thresholds for selection under the criteria for single habitats due, for example, to their small patch size.
It is therefore important to take a holistic view of a habitat mosaic’s value during this process, as the whole is typically greater than the sum of its parts.

Robust evaluation of dependent species and species assemblages is also important. Ensuring sufficient survey effort for invertebrates, for example, can be costly and time consuming due to requirement for multiple visits by experts for different species groups, sample processing and identification. There is also variability in the currently known status of invertebrate groups, with some being more comprehensive than others, and a number of Red Data Books and similar documents or lists are considered to be out of date. Additionally, guidance on criteria for evaluating invertebrate species and assemblages is not always available, although a number of methods (such as the Species Quality Index and Invertebrate Species-habitats Information System) can be used to help calibrate sites. Due to the uncertainties involved, evaluation can be complex and needs to involve experts. This is particularly important in order to meet Commitment 5’s requirement for the “assessment and transparent evaluation of impact significance”.

Habitat mosaics also present their own challenges in terms of mitigation in the context of Commitment 5’s requirements for “an effective description of measures designed to monitor and manage significant effects” of proposed development. For example, the need for compensatory habitat creation may arise in the event of habitat loss as a result of the development of brownfield land. In this case, it is important to incorporate the necessary environmental heterogeneity which gives rise to such mosaics in line with good practice guidance, particularly with regard to invertebrates. Managing retained and newly created habitat mosaics also requires careful consideration of the appropriate disturbance regimes (e.g. type, scale and frequency) necessary to maintain them. A flexible approach to habitat management informed by careful monitoring is also important.

In line with Commitment 5, it is crucial that high quality surveys and robust evaluations of habitat mosaics on brownfield sites are undertaken by experts to inform appropriate mitigation measures through the iterative Ecological Impact Assessment and project design process.


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