



Protecting *Manx Wildlife*
for the future

Calf of Man Seal Surveys

Autumn Report 2016



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Table of contents

1. Introduction	3
1.1 <i>Study site</i>	3
1.2 <i>Aims and objectives</i>	3
2. Methods	3
2.1 <i>Data collection</i>	3
2.2 <i>Data processing</i>	4
3. Results	4
3.1 <i>Pup census</i>	4
3.2 <i>Births per week</i>	6
3.3 <i>Pup distribution</i>	6
3.4 <i>Mother ID</i>	8
3.5 <i>Catalogue</i>	8
4. Discussion	9
4.1 <i>Pup census</i>	9
4.2 <i>Births per week</i>	9
4.3 <i>Pup distribution</i>	9
4.4 <i>Mother ID</i>	10
4.5 <i>Limitations and future recommendations</i>	10
5. References	11
6. Appendices	12

1. Introduction

The grey seal (*Halichoerus grypus*) is widely distributed throughout UK waters, with an estimated population size of 97,000–159,000 individuals in this area, equating to 39% of the global population (JNCC, 2007). Within the Irish Sea, where 5,000–7,000 individuals reside, the Isle of Man is an important haul-out site, providing ample coastline for resting and plentiful foraging opportunities (Stone et al., 2013). Important haul-out sites include The Sound, Langness, Maughold Head and the Calf of Man (Stone et al., 2013). The Calf of Man in particular, is a notable haul-out and pupping site (Barne et al., 1996), frequented by seals annually (Crow, 2013).

1.1 Study site

The Calf of Man (hereafter referred to as 'the Calf') is a largely-uninhabited islet off the south coast of the Isle of Man. The Calf boasts a diversity of habitats and species-rich communities, perhaps due to the presence of both exposed and sheltered areas (Barne et al., 1996). Grey seals inhabit both beaches and rocky inlets, that provide ideal conditions for hauling out and parturition (Crow, 2013). Although seals may use haul-out sites year-round, pupping season occurs in the autumn, typically between September and November (Stone et al., 2013).

1.2 Aims and objectives

1. Produce a grey seal pup census for the Calf; recording pup name, date of birth, mother ID and progression through developmental stages. Furthermore, pup location will be recorded in order to map pup distribution and determine relative popularity of sites.
2. Obtain photographic identification profiles of observed individuals to compare with the historical ID database, in order to determine whether individuals sighted previously, return to the Calf and particular sites in 2016.

2. Methods

Calf observation-based seal surveys have been conducted annually since 2009. The present survey was undertaken over a seven-week period from 19/09/2016 to 07/11/2016. The entirety of the Calf was surveyed, including 15 key sites where seals have been known to haul-out historically (**Figure 1**). The sites were divided into the northern route (Bay Fine to The Cletts and all sites in-between) and the southern route (Ghaw Lang to South Harbour and all sites in-between). The following volunteers/staff were involved in conducting the seal surveys: Rebecca Crow (six weeks), Mike Prior (one week), Pashala Yates (one week), Anton Caohen (one week), Lucy McLeod (one week) and Haley Dolton (one week). This year was the first year during which a single volunteer (Rebecca Crow) was primarily responsible for conducting the surveys, with additional volunteer support throughout. It was hoped that using one primary volunteer would improve consistency of data collection and the seal ID processes.

2.1 Data collection

Surveys were conducted on a daily basis, with each route surveyed on alternating days in order to minimise disturbance. Observations were non-invasive and disturbance kept to a minimal level, through use of a long lens SLR camera and maintaining a distance of 50m. At each site date, location and numbers of pups, females (juvenile and adult) and males (juvenile and adult) were recorded. Each pup was named using a designated letter for the 2016 cohort, in this instance the letter was 'P'. Pup developmental stage was also noted (**Appendix 1**). The observation of suckling behaviour was used to determine mother-pup pairs. Where possible,

two photographs were taken of each individual adult, one of both the left and right side of the head (ideally with a wet pelage), for photographic identification at a later date.

2.2 Data processing

Each day, data obtained was inputted onto existing Excel spreadsheets; daily log, pup developmental progress and ID catalogue. The ID catalogue contains photographs of each individual (females and males) previously seen on the Calf, labelled by the location at which the individual was first sighted. The left and right profile shots displaying a unique pelage pattern can be used to identify individuals. Once added to the catalogue, obtained photographs were compared to historical images and any females, including those exhibiting nursing behaviour, could be identified. Similarly, males were identified and recorded using the ID catalogue. In some instances it was not possible to obtain both left and right profile shots of individuals, but rather just left or right only. Photos of these individuals were added to the 'left/right nearly' catalogue.

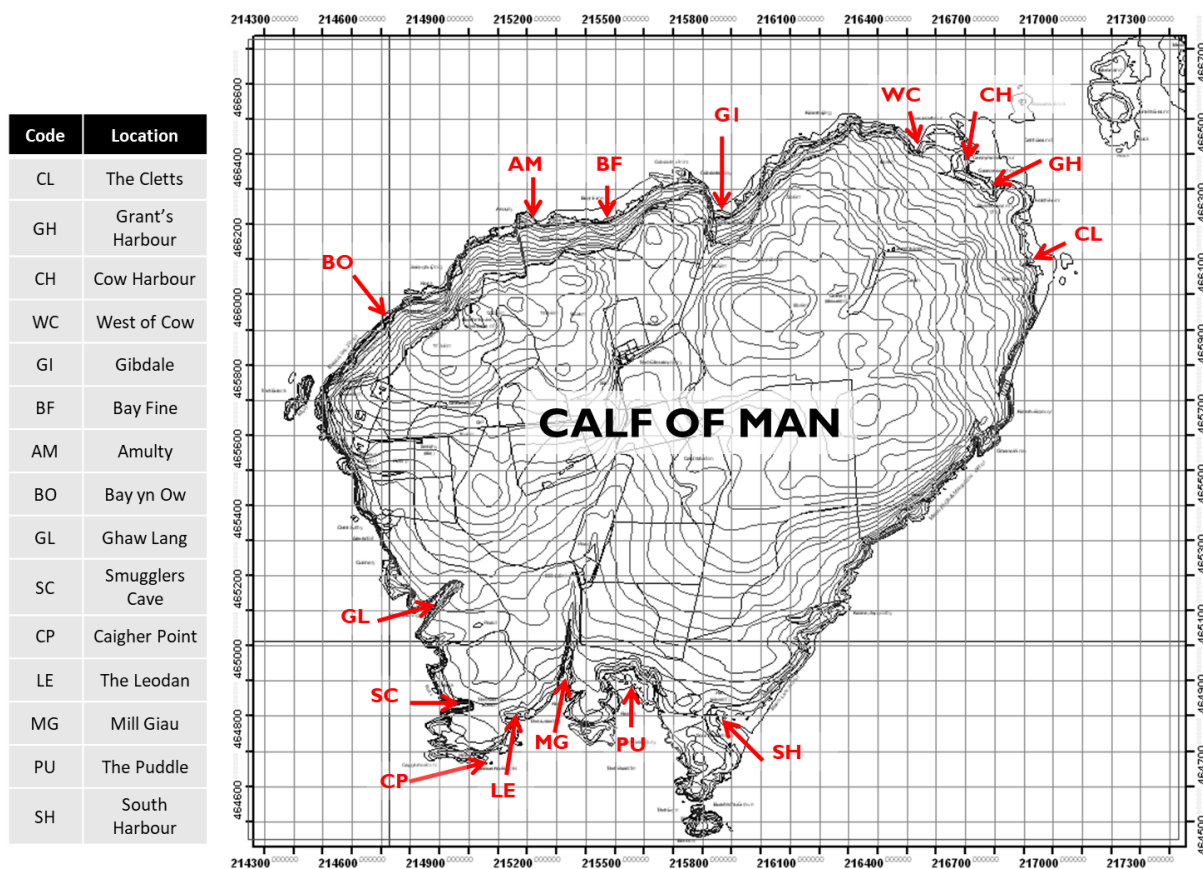


Figure 1 – 15 of the primary pupping locations upon the Calf of Man.

3. Results

3.1 Pup census

A total of 84 pups were recorded. Of these, 83 were observed across 13 historic pupping sites and one individual was observed at Kittiwake Cave. 47.62% (n= 40) were known to survive to stage 5 of development (fully weaned), 5.95% (n= 5) were confirmed deceased and a further 45.24% (n= 38) were unaccounted for (**Table 1**). These individuals were initially observed and possibly sighted subsequently at later stages but were not observed in a stage 5 state of

development. It is uncertain whether this insufficient data indicates survival or death and thus these individuals are subsequently referred to as 'missing'. However, it should be noted that eight individuals were seen for the first time at stage 5 of development and thus it is possible that these 'missing' individuals were present but not visible to/observed by surveyors. Should this be the case, survival rate would equate to 92.86%.

Figure 2 depicts the trend in total number of pups over an 8-year period from 2009 to 2016. There appears to be an overall positive trend with an increasing number of pups born annually, although there was no change between 2010 and 2011. The greatest number of pups were recorded this year (n= 84), equating to an increase of 21 individuals from 2015.

Table 1 – Total number of pups recorded and relative proportions of surviving, deceased and missing individuals.

Number of pups	Survived/weaned (%)	Deceased (%)	Insufficient data (%)
84	47.62	5.95	45.24

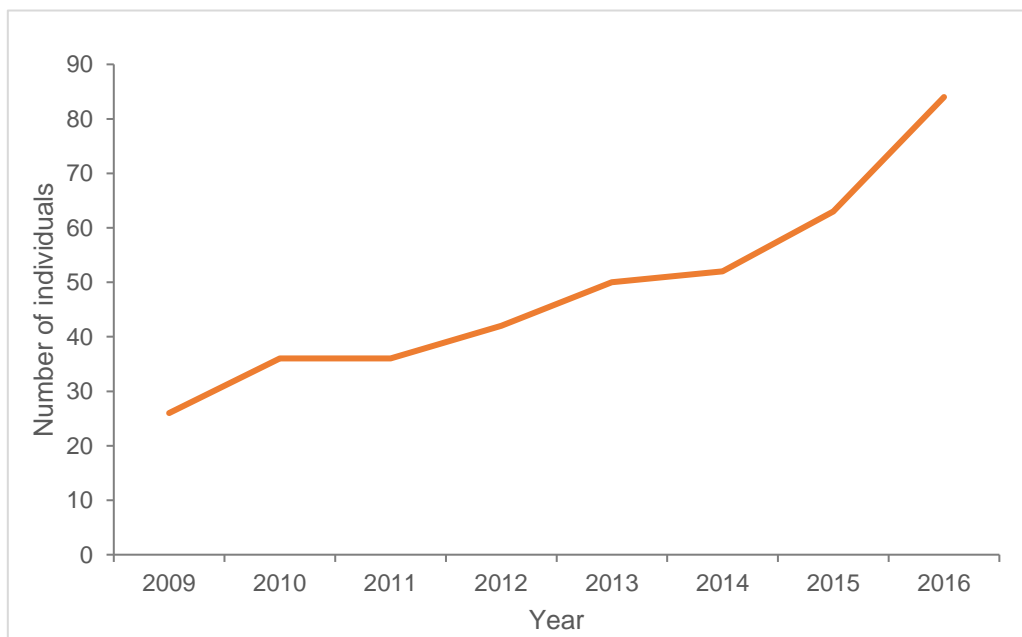


Figure 2 – Total number of pups observed on the Calf each year between 2009-2016.

3.2 Births per week

Figure 3 depicts no true pattern in the number of pups born each week during the survey period. Birth rate appears to peak in week 3, with 14 confirmed births. Furthermore, there is another smaller peak in week 5 in which five births occurred. Occasionally, exact date of birth was unknown, however for those individuals for which date of birth was known (32.14%, n= 27), first sighting was always on the same day. Therefore, date first seen is a relatively good indicator of date of birth and likewise **Figure 3** shows a similar trend line for both records.

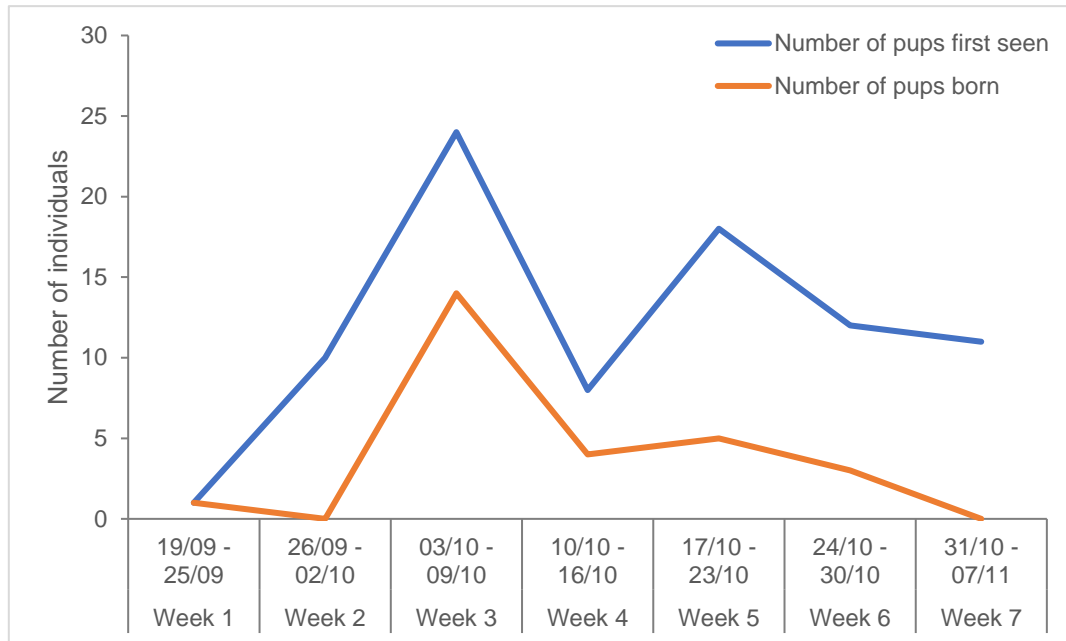


Figure 3 – Rate of pups born/first seen per week during the seven-week survey period. Number of pups born describes pups for which exact birth date was known.

3.3 Pup distribution

Of the 84 pups recorded in total, 83 individuals were recorded across 13 historic pupping sites (**Figure 4**). Pup abundance was greatest at The Puddle (PU), with 19.05% (n= 16) of pups recorded at this site, followed by Grants Harbour (GH) (13.10%, n= 11). Cow Harbour (CH), Mill Giau (MG) and The Cletts (CL) were also relatively popular sightings (11.90%, n= 10). The lowest number of individuals were recorded at Amulty (AM) and Bay Fine (BF) (1.19%, n= 1). No pups were recorded at Bay yn Ow (BO) or The Leodan (LE). Almost equal proportions of pups were sighted at southern (50.60%, n= 42) and northern (49.40%, n= 41) sites.

Pup distribution recorded in the present survey is relatively similar to the pattern of distribution in 2015 and 2014 (**Figure 5**). **Figure 5** shows the southeast and northeast corners of the Calf appear to be consistently the most popular areas. The Puddle (PU) and Grants Harbour (GH) have been the most highly frequented sites over the three-year period. The same sites were utilised in both 2015 and 2016, with the addition of The Cletts (CL) and West of Cow (WC) in the present year.

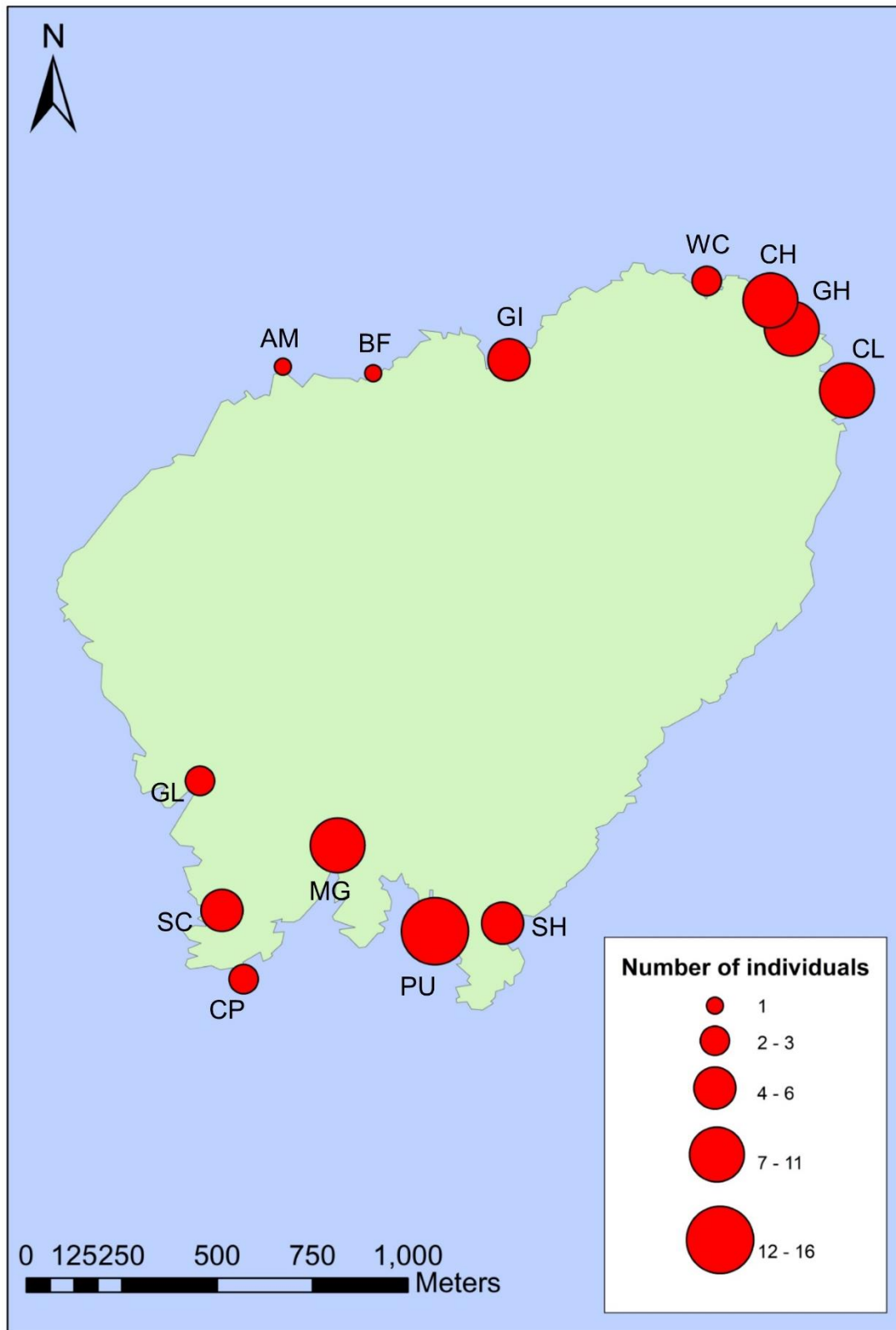


Figure 4 – The distribution of pups across 13 pupping sites on the Calf. Symbol size equates to number of individuals present/abundance. AM= Amulty, BF= Bay Fine, GI= Gibdale, WC= West of Cow, CH= Cow Harbour, GH= Grants Harbour, CL= The Cletts, SH= South Harbour, PU= The Puddle, MG= Mill Giau, CP= Caigher Point, SC= Smugglers Cave, GL= Ghaw Lang.

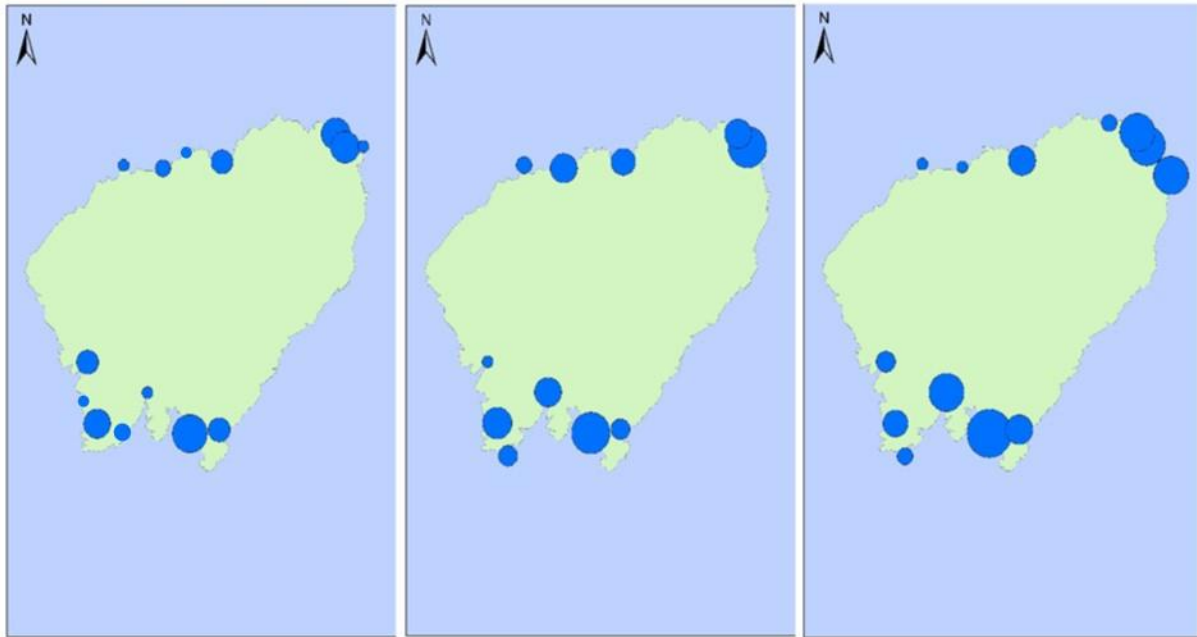


Figure 5 - Pup distribution across pupping sites in 2014, 2015 and 2016 (L to R). Symbol size is representative of proportion (%) of pups.

3.4 Mother ID

Of the 84 pups recorded, 82.14% (n= 69) of corresponding mothers were identifiable (viable left and right profile shots were obtained and added/compared to previous catalogue photographs) (**Table 2**). Of these identified females, 62.32% (n= 43) had previously given birth on the Calf, 4.35% (n= 3) had been sighted previously but without pups and 33.33% (n= 23) were new to the Calf. Mother identification was unsuccessful for 17.86% (n=15) of pups.

Table 2 - Relative proportions (%) of identified and unidentified mothers, based on photographic identification methods.

Number of pups/mothers	Identified mothers (%)	Unidentified mothers (%)
84	82.14	17.86

3.5 Catalogue

As of 2016, there are 194 females and 42 males in the ID catalogue (for which left and right profile shots have been acquired). Of these, 32 females and 15 males were newly added this year. There are also 71 'L/R nearly' records which describe individuals that have been observed but at present photographs of both the left and right profile are unavailable. Of these 'L/R nearly' entries, 7 individuals were added this year.

4. Discussion

4.1 *Pup census*

This year more pup births were reported than in any previous year (2009-2015), with a notable increase from 2015. Whilst there were more confirmed pup deaths this year (five compared to two in 2015), mortality rate was relatively low and similar to levels reported in previous years, with the exception of 2014 in which an unusually high rate was recorded. Furthermore, the proportion of pups known to survive to stage 5 of development also shows an improvement on 2015. Overall, these results appear to depict 2016 as a successful pupping year in terms of 'productivity', contributing to population growth. Despite this, it should be considered that inter-annual variation in surveyors, survey effort and abiotic factors (e.g. weather conditions) may have affected observations and conclusions drawn about pupping success. Additionally, similar to previous years, insufficient data was obtained for a relatively high proportion of pups and it is uncertain whether these individuals survived to stage 5 of development or died. It is perhaps likely that this was a result of inability to successfully identify pups during subsequent site visits or that the specific location of these individuals had changed (e.g. to a position that was not in observer field of view). However, it is also possible that a proportion of these individuals could potentially have been washed off by wave action and unable to re-position themselves on haul-out sites, as is somewhat typical for grey seal pups (Anderson et al., 1979). This may have been the case during periods of bad weather (storm conditions) that occurred occasionally during pupping season.

4.2 *Births per week*

Whilst birth rate shows no obvious trend, numbers were very low in week 1 (only one individual recorded) and show a decrease after week 5, thus it is likely that peak pupping period was covered during the survey. Peak in birth rate occurred during a similar temporal period in both the present year (03/10-09/10), 2015 (29/09-06/10) and 2014 (03/10-09/10). Based on this, it may be of interest to further investigate breeding/pupping behaviours and record abiotic conditions to examine any inter-annual patterns that could be influencing parturition.

4.3 *Pup distribution*

This year, the majority of pups were sighted at The Puddle (PU), followed by Grants Harbour (GH). This is consistent with results obtained from previous years, including both 2014 and 2015 in which these sites were the most popular pupping areas. These sites are easily accessible, possess gentle slopes/shelving with ample haul-out space at a variety of levels and provide shelter from north-westerly prevailing winds (Barne et al., 1996). Grey seals are often found to haul-out on sites with the aforementioned features suggesting these are favourable conditions (Pomeroy et al., 1994; Pomeroy et al., 2000a) and thus may explain the popularity of these sites on the Calf year after year.

It is perhaps interesting to note that whilst The Cletts (CL) was a relatively popular pupping site this year, it was not utilised for this purpose in either 2014 or 2015 and only one pup has been recorded here since Calf seal surveys began in 2009 (occurring in 2013). The site is largely covered by water at high-tide and thus it was thought to be somewhat unfavourable for pupping, explaining the lack of usage previously. Perhaps the higher abundance of individuals this year compared to previous years, including 23 mothers thought to be new to the Calf, resulted in less haul-out space in more favourable areas and increased use of this site instead. Furthermore, the site is located in the northeast corner of the Calf, in relatively close proximity to two popular sites (Grants Harbour (GH) and Cow Harbour (CH)). Therefore, it is likely to possess similar favourable features and shelter.

4.4 Mother ID

Although the majority of mothers were identified, a relatively small proportion were unidentifiable and therefore it is unclear whether these mothers, had they been identified, were new to the Calf or catalogued previously. It is notable that 23 females not previously sighted on the Calf gave birth this year. This implies the Calf may be an important pupping site for transient individuals/those that migrated to the area specifically for the purpose of parturition. However, it should be noted that it is possible that these individuals had visited the Calf previously but left and right profile shots may have not been obtained resulting in individuals not being catalogued. Another possible explanation is natal philopatry, whereby seals return to the site at which they were born (Pomeroy, 2000b). Based on this theory it is possible that seemingly new individuals were born on the Calf and have returned to give birth once reaching sexual maturity. Of the 47 females that were added to the catalogue in 2015, 12 gave birth in 2016.

4.5 Limitations and future recommendations

There are several limitations which may have impacted the present survey. The abundance and distribution of pups recorded may not be a fully accurate reflection of true values, as pups may have been miscounted at various locations. Decreased visibility/variable weather conditions, topography (e.g. large rocky outcrops and steep cliffs) and the 50m distance between the observer and the seals may have reduced the likelihood of sighting seals. Similarly, the number of pups may have been underestimated or overestimated (duplicate counts of a single individual) on occasions when a high number of seals were hauled-out at any one time. Furthermore, during the photo identification process, the poor quality of some photographs made it difficult to be certain of a match. This poses a risk of identification error and thus it is possible that individuals deemed to be new to the Calf may have been present previously. It is also possible that identification errors were made during observations, particularly in areas where seal density was high, which may explain why surveyors were uncertain of the fate of several pups. An additional constraint is the extensive time and effort required to conduct the identification process (comparing photographs with the large collection already existing in the catalogue), which continues to increase each year as the catalogue of individuals grows.

On reflection, using one key surveyor (with supplementary support from other volunteers) was thought to improve the consistency of data collection and made the project run more smoothly, compared to previous years where different volunteers would survey for 1-2 weeks each. Therefore, this approach will be utilised again in 2017.

This year pup abundance was greatest at The Puddle (PU), a location which has been a popular pupping site since surveys began and particularly in the last three years. Overall site use shows a similar pattern to previous years, supporting the idea that certain sites are particularly important pupping areas and therefore protecting these sites from human disturbance should be a priority. The increased use of The Cletts (CL) this year is a notable finding and it will be interesting to observe to what extent this site is utilised in future surveys. It may also be useful to examine the topographical features of this site in order to investigate site-selection.





The Manx Wildlife Trust was granted a licence by the Isle of Man Department of Environment, Food and Agriculture (DEFA) in order to carry out this research.

5. References

- Anderson, S.S., Baker, J.R., Prime, J.H. & Baird, A. (1979). Mortality in grey seal pups: Incidence and causes. *Journal of Zoology*, 189, pp. 407-417.
- Barne, J.H., Robson, C.F., Kaznowska, S.S., Doody, J.P. & Davidson, N.C. (1996). *Coasts and seas of the United Kingdom. Region 13 Northern Irish Sea: Colwyn Bay to Stranraer, including the Isle of Man*. Peterborough, Joint Nature Conservation Committee. Available at: http://jncc.defra.gov.uk/PDF/pubs_csuk_region13.pdf
- Crow, R. (2013). The great grey seal opera: An introduction to the life of the grey seal - *Halichoerus grypus*, and the Calf of Man seal pup survey 2013. In Kewley (ed.), *Isle of Man Studies* vol. XIV (2016), pp 6-12.
- Joint Nature Conservation Committee. (2007). *Second Report by the UK under Article 17 on the implementation of the Habitats Directive from January 2001 to December 2006*. Peterborough: JNCC. Available at: <http://jncc.defra.gov.uk/pdf/Article17/FCS2007-S1364-audit-Final.pdf>.
- Pomeroy, P.P., Anderson, S.S., Twiss, S.D & McConnell, B.J. (1994). Dispersion and site fidelity of breeding female grey seals (*Halichoerus grypus*) on North Rona, Scotland. *Journal of Zoology*, 233, pp.429-447.
- Pomeroy, P.P., Twiss, S.D. & Duck, C.D. (2000a). Expansion of a grey seal (*Halichoerus grypus*) breeding colony: Changes in pupping site use at the Isle of May, Scotland. *Journal of Zoology*, 250, pp.1-12.
- Pomeroy, P.P., Twiss, S.D. & Redman, P. (2000b). Philopatry, site fidelity and local kin associations within grey seal breeding colonies. *Ethology*, 106, pp. 899-919.
- Stone, E., Gell, F.G. & Hanley, L. (2013). Marine Mammals-Seals. In Hanley et al., (eds.), *Manx Marine Environmental Assessment. Isle of Man Marine Plan*. Isle of Man Government, pp. 19. Available at: https://www.gov.im/media/983589/3.4b_seals.pdf.

6. Appendices

Appendix 1: The 5 stages of pup development.

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	