Grey Seal Behaviour, Pup Census and Photo Identification Study: Calf of Man. Final Report 2010

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1.0 Introduction

In 2009 a short study of grey seals was conducted on the Calf of Man, during the pupping season. This included a pup census for the island, observing behaviour at pupping sites and photo identification of adults (predominantly females) at those sites. In 2010 this study was repeated and extended, due to the availability of volunteers to carry out the study. As grey seals are a protected species under Manx law, the study was carried out under license from the Isle of Man Government (Department of Environment, Fisheries & Agriculture, license number WLA/P010/10).

The 2010 study took place between 17th September and 6th November, with the first known pup being born on the 18th September and the last known pups born on the 3rd November.

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2.0 Methods

Methodology followed was broadly the same as in 2009. 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, based on Cadhla, 2007). This was to ensure that pups weren't double counted and also gives a better idea of the time frame of pup development in this area.

Behavioural observations were carried out at 8 different sites with the majority of effort concentrated at 2 sites. 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 catalogue from 2009 and were added to the catalogue if they had not been seen previously.

3.0 Results

3.1 Pup Census

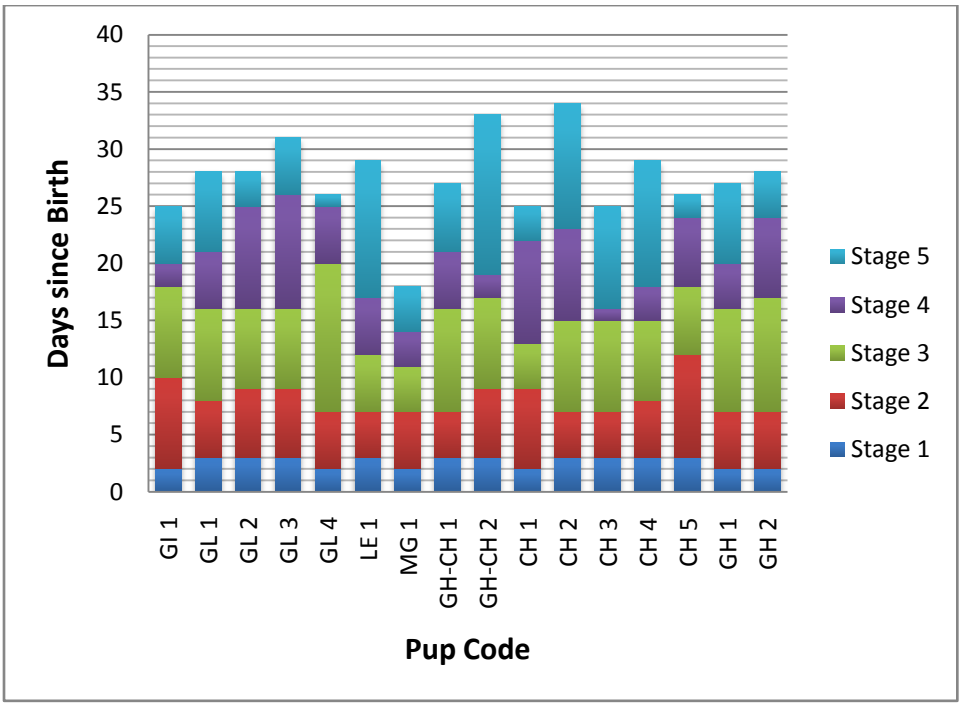
There were 38 pups recorded in 2010 at 11 different locations. Of these, 2 are known to have died and 3 disappeared shortly after being born. Taking just the known dead pups, this gives a pre-weaning pup mortality rate of 5%, including the missing pups it is 13%. In 2009 the pre-weaning pup mortality rate was similar, at 7%.

The distribution of pups can be seen in Figure 3.1.1 below. This also includes the distribution of pups in 2009. It can be seen that the majority of locations have been used in both years, indicating site fidelity and preference for these beaches. As in 2009, the highest density of pups was at 2 sites – Cow Harbour and Grants Harbour – on the north coast of the Calf. Again there were no pups seen along the east coast of the island. This lack of seal activity along this stretch, from south of the Cletts to South Harbour, is also reported in a seal survey from 2006/7 (Manx Bird Atlas, 2007).

3.2 Pup Development

The extended length of the 2010 study meant that pups could be followed from birth through to fully moulted & weaned. There were 16 pups that were observed moving through all 5 developmental stages and the length of time spent at each stage can be seen in Figure 3.2.1 below.

Figure 3.2.1: Development of each of the 16 pups followed from birth to fully moulted. Time at Stage 5 is only a minimum, as it was not known when the pups had actually left the pupping site.



The average time spent at each developmental stage was as follows. The time as described in the reference table is in brackets:
Stage 1 = 0-3 days (0-2)
Stage 2 = 3-8 days (3-7)
Stage 3 = 8-16 days (7-15)
Stage 4 = 16-21 days (16-20)
Stage 5 = 21 days onwards (18-25+)

This pattern of development therefore broadly follows the pattern described in the reference document, which is based on grey seals in Ireland, and is thus a good model for describing pup development on the Calf.

It can be seen from the graph that there is individual variation in pup development, which is most likely due to individual health and the health of the mother. One pup in particular (MG 1) developed very quickly and was almost fully moulted by 14 days old. Most of the variation comes after the pups reach Stage 3, when they have fattened out and are beginning to moult. This also coincides with the time the mother will wean her pup. Therefore it appears that most of the pups are passing through the critical period up to weaning at a similar rate, with individual variation coming post weaning. Additionally, the pups that died or went missing, all did so whilst at Stage 1 or 2.

Following pup development in this way can help track the general health of the group that use the Calf. For example, if pup development, especially up to reaching Stage 3, alters in future years it could be indicative of poor health of the mothers.

3.3 Behaviour

In total, behavioural observations were carried out for 106.25 hours, over 38 days. The breakdown of hours of effort at each location can be seen in Table 3.3.1 below.

Table 3.3.1

Location	Hours of Effort
Cow Harbour	49.5
Grant's Harbour	27.75
The Leodan	9.25
Ghaw Lang	9
South Harbour	4.75
Smugglers Cave	3.25
Gibdale	2
The Puddle	0.75

The breakdown of the behaviours observed at all the sites combined, can be seen in Figure 3.3.1 below. For each behaviour, this represents the total number of intervals in which that behaviour was exhibited (by either males or females). Therefore it does not represent the actual time spent engaged in that behaviour.

The predominant behaviour observed was resting, both in the water and hauled. Also of note is that suckling was observed in 21% of all intervals – a much higher figure than in 2009 when it was only 8%. This was to be expected as the study in 2009 was conducted over a shorter period of time, when many of the pups had already been weaned. It is likely that the 2010 figure of 21% is more representative.

Figure 3.3.1 Pie chart showing the occurrence of different behaviours. Males and females were combined. Behaviours on land are in green, those in the water in blue. H = hauled, W = in the water. L-S = moving from land to sea, S-L = from sea to land.

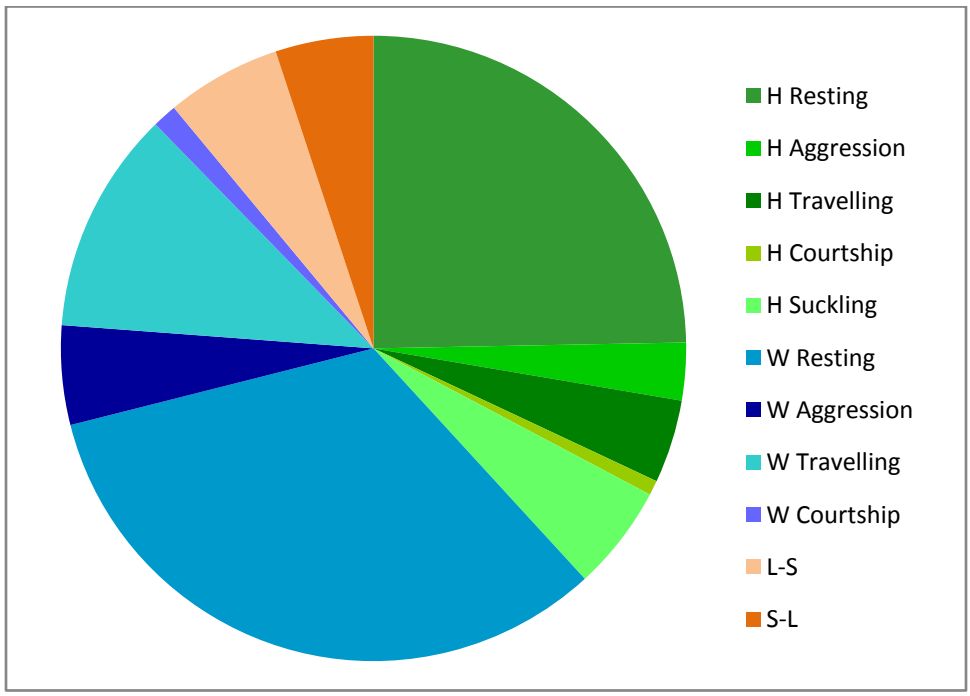
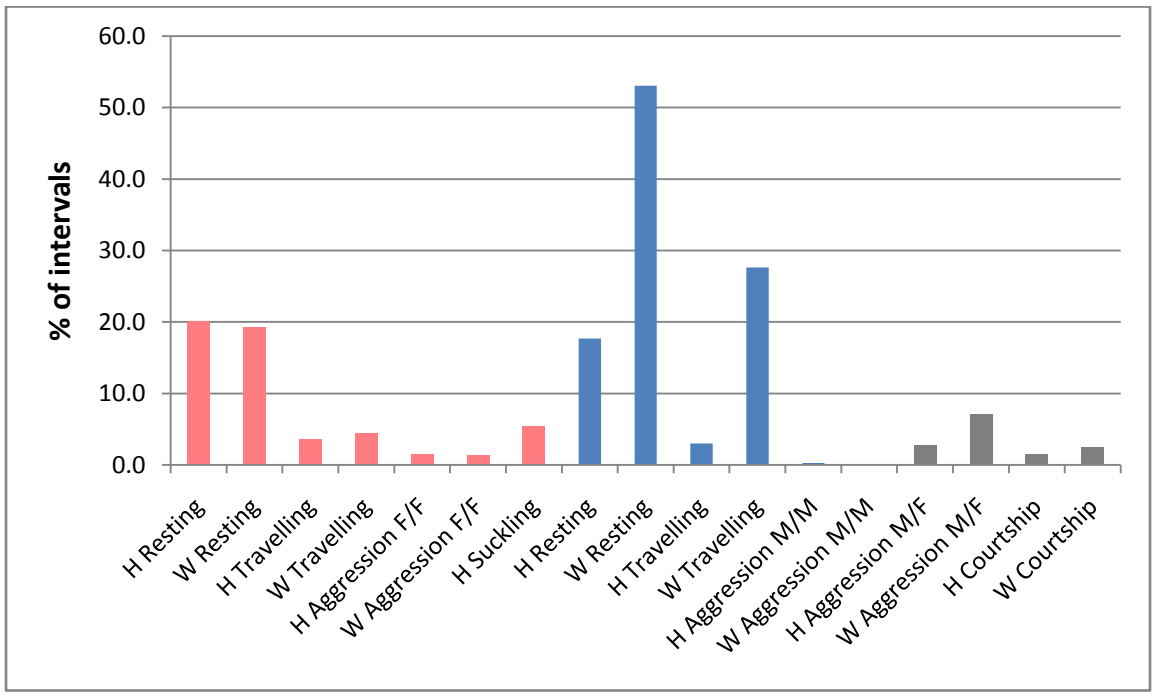


Figure 3.3.2 below shows a breakdown of the main behaviours exhibited, separated into male and female. On average, there were 1.1 males and 3.8 females present in each interval. Therefore these figures have been corrected to make the male/female ratio equal and hence the relative occurrence of each behaviour more comparable.

This shows that males spent a much greater proportion of time both resting and travelling in the water than females. Females used the water and land in almost equal proportion for resting, most likely following the tide cycle and hauling out at low tide to look after their pup, whereas males remained in the water throughout the tide cycle. Perhaps surprisingly, it also shows that there was a lot more aggression between females, or between a male and female, than between 2 males.

Figure 3.3.2 Breakdown of behaviours observed. H = hauled, W = in the water. M = male, F = female. Female behaviours in pink, male behaviours in blue, behaviours involving a male and female in grey.



Pup behaviour has not been quantified but they also showed a range of behaviours. Typically the young pups did not move around much, with their movement around the beach increasing as they got older, especially once weaned. Pups were also seen swimming, especially at the more spatially restricted gullies, and interacting with other pups.

3.4 Photo ID

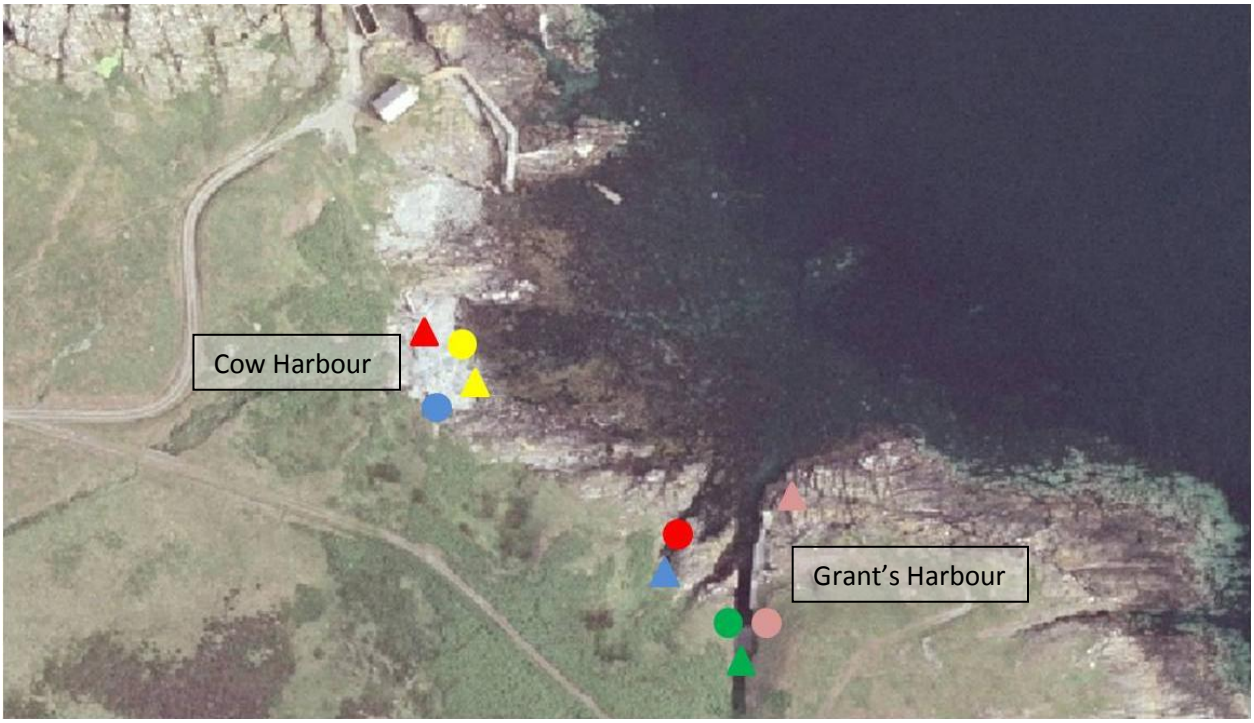
In 2010 a total of 28 different females and 7 males were identified, although most of the males had very few easily identifiable markings and therefore might not be recognised in the future. For 7 of the females, pictures were only obtained from one side of the head, which may make re-identification difficult in the future. Of the females, 21 had pups. As Cow Harbour and Grant's Harbour were the most populated areas and with the easiest accessibility, the majority of the female ID's came from these two locations (11 at Cow, 9 at Grant's).

Including the animals seen last year, the catalogue now comprises 32 females and 7 males. There are 5 females and 1 male that have been seen in 2009 and 2010. Additionally a few images have been obtained which shows that 3 of these females were also present in 2008. All these re-sighted females have had pups in all years, all at Cow Harbour or Grant's Harbour (2008 exact locations are unknown). Figure 3.4.1 below shows the locations that the females pupped in 2009 and 2010.

This shows that although 2 females had pups in almost exactly the same place each year, the others moved slightly around the sites or between them. However, the 2 sites are clearly very

closely connected and should perhaps be considered as the same location. It is, however, interesting that the 2 sites are very different in nature, with Cow Harbour being an open beach and Grant's Harbour a series of narrow, flooding gullies.

Figure 3.4.1 Aerial photo of the Cow & Grant's Harbour area. Different females shown in different colours. Circles = 2009, triangles = 2010.



4.0 Potential Disturbance

The study was carried out in accordance with the terms of the license, in order to minimise potential disturbance to the seals. The volunteer observers had previously worked under other similar Isle of Man government licenses and were therefore very aware of the need to act responsibly around the seals. They were also trained in the specifics of the seal study and behaviour, in order to notice any signs of distress. Due to the study being carried out over a longer period of time, observational watches were limited to 3 hours on any one day.

It was not felt by any of the observers that any significant levels of disturbance or harassment of the seals took place. The seals were naturally inquisitive but quickly became accustomed to the presence of the observer. Seals also showed individual variation in the level of reaction to the observer arriving at the site, with some paying no attention at all. Pups generally showed no reaction to the presence of the observer, although one pup would often approach the observer inquisitively.

In 2010 there was a pup at South Harbour, which is used by the boatman bringing supplies to the Calf. Close attention was paid when the boat arrived or departed and little reaction was

shown by either the pup or its mother. A group of 8 kayakers were also seen entering South Harbour, but again no reaction by the pup or mother was noticed. There were very few other visitors on the Calf during the study and no other records of disturbance to the pupping beaches were recorded.

5.0 Conclusions

The Calf of Man is believed to have the highest density and number of grey seal pups across the Isle of Man. In 2010 there were a minimum of 38 pups born at 11 locations, although there were likely to be many more at inaccessible sites. However the number of known pups was higher than in 2009, which could be as a result of greater effort in 2010. The pre-weaning pup mortality is similar to that in 2009 and falls towards the lower end of the expected range (Kiely et al, 2000). The number, distribution, mortality and development of pups indicate that the Calf is a well used and suitable location for grey seal pupping. Future monitoring of pup production and success should be used to help determine the general status of the grey seal population around the Isle of Man.

Behaviour at pupping locations is typical for the grey seal breeding period. This should be monitored in future years to determine any long term changes in site usage or should extra stresses be put on the population.

Photo ID has shown a degree of site fidelity to pupping locations, which is typical of grey seal populations. It would be expected that a greater degree of site fidelity will become apparent as the study progresses and more images are obtained in future years. Continuing photo ID studies will help chart the long term success of the breeding grey seals and hence their population status in Manx waters.

References

Ó Cadhla, O., Strong, D., O'Keeffe, C., Coleman, M., Cronin, M., Duck, C., Murray, T., Dower, P., Nairn, R.,Murphy, P., Smiddy, P., Saich, C., Lyons, D. & Hiby, A.R. (2007). An assessment of the breeding population ofgrey seals in the Republic of Ireland, 2005. Irish Wildlife Manuals No. 34. National Parks & Wildlife Service,Department of the Environment, Heritage and Local Government, Dublin, Ireland.

Kiely, O., Lidgard, D., McKibben, M., Connolly, N. & Baines, M. (2000). Grey Seals: Status and Monitoring in the Irish & Celtic Seas. Maritime Ireland/Wales INTERREG report.

Manx Bird Atlas (2007). Report on a survey of Grey Seals around the Manx coast, undertaken from April 2006 to March 2007. DAFF report.