

Computerised 'mug-shots' provide a 'who's who?' of seals

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Mothers at Donna Nook, demonstrating some potential problems with pattern recognition (angle to camera, dry fur, sand on coats). Credit: K. Robinson SMRU

(Phys.org)—A new computerised photo-ID system is helping scientists monitor and track the grey seal population in the UK and beyond.

The automated system uses a form of pattern-recognition to match key identifying marks with thousands of images held in a digital catalogue.

This work, published today (Friday 14 December), in the British Ecological Society's journal: *Methods in Ecology and Evolution*, was supported by NERC (Natural Environment Research Council) grants and the Esmée Foundation.

Female grey seals have unique coat markings that remain the same during their adult years. This allows any seal, whose image has been captured in photographs, to be identified repeatedly throughout her lifetime.

Scientists at the University of St Andrews, Conservation Research Ltd and Durham University have been using this technique to follow previously identified animals at the breeding colony of North Rona in the Outer Hebrides.

Long-term monitoring of individual seals is crucial for researchers to understand how factors, such as the choice of breeding site, affect seals' breeding rates and their lifespan.

Dr Paddy Pomeroy, Senior Research Scientist at the Sea Mammal Research Unit (SMRU) at the University of St Andrews, said: "Finding out how long individual seals live, and how their longevity varies according to their pupping history, is key to understanding [seal population](#) trends in the UK.

"Photo-ID lets us follow many individuals without the need to handle the animals – a good image is all that is required to "capture" them for life.

"We've built a photo-ID system that allows comparison of seal coat patterns and crucially, takes into account some of the complications arising from data of this type which had been overlooked previously."

Lex Hiby, of Conservation Research Ltd, said: "Although female grey

seals are distinctively patterned, they're a challenging problem for automated photo-ID in a field setting.

"The best image for photo-ID is of a seal lying flat and straight "broadside on", but often it is only possible to capture oblique images of seals swimming offshore, or lying on the shore in one of the wide range of body postures they display.

"The big advance in our software is in dealing with the risk of missing out on matches. This can happen where, although photographs are of the same part of the same seal, they don't get matched because images are of poor quality or the seal adopts different positions.

"The method of analysis we're reporting here, allows for this "failure to match" risk. It's possible now to analyse survival, abundance and preference for different areas despite the "failure to match" risk."

The research has confirmed that the apparent annual survival of female seals at North Rona is lower than expected, which is reflected in declining census counts of seal pups born there.

Pup production at the island has fallen from more than 2,000 in the 1970s to around 500 at present, whereas other colonies, particularly on the east coast, have seen pup numbers rise.

Dr Pomeroy added: "For population analysis, it's important to be able to identify potential errors – these methods are a real step forward.

"Our system allows records of [seals](#) "captured" at one site to be compared with those from other locations over many years, giving us the power to 'track' animals far longer than otherwise possible."

Provided by University of St Andrews

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