

HABITAT MANAGEMENT FOR BUTTERFLIES

Slide 1:

- In a 15-minute talk I only have time to outline some general principles of managing butterfly habitats, but first we need to understand the **ecological requirements of butterflies**.

Slide 2:

- Whilst adult butterflies need supply of nectar or other sources of nutrients this is rarely a limiting factor.
- Most studies show the **supply of larval hostplants is critical** (or host ant in the case of *Phengaris* butterflies). For many species, the hostplants must be growing in the right condition, either a **preferred growth form or microhabitat** which may in turn be dependent on the surrounding vegetation. In other words, only a subset of the hostplant population is suitable.

Slide 3:

- Most threatened butterfly species are **habitat specialists** and tend to be associated with a particular habitat type, such as unimproved grassland.
- The Marsh Fritillary is a good example which has just one main hostplant, Devil's-bit Scabious *Succisa pratensis*. Females select larger, more prominent plants on which to lay their egg batches which can support large numbers of larvae, although the larvae do eventually disperse to feed on other plants.
- It may seem an obvious point – but **management should therefore be geared towards maintaining, restoring or creating the specific habitat preferred by the species concerned**.

Slide 4:

- **Grasslands are the single most important habitat** with 57% of species utilising them, though woodlands and heath, fen or bog are important too.
- In Europe, most grasslands are semi-natural and therefore dependent upon management to maintain them. Agricultural intensification, through ploughing, fertilisers or pesticides is still a major threat and should be avoided otherwise such habitat will be permanently lost.

Slide 5:

- But **abandonment of traditional land management practices is actually considered the greatest threat** to butterflies in much of Europe.
- Abandonment can temporarily lead to increased butterfly populations, but scrub encroachment will mean breeding habitat is lost as open grassland turns to woodland.

Slide 6:

- Maintaining open grassland is therefore essential and is usually achieved by **maintaining active traditional pastoral systems**, including livestock grazing and hay cutting. Of course, the socio-economic conditions can have a significant impact on whether such pastoral systems survive.

Slide 7:

- **Restoration of abandoned grasslands** through scrub and woodland removal is **expensive** – it is more cost-effective to maintain existing grasslands.
- Nevertheless, **restoration of abandoned grassland habitat has proven to be very effective for butterflies** – providing mechanisms are in place to maintain such restored habitat.

Slide 8:

- In grasslands, the specific habitat requirements of butterfly larvae usually translate into a preference for a particular sward height.
- Some species are associated with short vegetation, others longer vegetation and some require a mosaic of vegetation.
- **Management should therefore aim to provide a range of conditions** often based around traditional land use patterns – either within a site or across a landscape

Slide 9:

- In livestock grazed grasslands managing for variety can be influenced by several variables, but principally, the stock type, grazing intensity, grazing timing and the grazing system (e.g. extensive, rotational, transhumance), but both **undergrazing** and **overgrazing** are threats, especially the latter.

Slide 10:

- Different grazing animals can have a big impact on butterflies.
- Because **sheep are more selective grazers they are often** considered the **least effective tool for butterflies**, but by manipulating other variables such as timing (e.g. by grazing in early spring, autumn or winter), stocking density or management system, sheep can be used to maintain grassland habitats.

Slide 11:

- It also worth noting that small-scale **mechanical disturbance** can be very effective tool for grassland restoration and easily be achieved by creating scrapes amongst ranker vegetation, producing habitat with more bare ground, more herbs and fewer grasses.

Slide 12:

- **Intensive and uniform management can seriously deplete butterfly populations or even cause local extinction.** This applies particularly to hay cutting or other grassland mowing regimes, but negative impacts can be minimised by varying cutting dates or ideally implementing a mosaic of small scale cutting, mimicking traditional management before mechanisation.

Slide 13:

- **Many butterflies use resources found in a range of habitat types.** Some species breed along **scrub** or **wood edges** and so need a mixture of grassland and scrub. Others may breed in in one habitat type and nectar in another. Such species require **a mosaic of habitats in the landscape.**

Slide 14:

- Woodland is the second most important habitat for butterflies. Like grassland, much is semi-natural and **some form of active management is essential to conserve threatened species**. Management actions include regular thinning, coppicing or planting.
- **Some species require maintenance of open habitat within woodland, such as sunny clearings or rides (paths/tracks)**. In this example there are three different zones in the ride structure. As a general rule, good sunny rides need to be 1.5 to times wide as the height of surrounding trees.

Slide 15:

- Habitat specialist butterflies tend to be relatively sedentary and persist as **metapopulations** in fragmented landscapes where local populations are connected by occasional dispersal. **Smaller sites tend to support smaller populations, which are more likely to go extinct and more isolated sites are less likely to be recolonised following extinction**.
- Managing single sites is unlikely to be successful and a better approach is to **manage at a landscape-scale across multiple sites**. This includes not only **managing the core sites where the species still occur but also those from which they have been lost or never occurred, as well as improving connectivity to maximise the chances of re/colonisation**. The latter might include creating new habitat but removing barriers to dispersal, as in this example of ride management, can be just as effective, improving connectivity within the site.

Slide 16:

- Research shows the **further restored sites are from an occupied site the less likely are they to be recolonised**. It is therefore best to **avoid restoring unoccupied sites which are more than a few kilometres from the nearest occupied site**.
- BC's landscape report which describes several evidence-based case studies which shows this approach can be very effective.

Slide 17:

- So what if more bespoke management is needed to benefit one (or a few) species?
- BC Europe's **Do's and Don'ts for Butterflies of the Habitats Directive** provides specific advice for each species.

Slide 18:

- To give one example the Scarce Fritillary *Euphydryas maturna* is a species of woodland edge habitat, and the document describes the habitat and ecology, as well as the main threats to the butterfly.

Slide 19:

- Broad **conservation actions** are outlined but the most useful management advice for the species is listed in the table of **Do's and Don'ts**.

- The detail of the advice varies according to how well-researched the species is – for some the advice is very specific giving for example suggested stocking rates for grazing animals.

Slide 22:

- Lastly, don't forget there may well be opportunities to **create new habitat**.
- Many such schemes focus on establishing new species-rich grasslands, through seeding low nutrient status substrates with local provenance plants (green hay). In the built environment habitat creation such as this is usually low maintenance and is therefore an increasingly attractive **cost-effective solution compared to traditional landscaping techniques**. When done well such schemes can provide suitable breeding habitat for butterflies in their own right but also help improve connectivity in fragmented landscapes.