



# Marine Monitoring Handbook

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## Common seal *Phoca vitulina*

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**Figure 4.2** Common seal *Phoca vitulina* (Lighthouse Field Station, University of Aberdeen)

### Introduction to the species' interest

The common seal *Phoca vitulina* (also known as the harbour seal) is the smaller of the two resident species in the UK, reaching a length of up to 1.85m and weighing up to 130kg (both measurements for adult males).<sup>1</sup> Common seals' habitual haul-out areas are generally found in shallow, sheltered waters, sea lochs and island archipelagos. They are characteristically found on sandbanks, mud flats and estuaries on the east coast of the UK (Wash, Dornoch Firth), or shores of small islands or isolated skerries in west Scotland and the outer islands. Individuals return to favoured haul-out sites and there are no known migratory movements. They are predominantly opportunistic fish feeders taking a variety of species that are locally abundant, and also invertebrates such as cephalopods, gastropods and crustaceans. Adult females bear a single pup in June or early July with no obvious regional differences around the UK. Pups are weaned after about 4–5 weeks and normally complete by late July at most colonies. Mating occurs soon after weaning. Common seals are top predators in the UK and there are few known sources of mortality. In 1988, populations were reduced by about 50% following a phocine distemper virus epizootic. Common seals are often perceived as having a great impact on fisheries, particularly those using set nets and cages, although their actual impact on fish populations is estimated to be very low. Pups were hunted for their skin in north and west Scotland and the Wash until the passing of the Conservation of Seals Act in 1970. In order to protect their catch, fishermen may kill seals if they are interfering with fishing gear.

The Sea Mammal Research Unit (SMRU) of the Natural Environmental Research Council (NERC) and Aberdeen University<sup>2</sup> have extensively studied common seal biology, population dynamics and diet on the east coast of Scotland. SMRU undertake annual surveys to estimate population size.<sup>3</sup>

The UK holds approximately 5% of the world population of common seals, and approximately 50% of the EC population. The biogeographical distribution in UK waters ranges from Strangford Lough, Northern Ireland to the south shores of the Clyde and then clockwise round the coast to the Thames estuary. The common seal is widespread, but population density varies greatly from place to place, with low numbers at many sites. This means it can be difficult to define the boundaries of specific sites. The census of the common seal population is based on numbers hauling out in coastal locations during the moulting period in August. Such haul-out areas are thought to be very important for the conservation of the species, as are the most important breeding colonies. Sites were selected using the most up-to-date population information available at the time, although populations at individual sites may fluctuate.

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1 These statistics and the following text are taken from: Bonner, W N and Thompson, P M (1990) Seals, etc.: Order Pinnipedia – common seal, in: Harris, S and Corbet, G B (eds) *The Handbook of British Mammals*, Chapter 11, pp. 462–471. Blackwells, Oxford.

2 See <http://www.abdn.ac.uk/~nhi519/lighthse/seals/seals.htm>

3 See [http://smub.st-and.ac.uk/ch1\\_1.html](http://smub.st-and.ac.uk/ch1_1.html)

## Monitoring requirements and suggested techniques for common seal

To help implement the UK's Common Standards for Monitoring programme, it is necessary to recommend a small number of techniques that are likely to provide comparable measures for each of attribute (Table 4-2). The UK Marine SACs project evaluated the inter-comparability of some of these techniques (for example acoustic versus visual counts of dolphins), but considerable further work is required to establish suitable techniques for many attributes. The advice presented below will be updated when new information becomes available.

**Table 4-2** Suggested techniques for measuring the attributes that may be used to define favourable condition of common seal populations. Guidance will be developed for the techniques listed.

<i>Generic attribute</i>	<i>Feature attribute</i>	<i>Technique</i>
Quantity (Abundance)	Population size	Thermal aerial photography; Colour aerial photography; Direct counts from boat or shore
Population dynamics	Recruitment	Pup counts
	Mortality	Pup carcass counts; Adult carcass recovery; Tagging individuals
	Emigration	Satellite telemetry
	Immigration	Satellite telemetry
Population structure	Age structure	ID of known individuals
	Sex ratio	
	Fragmentation/isolation	Count haul-out sites
	Genetic diversity	DNA techniques
Habitat requirements	Area for breeding	Aerial photography; airborne remote sensing; Habitat mapping
	Area for feeding	Habitat mapping (AGDS; Side scan sonar); Fish census techniques; Acoustic fish monitoring
	Environmental processes	Measure water quality factors <sup>4</sup> ; Debris/litter survey <sup>5</sup> ; Survey injury to animals <sup>6</sup>

## Specific issues affecting the monitoring of common seal

### *Estimating population size*

The current surveillance programme undertaken by the SMRU is likely to make a substantial contribution to condition monitoring of SACs. Currently, SMRU surveys common seals every five years in Scotland and annually in Lincolnshire and Norfolk. Surveys are carried out in August during the moult within two hours of low tides occurring between 13:00 and 19:00 hours. For rocky or seaweed dominated sites, seals are surveyed using a thermal-imaging camera mounted on a helicopter to discriminate the well-camouflaged seals from the background (Figure 4.3). Helicopters are preferred to fixed-wing aircraft because they can carefully follow the shore along a complex coastline. Conventional aerial photography is used for the east coast sandbank sites where those seals hauled out are conspicuous against the background sediment.

<sup>4</sup> To determine levels of nutrients, pollutants and pathogens.

<sup>5</sup> For example, discarded monofilament nets and ropes may entangle seals causing lacerations.



**Figure 4.3** A conventional photograph (left) and a thermal image (right) of common seals on a skerry in Scotland (from SMRU Internet site)

Although these surveys coincide with the period when the maximum number of seals are likely to be ashore, there will be an unknown number of animals in the water at the time of survey. Research studies in Orkney, the Moray Firth and the Wadden Sea developed ‘correction factors’. In the Moray Firth, the proportion of seals hauled out was estimated to be 0.5–0.75 of the total population.<sup>b</sup> It is important to establish the activity patterns of the seals when planning any census as the habitat can strongly influence the animal’s behaviour. For example, common seals on rocky shores in Orkney had diurnal patterns of activity, whereas in the Moray Firth the availability of haul-out sites on sandbanks depended on the tidal cycle. Census techniques must minimise within-year variation by investigating activity patterns at a local level. The study in the Moray Firth concluded that population trends may be detected over 4–6 years using annual counts based on 2–3 visits per year; >5–6 visits per year were found to be inefficient.

### *Population dynamics*

Common seal movements can be investigated by VHF or satellite-linked telemetry. Individuals are captured at the haul-out site and the telemetry device, which usually includes a data logger, glued to the fur on the top of the seal’s neck.<sup>c,d</sup> These tags detach from the body during the annual moult. Common seal movements are strongly influenced by local food availability, and most movements are considered ‘local’ compared with grey seals. Individuals may travel up to 45km on trips lasting six days, but then return to their ‘home’ site. Most mass movements are associated with the dispersal of young animals, although seasonal movements between haul-out sites are known.<sup>e</sup>

### *Population structure*

Sex ratio may be an important attribute, although any change may not manifest as a problem for several generations. It is necessary to investigate sex ratio at least twice during the annual life cycle because the sex of animals at a haul-out is biased toward female during the pupping season, and toward male during the annual moult.<sup>b</sup>

Common seals require suitable haul-out sites throughout their life cycle. Studies have shown that this species forms discrete populations with little interchange of individuals between populations. Any loss of haul-out sites within an SAC will affect the local common seal population. It may be necessary to monitor the number of haul-out sites with the SAC.

### *Habitat requirements*

Common seals are coastal feeders, rarely occurring further than a few kilometres offshore. Populations appear to remain within an area throughout the year, although the number of individuals at a haul-out site will change throughout the year. Studies have shown that seasonal changes in site use may be linked to a site’s physical characteristics, because they may be suitable for breeding females during pupping, or groups undergoing the annual moult, or because there are seasonal patterns in the abundance of the seal’s prey near a site.<sup>c</sup> Maintenance of viable populations within SACs is therefore clearly linked to the availability of suitable haul-out sites with foraging areas nearby (<60km) throughout the life cycle.

Monitoring the availability of suitable feeding areas must be linked to contemporary analyses of the seal’s diet because common seals switch their preferred prey in relation to its local abundance both within and between years.<sup>f</sup> Diet composition can be ascertained by analysing faecal material from samples collected at haul-out sites. The location of feeding areas can be determined by telemetry studies. The type of prey consumed will determine the technique required for monitoring prey abundance within these areas.

## Health and safety

Common seal colonies are often located in remote areas that present considerable health and safety risks. Staff must follow all standard procedures, particularly in relation to working alone (to be avoided), working in remote areas and working from small boats. Some specific risks include:

- working on sandbanks: getting stuck in the sediment, being trapped by rising tide;
- working on offshore rocks: difficulties associated with landing, wave surges, being stranded by a rising tide;
- attack by adult seals, particularly during the breeding season;
- infection of a wound if bitten;
- bacterial infection from seal faeces at breeding/haul-out sites.

The Wildlife and Countryside Act 1981<sup>6</sup> and the Animals (Scientific Procedures) Act 1986<sup>7</sup> control and regulate the study of wild animals that involve the capture and release, handling or remote sampling of individuals. Under this legislation, a licence is required from the UK Government for all activities that require the capture or handling of common seals.

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6 See: <http://www.wildlife-countryside.detr.gov.uk>

7 See: <http://www.homeoffice.gov.uk>