



### Key message

The Scottish grey seal population has increased, dominated by increases in the east coast populations. The harbour seal populations on the west coast are stable, whereas most populations in the Northern Isles, north and east coast areas are declining, the reasons for which are unclear.



Moulting harbour seals © Sea Mammal Research Unit.

### Background

Grey and harbour seals breed around the Scottish coast and forage in its waters. As top predators, seals can reflect the state of the marine ecosystem. Key potential drivers or pressures include pathogens, toxins and contaminants, competition with other species, changes in prey availability, underwater noise, disturbance, and fisheries and aquaculture interactions.

This assessment uses estimates of seal numbers from regular monitoring programmes focused on seal haul-out sites and breeding colonies. The data may also indicate major changes in distribution, although this is less readily assessed from the abundance surveys.



Figure 1:  
Grey seal female with pup.  
© K Robinson, Sea Mammal Research Unit.



Figure 2:  
Grey seals hauled out in the summer.  
© Monica Arso, Sea Mammal Research Unit.

The assessment uses three different datasets:

- Grey seal pup production during the autumn/winter breeding season (September – December):** Grey seal females give birth to a single pup (Figure 1). Unlike harbour seals, these pups remain on land for the first few weeks of live and thus, can be counted, allowing regional 'pup production' to be estimated and trends assessed.
- Grey seal abundance during the summer (August):** Outside the breeding season, grey seals are highly mobile and range over large distances, using different haul-out sites. However, regional numbers in the summer are useful for determining changes related to overall abundance or redistribution.

c. **Harbour seal abundance during the moult (August):** Counts during their annual moult (Figure 2), when the majority of the population are hauled out, are used to estimate population size and assess trends.

## Results

### Grey seal pup production

There has been an increase in total pup production in Scotland since surveys began in the 1960s. The number of pups born on the east coast has increased exponentially. In the north and west increases have also been seen, although pup production has, for the most part, been stable since around 2000 (Figure 3).

### Grey seal summer abundance

The grey seal summer counts are limited to two time points, 2008 and 2014 (Figure 4). The number of grey seals in Scotland during this time was higher in 2014 than in 2008. At a regional scale, numbers were stable in two of the management areas, Southwest Scotland and North coast and Orkney. Over the six year period, the abundance had increased by ~16.5%, thus not contravening the relevant assessment value.

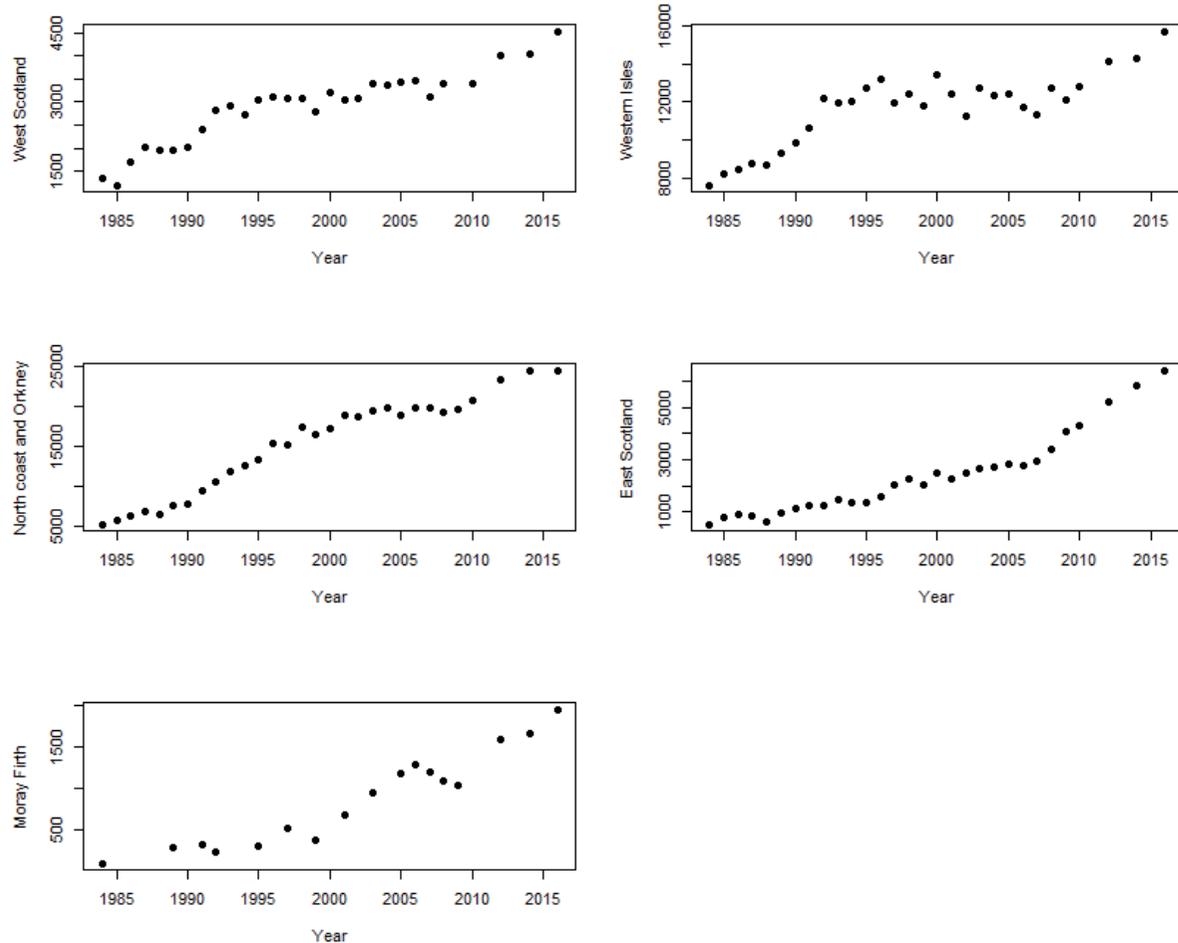


Figure 3:  
Grey seal pup production by seal management area. Source: SMRU

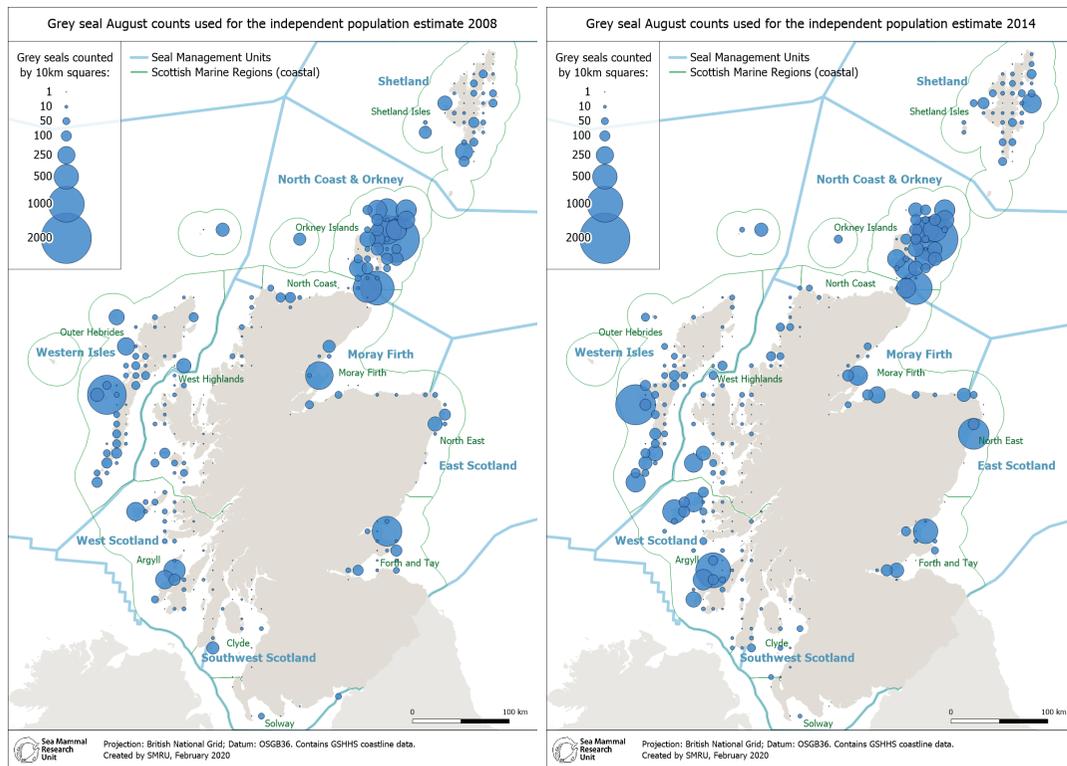


Figure 4: Grey seal summer abundance, 2008 (left) and 2014 (right). Seal management areas (blue lines) and Scottish Marine Regions (green lines) shown. Source: SMRU.

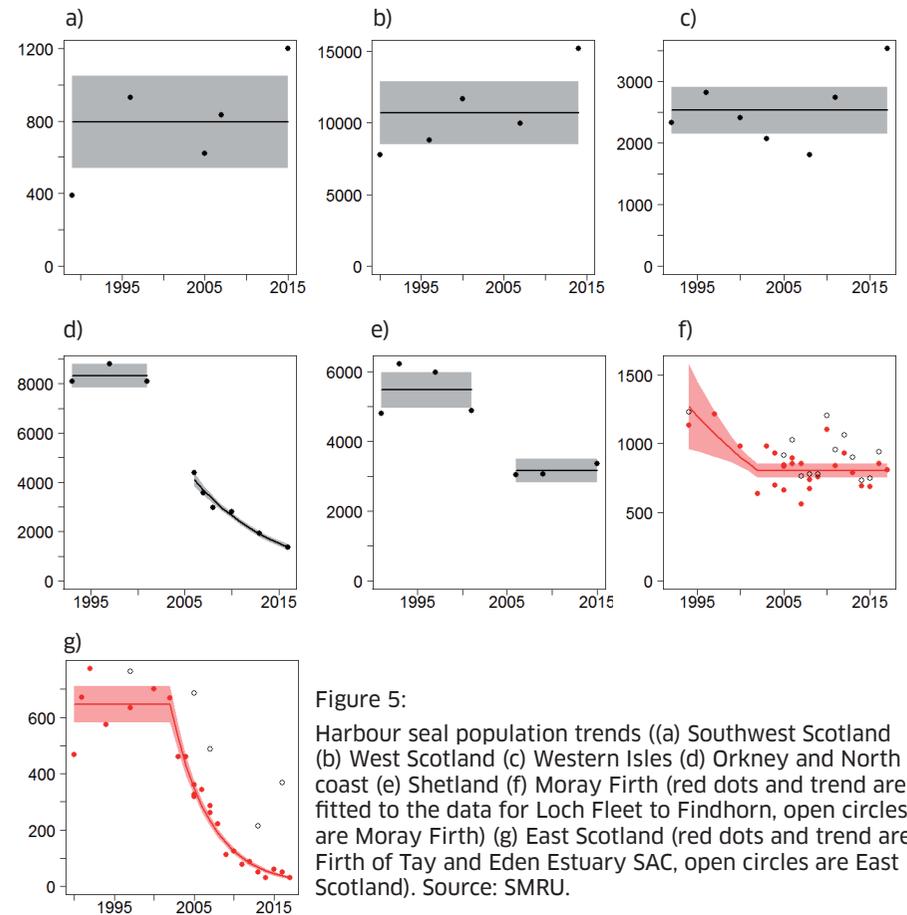


Figure 5: Harbour seal population trends (a) Southwest Scotland (b) West Scotland (c) Western Isles (d) Orkney and North coast (e) Shetland (f) Moray Firth (red dots and trend are fitted to the data for Loch Fleet to Findhorn, open circles are Moray Firth) (g) East Scotland (red dots and trend are Firth of Tay and Eden Estuary SAC, open circles are East Scotland). Source: SMRU.

## Harbour seal abundance during the moult

The trends in harbour seal abundance for each management area, across the time series available, is shown in Figure 5. In general, populations have **declined in north and east Scotland** (for unknown reasons), and trajectories fell **below** both assessment values for the North coast and Orkney, and East Scotland. Populations

are **stable on the west coast of Scotland** and trajectories did not fall **below** the assessment values for Southwest Scotland, West Scotland, and the Western Isles. These contrasting trends have resulted in research to investigate the causes of the declines (Arso Civil *et al.*, 2018).

## Conclusion

### Harbour seals

Harbour seals on the west coast are stable in abundance, although the most recent surveys indicate an increase. This will be confirmed when the next complete round of harbour seal survey data for Scotland are available. However, harbour seals foraging (i.e. feeding) and breeding on the North Sea coast and in the Northern Isles are generally not reaching the assessment values and are declining in abundance. Confidence in these conclusions is high. The long time series and extensive coverage of the surveys allow for robust trends and conclusions to be drawn. The types of pressures on harbour seals have not changed since the last assessment. Although there has been an increase in marine renewable energy developments, the population declines occurred before the start of these activities. Other pressures of concern remain; effects of toxins from harmful algal blooms and changes in prey or habitat as a result of human activities such as fisheries or climate change.

### Grey seals

Grey seals in Scotland, both the number of pups born and the number of animals foraging in Scottish waters during the summer, have continued to increase and are above the assessment values.

## Knowledge gaps

The main knowledge gap is a lack of understanding of the drivers of the decline in harbour seal populations. However, a long term research study is due to be completed in the next few years. This will estimate vital rates in declining and stable populations so that the factors involved can be narrowed down. For grey seal pups, some small colonies are not regularly counted and uncertainty in the estimates could be reduced. In addition, other more appropriate indicators would include at-sea usage and habitat preference. However, this involves more detailed knowledge of foraging and movements and research is continuing.

## Status and trend assessment

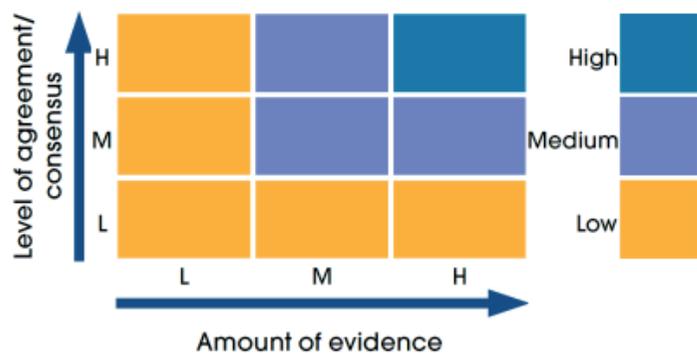
Seal Management Areas (SMAs) are written in bold, Scottish Marine Regions (SMRs) between parenthesis. Refer to Figure b in Assessment method section for correspondence between SMAs and SMRs.

Region assessed	Harbour seals		Grey seals	
	Status with confidence	Trend with confidence	Status with confidence	Trend with confidence
All Scotland				
East Scotland (Forth and Tay and North East)				
Moray Firth (Moray Firth)				
North Coast and Orkney (North Coast and Orkney Islands)				
Shetland (Shetland Isles)				
Southwest Scotland (Clyde and Solway)				
West Scotland North and Central (Western Highlands)				
West Scotland South (Argyll)				
Western Isles (Outer Hebrides)				

## Status and trend assessment legend

Status assessment (for Clean and safe, Healthy and biologically diverse assessments)		Trend assessment (for Clean and safe, Healthy and biologically diverse and Productive assessments)	
	Many concerns		No / little change
	Some concerns		Increasing
	Few or no concerns		Decreasing
	Few or no concerns, but some local concerns		No trend discernible
	Few or no concerns, but many local concerns		All trends
	Some concerns, but many local concerns	<b>Confidence assessment</b>	
	Lack of evidence / robust assessment criteria		
	Lack of regional evidence / robust assessment criteria, but no or few concerns for some local areas		Low
	Lack of regional evidence / robust assessment criteria, but some concerns for some local areas		Medium
	Lack of regional evidence / robust assessment criteria, but many concerns for some local areas		High

## Overall confidence



## Assessment regions

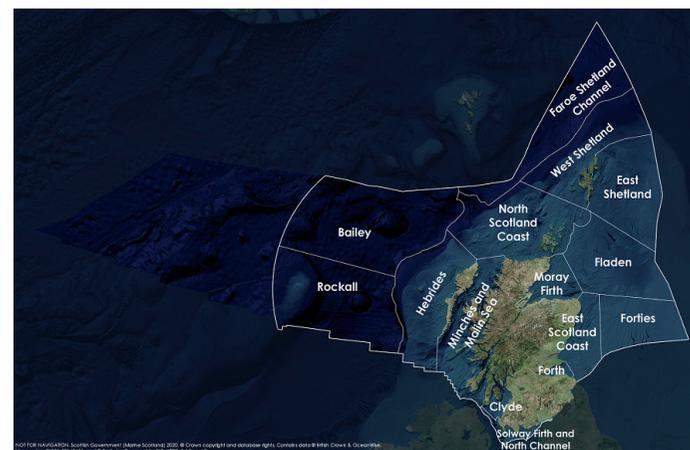


The Scottish Marine Regions (SMRs; S1 - S11) and the Scottish Offshore Marine Regions (OMRs, O1 - O10)

Key: S1, Forth and Tay; S2, North East; S3, Moray Firth; S4 Orkney Islands; S5, Shetland Isles; S6, North Coast; S7, West Highlands; S8, Outer Hebrides; S9, Argyll; S10, Clyde; S11, Solway; O1, Long Forties, O2, Fladen and Moray Firth Offshore; O3, East Shetland Shelf; O4, North and West Shetland Shelf; O5, Faroe-Shetland Channel; O6, North Scotland Shelf; O7, Hebrides Shelf; O8, Bailey; O9, Rockall; O10, Hatton.



Biogeographic, Charting Progress 2 (CP2) Regions. These have been used as the assessment areas for hazardous substances.



Scottish Sea Areas as used in Scotland's Marine Atlas 2011. These are sub divisions of the biogeographic, or Charting Progress 2 (CP2), Regions.