



Protecting *Manx Wildlife*
for the future

Calf of Man Seal Surveys

Autumn Report 2015



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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 2015.

2. Methods

Calf observation-based seal surveys have been conducted annually since 2009. The present survey was undertaken over a six-week period from 29/09/2015 to 11/11/2015. The entirety of the Calf was surveyed, including 15 of the main 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 for approximately one week each: Rebecca Crow, Alex Morrice, Lisa Whiteley, Charlotte Wells, Mike Prior, Theo Leach and Lara Howe. Each week one or two volunteers would be responsible for conducting the surveys and at the end of the week there was a change-over period, during which information about pups was shared with new volunteers. This change-over period was extended to overnight, (compared to approximately a few hours in 2014) to allow a greater time for information exchange.

2.1 Data collection

Surveys were conducted on a daily basis, with both routes surveyed each day. 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 2015 cohort, in this instance the letter was ‘O’. 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. It should be noted that in previous years behavioural observations were also conducted. However, due to increased catalogue size (resulting in greater time required for data input and processing) and the similarity in findings between existing surveys (2009-2013), behavioural investigations were omitted from the present study.

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.

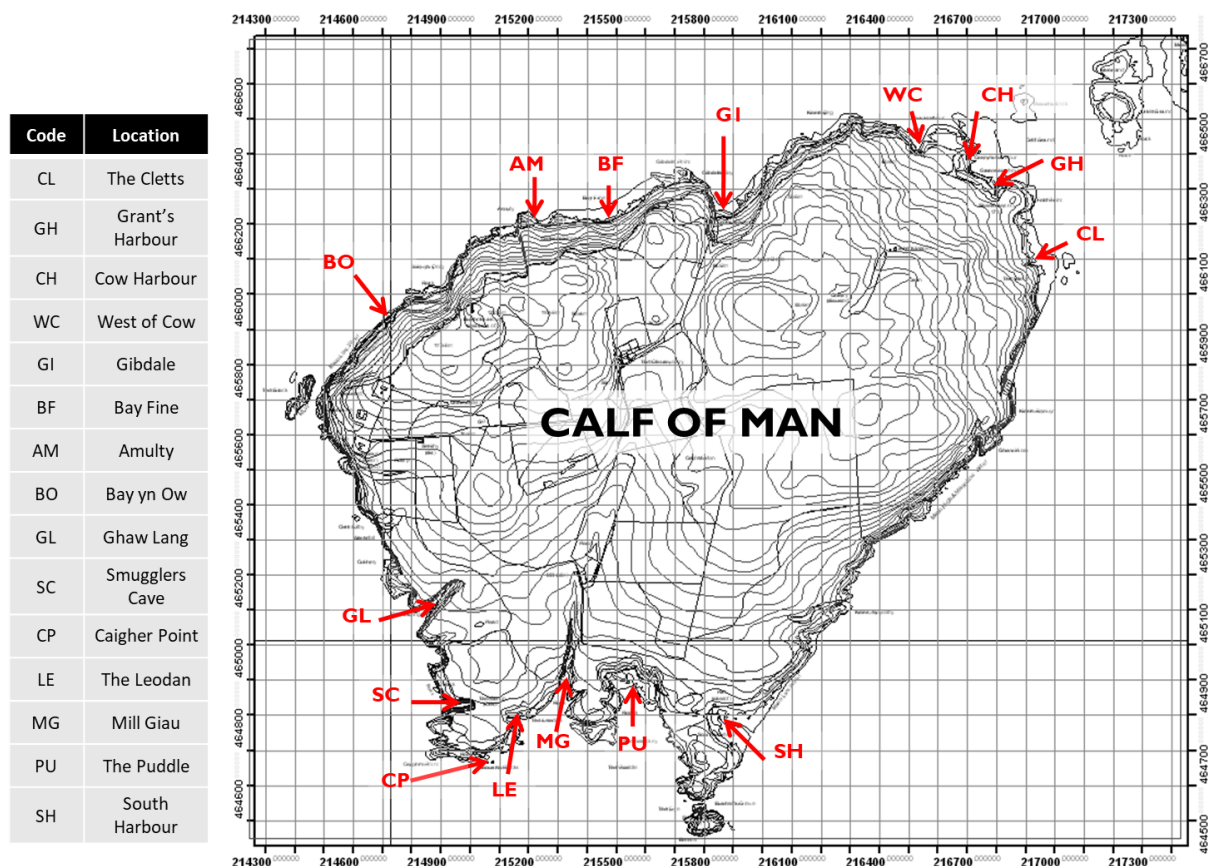


Figure 1 – 15 of the primary pupping locations upon the Calf of Man.

3. Results

3.1 Pup census

A total of 63 pups were recorded across 11 sites. Of these, 39.68% (n= 25) were known to survive to stage 5 of development (fully weaned), 3.81% (n= 2) were confirmed deceased and a further 55.56% (n= 35) were unaccounted for (**Table 1**). These individuals were initially observed (at stages 1 or 2) 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'. If these individuals survived, pup survival rate would equate to 95.24%. One individual pup (1.58%) was removed from South Harbour (SH) and taken to a sanctuary when its mother (female 198) died.

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

Number of pups	Survived/weaned (%)	Deceased (%)	Insufficient data/missing (%)
63	39.68	3.18	55.56

Figure 2 depicts the trend in total number of pups over a 7-year period from 2009 to 2015. 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. Whilst there was only a minor increase between 2013 and 2014 from 50 to 52 individuals, there were an additional 11 pups in 2015 compared to 2014.

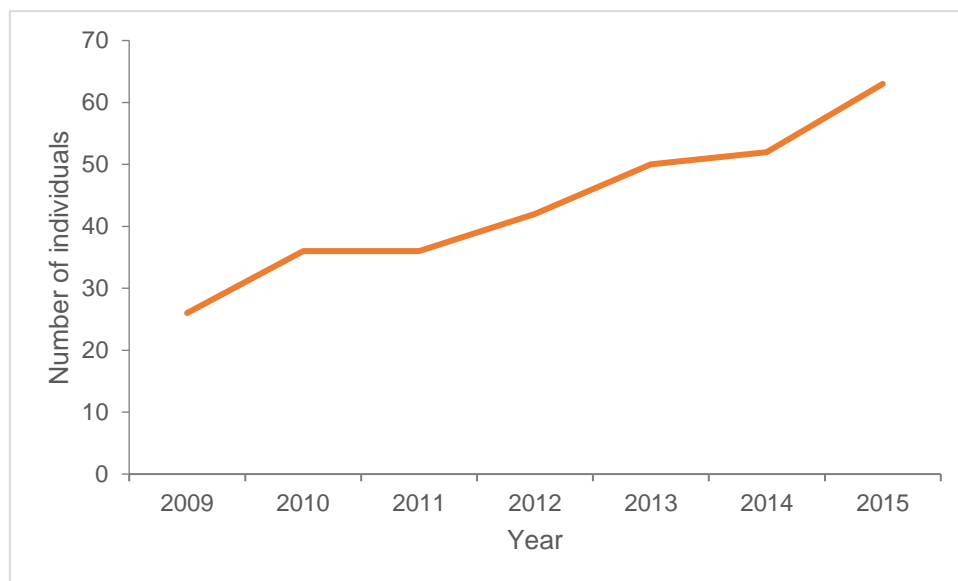


Figure 2 – Total number of pups observed on the Calf each year between 2009-2015.

3.2 Births per week

Figure 3 shows that the number of pups born peaked in week 1 with 13 confirmed births. Birth rate appears to decline following week 1 until week 5 when a small peak occurred (seven births). However, the number of births was lowest in week 6 with just one confirmed birth. Occasionally, exact date of birth was unknown, however for those individuals for which date of birth was known (37 individuals/58.73%), 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.

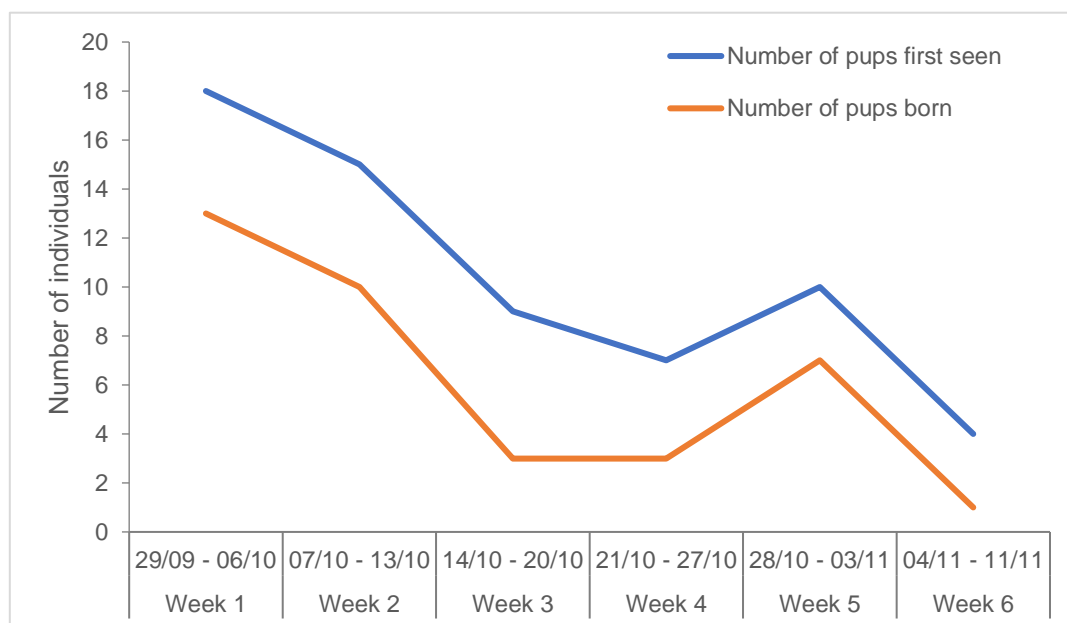


Figure 3 – Rate of pups born/first seen per week during the six-week survey period. Number of pups born describes pups for which exact birth date was known.

3.3 Pup distribution

The distribution of the 63 pups recorded is depicted in **Figure 4**. Pup abundance was greatest at Grants Harbour (GH) and The Puddle (PU), with 19.05% (n= 12) of pups recorded at each of these sites. Smugglers Cave (SC) (n= 7), Bay Fine (BF) (n= 6), Cow Harbour (CH) (n= 6) and Mill Giau (MG) (n= 6) were relatively popular pupping sites with an intermediate level of sightings. Ghaw Lang (GL) was the least popular pupping site, with only one individual (1.59%) recorded at this location. No pups were recorded at Bay yn Ow (BO), The Cletts (CL) The Leodan (LE) or West of Cow (WC). Almost equal proportions of pups were located at southern (50.79%, n= 32) and northern (49.21%, n=31) sites.

Pup distribution recorded in the present survey is relatively similar to the pattern of distribution in 2014 (**Figure 5**). The same sites were utilised, with the exception of Fold Point (FP) (utilised in 2014 but not in 2015) and Caigher Point (CP) (utilised in 2015 but not in 2014). In both years the northeast and southeast corners of the Calf appear to be the most highly populated areas.

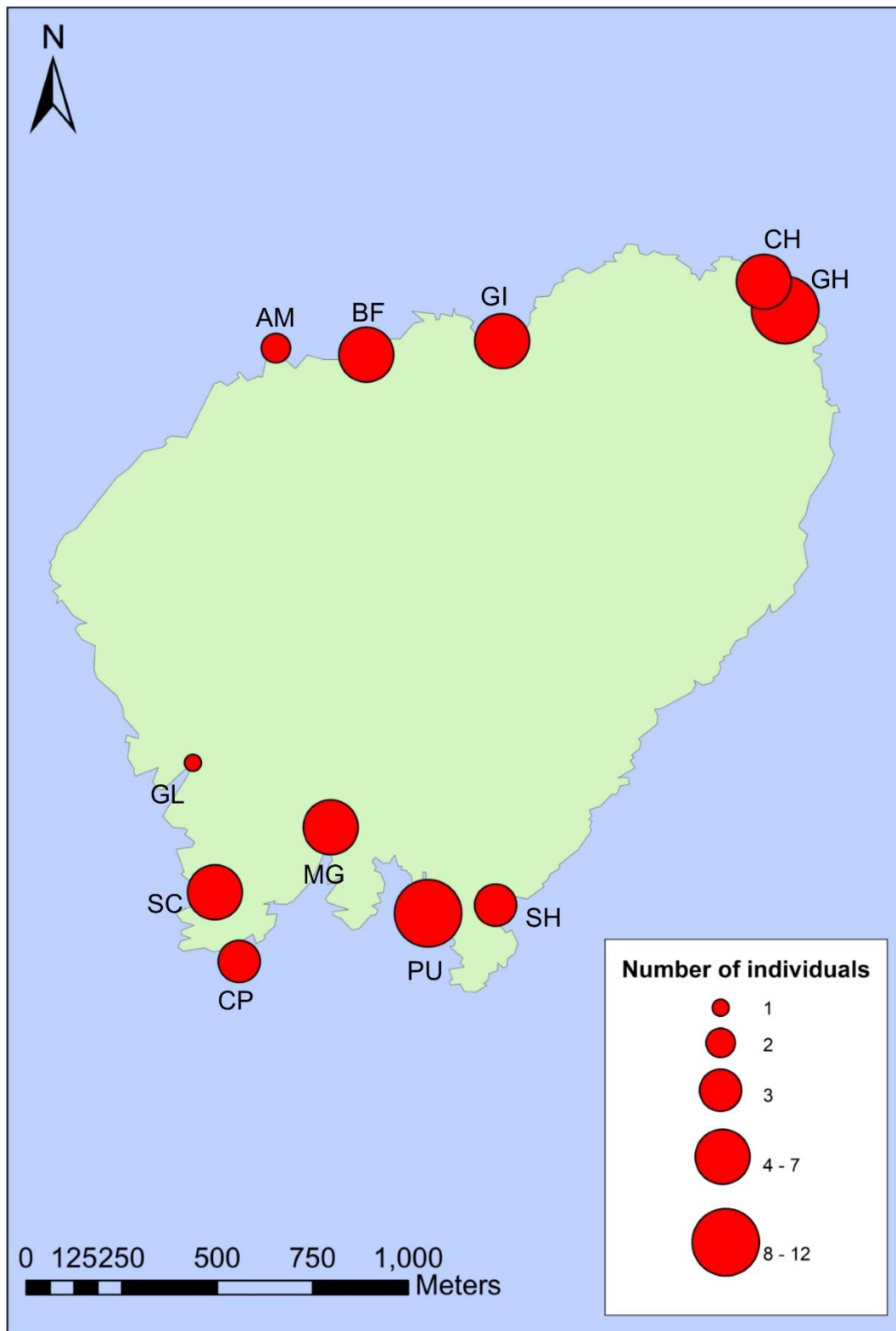


Figure 4 – The distribution of pups across 11 pupping sites on the Calf. Symbol size equates to number of individuals present/abundance. AM= Amulty, BF= Bay Fine, GI= Gibdale, CH= Cow Harbour, GH= Grants Harbour, SH= South Harbour, PU= The Puddle, MG= Mill Giau, CP= Caigher Point, SC= Smugglers Cave, GL= Ghaw Lang.

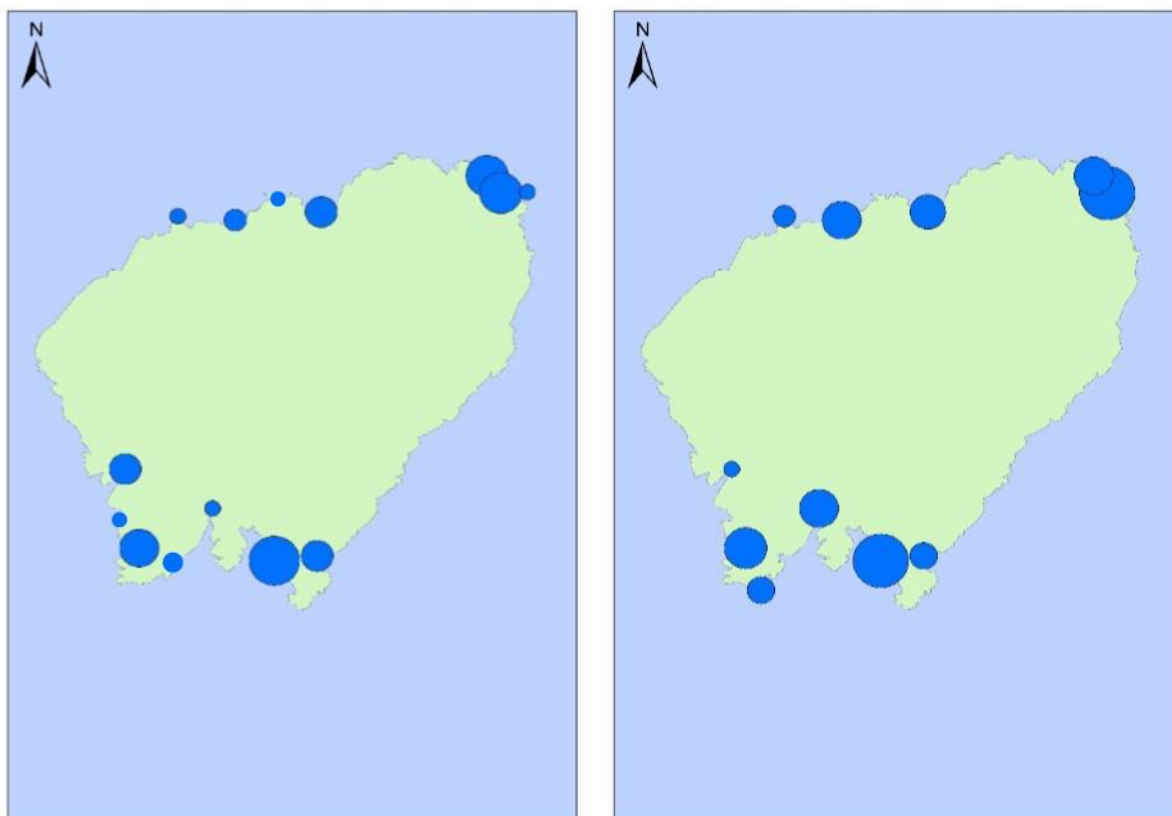


Figure 5 – Pup distribution across pupping sites in 2014 (L) and 2015 (R). Symbol size is representative of proportion (%) of pups.

3.4 Mother ID

Of the 63 pups recorded, 80.95% (n=51) 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, 39.22% (n= 20) had previously given birth on the Calf, 11.76% (n= 6) had been sighted previously but without pups and 33.33% (n= 17) were new to the Calf. A further eight mothers were not catalogued as suitable photographs (both left and right profile) were not obtained. These individuals were recorded as 'L/R nearly' and it cannot be certain whether they utilised Calf pupping sites for the first time this year or whether they have been sighted previously. Mother identification was unsuccessful for 19.05% (n= 12) of pups (**Table 2**).

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

Number of pups/mothers	Identified mothers (%)	Unidentified mothers (%)
63	80.95	19.05

3.5 Catalogue

As of 2015, there are 162 females and 27 males in the ID catalogue (for which left and right profile shots have been acquired). Of these, 47 females and 11 males were newly added this year. There are also 64 '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, 36 individuals were added this year.

4. Discussion

4.1 Pup census

This year a greater number of pup births were reported than in any previous year (2009-2014) and survival rate was also higher than reported previously. Furthermore, just two individuals were confirmed deceased, aligning mortality rate with previous years and perhaps implying the higher mortality rate in 2014 may have been an abnormality/particularly unsuccessful year. Insufficient data was obtained for over half of pups (55.56%) and it is uncertain whether these individuals survived to stage 5 of development or died. It is possible that the location of these individuals had changed (e.g. to a position that was not in observer field of view) or perhaps these individuals were washed off and unable to re-position themselves on haul-out sites, as is sometimes the case for grey seal pups (Anderson et al., 1979). It should be noted that at some sites where there were high numbers of pups it is possible that surveyors were uncertain of the identify of pups, making it difficult to record the developmental progress of each individual. This is likely to have become particularly difficult at later development stages when pups become more mobile and may have moved position compared to prior survey days. This may in part explain why insufficient data was available for a substantial portion of individuals. Despite this, the present year appears to have been relatively successful in terms of pup 'productivity' and possibly indicative of population growth. However, it is also possible that increased survey effort or extraneous variables (e.g. more favourable weather conditions) influenced observations.

4.2 Births per week

Birth rate was greatest during week 1 of the survey period. Whilst it is possible that this time period (29/09–06/10) covered the peak of pupping season for this year, we cannot be certain as the peak occurred during the first week of surveying and thus an increase of pups from zero was not observed. However, it is likely that any births that occurred prior to the start of the survey would have been sighted during week 1 observations. This reduces the likelihood of underestimating total births, but it may skew the data whereby week 1 appears to be a more important pupping period. Interestingly, number of births peaked at a later date between 3/10–09/10 in 2014. The results suggest that week 6 coincided with the end of pupping season. However, it may be beneficial to extend the survey duration to seven or eight weeks, in order to ensure the entire pupping season is covered and allow for more accurate determination of peak parturition period.

4.3 Pup distribution

The majority of pups were sighted at either Grants Harbour (GH) or The Puddle (PU). Similarly, in 2014 the most frequented sites were The Puddle (PU) and Cow Harbour (CH), followed by Grants Harbour (GH). This is also consistent with findings from each of the previous years in which these sites show similarly high pup abundance, reflecting the importance of these areas. Interestingly, The Puddle (PU) appears to have become particularly popular in the last two years. These sites are easily accessible, possess gentle slopes/shelving with haul-out space at a variety of levels and provide shelter from harsh

weather conditions/wind exposure. These features have been described as important for grey seal site-selection (Pomeroy et al., 1994; Pomeroy et al., 2000a), perhaps explaining the popularity of these locations on the Calf.

It has previously been suggested that the waters between the Calf and mainland Isle of Man are utilised for tourism and fishing vessels (Manx Bird Atlas, 2007). Therefore, it may be necessary to consider further restrictions around these key northeast pupping sites during the autumn season.

4.4 Mother ID

This year, a high proportion of mothers were identified (80.95%), meaning the photography and cataloguing process was successful. It is also notable that 17 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, and it will be interesting to learn whether these individuals return in following years. However, it should be considered that photograph quality may have restricted identification and it is not entirely certain that these individuals were new to the Calf. Furthermore, in some instances grey seals have been shown to express natal philopatry, whereby they return to the site at which they were born (Pomeroy, 2000b), and thus it is possible that these individuals were born on the Calf and have returned to give birth once reaching sexual maturity. Of the 28 females that were newly catalogued in 2014, seven gave birth in 2015 (four for the first time).

4.5 Limitations and future recommendations

There are several limitations which are likely to 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 (implemented to minimise disturbance) 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. At particularly crowded sites it often proved difficult to tell individuals apart, potentially resulting in misidentification of both pups and adults. Furthermore, during the photo identification process, the poor quality of some photographs made it difficult to be certain of a match. Therefore, there was a risk of identification error and thus it is possible that individuals deemed to be new to the Calf may have been present previously. 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.

This year, The Puddle (PU) and Grants Harbour (GH) showed particularly high pup abundance, sites which have been consistently popular since surveys began in 2009. These combined findings highlight the importance of these sites as pupping locations for Irish Sea grey seals. In future surveys it would perhaps be useful to record particular features about these popular sites, in order to investigate site-selection and determine how best to manage these areas in terms of conservation.





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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	