

## 5. Principles and Planning

### 5.1. General principles

An understanding of reptile habitat requirements will help the development of effective management plans. These requirements can be used to formulate some fundamental principles of habitat management for reptiles:

- Sufficient suitable habitat must be present to support viable reptile populations. This may be a single, large block or a series of closely spaced and/or suitably linked habitat patches.
- Reptiles require both warmth and shelter from the elements.
- Reptiles require ready access to cover to escape predators
- The maintenance of a diverse vegetation structure, on both small and large scales, is important.
- Habitat edges/transitional zones, with a favourable aspect for basking, are important to reptiles.
- Habitat connectivity, within a site, and between sites, is important.
- Reptiles must have access to safe, undisturbed and climatically stable sites for hibernation.
- Reptiles require the continuous availability of suitable habitat within the areas occupied by a population or metapopulation.
- Reptiles have limited dispersal abilities and may not be able to re-colonise isolated sites once lost. It is therefore preferable that they are not lost in the first place.
- The type, scale, location and timing of management can all have profound effects on reptile populations; management activities should be modified to take account of reptile requirements and their impacts monitored, particularly at the microhabitat level.
- The requirements of UK reptile species are broadly similar, but there are some significant interspecific differences.
- Sand lizards and grass snakes need suitable egg-laying sites.
- Many other species, particularly herbaceous plants and invertebrates, benefit from the same successional stages, or particular aspects of the structurally diverse habitats, preferred by reptiles.
- Incorporating reptile requirements into general habitat management is usually simple and often saves money.

#### Key considerations in management planning

- Habitat extent
- Habitat connectivity, within and between sites
- Warmth/insolation
- Diversity in vegetation structure
- Temporal continuity of habitat

### 5.2. Habitat extent and connectivity

Reptile habitat must be sufficient in size to support viable populations (i.e. avoid local extinctions), and to avoid genetic impoverishment in the longer term. Lizards often occur in smaller habitat patches than snakes, reflecting their more sedentary nature. Adders and grass snakes move over larger areas and hence require a larger expanse of habitat. Site managers should examine how reptiles use their site and try to optimise the value of available habitat.

Reptile distribution across a site is usually patchy, rather than even, either because some parts of the site are particularly favourable to reptiles, or because other parts are unsuitable. Areas of high concentrations of reptiles, which are usually associated with a habitat feature (e.g. a tumulus or embankment) are referred to as foci. If these are reasonably closely spaced and linked by traversable intervening habitat, then individuals (usually juveniles) can readily move between clusters of animals, which will effectively form part of a single large population, or sub-populations of a single metapopulation. Movements between sub-populations do not need to be on a large scale or continuous. The movements of only a few animals from each generation are enough to maintain healthy metapopulations. The areas between sub-populations do not need to support prime reptile habitat on a permanent basis, but they should be suitable for reptile movements from time to time.

Increasing the connectivity of patches of suitable habitat:

- Increases the area of habitat effectively available.
- Sustains larger, and hence more genetically viable, populations.
- Reduces the chance of extinction of otherwise isolated populations.
- Facilitates recolonisation of habitat patches, should reptiles disappear from them.

Site managers should seek opportunities to link patches of suitable habitat, or clusters of reptiles, within a site and between neighbouring sites. Habitat patches can be linked by favourable management of intervening habitat, either as continuous habitat blocks, or as habitat corridors such as hedgerows, field margins, boundary banks and forest rides.

### 5.3. Temporal continuity

It is crucial to maintain temporal continuity of extensive habitat within a site. The right sort of habitat, and enough of it, must always be present, especially on isolated sites. Reptile populations can be decimated if management such as scrub removal or intensive grazing affects the whole of a site at the same time. Reptiles are unable either to escape the harmful impacts of these operations or to recolonise isolated sites at a later date. Implementation of such management measures should be staged, so that not all habitat on site is affected (or removed) simultaneously.

### 5.4. Management planning



The process of planning habitat management for reptiles differs little from the development of plans for any other taxonomic group. Ongoing, attentive monitoring is recommended to assess the impact

of management on vegetation structure and reptile occurrence, so that plans can be adjusted if necessary. If site managers are not familiar with local reptile status or habitat requirements, then expertise and advice may be available from Amphibian and Reptile Groups [www.arguk.org](http://www.arguk.org) or for the rare species, Amphibian and Reptile Conservation (see 14. *Sources of Information and Advice*).

### 5.5. Site audit

Assessing what is already on site is the starting point for planning reptile habitat management. Reptiles are secretive animals, so their presence may go unnoticed. A site audit should involve consultation with interested groups to determine whether current or historical species records are available. It should, however, be noted that reptile recording effort is often incomplete, and hence a site survey is normally required. Long-term surveys, for example over the course of the reptiles' active season, are particularly useful, since site usage by grass snake and adder can change over the course of a year. A slope that is dominated by stands of bracken in late summer may offer little to reptiles at the time, but may be used as an overwintering site by snakes, which may be evident only in early spring.

Survey can also be a precautionary measure to avoid harming reptiles during the course of site management. In particular, management that potentially affects European protected species (sand lizard and smooth snake) may require particular care to avoid offences (see 3.4. *Implications for site managers*).

A site survey should:

- Determine the presence/likely absence of reptiles.
- Identify general areas of the site used by reptiles.
- Identify significant features used by reptiles, such as habitat interfaces, favoured microhabitats and major hibernation sites.

An alternative approach is to map out areas of low, medium and high suitability habitat for reptiles. This can be done by assessing the characteristics important to reptiles. An objective scoring system (as exists for some species, such as the great crested newt) is yet to be developed for UK reptiles. The basic features may be identified using information given in 4. *Habitat Requirements*. So, each compartment (or whatever unit is chosen) of the site could be assessed in terms of aspect, vegetation structure, refuge potential, etc. The result of this should be a map, dividing the site into low, medium and high suitability areas. Such mapping can incorporate species survey data, but can also be carried out when such information is unavailable.

Maps not based on species survey will be less reliable, but especially on very large sites it may be more practical to use habitat suitability for broad management planning purposes.

Both reptile survey and habitat suitability maps can be used to:

- Inform the scale, location and timing of general habitat management.
- Identify key features or areas of microhabitat that require special attention.
- Incorporate specific habitat management measures favourable to reptiles.

Information on how to carry out a reptile survey is summarised in *13. Survey and Monitoring* and given in full in several other publications (e.g. Foster and Gent, 1996; Gent and Gibson, 1998; Froglife, 1999).

## 5.6. Management objectives

Once the species present have been identified and areas and features important to them have been located, clear management objectives should be set. These could include:

### Addressing threats

- Prevent arson.
- Reduce disturbance of reptile foci.

### Providing favourable habitat

- Maintain a mosaic of open habitats and scrub.
- Maintain a diversity of ages of heather stands.
- Maintain scrub in mid-successional state.
- Increase the area of habitat suitable for reptiles.
- Maintain linkage between habitat patches.
- Create egg-laying sites.

### Public involvement

- Inform the local population of the rationale for site management.
- Engage the local population in site wardening or survey.

## 5.7. Management constraints

There are always constraints to managing habitats. For example, on SSSIs, site management objectives are linked to conserving the interest features and achieving 'favourable condition'. There may be other species or habitats requiring particular management. Funding for work on SSSIs may be focused on maintaining the interest features. Normally, this situation will be consistent with conserving reptiles,

but in a minority of cases there can be conflicts. Guidance here should help to resolve such conflicts. The legal protection of reptiles may also impose constraints on habitat management. For example, burning a pile of brash that has become occupied by reptiles is likely to result in an offence; it should therefore be avoided and another method of brash disposal should be found.

Other statutory consents need to be considered e.g. felling licences, use of chemicals, Tree Preservation Orders, and Scheduled Ancient Monuments permissions.

Public perception of management practices is not always favourable. Consultation and education can be helpful, but habitat management may have to compromise to accommodate public sensibilities.

The site manager, therefore, has the challenging task of ensuring that reptiles are soundly conserved whilst balancing all these objectives and constraints. The task tends to be more difficult on smaller sites, and those with multiple scarce species.

## 5.8. Timing of management

See *Reptile habitat management calendar* (page 26), for a timetable of typical management methods. The timing of management operations may alter their effectiveness, as well as the chance of incidental mortalities of reptiles and other species. In the worst case, populations can be lost due to insensitively timed operations.

In general, substantial management should be undertaken in winter when reptiles are hibernating. Tree and scrub cutting has to be undertaken in winter to avoid disturbance of nesting birds. Even at this time, though, care should be taken to ensure that hibernation sites themselves are not damaged or left devoid of cover.

Bracken control, however, is effective only when vegetation is growing and therefore has to be undertaken in summer, when reptiles are active; hence precautions should be taken to avoid harming them (see *7.7 Bracken management*).

## 5.9. Impact assessments

When developing a management plan, impacts of proposed methods on reptiles (and other species) should be considered. For example, closely mowing a grassland site in a single operation risks directly

harming resident reptiles, removing their shelter from adverse weather and exposing survivors to predation. Such an operation could lead to the eradication of reptiles from the site; this could be a permanent local extinction if there are no sources of colonisation nearby.

Prompted by concerns about the adverse impact of some grazing projects on invertebrate and reptile populations, a *Grazing Impact Assessment* protocol has been developed to ensure that features important for these animals are considered (Offer, Edwards and Edgar, 2003). This is considered further under the advice on grazing, later. A similar approach is advised when considering substantial changes in management regime.

- High densities of reptiles may occur where there is favourable topography (south facing slopes, boundary banks, tumuli etc.) and other features (e.g. structurally diverse vegetation, degenerate dry heath). These often small areas (foci) can be targeted with more sensitive management specifically aimed at reptiles.
- Most of any particular site will invariably need long-term management to maintain habitat condition. If the type of management employed is suspected to have an adverse impact on reptiles (or other species) it should be considered in light of their conservation status.
- Occasionally, areas with very poor nutrient status soils can be left unmanaged, allowing natural vegetation cycling.

### 5.10. Management checklist

Factors that should be considered during reptile habitat management planning are as follows:

- Features of importance to reptiles should be incorporated into management plans, ensuring the continuity of those features in space and time.
- The identification of any communal hibernacula (especially those used by snakes) is crucial, as these usually localised features are particularly vulnerable to damage through management.



The sand wasp *Ammophila pubescens* (nationally scarce) is one of a range of species to benefit from the maintenance of warm, open habitats needed by reptiles (Mike Edwards)

### Reptile habitat management calendar

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mowing												
Scrub/tree cutting												
Stump treatment												
Bracken cutting												
Bracken spraying												
Sand rotovation												

Most effective and least damaging time to carry out work

Work may be less effective and/or requires more care to avoid disturbance