



## Managing wildlife sites to adapt to climate change

Key principles:

- 1. Existing protected area networks will remain the core mechanism for maintaining biodiversity.** Even though the species assemblage of individual protected sites will inevitably change, protected areas will remain almost the only areas of land on which habitat conditions remain suitable for many species unable to survive in agricultural or urban areas, for many years to come.
- 2. Most actions needed to increase the resilience of existing sites already take place as part of best practice conservation management.** Examples include increasing the size of sites to increase the population size of species; reducing impacts of non-native species; ensuring a suitable water supply at wetlands; and generally maximising habitat quality for species of high conservation priority.
- 3. It is important to understand the principle mechanisms through which climate change is likely to affect particular habitats or species, to identify actions needed to minimise any negative impacts.** Climate envelope modelling provides valuable indications of the likely shifts in distribution of species. However, it is important to remember that climatic conditions affect the suitability of conditions for individual species through a range of different mechanisms. Often, changes in climate will exacerbate existing pressures on species and habitats.
- 4. Some actions need to take place now, where they:**
  - **Have long-term implications (e.g. actions required now to secure long-term water supplies at wetlands, and acquisitions required to enlarge existing protected areas)**
  - **Take a long time to achieve their outcomes (e.g. most types of habitat (re)-creation).**

Habitat (re)-creation needs to start taking place now because even 'simple' habitats take a long time to become suitable for the majority of the important species found on them. Habitat that starts to be (re)-created now needs sufficient time to become suitable for species predicted to be lost from existing areas of habitat.

The main habitats that will need to be (re)-created are intertidal habitats and freshwater and brackish wetlands, to compensate for losses of these habitats in coastal areas because of sea level rise and increased storm activity. Additional wetlands will also probably need to be created to compensate for reductions in the suitability of some inland wetlands caused by reductions in water availability in summer. Lowland heathland can be created to provide habitat in regions that will become climatically suitable for many lowland heathland species, but where there is currently little or no lowland heathland present.

**5. In most cases, changes in site management aimed at increasing resilience and enabling adaptation will take place gradually over time, in response to changes in populations and distribution of species, and improvements in our understanding of the changes taking place.** Even though it is useful to have a long-term view of the likely impacts of climate change at a site, in most cases management decisions only affect habitat conditions in the short term (1-5 years), and consequently only need to be modified on a relatively short timescale. This approach is the same as taken for other changes in habitat conditions on sites. The decision-making process is the same as for other site management decisions i.e. manage, monitor, review, and modify management if required.

**6. Many species of high conservation value that are restricted to protected areas (especially plants and invertebrates) will need to be translocated to climatically suitable areas.** For populations of species to persist, individuals will have to colonise areas that become suitable for them, to offset reductions in their population caused by their extinction at sites that become unsuitable for them.

The likelihood of species colonising areas of habitat as they become suitable for them can potentially be increased by:

- Reducing the distance between suitable habitat patches, by creating new areas of suitable habitat, and by providing suitable conditions for these species on existing patches of habitat;
- Increasing the source of potential colonists by increasing breeding productivity at existing sites;
- Providing suitable habitat corridors and 'stepping stones' to make the countryside surrounding protected sites more permeable to species of limited mobility. Species may not be able to complete their life cycles within these, but they should be of sufficient quality to allow the species to disperse through it.

In practice, high priority species on sites which are most vulnerable to negative impacts of climate changes are usually, by definition, species with small populations restricted to a very narrow range of conditions, and often have limited mobility. These are species extremely unlikely to colonise new patches of habitat as they become suitable for them. These species will probably therefore need to be translocated between sites.

**7. Objective setting, timing of management operations, monitoring frameworks and funding conditions set by grant-making bodies will all have to become more flexible and adaptable in response to climate change.** Currently, objectives set in management plans, targets (and timescales) for monitoring, and grant conditions tend to be tightly defined and time-limited. It may prove increasingly difficult to manage many sites under this regime in future. For example, on a wet grassland site unpredictable rainfall may prevent management operations from being completed in the anticipated season/year. Ground conditions may be unsuitable for machinery, or for grazing to take place as planned. Grant-making bodies will need to recognise the increasing difficulty site managers may face in achieving pre-set management objectives because of climate change, and allow for greater flexibility in the timing of key operations and achievement of objectives.