Grey Seal Behaviour, Pup Census and Photo Identification Study: Calf of Man Final Report 2011

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Bull seal, Cow Harbour beach

1.0 Introduction

Grey seal monitoring during the pupping season was started in 2009, with a short pilot project, and extended in 2010. Once again, the project has taken place in 2011, covering the majority of the pupping season. The study was conducted between the 20th September and 1st November, with assistance before and after from the Calf wardens. The project was again carried out under license from the Isle of Man Government (Department of Environment, Food & Agriculture, license number WLA/P006/11).

2.0 Methods

Methodology followed was the same as in 2010. The pup count was carried out on an ad hoc basis while the wardens were carrying out other duties. When the volunteer observers arrived, effort was increased with almost daily walks to the main pupping sites. Pup presence was recorded and pups were assigned to one of 5 developmental stages (see Appendix 1). This was to ensure that pups weren't double counted and also to give a better idea of the time frame of pup development in this area.

Behavioural observations were carried out at 4 different sites with the majority of effort concentrated at 1 site, Cow Harbour. The maximum length of any one watch was 3 hours (to minimise potential seal disturbance and reduce observer fatigue). Watch periods were divided into 15 minute intervals and information on the number of adults and pups was recorded in each interval. The behaviours exhibited by adult seals (split by males/females and hauled or in the water) in each interval were also recorded, according to the codes below. If a behaviour was seen in an interval it was recorded as being a 'positive interval' for that behaviour, regardless of how long the behaviour was exhibited for.

Behaviour Codes

H = Hauled
W = in the Water

M = Male
F = Female

R = Resting
A = Aggressive interaction (between 2 males, 2 females or 1 male & 1 female)
T = Travelling
C = Courtship
S = Suckling

L-S = moving from Land to Sea
S-L = moving from Sea to Land

Photo ID was carried out using a Canon D50 with 70-300mm lens. Seals were allowed to become accustomed to the observer's presence before being approached to take photos. Seals identified were predominantly female, most of which had pups. The best images of each individual were compared to the existing catalogue and were added to the catalogue if they had not been seen previously.

3.0 Results

3.1 Pup Census

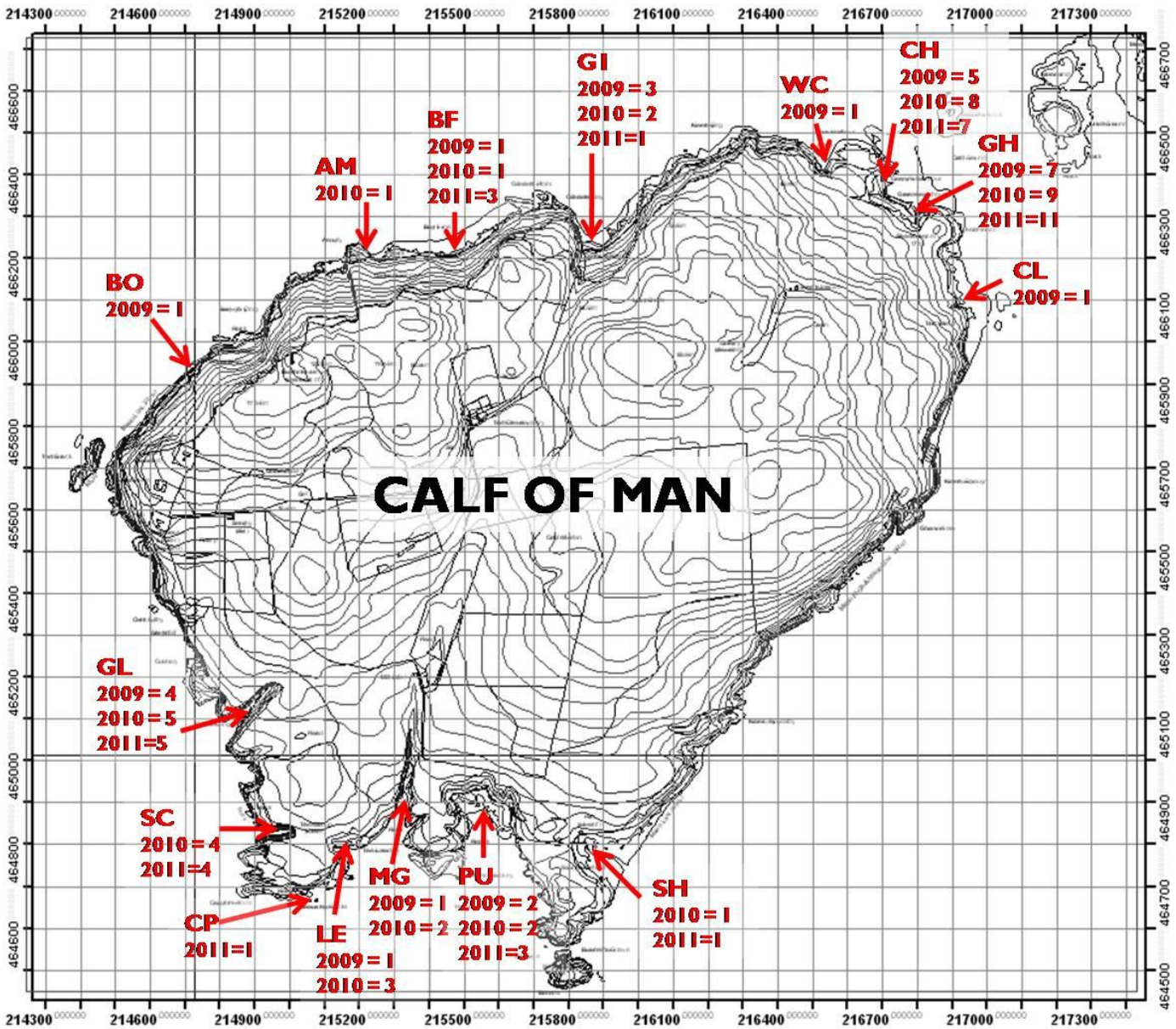
There were 37 pups found on the Calf in 2011, at 9 different sites. Only 2 dead pups were seen, making the pre-weaning mortality rate 5%. This is similar to both 2009 and 2010 on the Calf, as well as being relatively low compared to general grey seal pup mortality.

The distribution of pups can be seen in Figure 3.1.1 below. This map also has the distribution of pups in 2009 and 2010. Distribution is broadly similar, with a clear high density of pups at Cow & Grant's harbours once again.

Figure 3.1.1: Distribution of pups, 2009-2011

Map showing the location & number of pups born in 2009, 2010 & 2011 .

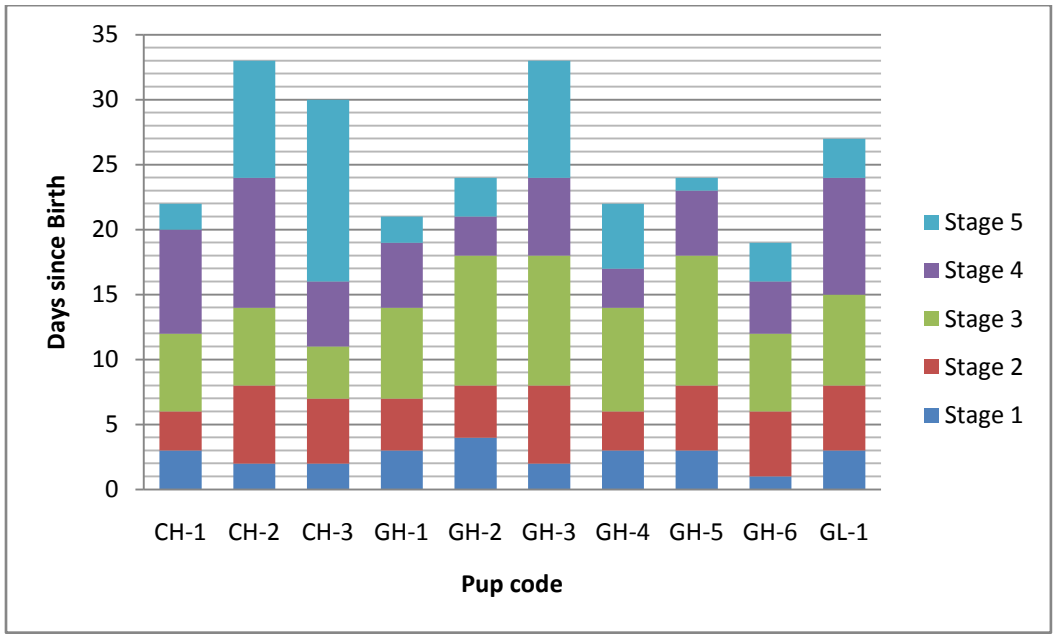
Code	Location
CL	The Cletts
GH	Grant's Harbour
CH	Cow Harbour
WC	West of Cow
GI	Gibdale
BF	Bay Fine
AM	Amulty
BO	Bay yn Ow
GL	Ghaw Lang
SC	Smugglers Cave
CP	Caigher Point
LE	The Leodan
MG	Mill Giau
PU	The Puddle
SH	South Harbour



3.2 Pup Development

It was possible to follow the full development of 10 pups, from birth to stage 5. The time each pup spent at each developmental stage can be seen in Figure 3.2.1 below.

Figure 3.2.1: Time spent at each developmental stage. Time at stage 5 is only a minimum as it was not always known when the pup actually left the pupping site.



The time spent at each developmental stage (on average) was as follows:

Stage 1= 0-3 days
Stage 2 = 3-8 days
Stage 3 = 8-15 days
Stage 4 = 15-21 days
Stage 5 = 21 days onwards

Although there is individual variation in the time of pup development, this pattern is very similar to that in 2010, with the majority of individual variation coming after pups reach stage 3. These initial few days are the most critical time for the pups, as this is the time when they are suckling the most and putting on weight quickly. Following pup development over time in this way will help track the general health of the group of seals that use the Calf.

3.3 Behaviour

Behavioural observations were carried out for a total of 116.75 hours, over 41 days. The breakdown of time spent at each site is shown in the table below:

Site	Hours Observation
Cow Harbour	94.25
The Puddle	12.25
Grants Harbour	7
Bay Fine	3.25

Figure 3.3.1 below shows the breakdown of the occurrence of all behaviours, males and females combined. This represents the number of intervals that were positive for that behaviour, rather than the length of time spent engaged in that behaviour. It can be seen that once again, the most commonly observed behaviour was resting, both on land and in the water. Suckling was observed in 19% of intervals, a figure comparable with the 21% seen in 2010.

Figure 3.3.1: Occurrence of each behaviour, males and females combined. H = hauled, W = in the water, L-S = moving from land to sea, S-L = moving from sea to land.

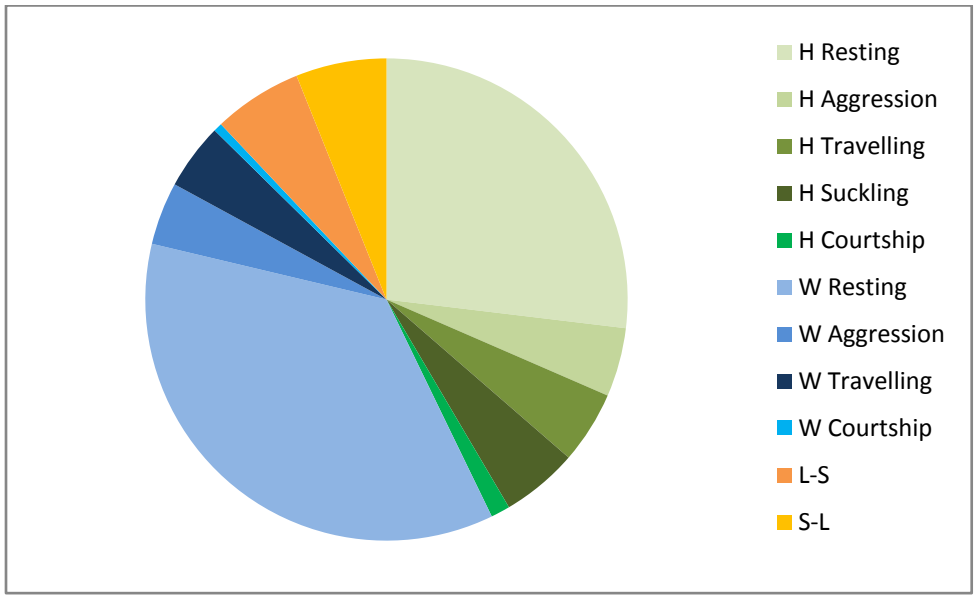
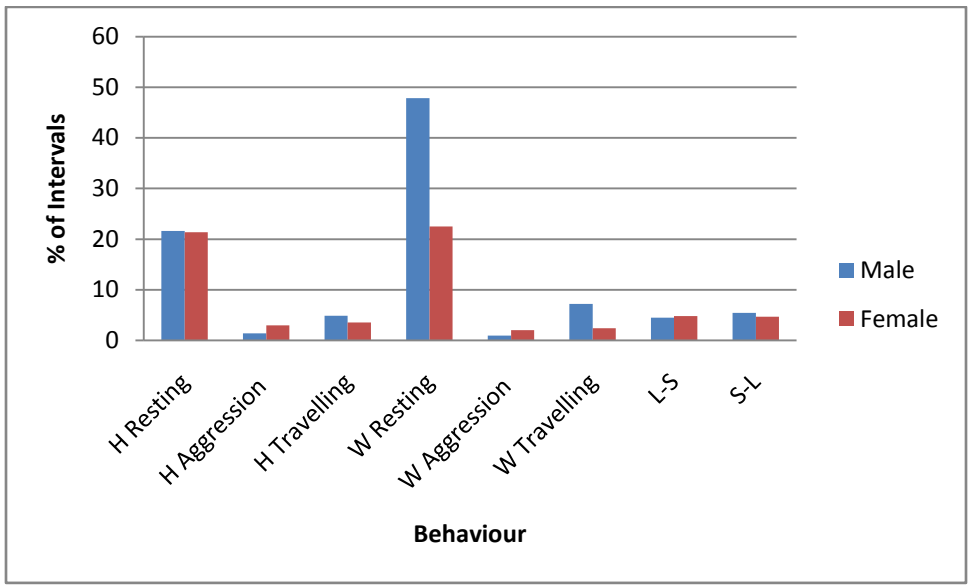


Figure 3.3.2 shows the breakdown between males and females for the more commonly observed behaviours. The average number of males present in each interval was 1.1 and the average number of females was 3.5 (again, very similar figures to 2010). Using these as correction factors makes the results for males/females more comparable.

The main difference between the genders was that males spent considerably more time resting in the water than females. Males were also observed travelling more than females, especially in the water. Additionally, it can be seen that there was more female-female aggression than male-male aggression. These observations are very similar to those in 2010.

Figure 3.3.2: Breakdown by males and females of the more commonly seen behaviours. H = hauled, W = in the water, L-S = moving from land to sea, S-L = moving from sea to land. Aggression refers to male-male or female-female encounters. Male-female aggressive encounters were seen in 4.5% (on land) and 7.0% (in water) of total encounters.



Pup behaviour was not quantified, but, as in previous years, pups showed a variety of behaviours, especially as they got older. There was also individual variation in the amount pups moved around and went in the water, partly dictated by their physical positions on the beach/rocks.

3.4 Photo Identification

In 2011, 33 females and 1 male were identified fully, i.e from good quality photos of both the left and right side of the head. Additionally, a further 11 females and 4 males were identified, either from poorer quality photos or from photos of only one side. The total number of individuals in the catalogue is now:

Females (full ID) = 43
Left/Right females = 21
Males = 12

Of the 33 females identified, 24 had pups in 2011. 15 females identified had been seen in previous years – 1 individual has now been seen 4 years running, 5 have been seen in 3 seasons and 9 in 2 seasons. There is also 1 male who has been identified 3 years running – the bull seal at the top of this report, who has been at Cow harbour every year and been seen mating with several of the females.

Returning females generally had pups in the same location as in previous years. However, 1 female moved between Cow & Grants harbour and 1 moved from the Leodan to the Puddle, both very short distances apart. However, for the first time, a female moved pupping locations from the north of the Island (Cow harbour) to the south and pupped this year in the Puddle. She was also seen a few

days before giving birth at a location close to the Puddle, Mill Giau, a location previously used by many females for pupping but not at all this year.

4.0 Potential Disturbance

The study was carried out according to the terms of the license, in order to minimise disturbance. Although it was noticed that females in particular showed a reaction to the presence of the observer, typically they reverted to their original behaviour once the observer had settled into position. There was also considerable individual variation in the level of response shown towards the observer. Over the length of the study, seals typically became habituated to the presence of the observer.

In previous years, more observations were carried out at Grants harbour than in 2011. However, the females appeared to be particularly skittish there this year, so long observations were not carried out for long periods. Once again, there was a pup in South Harbour. It was born quite late in the season and was not unduly disturbed by the few boats that came into the harbour. Indeed, the mother was very often not seen near the pup and did not scare into the water on the arrival of the boat. Overall, whilst reactions were shown, it was not thought that this had any significant negative impact on the health of the seals.

5.0 Conclusions

The 2011 grey seal pup study was again carried out very successfully during the 2011 season and the results showed a great many similarities to previous year's results. The total number of pups, at 37, was consistent with the 2010 figure, as was the mortality rate. Most of the same locations were used for pupping, with Cow and Grants harbours still having the highest density of pups and a lack of pups along the east coast.

Behavioural observations were also consistent with previous years. It may be possible to do a more detailed behavioural study in 2012, including focal follows on individual females to quantify the time invested in their pup.

Photo identification is proving very useful for studying site fidelity to the Calf. Each year more females are being added to the catalogue, indicating that we still haven't encountered all the different seals using the Calf for pupping. However the increasing number of seals recognised as returning to the Calf indicates it continues to be a suitable location for this population. It has not yet been possible to track any of the seals beyond the Calf, but potentially comparisons with other photo ID catalogues may also show up more wide scale movements. Long term photo ID studies will enable a more accurate understanding of the number of grey seals utilising the Calf. As the Calf has the highest density of pups around the Isle of Man, long term study should also continue to ensure this protected species is monitored during this crucial life stage.

Appendix 1

Seal Pup Developmental Stages

Stage	Age	Characteristics	
Stage 1	0-2 days	Thin baggy-skinned body Yellow stained or white natal fur Conspicuous umbilical cord Docile & poorly coordinated	
Stage 2	3-7 days	Smoother bodyline, few loose folds Neck still distinguishable Umbilical cord atrophied Aware & coordinated	
Stage 3	7-15 days	Rounded or barrel shaped body Neck thickened/indistinguishable Partial moulting from head or flippers May be aggressive on approach	
Stage 4	16-20 days	Rounded body Partial moulting from torso Head & flippers moulted May be aggressive on approach	
Stage 5	18-25+ days	Fully moulted to short fur coat (< 100cm^2 natal coat remaining) May be aggressive on approach