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From birth to death: how sharing sightings and strandings data is revealing grey seal ecology

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Introduction

Cornwall, in SW England, UK, is home to breeding colonies of grey seals (*Halichoerus grypus*), representing around 0.5% of the total UK population. They are studied by two groups: Cornwall Seal Group (CSG) and the Cornwall Wildlife Trust Marine Strandings Network (CWTMSN).

CSG has been studying individual seals at up to 34 sites since 2000 and monitors their movements by photographing live seals that visit various haul-out sites around Cornwall and Devon. CSG liaises with other more distant organisations that photograph and/or identify seals. Each seal's unique, lifelong pelage pattern has enabled CSG to build up an ID catalogue of over 1000 different seals, against which sightings can be compared by eye. Each is assigned a unique identifier and sightings are recorded in a database.

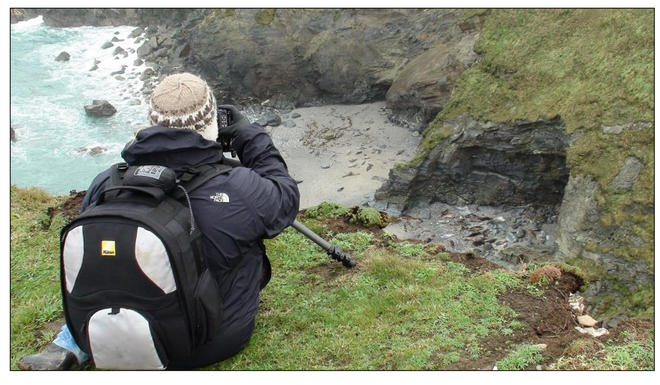
The CWTMSN has a team of over 120 trained volunteers who examine, measure and photograph dead stranded animals, including seals, using digital photography. It researches possible anthropogenic effects and causes of death. Photos taken include views of pelage patterns on both sides of the head, and full body length. The sex is recorded and each animal is assigned a unique identification number. Between 2005 and 2011, the team recorded 492 animals for the Network's extensive database, which now holds over 4500 photos of this species alone.

Method

In this study, whitecoat pup carcasses were excluded and many of the juvenile and adult seals recorded by the CWTMSN were too decomposed to weald useful pelage pattern data. However, of the 492 sets of photos taken by the CWTMSN, 80 (16%) showed individual pelage markings sufficiently clearly to be analysed by CSG, with whom they shared their data.

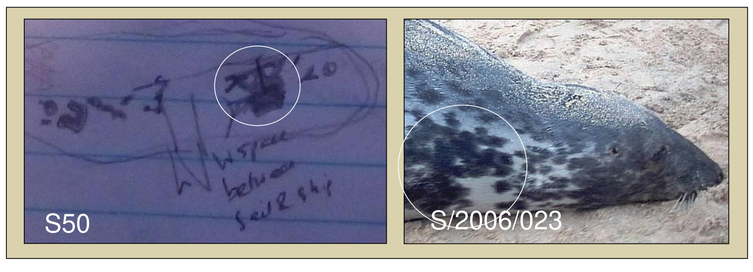
Photos of dead seals were visually scanned and photos of familiar seals were selected to be placed next to ID photos (or sketches) of seals from the catalogue in MS PowerPoint. To confirm an identification, CSG used a minimum of five matching marker patterns, preferably from both sides of the seal.

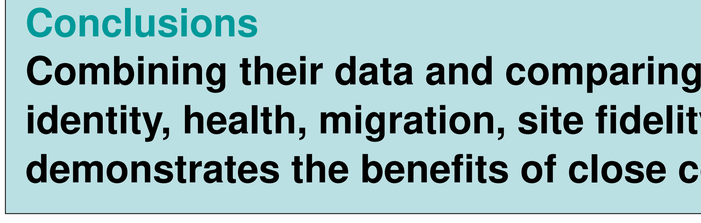
These were presented to CSG observers to ensure validation of the identification. Sightings data for each dead seal identified from the catalogue could then be extracted from CSG's database and shared with the CWTMSN to build up a calendar of seal movements.



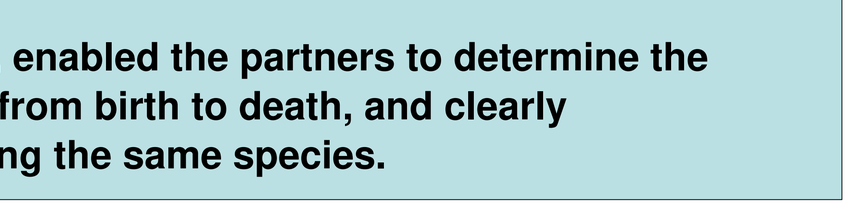
Results

11 dead seals (14%) - four females and seven males - were positively identified by CSG from the CWTMSN photo sets:





CSG ID	Number of sightings	Mean sightings per year	Migrant (M) or Regular (R)	Est. year birth	Est. age at death	Age class
S23	53	7	R	1998	11 years	Breeding
S50	1	0	M	1992	14 years	Breeding
S68	3	1	M	1992	13 years	Breeding
S143	45	6	R	1994	17 years	Breeding
S251	17	4	M	1997	14 years	Breeding
DP12	6	1	M	1993	19 years	Breeding
DP41	149	15	R	1997	14 years	Breeding
DP52	58	8	R	1987	22 years	Elderly
DP88	82	8	R	1998	13 years	Breeding
DP147	20	3	M	1998	12 years	Breeding
DP154	8	3	M	2001	6 years	Pre-breeding



Discussion

The 11 seals identified included five that died in 2011. Two had survived net entanglement, both for seven years. One was an active dominant male from a Cornish haul out. Two of the seals were known to have visited Skomer Island, Wales, where one had given birth to a pup and the other had been a dominant male. One seal had been rehabilitated, so had been monitored from its birth in 1996 to its death in 2006. This represents the longest known survival of a rehabilitated seal in Cornwall. Two of the seals died in rock falls. The nutritional condition at death of fresh seals informed the groups' research as did the fact that one seal was pregnant and was approximately 20 years old at death. Due to their extensive experience of comparing fur patterns of the same seals many times by eye, CSG was able to analyse images that computerised photo ID software would reject as unsuitable. However, a list of factors that limit the success of this method was also compiled and included: state of decomposition, headless carcasses, photo quality, pattern masking by sand/debris, difficulty in identifying juveniles, limited sightings data on weaned pups, issues of scale, scuffed fur, scavenging, angle of photo and difficulty in rolling large seals over to photograph the complete fur pattern.

Conclusions

Combining their data and comparing individual seals - alive and dead - from photos, enabled the partners to determine the identity, health, migration, site fidelity and longevity of individual seals, in one case from birth to death, and clearly demonstrates the benefits of close communication between research groups studying the same species.

The CWTMSN and CSG are grateful to their dedicated volunteers, British Divers Marine Life Rescue and the Cornish Seal Sanctuary, Gweek. Thanks also to James Barnett and Nick Davison at the AHVLA, Polwhele, Truro.