

Environmental Studies FACT SHEET



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Managing conflicts in nature reserves

This Factsheet:

- Summarises the conflicts that face nature reserve managers
- Discusses how these conflicts can be resolved
- Uses national and international Case Studies to illustrate the management techniques used
- Reviews recent exam questions on nature reserves.

Managing a nature reserve may look easy – the warden’s job is simply to ensure that the wildlife habitats are well managed and that visitors don’t disturb the wildlife, right?

Well, there’s a bit more to it than that... Let’s consider some of the major decisions that the reserve manager needs to make.

Decision No.1: How many visitors should be allowed?

The major problems caused by visitors are:

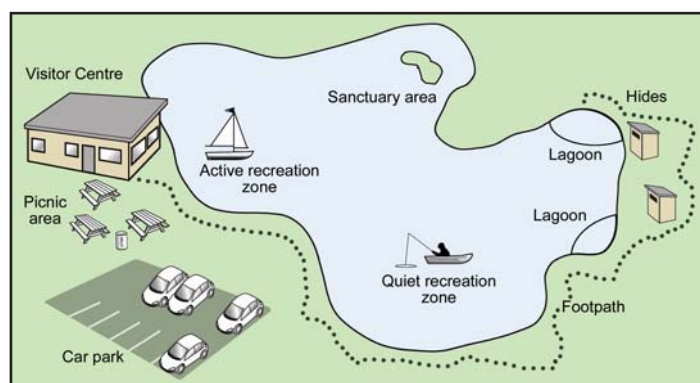
- Trampling of vegetation
- Compaction and erosion of footpaths
- Disturbance of wildlife, especially in the breeding season
- Litter
- Noise and pollution from vehicles
- Vandalism

The major solutions!

1. Spatial Zoning

This means concentrating visitors and recreational uses in certain areas or zones (Fig.1). This makes it easier and more economical to manage visitors – provide toilets, interpretation signs (Fig. 2), hides, a café etc – and helps protect those species sensitive to visitor disturbance.

Fig.1: Zoning in a lake-based nature reserve in Cornwall



As you can see in Fig.1, which was originally a flooded quarry, zoning has been used to:

- Concentrate the visitors in and around the visitor centre
- Deny access to the Sanctuary area by stopping the footpath. Footpaths should be screened and fenced using thorny bushes to deter wandering and contain bends so as to reduce any person’s perception of the number of visitors there are at any one time
- Locating the sanctuary area a long way from the visitor centre. The sanctuary area will need to meet the needs of different species e.g. have different water depths for paddling/diving duck species. Islands can provide secluded roost sites within the sanctuary
- Locating the active recreation zone near the visitor centre
- Concentrate the wildlife hides together
- Separate active from more leisurely recreational pursuits.

Fig.2: Visitor and interpretation signs



Spatial zoning works well in protecting sand dunes from trampling. Exposed zones next to the sea are very sensitive to trampling – marram grass does not tolerate trampling – but the slacks, backdunes and grasslands can and careful zoning can keep the majority of walkers away from the sensitive dunes.

Activity:

Visit your local Nature Reserve. Draw a map and identify what zoning approach has been used.

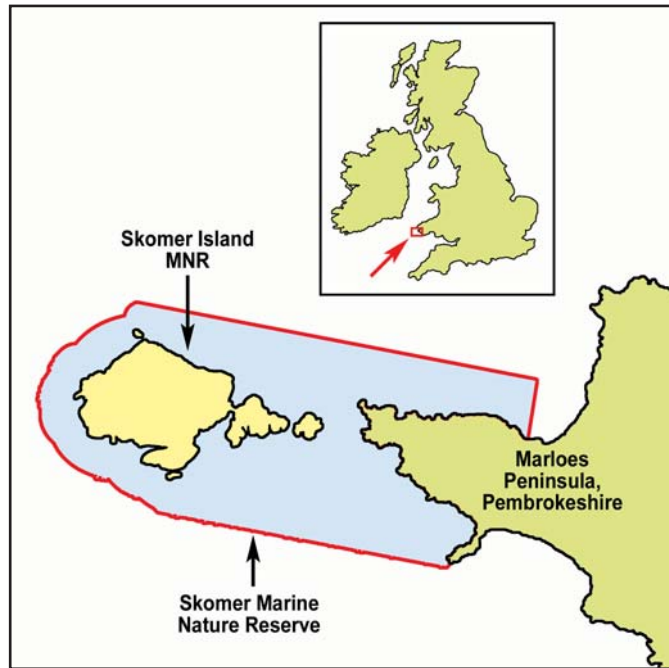
Spatial zoning can only be done once the warden has worked out what and where the most sensitive plant and animal species are. The warden creates a map showing the distribution of the plant and animal species. This will change over a year so there may be more than one map and, for animals, it will need to show the location of dens, setts and nesting, roosting and feeding sites.

Decision No.2: When should visitors be allowed in particular zones?

Temporal zoning refers to the prevention of access to certain areas at certain times of the year e.g. breeding seasons. This is potentially expensive – it is relatively easy to control how many people enter a reserve but preventing them wandering takes more wrens – and money. Despite this, spatial and temporal zoning are often used together – see Case Study 1.

Case Study 1: Skomer Marine Nature Reserve (MNR)

Fig.3: Skomer MNR



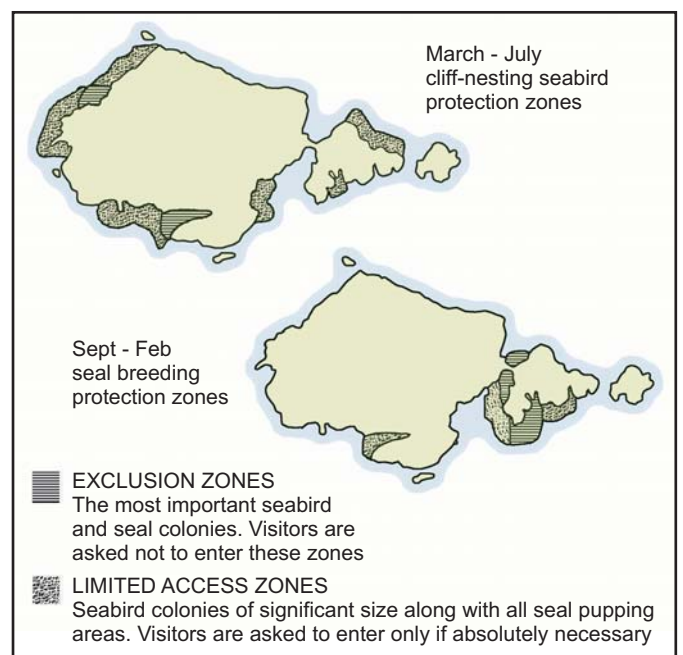
As you can see, Skomer MNR has both a marine and island component. These are protected by several designations (see Table):

Designation	Location	Area covered/ha	% covered
Site of Special Scientific Interest (SSSI)	Island only	71	5
Special Area of Conservation (SAC)	Sub-tidal and inter-tidal area	1,324	100
National Park	Inter-tidal area only	39	3

So, what does management of this MNR involve?

- Zoning, both spatial and temporal (Fig. 4)
- Warden patrols to identify and prevent illegal scallop dredging, beam trawling and spear fishing, deter boy-racers and arsonists and prevent disturbance of cliff nesting sea birds e.g. guillemots and puffins
- Monitoring of visitor type (mainly recreational craft, divers and anglers) and numbers
- Transect surveys of sea urchins, stars and squirts
- Population estimates of seals by dye-marking and mark-and-release calculation
- Maintenance of moorings
- Provision of diving maps, species distribution maps, sightings of particular species and educational materials
- Working with other agencies – English Nature, Pembrokeshire Coast National Park, Wildlife Trusts and Universities

Fig.4: Zoning



Larger nature reserves are often designed using the concept of transition, buffer and core zones (Fig.5).

Fig.5: Zoning in a proposed large nature reserve in Zambia

Transition zone:

- permanent settlements of limited size but expected to cause high impact
- their size is limited to minimize and control their impact on the boundary of the buffer zone.

Buffer zone:

- allows research to increase knowledge of species, habitats and ecosystems
- which can be used for better conservation
- provides visitor centre/café to raise revenue, raise public interest and provide interpretation facilities
- encourages sustainable exploitation by locals so that they financially and practically benefit from the reserve and its visitors. Local support for the reserve is crucial.

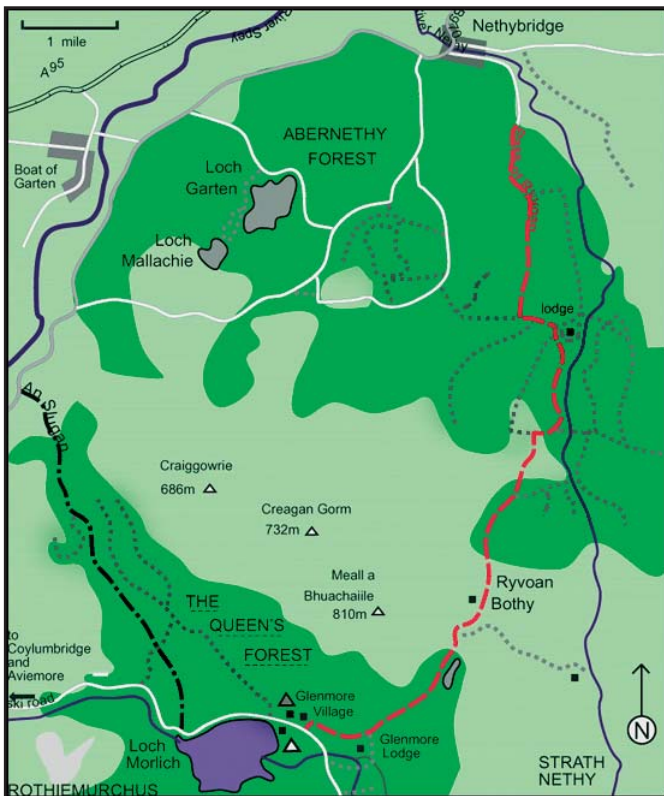
KEY:

- Transition zone
- Buffer zone
- Core zone

Core zone:

- minimizes human contact in the zone
- large enough to maintain species/ genetic diversity that can spread into the buffer zone
- may still require intensive management at times e.g. elimination of exotic species, control of fires.

Case Study 2: Abernethy Forest, Speyside, Scotland



Abernethy is a 140 sq km RSPB nature reserve at the heart of the Cairngorms National Park. The reserve includes the largest surviving area of ancient native Caledonian pinewood in Scotland and is the single most important site for capercaillie – *Tetrao urogallus* – (Fig. 6) in the UK, attracting thousands of visitors each year.

The RSPB have used spatial zoning at the pinewoods at Abernethy to protect capercaillie against visitor disturbance:

The main hide serves as a visitor centre and directs visitors onto carefully waymarked walks in the pinewoods.

The main area is well publicized, has large car parks and signs but the rest of the pinewood is not promoted and any reference stresses its fragility.

No new tracks or footpaths are created and some existing ones have been removed.

Vehicles are allowed access but roads are deliberately not tarmaced to deter drivers.

A “honeypot” has been created at Loch Garten where for years visitors have been able to watch pairs of Ospreys nesting via binoculars, telescopes and short-circuit television. This effectively distracts visitors from disturbing the capercaillie and osprey nesting sites elsewhere. This principle – promoting the photography and study of just one pair of rare birds to protect other pairs from disturbance – is often used by the RSPB.

Fig. 6: Capercaillie



Habitat management projects at Abernethy:

- Expansion of the forest by 400ha
- Forest restructuring for capercaillie – new planting and natural regeneration of pines, creation of dead wood and increasing ground cover. Natural regeneration – preparing the land to encourage seeds from adjacent trees to germinate and grow into new trees.
- Reintroducing under-represented tree and shrub species (the ‘missing’ forest).
- Deer culling to protect saplings that have naturally regenerated.

Before any work began an extensive Environmental Impact Assessment (EIA) was conducted at Abernethy. This looked at possible positive and negative effects on many aspects: landscape; soils; insects; birds; mammals; local hydrology and climate change.

The tables summarise some of the conclusions of the EIA.

Species that are expected to decline as a result of the Abernethy Management Plan

Species	UK Red List	Comments
Curlew	Amber	Already, the population is small
Meadow pipit	Amber	Open dry heath will be converted to forest, so it will lose habitat
Merlin	Amber	May increase slightly initially but overall long-term effect will depend on ratio of closed woodland to open heath
Red grouse	Amber	Open dry heath will be converted to forest, so it will lose habitat
Bracken	N/a	Via burning, clearing and reafforestation

Species that are expected to increase as a result of the Abernethy Management Plan

Species	UK Red List	Comments
Bees, ants and wasps	Endangered	Will benefit from open areas within forest and by joining up of Abernethy and Glenmore forest populations
Capercaillie	Red	Reduced disturbance, larger habitat
Scottish crossbill	Red	More trees
Spotted flycatcher	Red	More trees
Fungi and mosses	Near threatened	More habitat / deliberate retention of dead trees

As you can see, species-wise there will be winners and losers but that is always the case. Many other species are likely to be affected but it is not clear how. These will require monitoring. The priority is to increase the populations of certain species and restore and increase the cover of the ancient pinewoods.

National Nature Reserves (NNR):

Designated by Natural England under the 1949 National Parks and Access to the Countryside Act and managed by Natural England or organisations such as the RSPB or National Trust. They represent the best examples of important habitats with complete species' communities.

Local Nature Reserves (LNR):

Also designated under the 1949 National Parks and Access to the Countryside Act but owned or controlled by Local Authorities for the benefit of wildlife and the public.

Marine Nature Reserves (MNR):

Designated under the Wildlife and Countryside Act (1981) to protect coastal habitats, resident and migratory species, underwater features and to provide opportunities for research.



Practice Questions

- (a) Suggest:
 - (i) two characteristics that an area should have if it is to be designated a nature reserve (2)
 - (ii) two economic benefits of creating and maintaining a nature reserve (2)
 - (iii) how habitat fragmentation threatens wildlife (2)
- (b) In Cambridgeshire a 56ha area of previously neglected forest has been designated as a local nature reserve (LNR). It is surrounded by farmland and close to two villages and a town.

The wardens and management team are putting together a management plan for the reserve. Outline some of the problems that they are likely to face in managing the new designation in each of the following categories:

 - (i) habitat management as a result of previous neglect (3)
 - (ii) agricultural pollution (3)
 - (iii) social problems (3)
- (c) Describe management strategies that can be used to reduce the impact of visitors on habitats within a nature reserve (4)

- (c) spatial zonation; temporal zonation; prevents trampling of plant species / disturbance nests / burrows / breeding sites; honeypot approach / designated car parks / visitor centres; prevents offroad damage by cars; wardens patrolling; control of litter/fires etc; buffer to prevent animal and plant disturbance; interpretation facilities / community involvement.
- (iii) vandalism; squats; resistance to management methods e.g. zonation; resistance to charring; distance to wildlife; restrictions on farmer e.g. nitrate applications;



- Mark scheme**
- (a) (i) large enough to function as a viable unit / large enough for viable population of top carnivores; have cooperation / support of local community; minimal edge:area ratio; corridor areas; variety of habitats;
 - (ii) income; from tourists / visitor passes / café / shop / educational visits / research; can be used to pay wardens / manage habitats; creates jobs;
 - (iii) prevents migration; decreases size of gene pool; creates large edges that can allow entry of predators / too many visitors;
 - (b) (i) clearing of overgrown areas / letting more light into forest floor; removal of undesirable species / culling; dredging / clearing ponds; replanting; habitat intervention e.g. nest boxes; recovery / reintroduction of valuable/threatened species;
 - (ii) aerial spread of pesticides; runoff containing nitrates and phosphates; ref to eutrophication / algal blooms; noise of machinery; maintenance of boundaries / ref to visitors damaging crops;

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