Skomer Seal Report 2013

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SUMMARY

179 pups were born on Skomer in 2013. Slightly less than in 2012 but still together with 2007, the third highest total ever recorded. See section 4.2

324 pups were born in the Marine Nature Reserve as a whole in 2013: 179 on Skomer and 145 on the mainland. See section 4.2

The busiest week this year was week 42 (14-20/10) when 28 pups were born. This is one week earlier than 2012. See section 4.2

The most productive beaches were Matthew's Wick (35 pups), South Haven (34 pups) and Driftwood Bay (21 pups). North Haven beach was not popular this year. Only 18 pups were born on this beach in contrast to 26 in 2012. See section 4.2

121 pups are known, or assumed to have survived on Skomer, giving a survival rate of 68%, which is the third lowest survival rate since recording began. See section 4.3

The mean age at onset of moult was 14 days, the mean age at completion of moult was 22 days and the mean duration of moult was seven days. See section 4.6

In 2013 the maximum haul-out of 306 was recorded on 29 October. The number of seals using the haul-outs was slightly lower than the average for the last ten years. See section 5.

Twelve seals were recorded that had been become entangled in netting or similar. See section 6

Photo-monitoring continued in 2013 although we were rather restricted by the lack of good camera equipment. We managed to take photos of nearly all pupping cows but due to the bad quality of the pictures we had to discard a large proportion of the material. Moreover it is getting more and more difficult to match seals up as the catalogue spans over ten years and contains many hundreds of photos.

CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF PLATES

1. INTRODUCTION

Between 22 August and 15 November 2013 the breeding activities of Grey Seals (*Halichoerus grypus*) on Skomer Island were observed and recorded, using the methods employed in previous years. These are detailed in the Grey Seal Monitoring Handbook, Skomer Island (Poole 1996a), with revisions made regarding access to some sites (Hughes 1999 & 2002), and are also mentioned in the individual site sections of this report.

2. OBJECTIVES

1. To record the number of Grey Seal pups born at all known pupping sites around Skomer Island throughout the pupping season.

2. To determine the survival rate of seal pups up to their first moult and to record the probable cause of death of any fatalities.

3. To record details of Grey Seal pup moult, especially the age at the onset of moult and duration of moult.

4. To monitor the behaviour of all seals during site visits, in particular that of territorial bulls at Castle Bay.

5. To maintain a daily record of the number of Grey Seals using the main haul-out sites, particularly Castle Bay and North Haven, including details of the age and sex of hauled out animals.

6. To record and document all observed cases of seal disturbance, their cause and outcome, including entanglement with man-made materials (angling line, fishing net, etc).

7. To record and document individual adult and immature Grey Seals with distinctive scars/markings to compare with previous years, supplementing the methods in Poole (1996a) with digital photographs.

8. To make comparisons of objectives 1, 2 and 3 with previous years' data.

3. CENSUS METHODS

Between 22 August and 15 November 2013 all the main Grey Seal pupping sites on Skomer Island were checked regularly and individual records were kept of each pup's progress, from birth to completion of moult, as laid out in Poole (1996a)

The most important beaches, North Haven, Amy's Reach, Matthew's Wick, Castle Bay, Driftwood Bay and South Haven were checked daily from the cliff tops. There are a couple of caves running off both North Haven and South Haven beaches which can only be properly checked by entering them. To avoid excessive disturbance these were only visited after having observed pregnant females on the beach.

The Wick was checked every two days, more often when the site was busy.

South Stream Cave was checked most days from across South Haven and any activity followed up with a visit to the site.

Pigstone Bay was checked every four to five days.

Because checking Prothero's Dock and High Cliff Boulders causes unavoidable disturbance, as the beaches have to be visited and pups searched for among the boulders, visits were reduced to weekly checks.

Because of access difficulties and the unavoidable disturbance all the main cave sites (The Lantern, Seal Hole and South Castle Beach Cave) were checked whenever conditions allowed but not more often than once a week. Entry to the caves is dependent on tides, weather and adult seal activity. To avoid causing more disturbance than absolutely necessary no cave was ever entered if a cow remained inside guarding her pup.

Most pups are found within 24 hours of being born on Skomer and therefore their date of birth is known very accurately. When pups were born in the less frequently visited sites their date of birth was approximated based on the date of the previous visit, the pup's size and appearance and EA Smith's five-stage age classification system (see Appendix 1).

Sites were visited when necessary to mark pups in accordance with Poole (1996a), unless otherwise stated due to recent safety recommendations, Hughes (2002).

In most instances seal pups were individually marked using coloured aerosol sheep-fleece marker sprays. Pups younger than four days old were not routinely marked because of concerns that marking may interfere with the mother/pup bond. Younger pups were occasionally given a very small mark, usually near the tail, if the beach was being visited anyway. This allowed an individual to be monitored over the following days before being marked properly (when the pup was old enough).

During site visits and inspections disturbance was kept to a minimum.

An assessment was made of the condition of each pup when last seen, classified on a five-point scale:

1. Very small	Assumed not to have survived long after moult
2. Small but healthy	In good condition, would have a reasonable chance of survival
3. Good size	Most should survive
4. Very good size	All should survive
5. Super-moulter	An exceptional sized pup

An assessment of the quality of care given by cows was also made, on a three-point scale:

1. Poor
2. Satisfactory
3. Very good

Seal pups were considered successful if they survived until the onset of moult, unless they were in poor condition (Hewer, 1974). If a pup disappeared before the onset of moult an individual assessment was made on its likelihood to have survived based on the above criteria.

4. CENSUS RESULTS

4.1 GENERAL

179 pups were born on Skomer in 2013. Slight less than in 2012 but still, together with 2007, the third highest total ever recorded.

The first pup of the season was born in the Lantern on approximately 18 August and was found on 22/8/13.

Eight pups were born in August, 60 in September, 92 in October and 19 in November. Therefore the busiest month was October, the same as in 2012 and 2011 whereas more pups were born in September than in October between 1998 andl 2010.

The busiest week this year was week 42 (14-20/10) when 28 pups were born. This is one week earlier than 2012.

121 pups are known, or assumed to have survived on Skomer, giving a survival rate of 68%, which is the third lowest survival rate since recording began

The main pupping sites on Skomer are shown in Figures 4.1.1 and 4.1.2

Figure 4.1.1 Skomer Island Grey Seal pupping sites

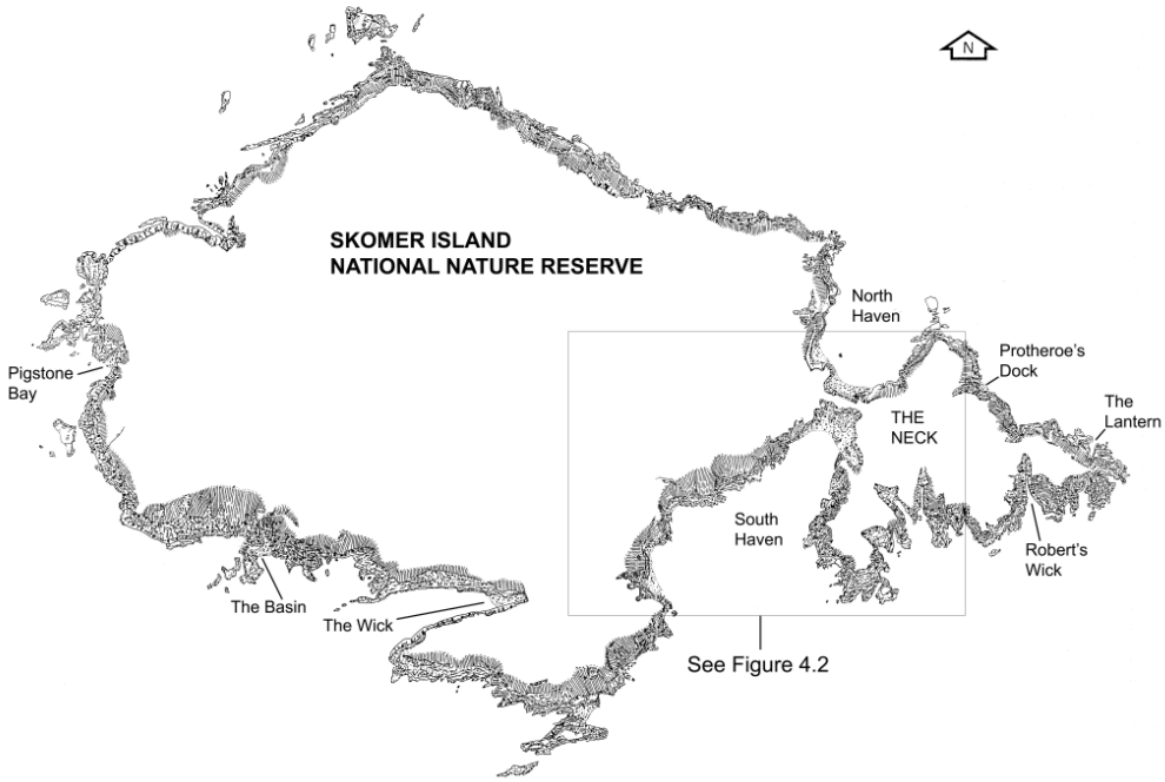
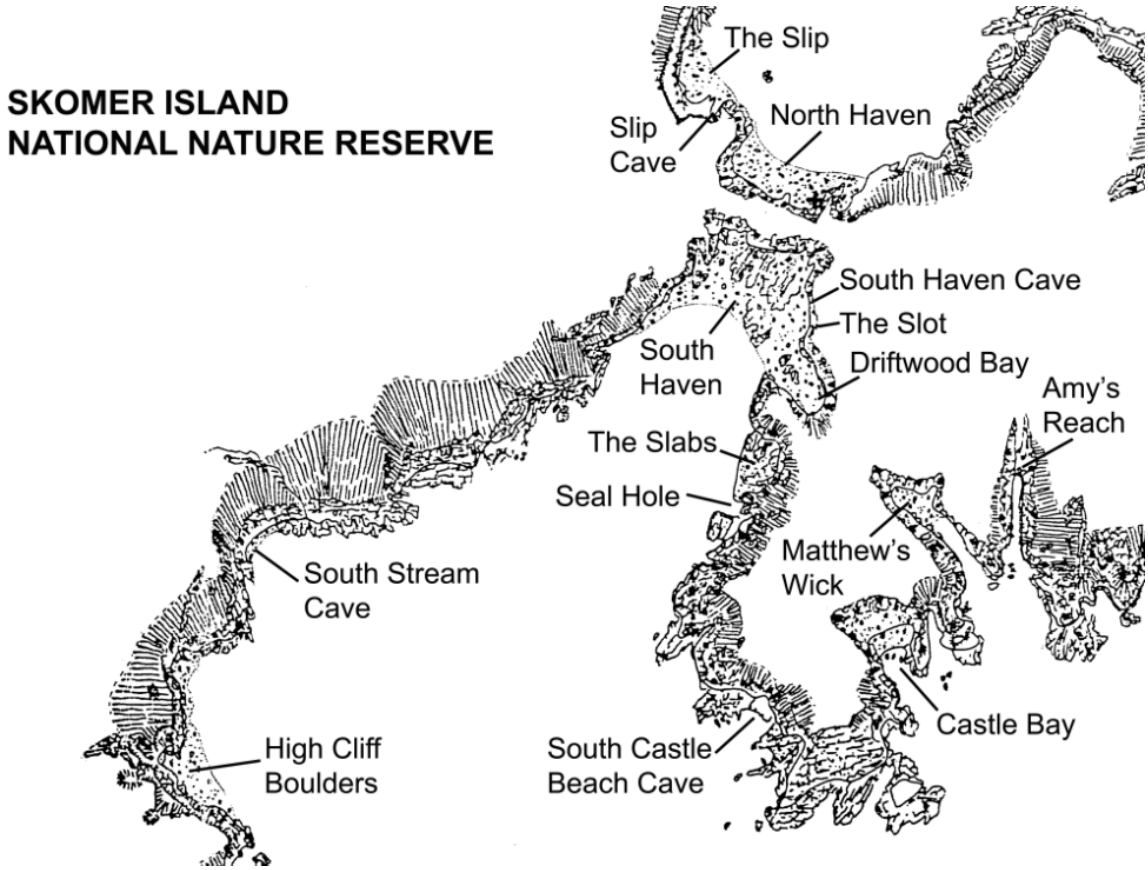


Figure 4.1.2 Main concentration of pupping sites on Skomer Island



4.2 PUP NUMBERS

324 pups were born in the Marine Nature Reserve as a whole in 2013: 179 on Skomer and 145 on the mainland. There was a pup born on Skomer Island in April 2013 which is not included in the analysis. The mainland experienced its highest number of pups ever recorded. There were less pups recorded on Skomer in 2013 than in 2012. However this might be due to the fact that the recording period ended 9 days earlier than in the previous year.

It seems that Skomer, with +/-180 births, is at its capacity whereas the mainland appears to be able to support a further increasing seal population.

Figure 4.2.1 Number of seal pups born in Skomer Marine Nature Reserve 1983-2013

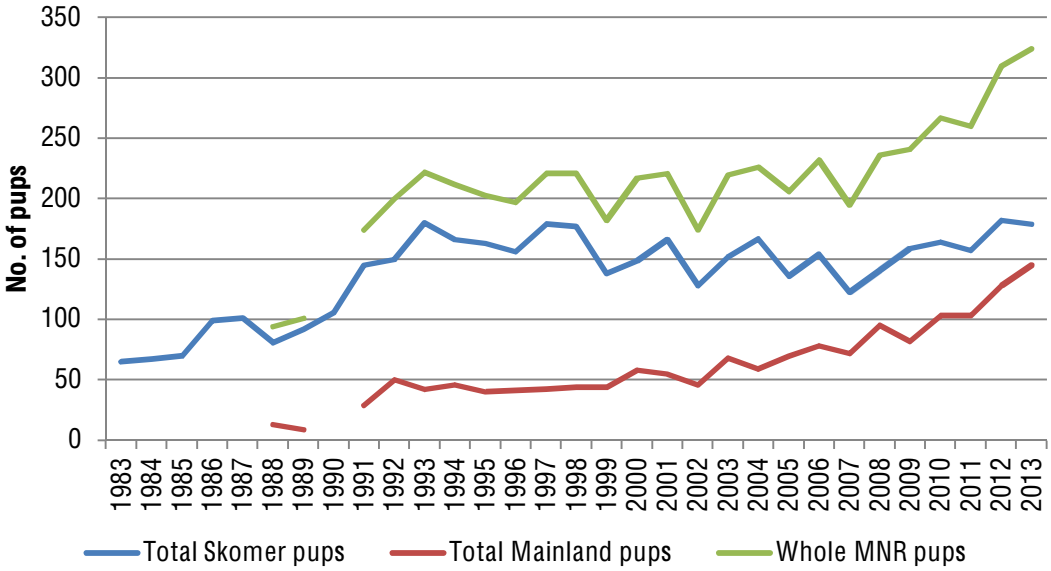


Figure 4.2.2 Daily totals of seal pups born on Skomer Island in 2013

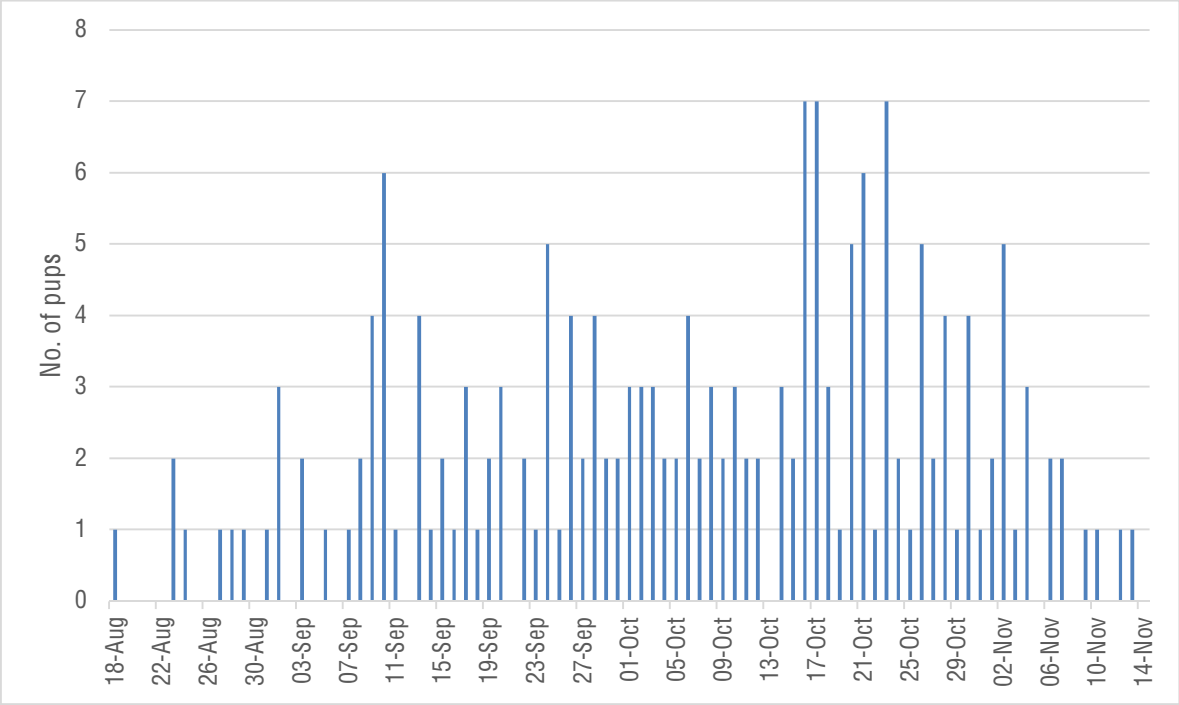


Table 4.2.1 Monthly number & percentage of seal pup births on Skomer Island 1983-2013

	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER
2013	0	8 (4.5%)	60 (33.5%)	92 (51%)	19 (11%)
2012	0	19 (10%)	65 (36%)	77 (42%)	21 (12%)
2011	0	11 (7%)	55 (35%)	56 (36%)	35 (22%)
2010	0	11 (7%)	75 (46%)	50 (30%)	28 (17%)
2009	0	13 (8%)	62 (39%)	47 (30%)	36 (23%)
2008	0	11 (8%)	79 (57%)	37 (27%)	11 (8%)
2007	0	10 (8.5%)	63 (53%)	35 (30%)	10 (8.5%)
2006	0	11 (7%)	78 (52%)	47 (31%)	15 (10%)
2005	0	12 (9%)	79 (58.5%)	35 (26%)	9 (6.5%)
2004	0	24 (14%)	98 (59%)	37 (22%)	8 (5%)
2003	1 (1%)	17 (11%)	92 (60%)	38 (25%)	6 (4%)
2002	0	21 (16.5%)	62 (48.5%)	42 (33%)	3 (2%)
2001	0	17 (10%)	90 (54.5%)	57 (34.5%)	1 (1%)
2000	2 (1%)	14 (9%)	102 (65%)	40 (25%)	0
1999	0	6 (4%)	91 (65%)	44 (31%)	0
1998	0	7 (4%)	96 (54%)	70 (39%)	5 (3%)
1997	0	3 (2%)	75 (43%)	85 (49%)	10 (6%)
1996	0	0	61 (39%)	75 (48%)	20 (13%)
1995	0	2 (1%)	49 (30%)	99 (61%)	13 (8%)
1994	0	2 (1%)	51 (31%)	96 (58%)	16 (10%)
1993	0	6 (3%)	67 (38%)	87 (49%)	18 (10%)
1992	1 (0.5%)	4 (3%)	40 (28%)	73 (50%)	27 (18.5%)
1991	1 (1%)	0	20 (14%)	75 (54%)	43 (31%)
1990	0	3 (3%)	17 (16%)	69 (64%)	18 (17%)
1989	0	2 (2%)	18 (19%)	45 (46%)	32 (33%)
1987	0	0	11 (13%)	41 (49%)	32 (38%)
1986	0	0	22 (25%)	32 (36%)	34 (39%)
1985	0	0	18 (31%)	20 (34.5%)	20 (34.5%)
1984	0	0	9 (16%)	28 (51%)	18 (33%)
1983	0	0	24 (34%)	31 (44%)	15 (22%)

This table excludes pups born outside the main observation period. There was a seal pup born on Skomer Island in April 2013, which is not included in the table. In the early years of seal monitoring on Skomer observations extended until at least mid-December, carrying on throughout the winter in 1984-1985, but since 1988 only 2006 had any observations in December.

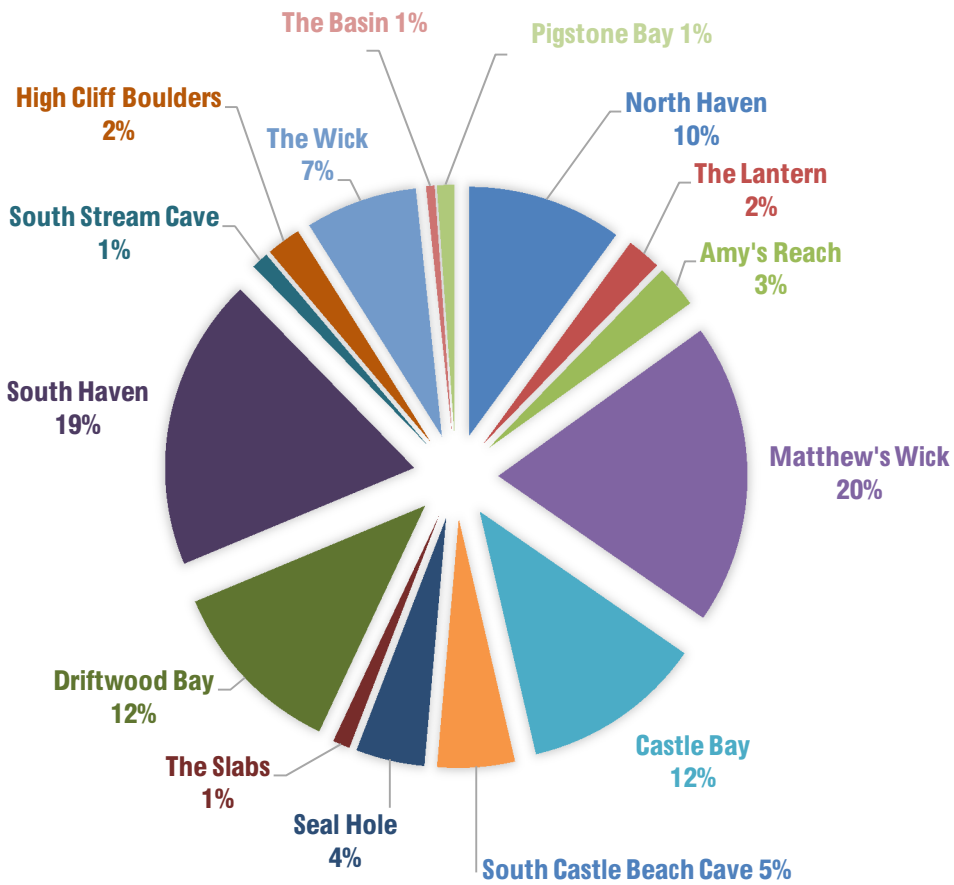
This table also excludes 1988 as it was not possible to extract the data.

2013 seems to have been a slightly unusual pupping year. The percentage of pups born in October was the highest since 1995, August was the lowest since 1997 whereas November is in line with previous years.

The busiest week this year was week 42 (one week earlier than last year), between 14-20 October, when 28 pups were born.

The most productive beaches were Matthew's Wick (35 pups), South Haven (34 pups) and Driftwood Bay (21 pups). North Haven beach was not popular this year. Only 18 pups were born on this beach in contrast to 26 in 2012.

Figure 4.2.3 Percentage of seal pups born at each site on Skomer Island in 2013



4.3 SURVIVAL RATE

121 pups are known, or assumed to have survived on Skomer, giving a survival rate of 68%, which is the third lowest survival rate since recording began. If only the known survived and known dead are considered the survival rate rises to 73%. However, as this figure does not take pups into account which disappeared before start of moult, and were thus assumed dead, it might paint too a positive picture.

On the mainland 110 pups are known, or assumed to have survived, giving a survival rate of 76%, considerably more than on Skomer but nonetheless 7% lower than in 2012.

Figure 4.3.1 Total number of seal pups born/survived on Skomer Island, 1983-2013

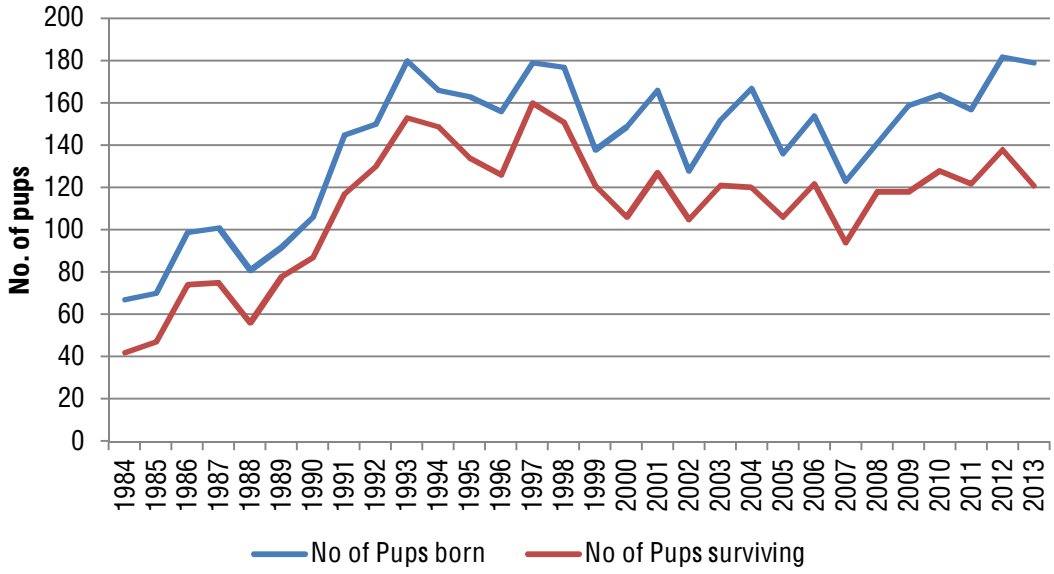


Figure 4.3.2 Total number of seal pups born/survived on the MNR mainland, 1988-2013

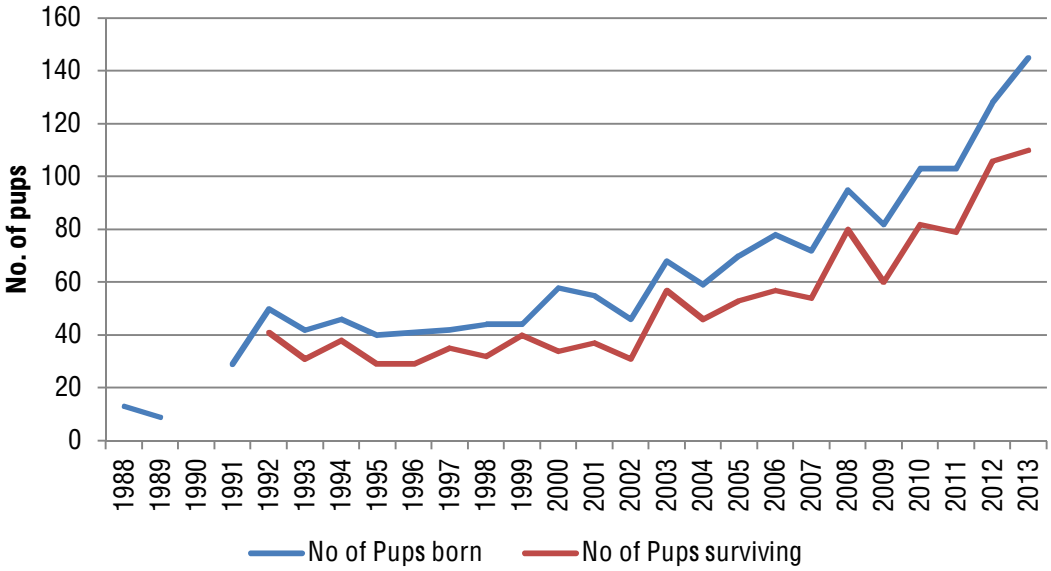
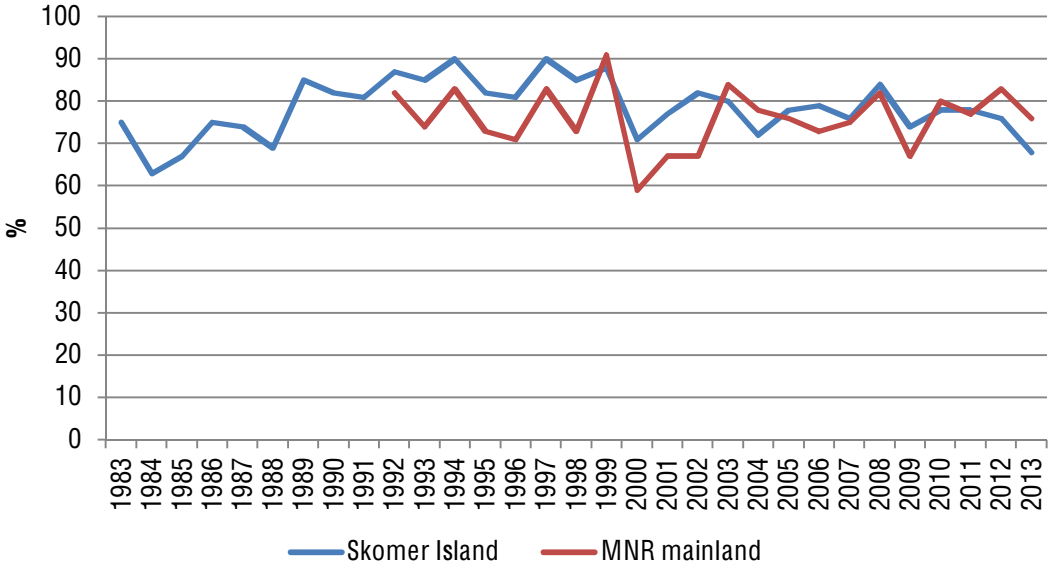
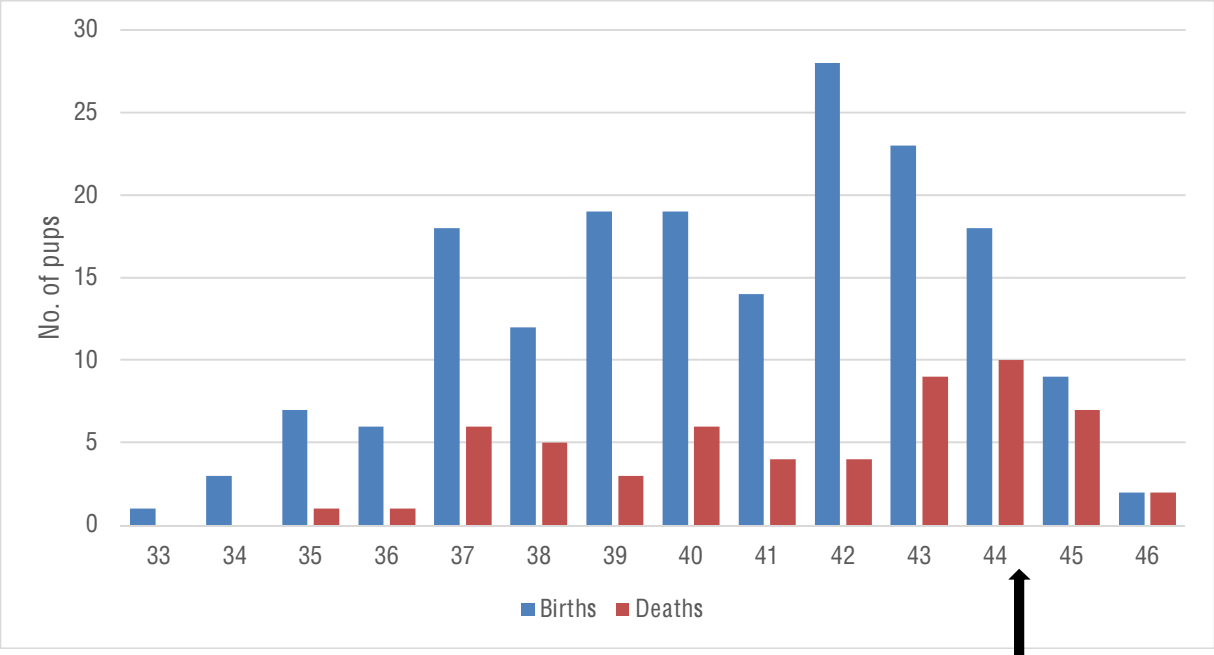


Figure 4.3.3 Percentage of seal pups surviving in Skomer/Marine Nature Reserve 1983-2013



The confidence limits for this data (at a 95% confidence level) is 76 (lower bound) and 81 (upper bound), hence the value of 2013 lies outside the confidence limits and the change in survival rate seems to be significant. A probable reason for this result is the unsettled weather in October. It could also be an artefact of the change in surveyors and these two factors will not be exclusive of each other.

Figure 4.3.4 Weekly seal pup births and deaths on Skomer Island in 2013



Note: monitoring only started in the middle of week 34 and was only conducted on four days in week 64.

Table 4.3.1 Survival rates of seal pups on Skomer Island in 2013

Site	Total Number of pups born		Number of pups known/assumed to have survived		Number of pups known/assumed to have died	Survival Rate	
	2012	2013	2012	2013	2013	2012	2013
Amy's Reach	5	5	4	2	3	80%	40%
Castle Bay	12	21	7	14	7	58%	67%
Driftwood Bay	12	21	8	18*	7	67%	72%
High Cliff Boulders	2	4	1	4	0	50%	100%
Matthew's Wick	40	35	32	25	10	80%	71%
North Haven	26	18	19	8	10	73%	44%
Pigstone Bay	2	0	1	0	0	50%	-
Prothero's Dock	0	2	0	2	0	-	100%
Seal Hole	10	6	9	5	1	90%	83%
South Castle Beach Cave	8	9	6	7	2	75%	78%
South Haven	32	34	29	21*	8	91%	72%
South Stream Cave	3	2	2	2	0	67%	100%
The Basin	1	1	1	0	1	100%	0%

* Pups that had moved to another beach and survived/died there were added to that beach's total.

The Lantern	4	4	1	3	1	25%	75%
The Slabs	3	4	2	1	3	67%	25%
The Wick	22	13	16	7	6	73%	54%
Total	**182**	**179**	**138**	**118**	**58**	**76%**	

Table 4.3.2 Causes of seal pup deaths on Skomer Island in 2013

Cause of death	No. of pups	% of deaths	% of total pups born
Abandoned/separated/starved	10	17	6
Stillborn	13	22	7
Drowned	6	10	3
Unknown	4	7	2
Sick/diseased	5	9	3
Disappeared ≤ stage 2	20	35	11
Total	**58**	**100%**	**32%**

4.4 SITE SUMMARIES

4.4.1 North Haven

Pups on the main North Haven beach can be very difficult to monitor as there are several caves and overhangs at the back of the beach where pups often disappear, especially during rough weather. The beach is a popular haul out site and it becomes impossible to try and see hidden pups without disturbing the haul out.

A total of 18 pups were born in North Haven in 2013, the lowest total since 2006.

Four pups were monitored till they were weaned, two pups survived to the onset of moult, two pups are assumed to have survived giving a survival rate of 44%.

Figure 4.4.11 Number of seal pups born in North Haven 1983–2013

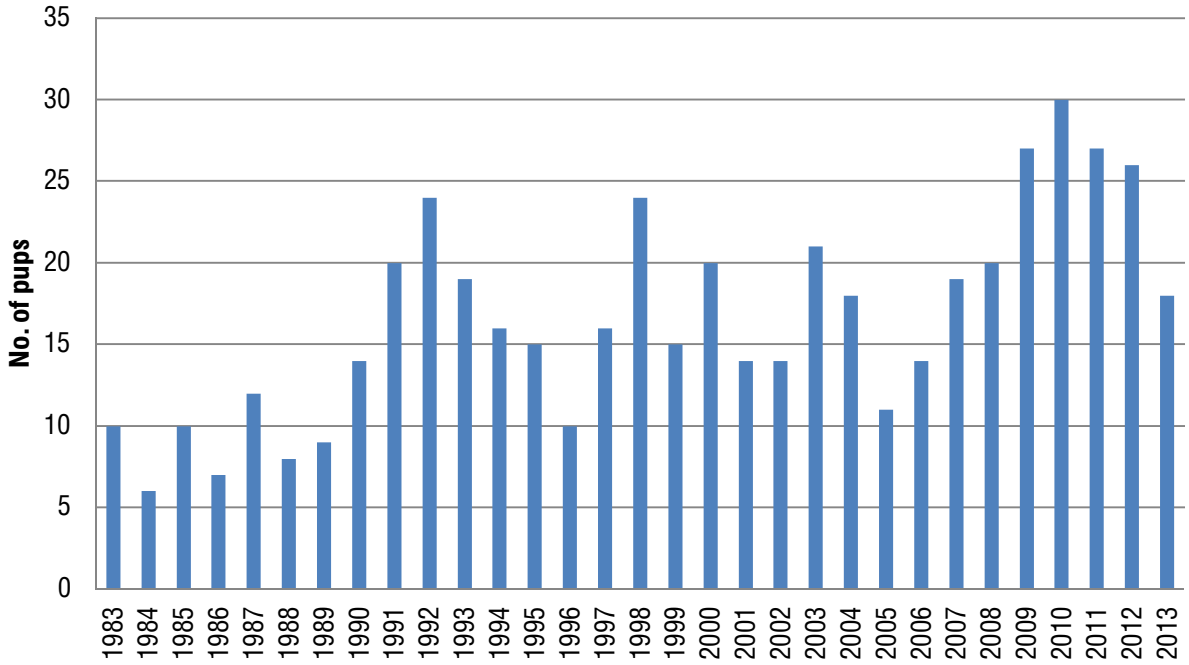


Figure 4.4.12 Weekly seal pup births in North Haven in 2013

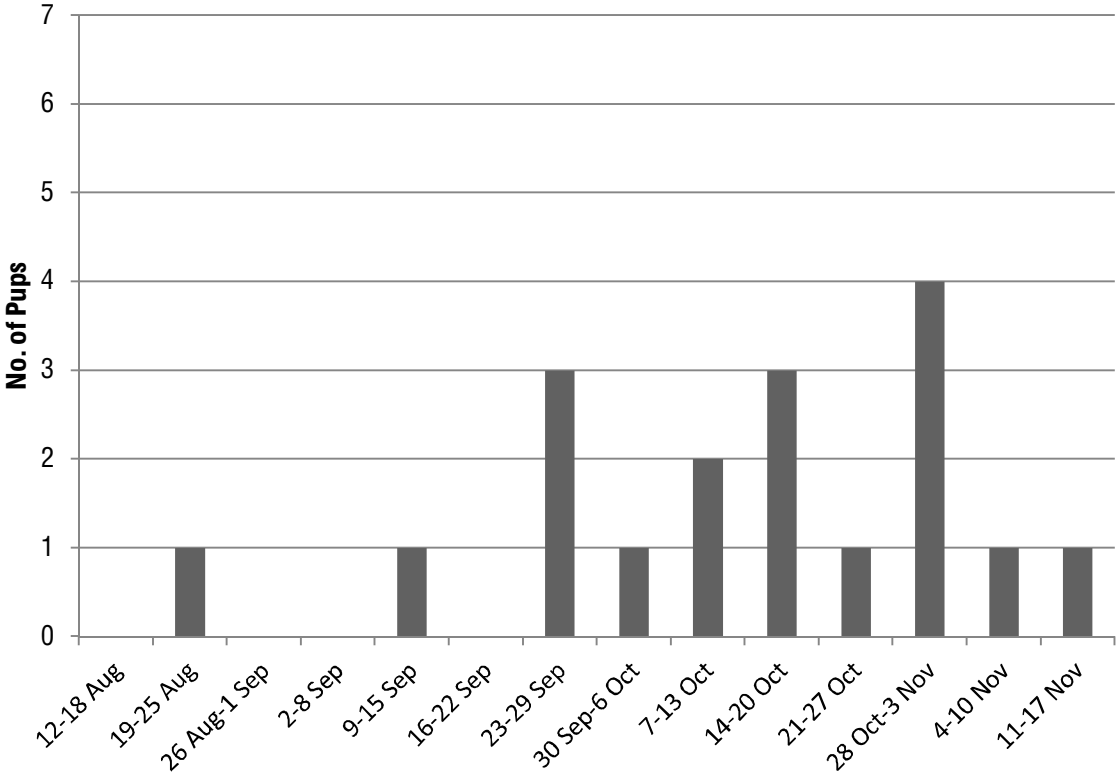


Table 4.4.11 Sizes of pups at onset of moult in North Haven in 2013

Size at onset of moult	No of pups
1 Very small	1
2 Small but healthy	1
3 Good size	2
4 Very good size	3
5 Super-moulter	1

Pup 59 was born on 26/9/13 and was already moulting. It finished moult five days later still rather small but seemed to be healthy.

Plate 4.4.11 Pup 59 on 28/9/13 at two days old

Six pups are assumed to have died, four pups were known to have died. One pup was only five days old when the island was vacated on 15 November. It was very small and possibly abandoned, and was hence assumed dead.

Table 4.4.12 Causes of seal pup deaths on North Haven beach in 2013

Cause of death	No. of pups
Abandoned/separated/starved	1
Stillborn	4
Drowned	0
Unknown	1
Sick/diseased	0
Disappeared ≤ stage 2	4
Total	**10**

On 5/11/13 a size three pup turned up on North Haven beach marked blue and red. It stayed on North Haven beach till the 11/11/13. As it was not one of our own marked pups, we tried to find out where it had come from. We got in touch with Ramsey but they had not marked any pups that year. Even though Lisa Morgan from Ramsey helped to track down the origin of the pup we were only able to find out that it most probably had been marked by a local animal hospital. It would be desirable to coordinate the marking of pups with other organisations to reduce confusion and monitor pup movements.

Plate 4.4.12 Wandering pup on North Haven Slip on 6/11/13

4.4.2 Prothero's Dock

For the first time in five years two pups were born on Prothere's Dock. One of them weaned size three. The other one was seen at the onset of moult size four, giving a survival rate of 100%.

Figure 4.4.21 Number of seal pups born in Prothero's Dock 1983-2013

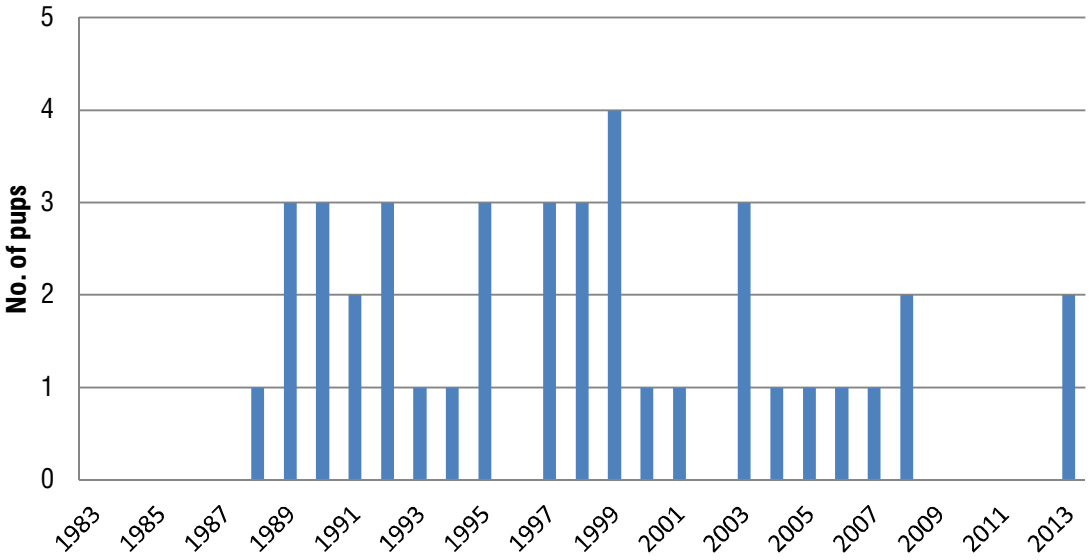
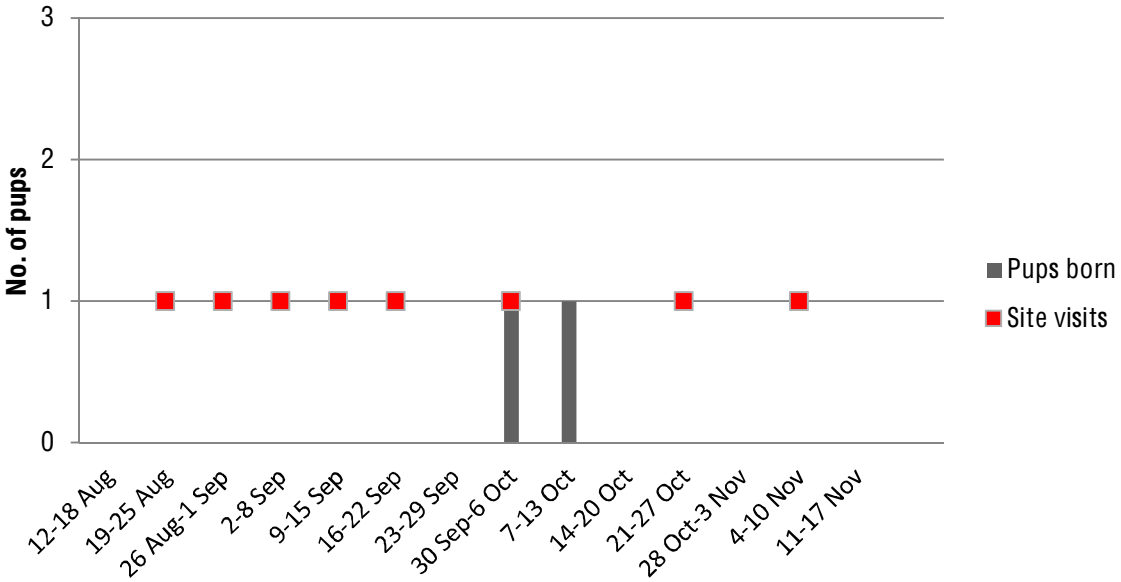


Figure 4.4.22 Weekly seal pup births in Prothero's Dock in 2013



We conducted a full site visit seven times during the monitoring period. We also kept an eye on developments at Prothero's Dock by boat.

4.4.3 The Lantern

All access routes into the Lantern are hazardous in wet weather or when there is a big swell. Even if access is possible cows often remain high inside the cave making marking pups impossible and accurately assessing their progress very difficult.

This year we managed to access The Lantern eight times. Although we used every possible opportunity we sometimes had gaps of up to two weeks in between visits as the weather and tides prevented us from going more often. Still we feel that we did not miss pups that moulted in the cave but maybe some that were lost soon after birth.

Four pups were born in The Lantern in 2013 of which two are assumed to have survived and one survived and was weaned. One newly born pup was floating dead just outside the cave on 9/9/13 which gives a survival rate of 75%.

Figure 4.4.31 Number of seal pups born in The Lantern 1983-2013

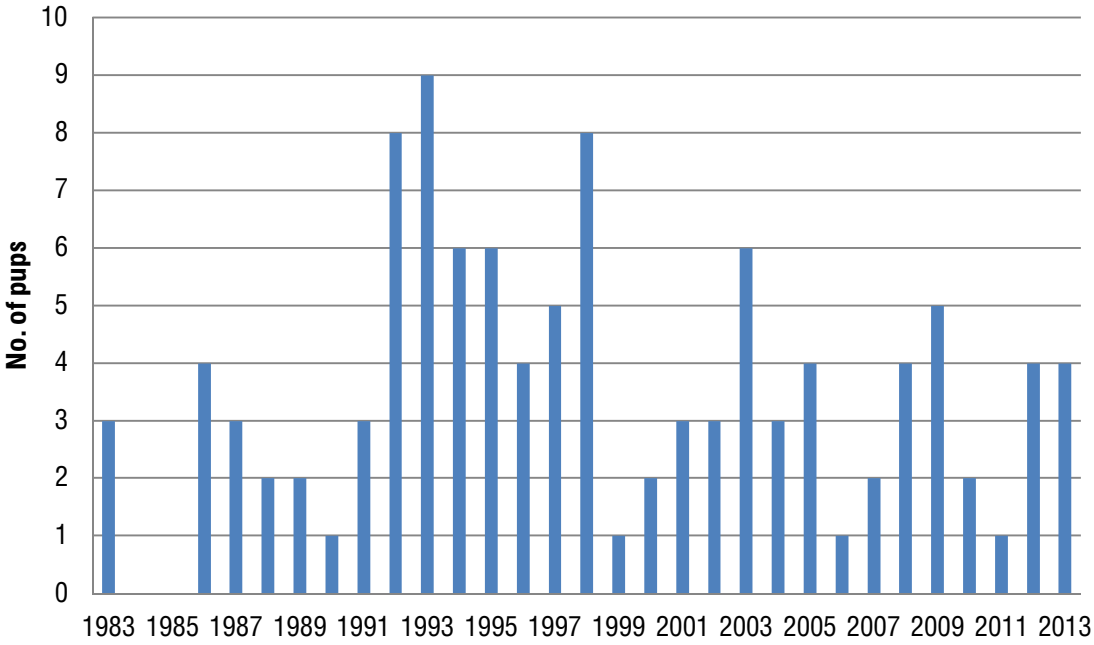
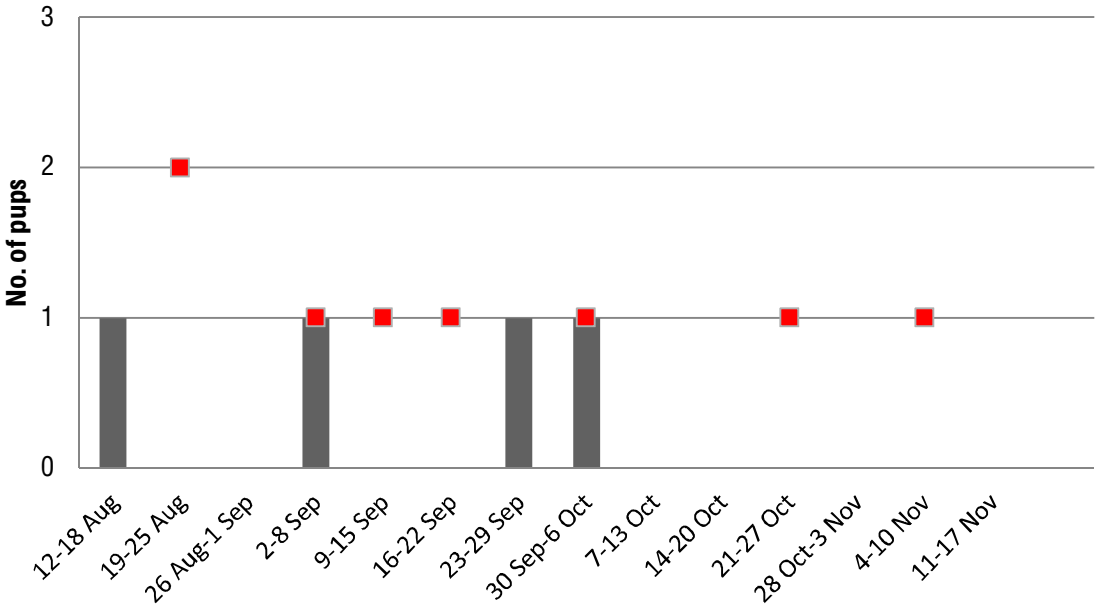


Figure 4.4.32 Weekly seal pup births in The Lantern in 2013



4.4.4 Amy's Reach

Five pups were born in Amy's Reach in 2013, the same number as last year. Two pups survived and were weaned, one pup was ten days old when the island was vacated but as it was well attended and growing it is assumed to have survived. Two pups ≤ size two were lost in the storm on the 3/11/13, giving a survival rate of 60%.

Figure 4.4.41 Number of seal pups born in Amy's Reach 1983–2013

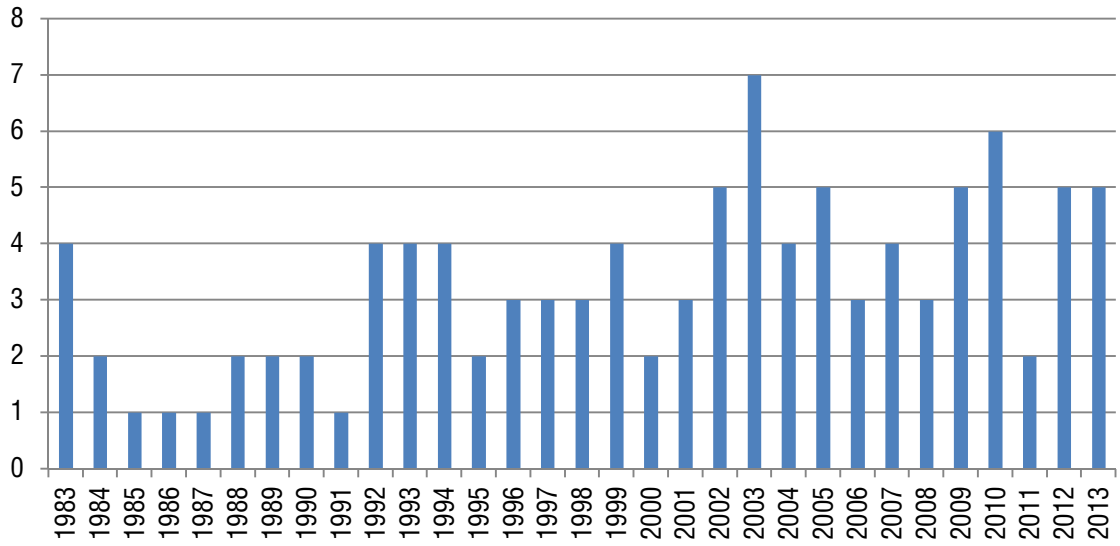
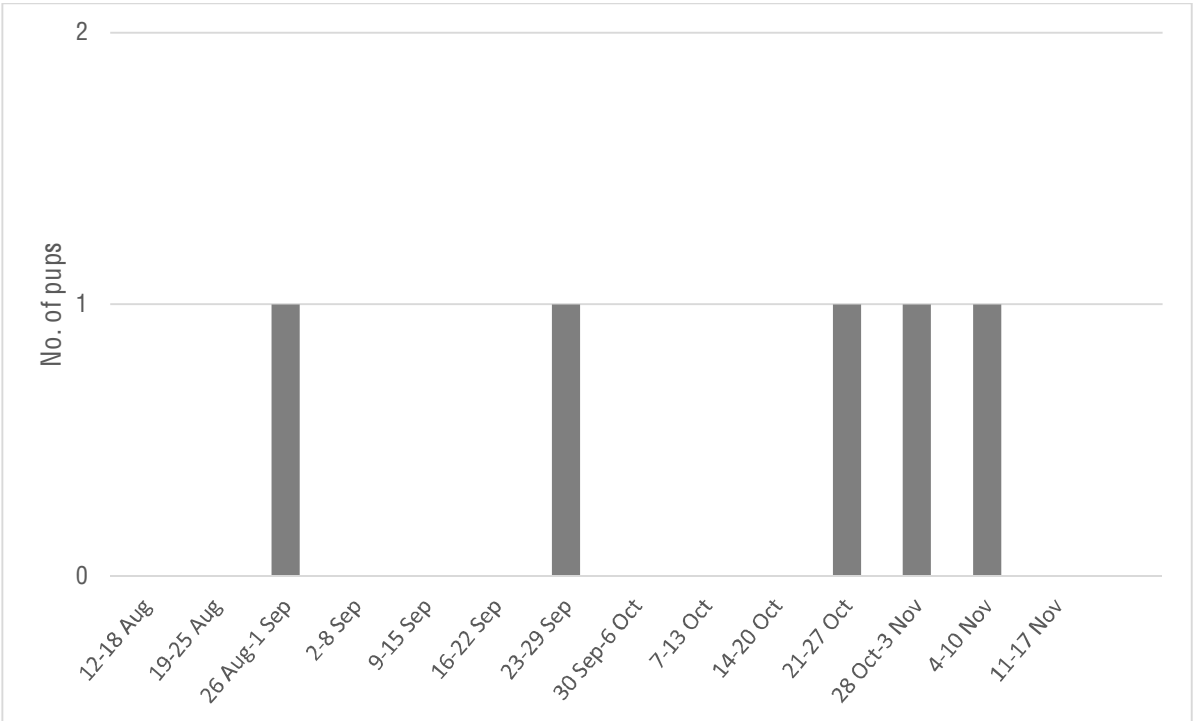


Figure 4.4.42 Weekly seal pup births in Amy's Reach in 2013



4.4.5 Matthew's Wick

35 pups were born on Matthew's Wick in 2013. One pup moved to Driftwood Bay and survived there, another moved from South Haven to Mathew's Wick and finished moult there. In order to be able to make an accurate statement on the suitability and survival rate of a specific site, in this case Mathew's Wick, the immigrating seal pups were included in the data whereas the emigrating ones where excluded.

Table 4.4.51 Number of seal pups born in Matthew's Wick 1983–2013

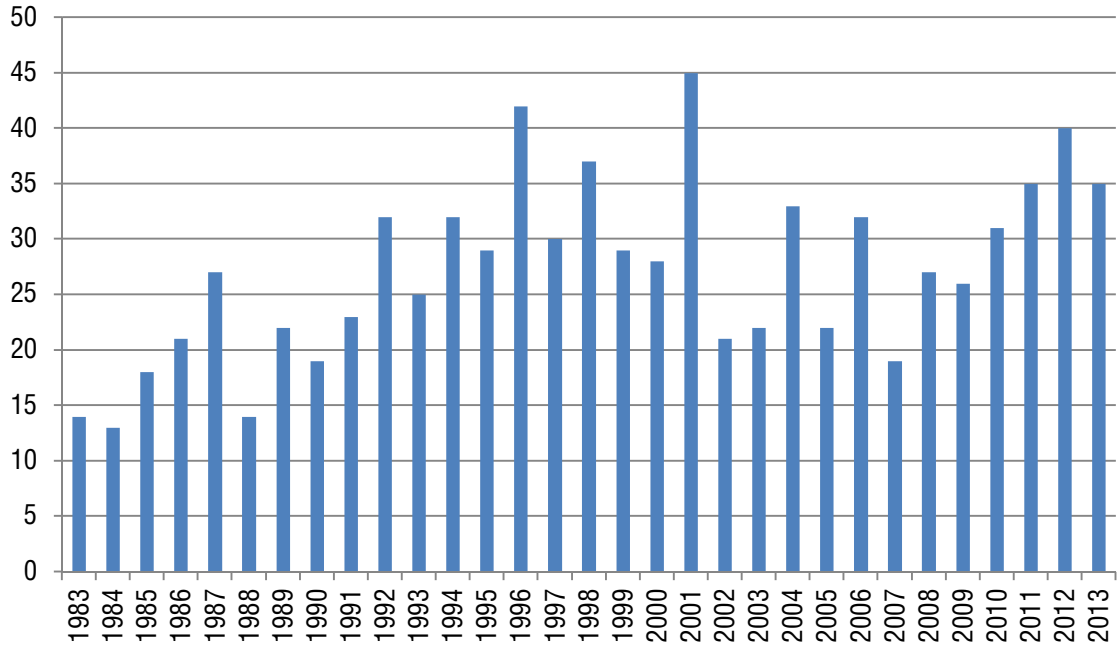


Figure 4.4.52 Weekly seal pup births in Matthew's Wick in 2013

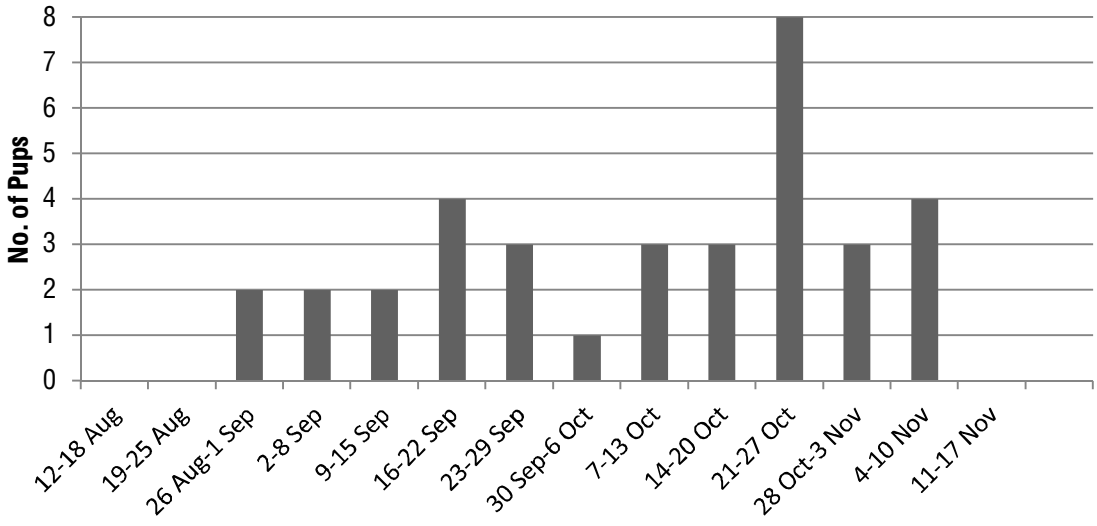


Table 4.4.52 Sizes of pups at onset of moult on Mathew's Wick in 2013

Size at onset of moult	No of pups
1 Very small	0
2 Small but healthy	4
3 Good size	8
4 Very good size	11
5 Super-moulter	0

Four of the pups that were present on Mathew's Wick (including immigrants and excluding emigrants) are assumed to have survived, three survived to the onset of moult, 18 pups survived and were weaned. Three pups are assumed to have died, seven were seen dead. One pup moved to Driftwood Bay and survived there, and one pup moved from South Haven to Mathew's Wick and survived there.

Table 4.4.53 Causes of seal pup deaths on Mathew's Wick in 2013

Cause of death	No. of pups
Abandoned/separated/starved	3
Stillborn	1
Drowned	2
Unknown	1
Sick/diseased	1
Disappeared ≤ stage 2	2
Total	**10**

When the site was visited on the 31/10/2013 we noticed that several pups had infected eyes and respiratory systems with pus coming out of their eyes and noses. Pup 115 was in good condition but had one blind eye, pup 127, 153 and pup 179 were also in good condition but suffered from this infection. As the infection was only obvious at close range there might have been more ill pups on Skomer which were not noticed.

Plate 4.4.51 Seal pup 153 with eye infection

Pup 181 was born on South Haven beach on 28/10/2013 and marked there blue/red/blue on 31/10/13.

Plate 4.4.52 Pup 181 on 31/10/13 on South Haven Beach

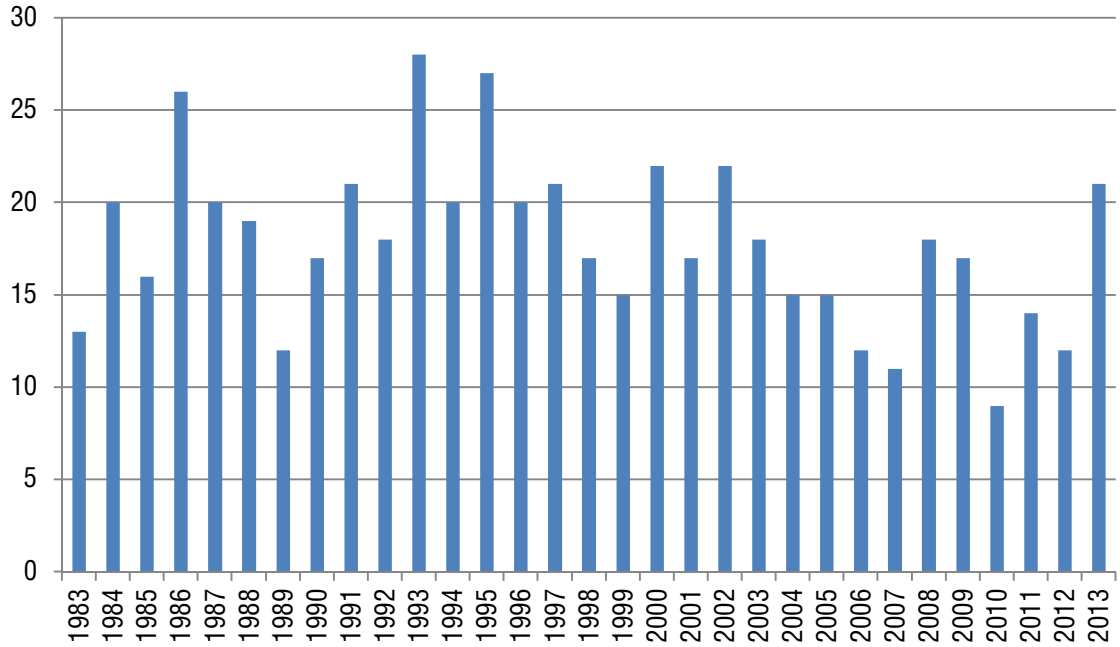
Plate 4.4.53 Pup 59 on 08/11/13 on Driftwood Bay

On 4/11/13 it turned up on North Haven Slip and stayed till 5/11/13. Next it was seen on 8/11/13 on Driftwood Bay, still without mum and getting thinner. On 10/11/13 it appeared on Mathew's Wick, by now 13 days old but only size two. As no mother had ever been observed attending the pup it was astonishing that it was still alive. However on Mathew's Wick we observed for the first time a female lying next to the pup, whether it was its mum could not be deduced. The next day the pup was still on the beach and now well attended by the female, which was guarding it fiercely against other seals and was suckling it. On 15/11/13 when the island was vacated, pup 181 was still on Mathew's Wick with its mum and was growing nicely. Whether the original mum found its pup again or whether a female that had lost her pup adopted pup 181 is unknown.

Plate 4.4.54 Pup 181 on 12/11/13 on Mathews Wick with a very attentive mum

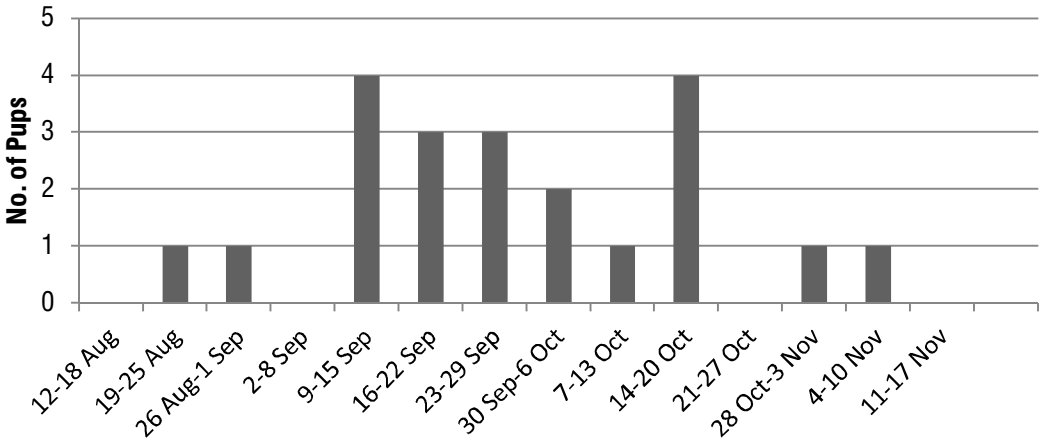
4.4.6 Castle Bay

Figure 4.4.61 Number of seal pups born in Castle Bay 1983-2013



Last year only twelve pups were born in Castle Bay which was slightly below the average for the last 10 years. This year however Castle Bay seemed popular again as 21 seal pups were born there.

Figure 4.4.62 Weekly seal pup births in Castle Bay in 2013



One pup is assumed to have survived, six survived to the onset of moult and seven were seen weaned, giving a survival rate of 67%. According to BOYLE, D (2012) the site often has a high mortality rate. Pups born at the east end of the beach are regularly abandoned, possibly because their mothers struggle to get through the large haul-outs that can be gathered there. This year this behaviour was not observed. The only incident that was witnessed was a pup which got stuck in the boulders on the west side of the beach. Pup 150 got stuck on 10/11/13. Its mum was present but could not get to nor suckle the pup. Two days later the pup was still struggling to get out of the boulders so we decided to take our boat to the beach and free the pup. It was healthy and in good condition and moulted successfully on the beach. Its mother however did not return after the pup got stuck.

Plate 4.4.61 Pup stuck in the boulders on 11/11/13

Plate 4.4.62 Pup freed on 13/11/13

Table 4.4.61 Sizes of pups at onset of moult Castle Bay in 2013

Size at onset of moult	No of pups
1 Very small	1
2 Small but healthy	1
3 Good size	9
4 Very good size	3
5 Super-moulter	0

Pup 35 was born moulting on 16/9/13, hence it was size one at onset of moult. It was well attended by its mother and finished moult after nine days.

Plate 4.4.63 Pup 35 two days old on 17/9/11

Table 4.4.62 Causes of seal pup deaths on Castle Bay in 2013

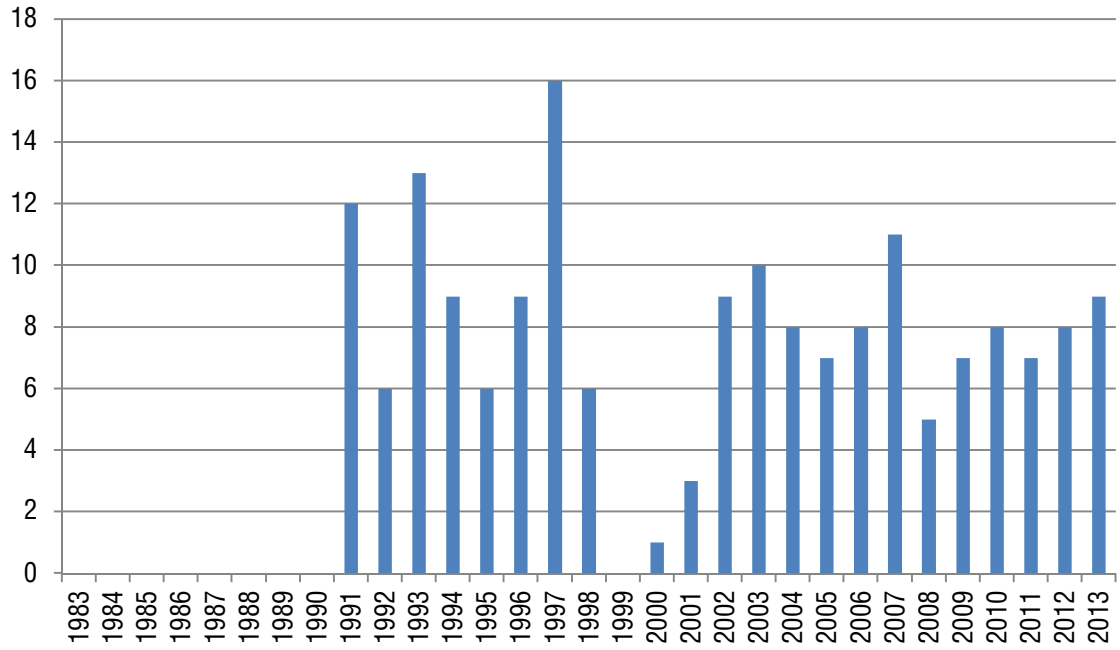
Cause of death	No. of pups
Abandoned/separated/starved	0
Stillborn	4
Drowned	0
Unknown	1
Sick/diseased	1
Disappeared ≤ stage 2	1
Total	**7**

4.4.7 South Castle Beach Cave

South Castle Beach Cave was overlooked as a pupping site prior to 1990, and between 1999-2001 access was severely limited as the unstable nature of the rock above was deemed unsafe for the rope access recommended in the Handbook (Poole, 1996a), and boat access is virtually impossible due to the almost constant swell. Following a re-assessment in 2002 it was considered that a scramble route without rope was a reasonable option in dry conditions (Hughes, 2002). The cave is only accessible from land at low tide and because of the long and rocky route from the cave to the water it was decided not to enter the cave when cows were present to avoid excessive disturbance.

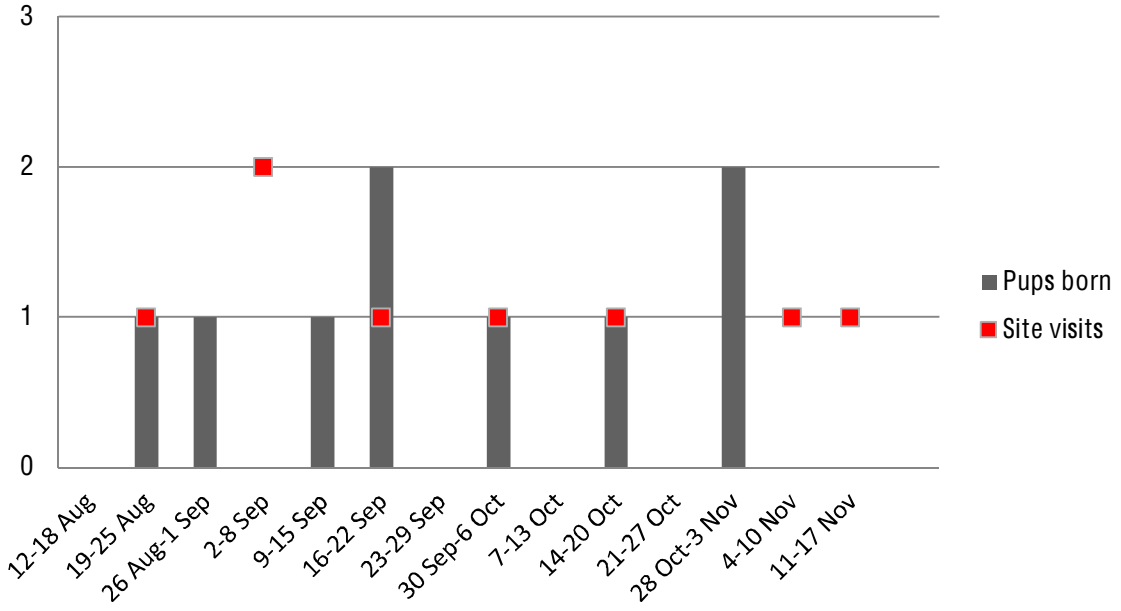
Nine pups were born in South Castle Beach Cave in 2013. One survived to the onset of moult, six are assumed to have survived, one is assumed dead and one was abandoned. The survival rate is 78%.

Figure 4.4.71 Number of seal pups born in South Castle Beach Cave 1983-2013



We managed to visit South Castle Beach Cave eight times during the observation period. It proved more and more difficult to access the site as the year progressed due to weather and short days not giving the rocks time to dry out. Hence it is possible a pup or two could have been missed.

Figure 4.4.72 Weekly seal pup births in South Castle Beach Cave in 2013



4.4.8 Seal Hole

Seal Hole is the easiest of the main cave sites to access and we visited the site ten times. However several times the cave could not be explored as adult seals blocked the entrance. Hence pups that were born in the back of the cave might have been missed.

Six pups were known to have been born in Seal Hole in 2013. Five are assumed to have survived, one is assumed dead, giving a survival rate of 83%

Figure 4.4.81 Number of seal pups born in Seal Hole 1983-2013

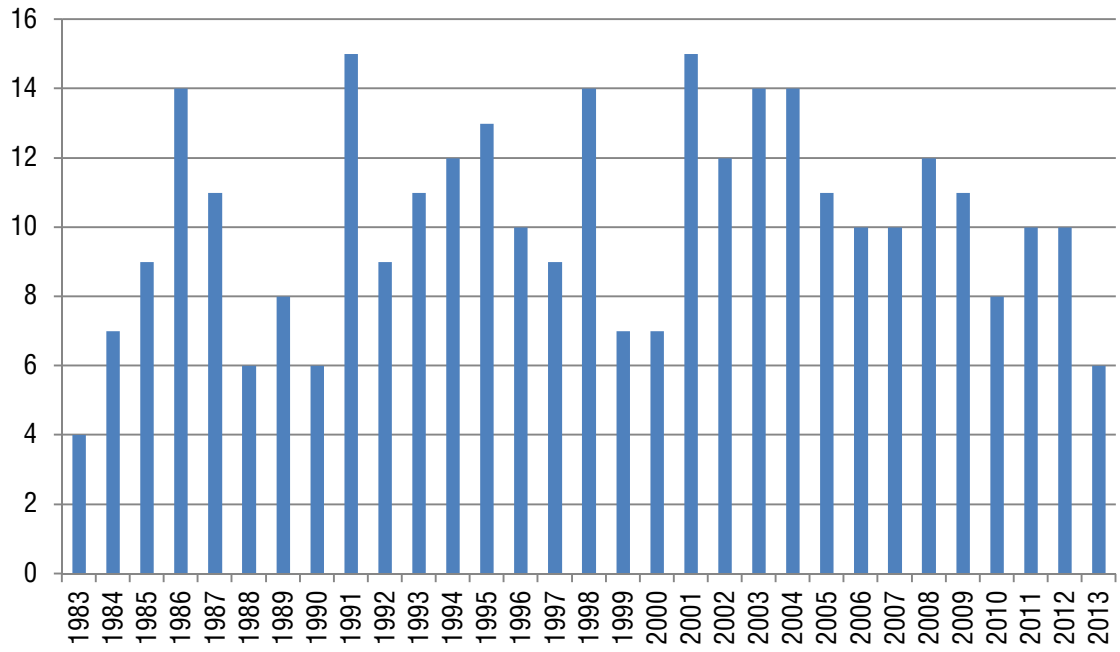
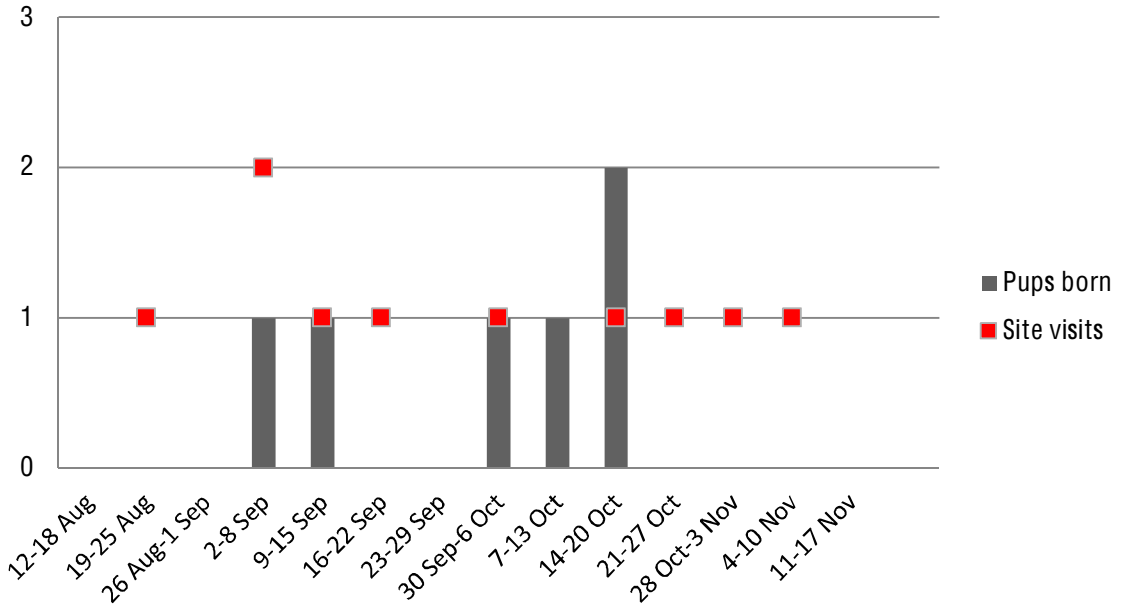


Figure 4.4.82 Weekly seal pup births in Seal Hole in 2013



4.4.9 The Slabs

Four pups were born on The Slabs in 2013.

One pup is assumed to have survived, three pups are known to have died, giving a survival rate of 25%. The Slabs do not seem to be a very suitable place for seal pups as it offers little shelter and gets fully flooded on many tides.

Figure 4.4.91 Number of seal pups born on The Slabs 1983-2013

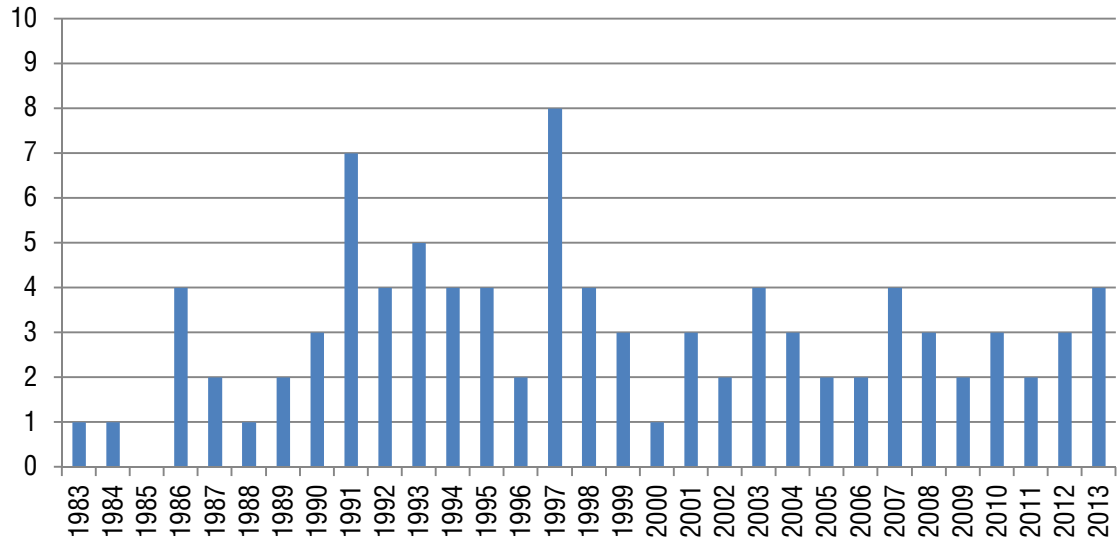
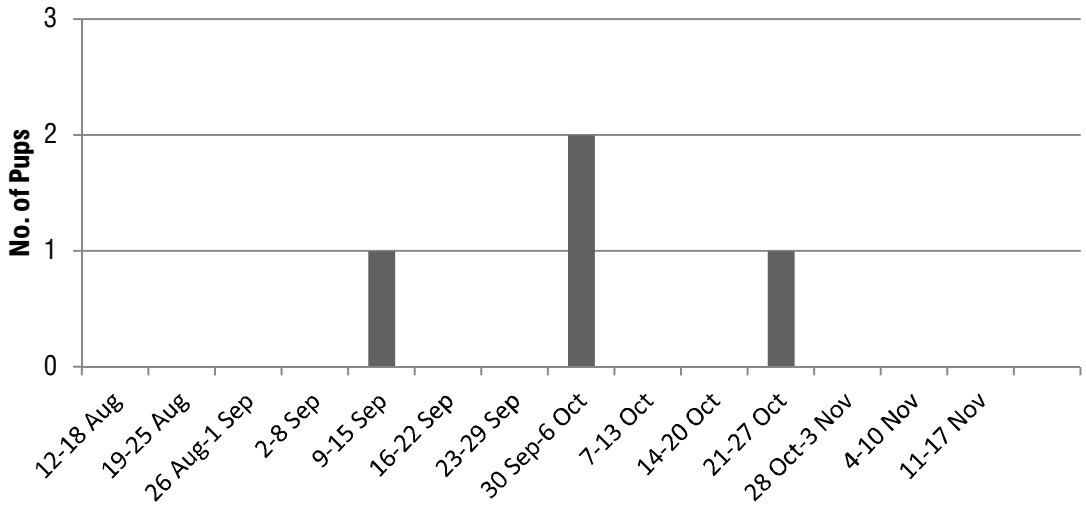


Figure 4.4.92 Weekly seal pup births on The Slabs in 2013



Pup 79 was born on 4/10/13 on The Slabs during a spring tide and ended up stuck in a crack five meters above Seal Hole. On checking Seal Hole on 5/10/13 at 13.00h the pup was heard crying and after some searching was found and taken down and placed on a ledge close to the water. In order to not contaminate the pup with human scent gloves were worn and the pup was given a small red mark to be able to monitor its progress and ascertain whether the rescue operation was at all successful. At 16.00h the mother of the pup was seen eagerly trying to get up onto the ledge but had to wait until the tide had come up some more. The next day pup 79 was sleeping on The Slabs with mother nearby. It progressed well during the next ten days but unfortunately was recorded lying dead on The Slabs on 16/10/13. Whether the pup had become ill or chilled too much in the rainy and cold weather at that time is unknown.

Plate 4.4.91 Pup 79 stuck on 5/10/13 at 13.00h

Plate 4.4.92 16.00h mum of pup 79 trying to get to pup

4.4.10 Driftwood Bay

21 pups were born in Driftwood Bay in 2013 which is five more than the average. In 2012 only 12 where born on this beach. In 2013 a correlation between wind direction and beach selection was observed. In strong south-westerly winds Driftwood Bay provides maximum protection. It would be very interesting to find out more about beach preferences of pupping females.

Figure 4.4.101 Number of seal pups born in Driftwood Bay 1983-2013

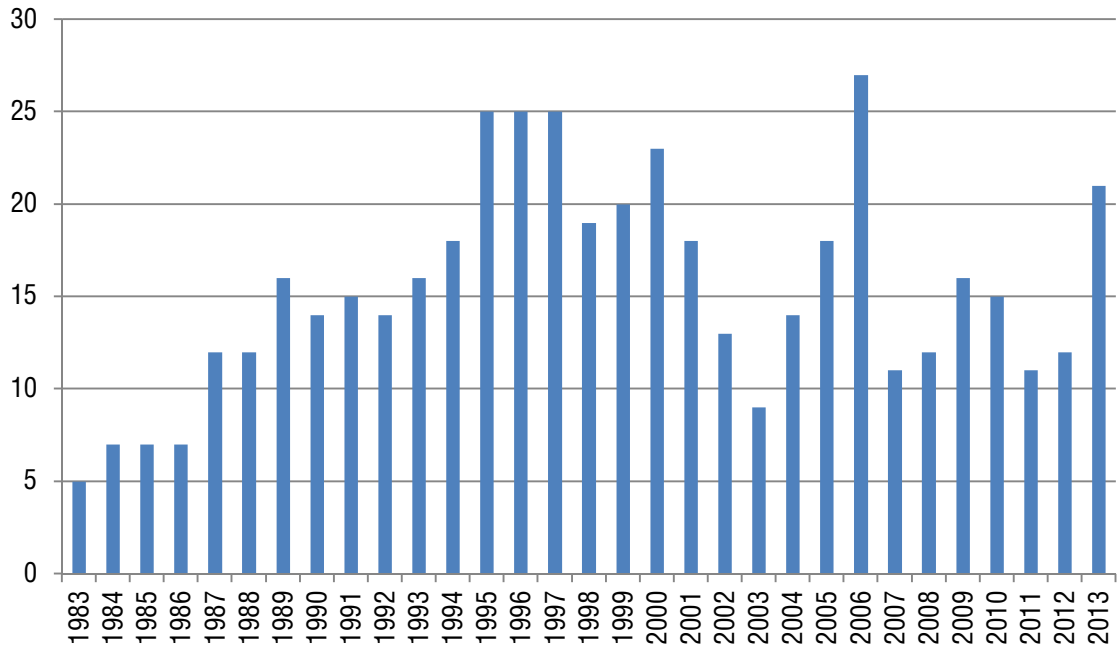
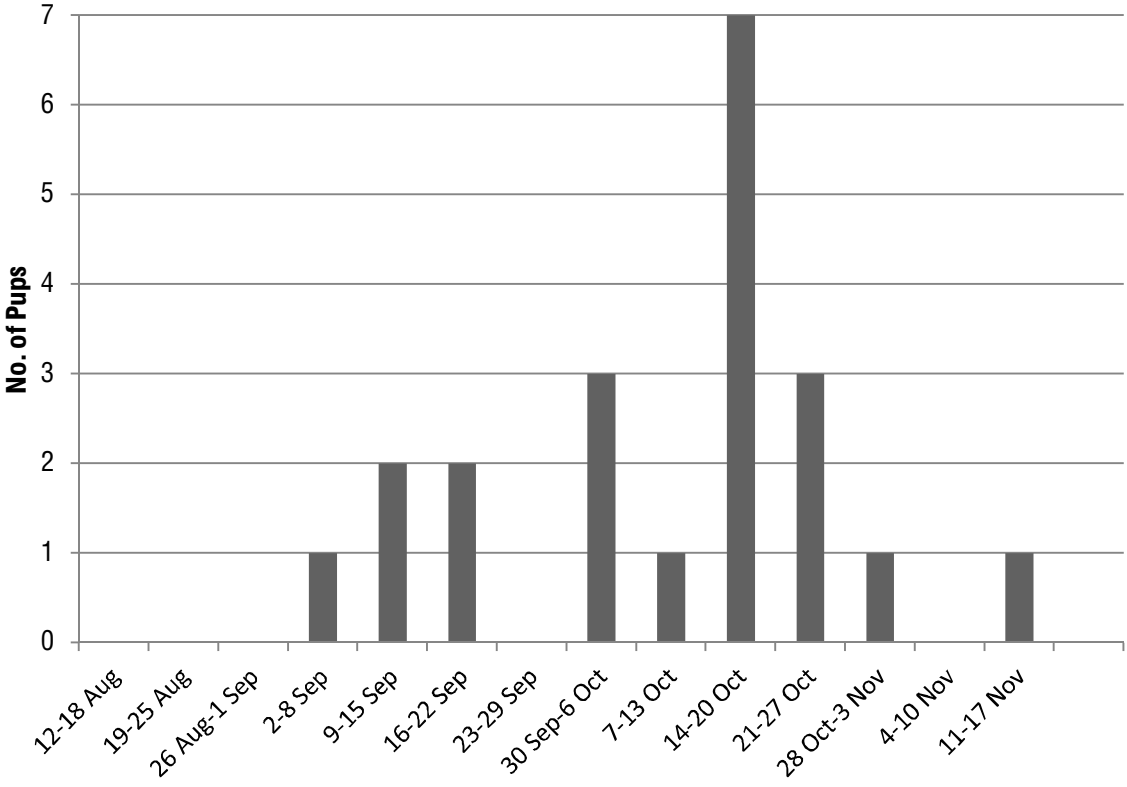


Figure 4.4.102 Weekly seal pup births in Driftwood Bay in 2013



One pup left Driftwood Bay and moved to South Haven. Five pups moved from South Haven to Driftwood Bay and another one from Mathew's Wick. In total 26 pups spent most of their first three weeks on Driftwood Bay. In order to obtain survival rate/ moult score etc. for the location Driftwood Bay the immigrants were taken into account whereas the emigrants were not.

Table 4.4.101 Sizes of pups at onset of moult on Driftwood Bay in 2013

Size at onset of moult	No of pups
Unknown	3
1 Very small	0
2 Small but healthy	3
3 Good size	6
4 Very good size	3
5 Super-moulter	3

Four pups are assumed to have survived, one pup survived to the onset of moult and 13 where weaned on Driftwood Bay, giving a survival rate of 79%. If only the pups which were born on Driftwood Bay are taken into account the survival rate is 67% which is exactly the same as last year. This figure however ignores the immigrating pups.

Table 4.4.102 Causes of seal pup deaths on Driftwood Bay in 2013

Cause of death	**No. of pups**
Abandoned/separated/starved	4
Stillborn	0
Drowned	1
Unknown	1
Sick/diseased	1
Disappeared ≤ stage 2	1
Total	**8**

4.4.11 South Haven

34 pups were born on South Haven beach in 2013 which is the third highest total since recording began.

This site is made up of South Haven main beach and the two caves between the beach and Driftwood Bay. The caves where only visited when pups where marked on the main beach as accessing the caves inevitably disturbs all seals on the beach. The entrances to the caves can be monitored from across the bay and pups tend to move out of the caves within their first week and can be observed from above thereafter.

Figure 4.4.111 Number of seal pups born in South Haven 1983-2013

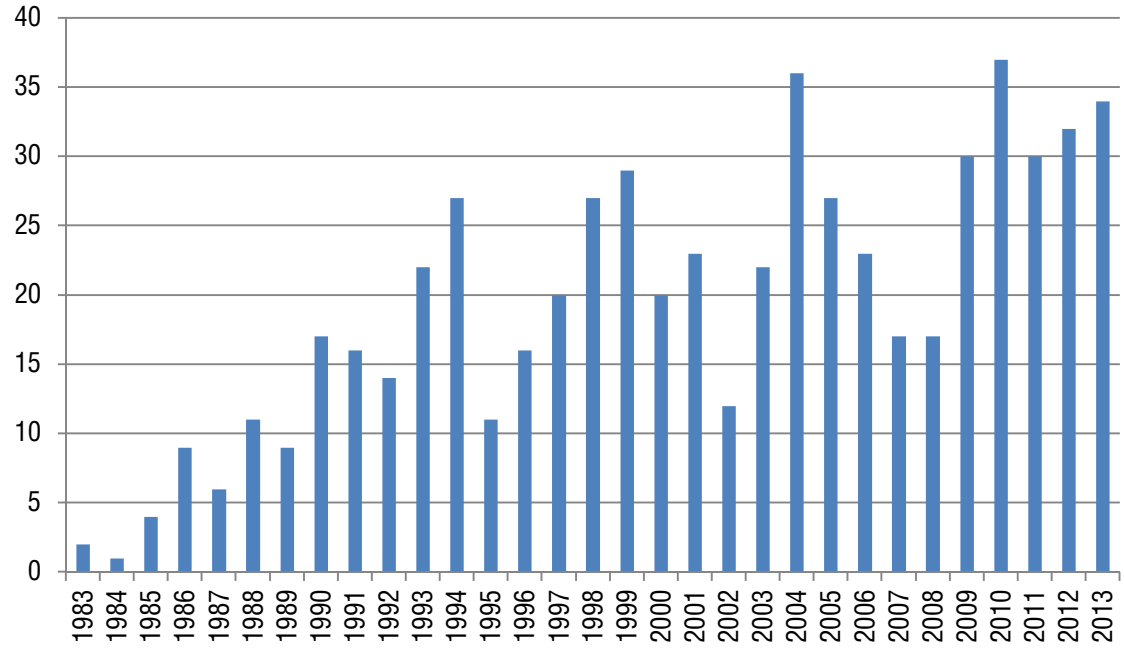
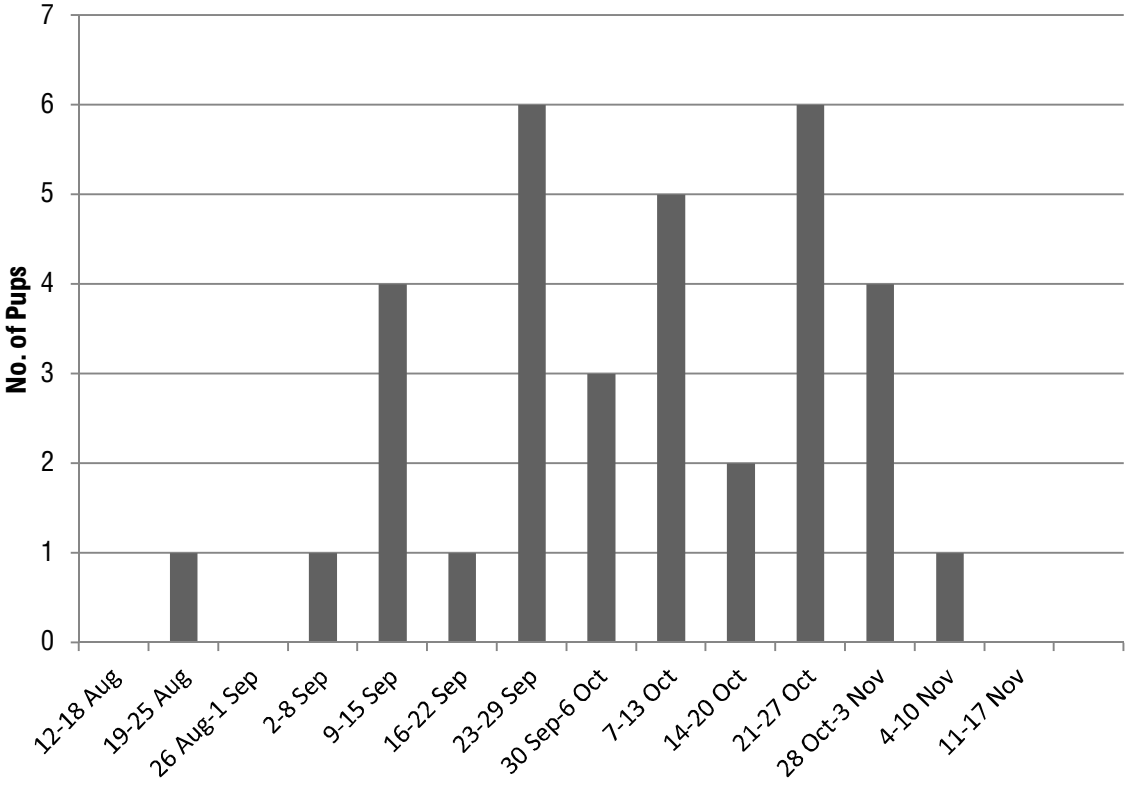


Figure 4.4.112 Weekly seal pup births in South Haven in 2013



29 pups spent most of their first three weeks on South Haven beach. One pup moved from Driftwood Bay to South Haven beach and was weaned there. Five pups moved from South Haven beach to Driftwood Bay (four survived or are assumed to have survived, one died), pup 181 moved to Mathews Wick, see section 4.4.5.

Taking the immigrants and emigrants into account the survival rate on South Haven beach was 76% in 2013.

Table 4.4.111 Sizes of pups at onset of moult on South Haven beach2013

Size at onset of moult	No of pups
Unknown	4
1 Very small	1
2 Small but healthy	2
3 Good size	7
4 Very good size	7
5 Super-moulter	1

Table 4.4.112 Causes of seal pup deaths on South Haven beach in 2013

Cause of death	No. of pups
Abandoned/separated/starved	0
Stillborn	1
Drowned	0
Unknown	0
Sick/diseased	0
Disappeared ≤ stage 2	6
Total	**7**

4.4.12 South Stream Cave and Boulders

South Stream Cave and Boulders is a hard site to monitor well. Access to the cave is only possible at low tide and is very treachrous in wet weather, pups are usually hidden in the cave or boulders and the only sign that they are present is when cows are seen swimming offshore. It is best to check the site daily from The Neck and then follow up any activity with a visit to the cave.

Two pups were born in South Stream Cave and Boulders in 2013, both are assumed to have survived.

Figure 4.4.121 Number of seal pups born in South Stream Cave 1983-2013

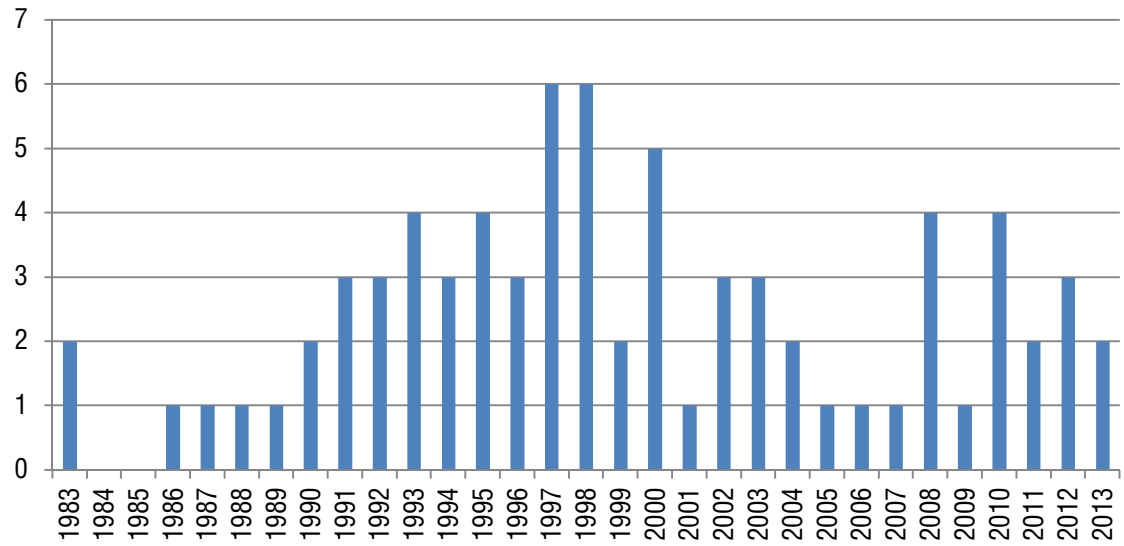
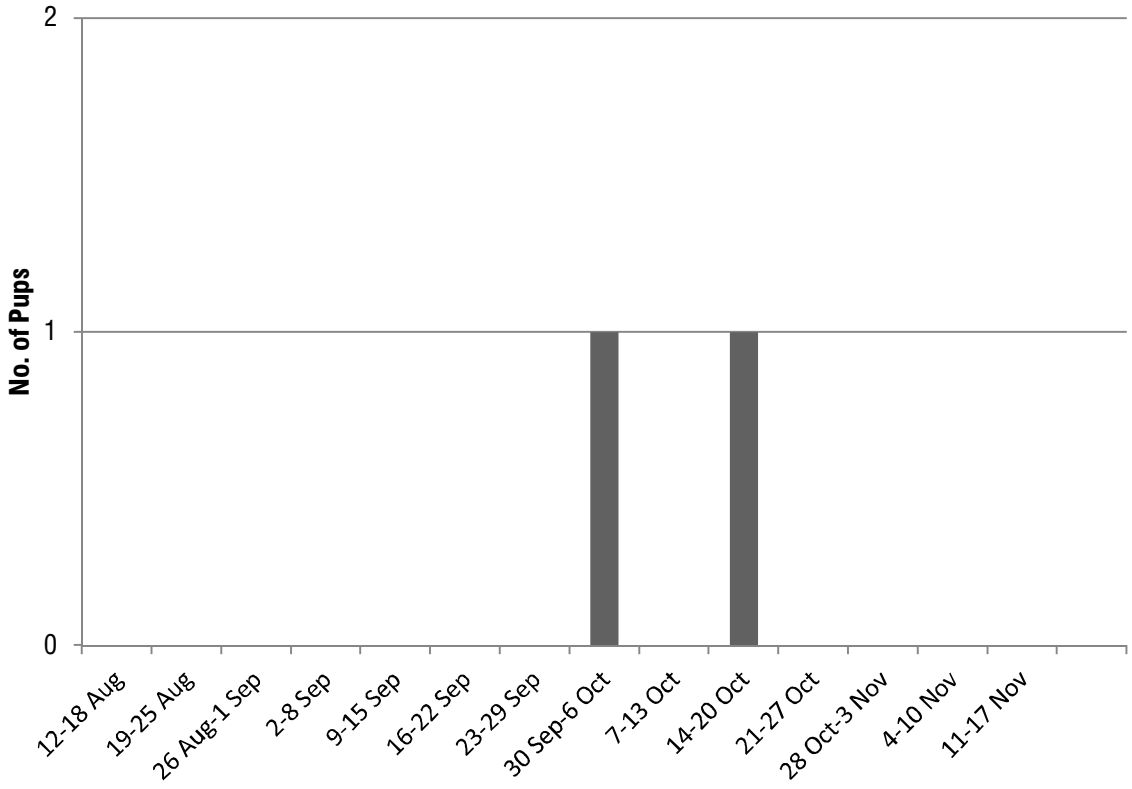


Figure 4.4.122 Weekly seal pup births in South Stream Cave and Boulders in 2013



4.4.13 High Cliff Boulders

Four pups were born/present at High Cliff Boulders, all of them are assumed to have survived. High Cliff Boulders is another site which is difficult to monitor as the boulders shield the pups from view. The only way to check the beach fully is to scramble to the bottom and search within the rocks. Additionally to the site visits we observed the site from above. None the less some of the pups recorded on High Cliff Boulders might have moved onto the beach in their first week and were possibly not born there.

Figure 4.4.131 Number of seal pups born at High Cliff Boulders 1983-2013

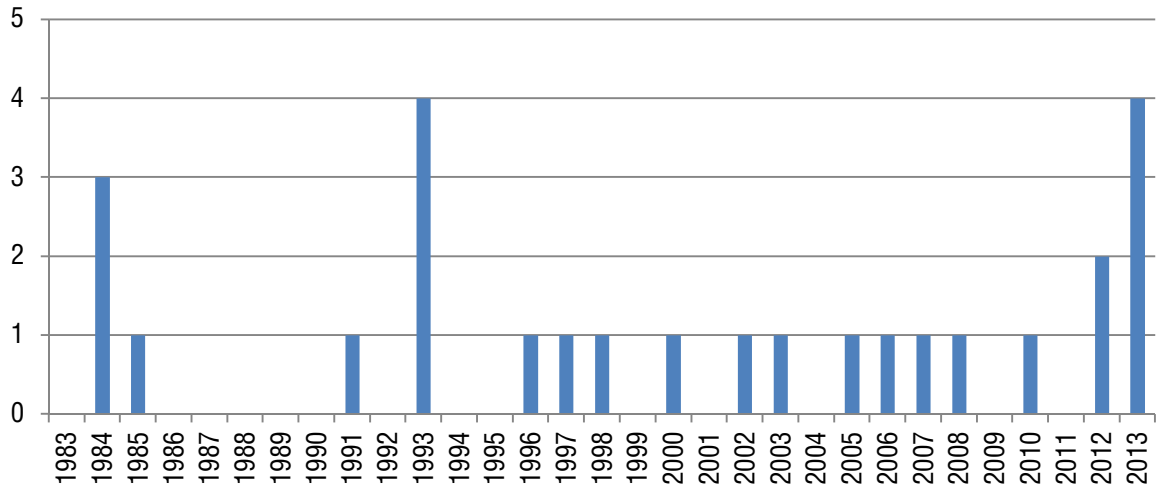
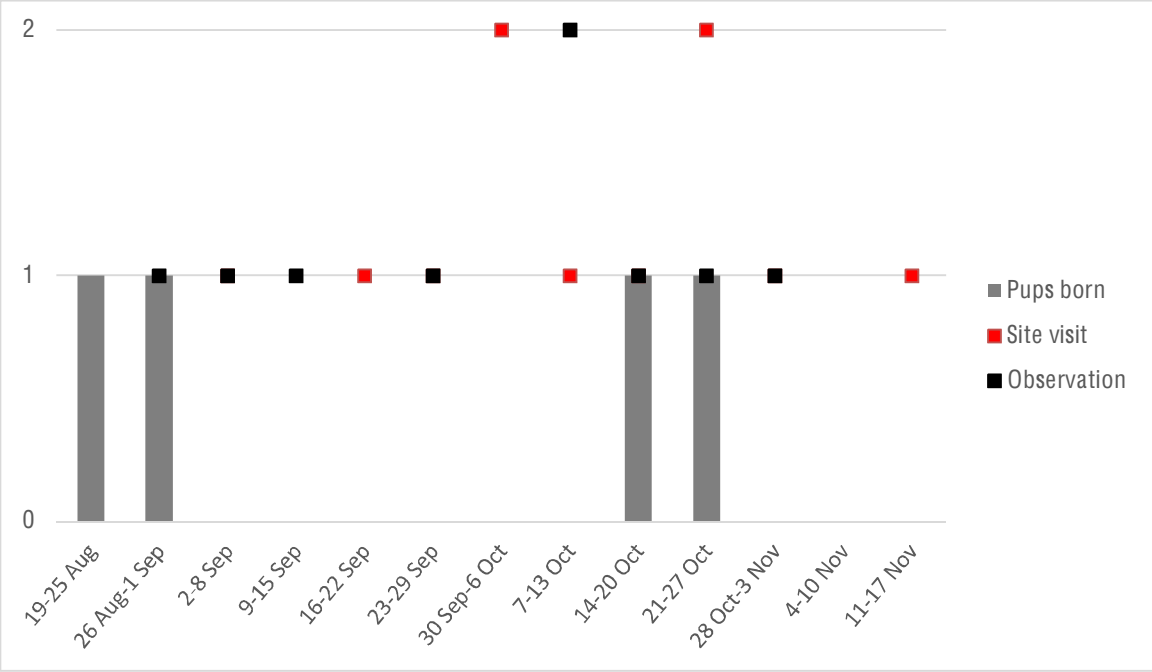


Figure 4.4.132 Weekly seal pup births at High Cliff Boulders in 2013



4.4.14 The Wick

13 seal pups were born on The Wick in 2013.

Three pups survived to onset of moult, four pups were weaned on The Wick. Four pups are assumed to be dead as they disappeared ≤ size two, one was still born and one was abandoned, giving a survival rate of 54%. The pups on The Wick suffer a lot on windy days as the site opens to the south-west and the prevailing winds are south-westerly. We lost three pups in the storm (force 9) on 2/11/13.

Figure 4.4.141 Number of seal pups born in The Wick 1983-2013

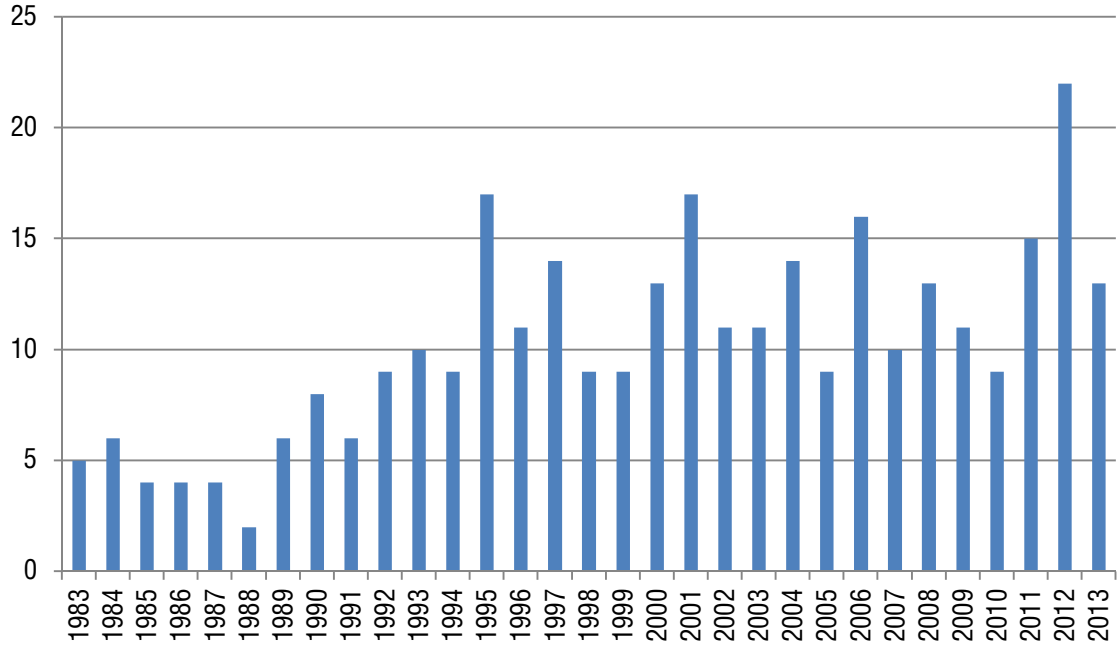
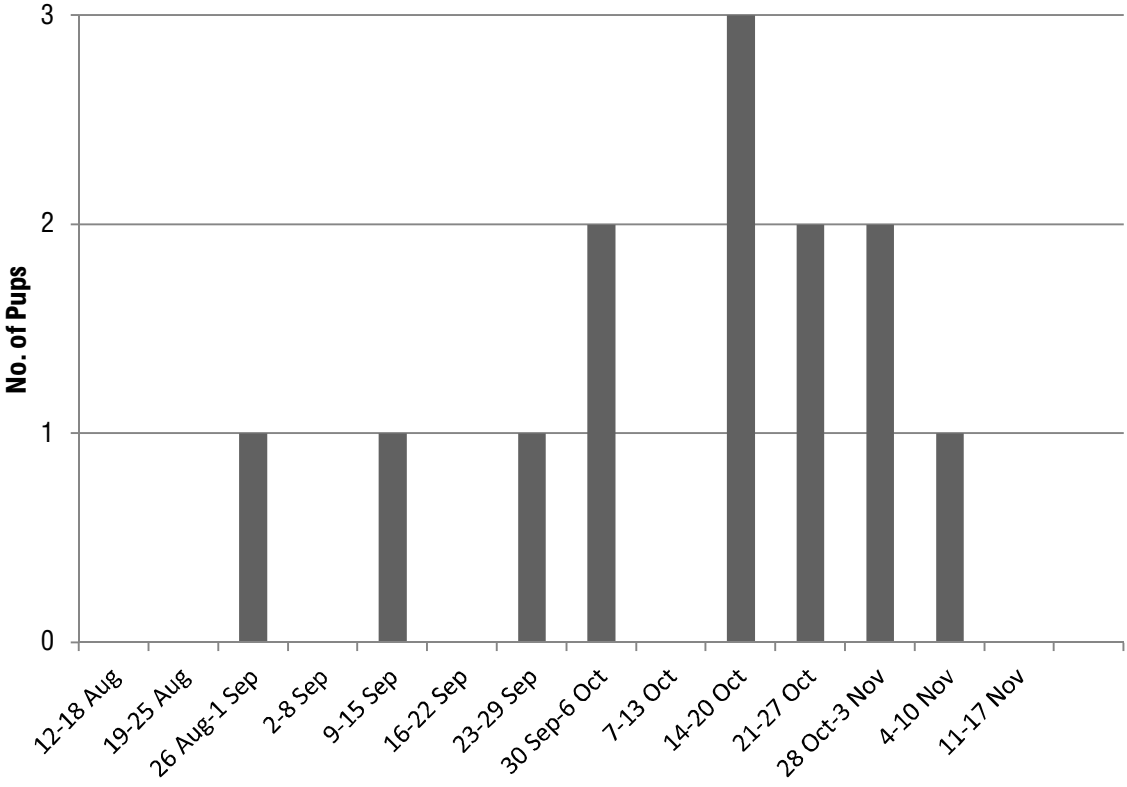


Figure 4.4.142 Weekly seal pup births in The Wick in 2013



4.4.15 The Basin

One pup was born in The Basin on 2013, which was assumed to have died as it disappeared in its first week.

Figure 4.4.151 Number of seal pups born in The Basin 1983-2013

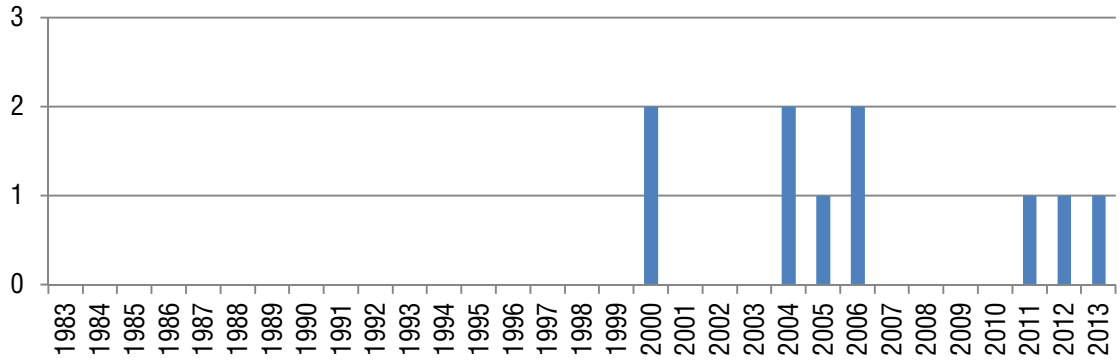
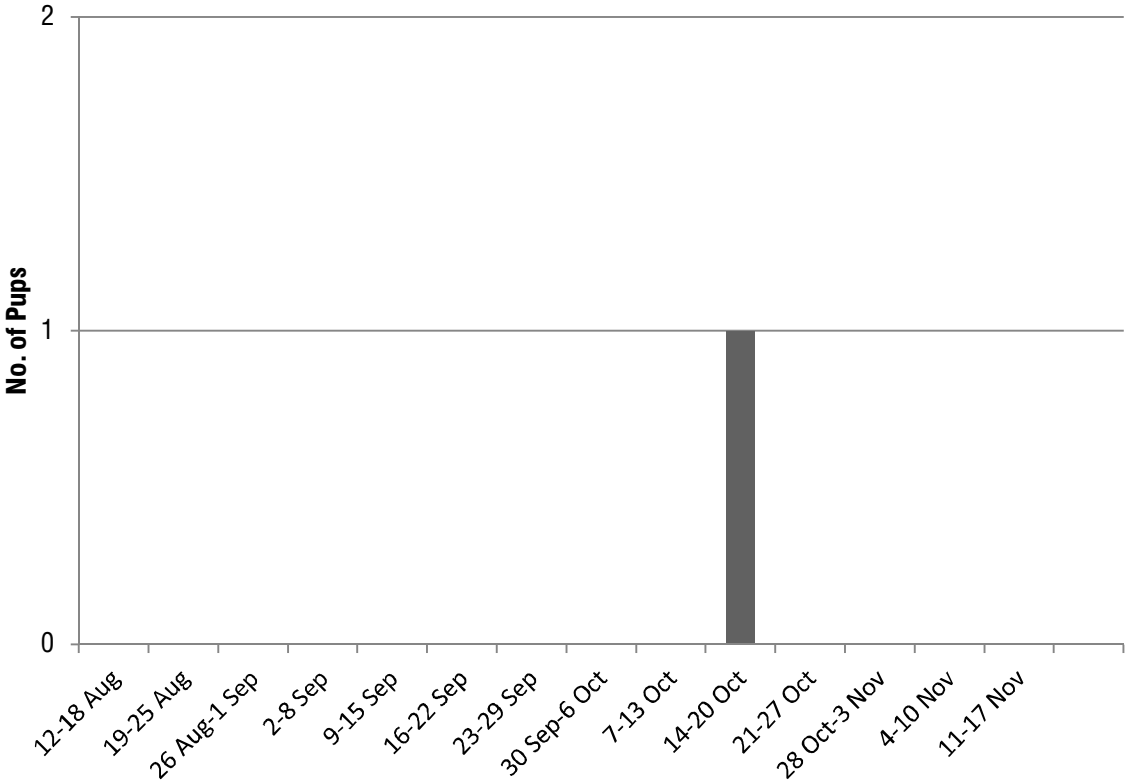


Figure 4.4.152 Weekly seal pup births in The Basin in 2013



4.4.16 Robert's Wick

No pups were born in Robert's Wick in 2013. This site was possibly used once, in 2001.

4.4.17 Tom's House

No pups were born at Tom's House in 2013. The site has only been used once, in 1997, when a single pup was born.

4.4.18 Pigstone Bay

Pigstone Bay is the only site on Skomer which is impossible to monitor. There is an easily accessible boulder beach where it has been thought pups were occasionally born. However there is a sea cave, which is impossible to access, which seems to be the source of pups found on the beach, presumably having been washed out during spring tides/big swells. The cave was entered by boat in 1985 and found to end in a shingle beach which held about a dozen hauled out seals and it was considered the cave could be an important pupping site (ALEXANDER & ALEXANDER, 1987). Any pups that are seen at Pigstone Bay are rarely seen again and are usually assumed to have died, although it is equally possible they could have just swam back to the cave.

In 2013 one single seal pup size three was seen once at Pigstone Bay which could have either been a pup from the cave or a wandering pup. This pup was not included in the count for the island.

4.4.19 The Garland Stone

No pups were seen at The Garland Stone in 2013. The site has only been used twice, in spring 2001 and 2007, when single pups were born.

4.5 MOVEMENTS

During 2013 eight marked pups were recorded making movements between beaches on Skomer.

According to BOYLE, D (2012) movements of pups between beaches usually occur during periods of strong winds and spring tides and are presumably a result of pups running out of dry land on their natal beach and swimming to the nearest available dry site. However pup 181 moved beach four times possibly because it was looking for its mother, another pup turned up on Mathew's Wick stage four and moved without apparent reason to Driftwood Bay. Pups also were observed swimming far out into South Haven Bay, which will increase the risk of getting swept onto another beach.

Only one of the marked pups which moved beach died, all other ones survived or are assumed to have survived.

Table 4.5.1 Movements of marked pups on Skomer Island in 2013

Natal Site	Pup No.	Destination	Age (on arrival at destination)	Pup condition when last seen	Comments
South Haven	34	Driftwood Bay	7 a	2	Size two but started moulting on DWB
South Haven	61	Driftwood Bay	5 a	1	Dead, pos. ill
South Haven	84	Driftwood Bay	16 a	4	
South Haven	88	Driftwood Bay	13 a	4	
Driftwood Bay	99	South Haven	5 a	4	
Mathew's Wick	153	Driftwood Bay	14 u	3	Moulting on DWB
South Haven	170	Driftwood Bay	2 a	4	
South Haven	181	North Haven	8 u	1	
		Driftwood Bay	12 u	2	
		Mathew's Wick	14 a	2	Well attended

a – Pup attended by mother
u – Pup unattended

4.6 WANDERERS

One definite wanderer turned up on Skomer, see section 4.4.1 and another six pups that were not thought to have been born on the island were recorded. Most of these pups were in good condition and had just started moulting or were just about to.

4.7 SEAL PUP MOULT

Details of moult were recorded for pups whose progress could be accurately monitored from birth, but only for pups where date of birth and moulting strategy were known to within 24 hours.

The age of pups at the start of moult is normally quite easy to record but pups have a nasty habit of vanishing just before they complete moult, or become indistinguishable from other moulting or moulted pups once they lose their individual markings, making accurately recording the age at completion and duration of moult much harder to record.

Moulting details for 83 pups are given in Appendix II.

The mean age at onset of moult was 14 days (n=62, range 1-22 days).
The mean age at completion of moult was 22 days (n=39, range 6-32 days).
The mean duration of moult was seven days (n=43, range 2-18 days).

Table 4.7.1 Seal pup moult records on Skomer Island 1995-2013

Year	Mean age at onset (days)	Mean duration (days)	Mean age at completion (days)
2013	14	7	22
2012	15	6	20
2011	15	5	20
2010	14	6	19
2009	15	6	22
2008	14	5	20
2007	10 (flippers) 15 (body)	10 (max.) 6 (min.)	20
2006	8 (flippers) 13 (body)	12 (max.) 6 (min.)	19
2005	10 (flippers) 14 (body)	8 (max.) 5 (min.)	19
2004	11 (flippers) 15 (body)	10 (max.) 6 (min.)	21
2003	11 (flippers) 14 (body)	10 (max.) 6 (min.)	21
2002	12	9	22
2001	13	6	20
2000	16	4	20
1999	15	5	20
1998	17	6	22
1997	17	5	22
1996	16	5	20
1995	16	5	22

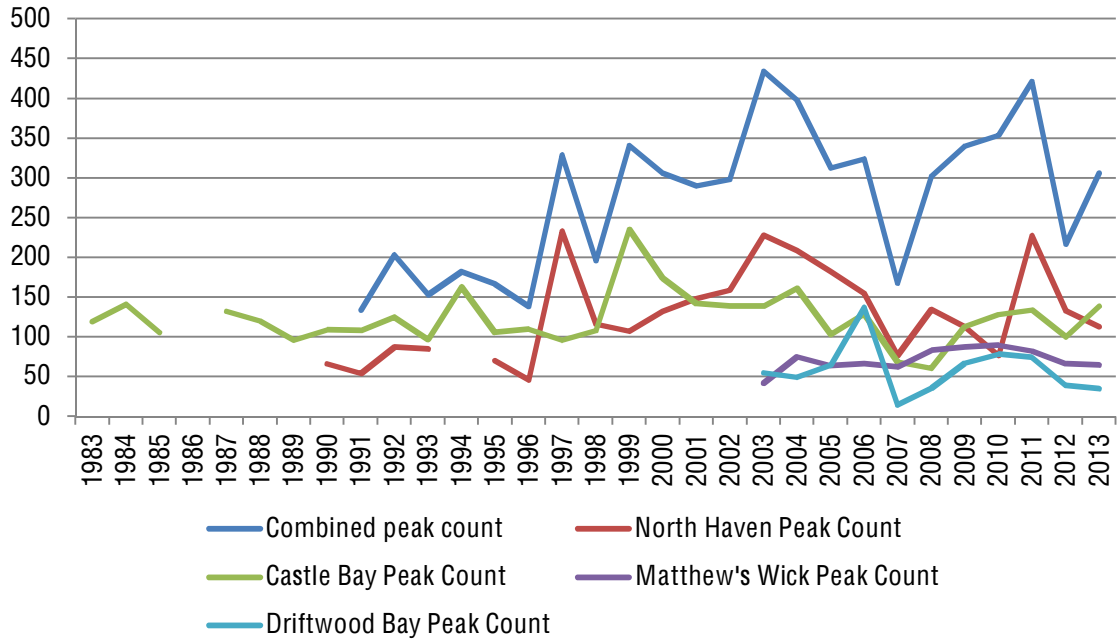
Two pups where born moulting, see sections 4.4.1 and 4.4.6

5. THE HAUL-OUTS IN 2013

In 2013 the maximum haul-out of 306 was recorded on 29 October. The average maximum haul-out on Skomer Island since recording began is 273, and 327 for the last ten years, hence the number of seals using the haul-outs was slightly lower than the average for the last ten years. In 2012 the number of seals using Skomer to haul-out had reached its lowest peak since 2007 (BOYLE, D (2012)).

Castle Bay (including Shag Rock) and North Haven (including Rye Rocks) were the most popular haul-out sites. Castle Bay had an average of 35 and a maximum of 139 seals on 29 October, North Haven had an average of 36 and a maximum of 113 seals on 24 October hauled-out.

Figure 5.1 Peak haul-out counts on Skomer Island 1983-2013



See APPENDIX 3 for detailed haul-out figures.

Castle Bay became busier as the year progressed. So did North Haven, although the trend is not as clear as the number of seals fluctuated more. North Haven experienced its peak at the end of September, whereas the numbers on Castle Bay were still climbing when the island was vacated. The seal numbers on Driftwood Bay and Matthew's Wick increased steadily from end of September onwards.

Table 5.1 Average haul out on Castle Bay and North Haven in 2013

Date	Average haul			
	Castle Bay	North Haven	Driftwood Bay	Mathew's Wick
21/8-30/8	3	15	0	0
31/8-9/9	10	13	0	1
10/9/-19/9	24	25	2	6
20/9/-29/9	31	26	1	8
30/9-9/10	36	39	2	6
10/10-19/10	40	39	4	5
20/10-29/10	60	82	17	34
30/10-8/11	65	41	16	39
9/11-15/811*	54	46	22	48

*in this period recording only took place on seven days

POOLE, J (1996a) wanted to find out whether there is a correlation between seal haul-outs and tidal range. BOYLE, D (2012) says that North Haven and especially Rye Rocks are not very suitable haul-out sites on days with strong northerly winds and/or neap tides. However in 2013 there seemed to be no correlation between seal haul-outs and tidal range. When mapping the data on a scatterplot the distribution appears to be random (see figure 5.2). This statement could be further investigated with statistical analysis.

Figure 5.2 Castle Bay seal haul-outs and tidal range compared

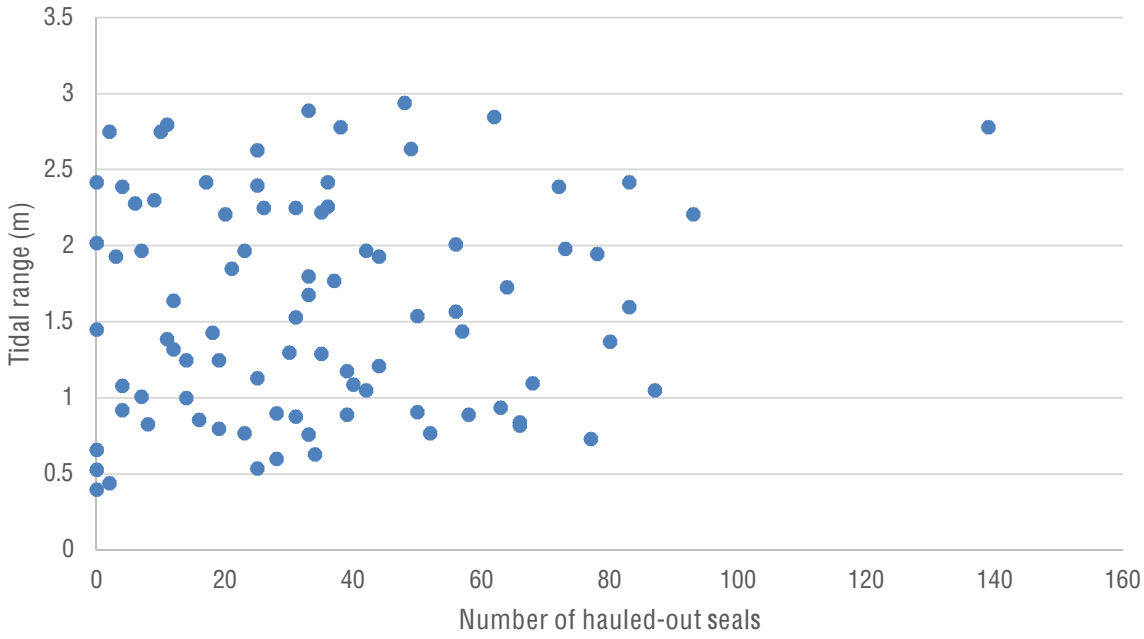


Figure 5.3 Castle Bay haul-out in 2013

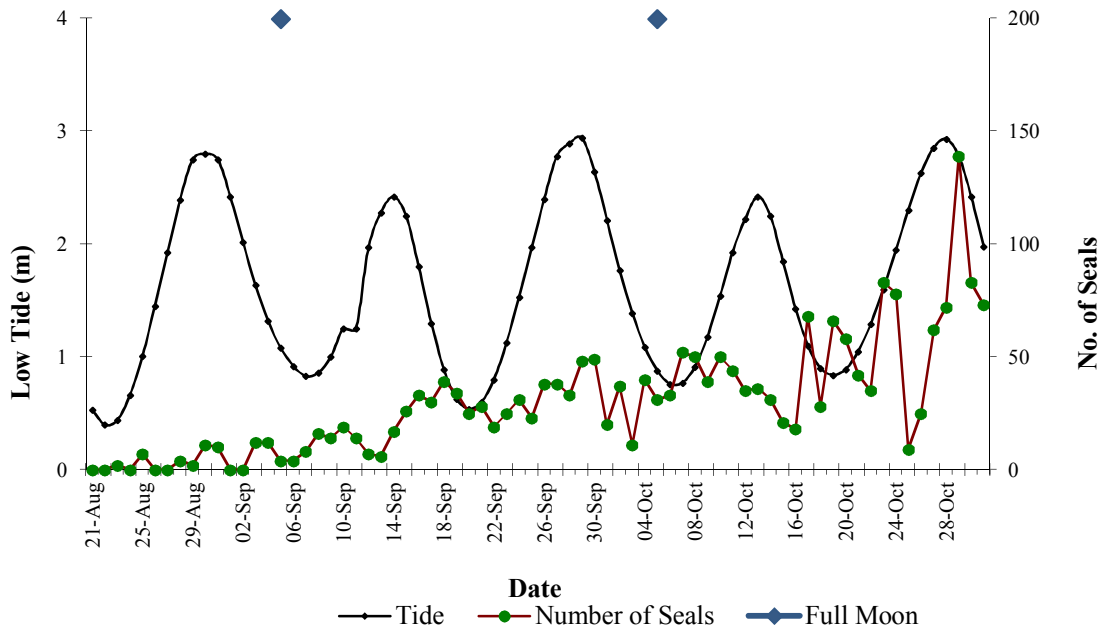


Figure 5.4 North Haven haul-out in 2013

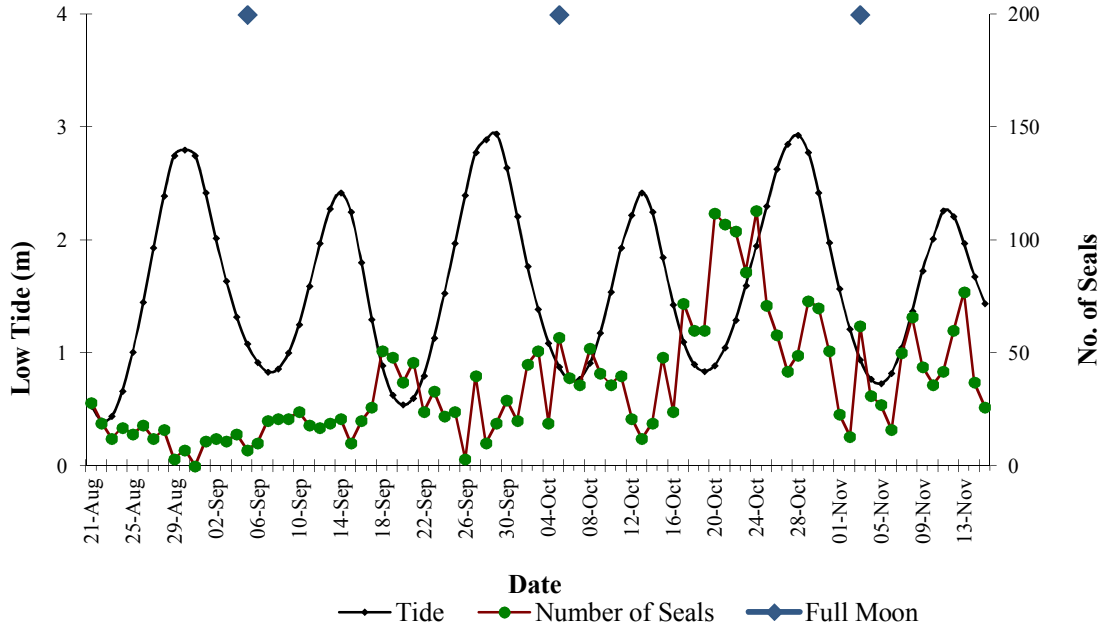


Figure 5.5 Driftwood Bay haul-out in 2013

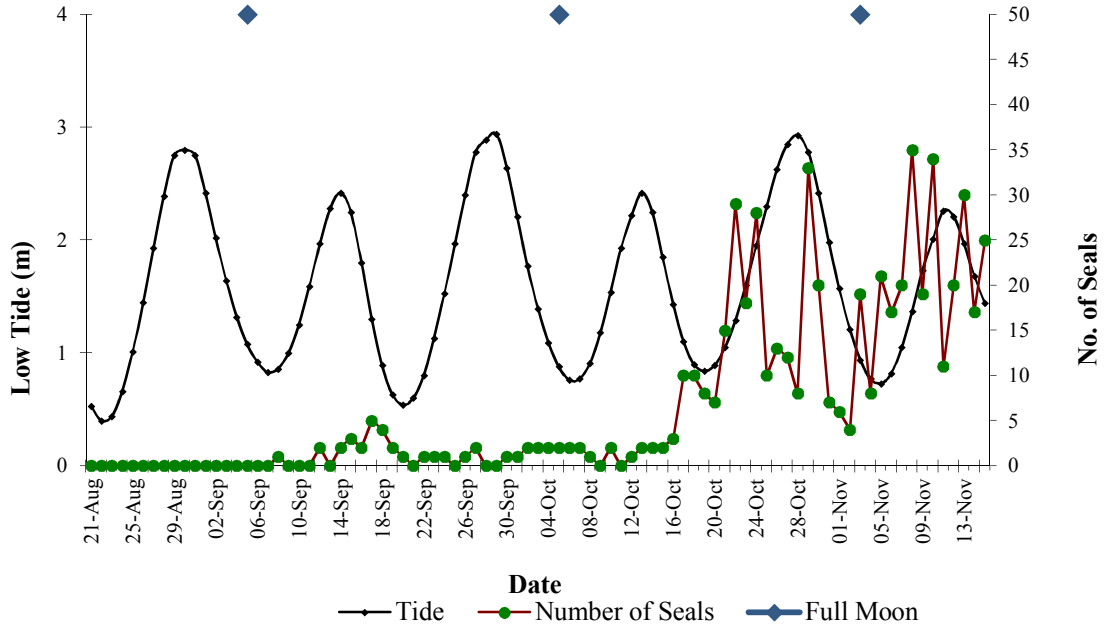


Figure 5.6 Matthew's Wick haul-out in 2013

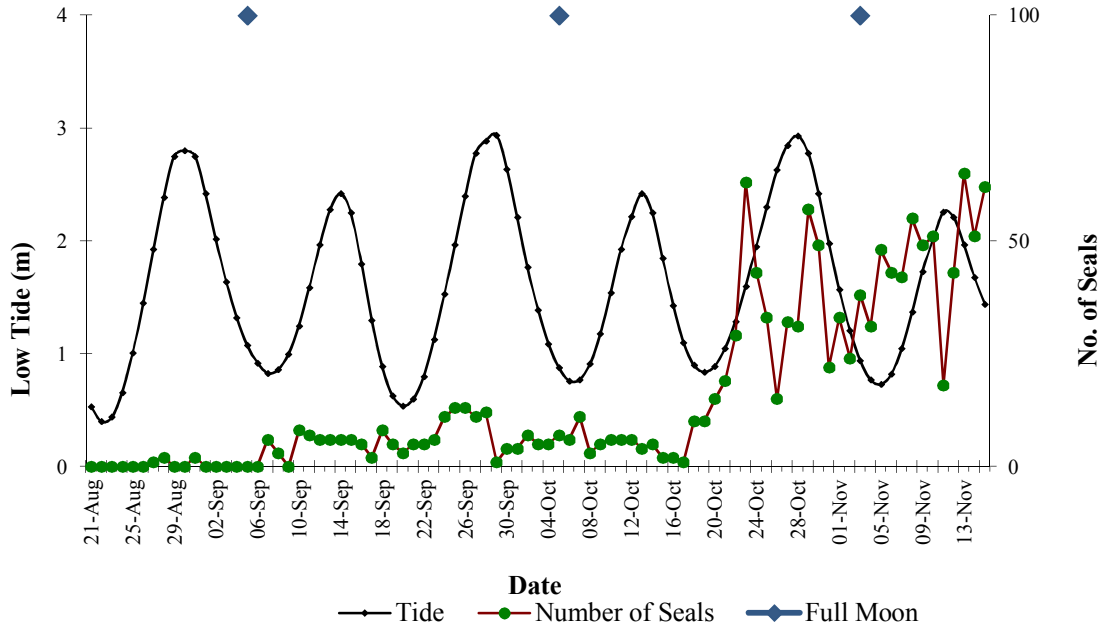
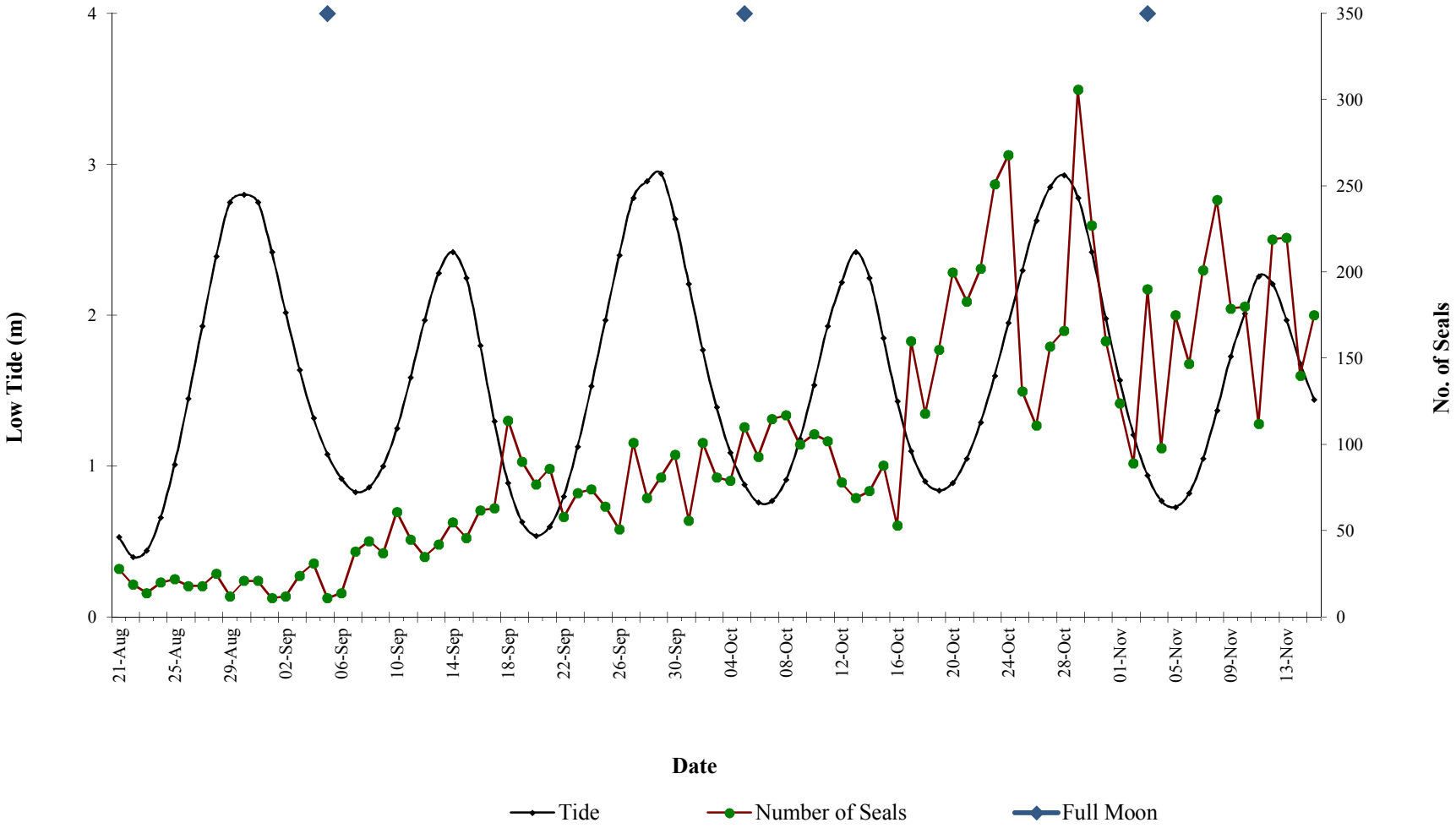


Figure 5.7 All haul-outs combined in 2013



6. POLLUTION

6.1 NETTING

Monofilament line and netting were the obvious pollutants affecting several seals. In 2013 twelve different seals seen around the island showed obvious signs of being entangled in nets at some time in their lives, most commonly a deep scar around their necks, often with netting still embedded. None of these seals had been recorded before, or at least none of them could be assigned to any of the previous photographed seals.

6.2 OIL/TAR

Skomer's beaches remain very clean, with no pups at all being seen with tar spots on their coats again in 2013.

7 DISTURBANCE

There were no serious instances of any disturbance to seals on Skomer in 2013

8. BULL SEAL BEHAVIOUR

Recording dominant bull seals on Skomer's main beaches forms a difficult part of the seal study. Keeping track of unmarked seals is rather challenging and extremely time consuming. At the beginning of the study period bull seals were more site faithful than in the second half. The change overs happened so quickly that it was difficult to follow, hence there is better data for the first part of the breeding season.

In future the value of casual recording of bull seal activity should be a matter of debate. With an expanding population of seals to monitor and emphasis shifting towards ID of pupping cows, time consuming behavioural work on bull seals may not be realistic.

8.1 DOMINANT BULLS IN NORTH HAVEN MAIN BEACH IN 2013

07.NHV.B02 (Steps Bull) has returned to North Haven every year since 2007, apart from 2008. This year he was the dominant bull on the entire North Haven main beach for nearly a month.

10.NHV.B03 was the dominant bull on North Haven main beach and dominant bull in Matthew's Wick in 2010. In 2011 he was again the dominant bull on main North Haven beach and subordinate bull in South Haven.

10.NHV.B04 returned to the main North Haven beach for the fourth year running

Table 8.1.1 Bulls on North Haven main beach in 2013

Dates	Bull Code/Name	Notes
26/8-30/9	07.NHV.B02	Dominant bull
17/10	10.NHV.B03	Present on beach, dominant ?
16/09	13.SB.001.NHV	Subordinate under 07.NHV.B02
24/10-15/11	10.NHV.B04	Dominant bull on east side of beach
31/10	13.SB.003.NHV	Prospecting bull
04/11-8/11	13.SB.004	Dominant bull on west side of beach
2/9	13.SB-NK-004.NHV	Hauled out
14/11	13.SB-LBK-001.NHV	Hauled out

8.2 DOMINANT BULLS ON CASTLE BEACH IN 2013

Three bulls were recorded holding territory in Castle Bay in 2013. Three of these bulls had been Beach-masters in Castle Bay in the past and the other two had previously been Beach-masters in Seal Hole and The Slabs.

10.NHV.B03 was the dominant bull on main North Haven beach and dominant bull in Matthew's Wick in 2010. In 2011 he was again the dominant bull on North Haven main beach and subordinate bull in South Haven.

11.SHO.B03 was a Beach-master in Seal Hole and The Slabs in 2011 and at Castle Bay in 2012 and 2013.

Table 8.2.1 Bulls in Castle Bay in 2013

Dates	Bull Code/Name	Notes
23/8-7/9	13.SB.002.CBY 2 nose spot bull	
27/8-3/9	13.SB.004.CBY Harry Potter Bull	Dominant bull
2/9-12/9	10.NHV.B03	Subordinate bull
05/9-18/9	11.SHO.B03 No scar bull No scar bull	Dominant bull
6/11-10/11	13.SB.003.CBY 4 spot bull	Dominant bull
13/11	13.SB001.CBY	Hauled out

9. COW BEHAVIOUR

In 2013 there were the usual cases of cows suckling pups other than their own and pups suckling on cows that were not their mother. This behaviour was noted on North Haven Slip, Matthew's Wick, Drifwood Bay and South Haven.

There seemed to be no obvious detrimental effect to pups whose mother was seen feeding other pups. The foster pup as well as the cow's own pup all survived to the onset of moult. There was only one exception in Mathew's Wick where the apparently abandoned pup 91 suckled on pup 95's mum and died at the age of ten days. The pup was of good size and the death is a mystery. However at that time pups with infections where noted at Mathew's Wick so pup 91 could have been ill.

Plate 9.1.1 Pup 91 and 95 all suckling on female 13.SC095.MWK

On Driftwood Bay was a cow observed which suckled three pups. Pup 108, 109 and 110 were all born on 17/10/13 and all survived and were weaned. They were quite small, size two to three, when they started moult but healthy. It remained unknown which pup was actually 13.SC108.DWB's. No other cow was ever observed suckling pup 108, 109 and 110.

Plate 9.1.2 13.SC108.DWB suckling three pups on 28/10/13

On South Haven beach a well known cow reared two pups. 07.C114.SHV first looked after her own pup 71 successfully which finished its moult on 22/10/13. On 26/10/13 she was then seen looking after pup 130. She is a very aggressive cow and does not let anyone near her pup. What had happened to the original mum of pup 130 is unknown as she was never observed on the beach. Pup 130 was last seen on 31/10/13 size four and was moulting heavily. This female has been seen on Skomer regularly since 2007.

Table 9.1.1 Records of female 07.C114.SHV

Year	Pup #	Pup DOB.	Site	Outcome	Age at start of moult	Age at completion of moult	Size at start of moult	Quality of care
2007	114	19 Oct	SHV	Survived	12	21	4	3
2009	94	10 Oct	SHV	Survived	18	21	5	3
2010	6-7 Oct, heavily pregnant cow hauling out at east end South Haven main beach, but not known to have pupped on Skomer							
2011	94	11 Oct	SHV	Survived	18	24	4	3
2012	93	7 Oct	SHV	Survived	16	22	4	3

Plate 9.1.3 Pup 71 with cow 07.C114.SHV on South Haven beach on 15/10/13

Plate 9.1.4 Pup 130 with cow 07.C114.SHV on South Haven beach on 26/10/13

Pup 48 was born on 23/9/13 on North Haven Slip and was well attended by its mother. Pup 60 was still born on 28/9/13. The mother (13.SC-LS-060.NHV)of the dead pup stayed on the beach over the following days and finally on 2/11/13 adopted/abducted pup 48. The new mum was seen suckling pup 48 as well as the original mum. The two females were aggressive towards each other but both continued to look after the pup. Finally on 8/10/13 the pup size five started moulting and was still seen as a weaner on the beach a week later.

Plate 9.1.5 Pup 48 with mum on North Haven Slip on 23/9/13

Plate 9.1.6 Pup 48 with mum 13.SC-LS-060.NHV of still born pup 60 on 2/10/13

10. DISEASE

See section 4.4.5.

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APPENDIX 1. EA. SMITH'S AGE CLASSIFICATION SYSTEM

Stage 1: 1 – 5 days old

Body contour thin, neck well defined, skin in loose folds around body. Coat often stained yellow by prenatal excreta. Umbilical cord conspicuous, pink or brown, not dried (variable character). Claws soft, whitish. Voice a weak bleat. Docile.

Stage 2: 6 – 10 days old

Outline smoother with neck still recognisable, but no loose folds on body. Cord atrophied, or a conspicuous scar. Claws dark and hard. Voice loud, snarling when handled

Stage 3: 11 to 15 days old

Outline rounded to barrel-shaped. Neck indistinguishable and naval inconspicuous. Vigorous attack and escape reactions to handling,

Stage 4: 16 – 20 days old

As Stage 3 but with patches of white natal fur moulted to reveal first-year pelage underneath. These pups are weaned or approaching weaning.

Stage 5: 21+ days old

Fully moulted to first-year pelage. All weaned and often segregated (with some Stage 4's) from breeding area

APPENDIX 2. INDIVIDUAL SEAL PUP RECORDS IN 2013

KEY

Fate:

SBM	Known to have survived to the onset of moult
SW	Known to have survived and weaned
D	Known to have died
ASM	Assumed to have survived to the onset of moult
AD	Assumed to have died

Birth Sites:

AMR	Amy's Reach
BAS	The Basin
CBY	Castle Bay
DWB	Driftwood Bay
HCB	High Cliff Boulders
LTN	The Lantern
MWK	Matthew's Wick
NHV	North Haven
NHV(S)	North Haven Slip
NHV(SC)	North Haven Slip Cave
PSB	Pigstone Bay
SBS	The Slabs
SCBC	South Castle Beach Cave
SHO	Seal Hole
SHV	South Haven
SHV(C)	South Haven Cave
SHV (CKI)	South Haven (Captain Kites Inlet)
SHV(S)	South Haven Slot
SSC	South Stream Cave
WCK	The Wick

Quality of Care:

1	Poor
2	Satisfactory
3	Good

Condition at Onset of Moult:

1	Very Small	Assumed not to have survived long after moult
2	Small, but healthy survival	In good condition, should have a reasonable chance of
3	Good Size	Most should survive
4	Very good size	All should survive
5	Super-moulter	An exceptionally sized pup

Pup No.	Site	ca.	DOB (date of birth)	Found	Size at SM (start of moutl)	Date of start of moult	Date of end of moult	Age at start of moult	Duration of moult	Fate SW:survived and weaned SBM:survived to beginning of moult D:dead UN:unknown AS: Assumed Survived AD: Assumed dead	ca	Date of death
1	LAN	ca	18/08/13	22/08/13	UN	UN	UN			AS		
2	CBY		24/08/13		3.0	07/09/2013	16/09/2013	15	7	SW		
3	SHV	ca	23/08/13	25/08/13	2.0	30/08/2013	08/09/2013		9	SW		
4	NHV		27/08/13							AD		30/08/2013
5	WCK	ca	28/08/13		3.0	ca 06.09.2013	ca 15.09.2013			SW		
6	MWK		29/08/13		3.0	16/09/2013	22/09/2013	19	6	SW		
7	MWK		31/08/13		4.0	16/09/2013	22/09/2013	17	6	SW		
8	CBY		01/09/13		2.0	17/09/2013	22/09/2013	17	5	SW		
9	AMR		01/09/13		3.0	11/09/2013	18/09/2013	11	7	SW		
10	SCBC	ca	23/08/13	04/09/13	2.0	UN	UN			SBM		
11	SCBC	ca	01/09/13	04/09/13	UN	UN	UN			AS		
12	MWK		03/09/13							D		04/09/2013
13	DWB		07/09/13							D		10/09/2013
14	MWK		08/09/13		4.0	23/09/2013	26/09/2013	16	3	SW		
15	SHO	ca	05/09/13	08/09/13	UN	UN	UN			AS		
16	LAN	ca	08/09/13									09/09/2013
17	SBS		10/09/13							D		13/09/2013
18	SHO		09/09/13	10/09/13	UN	UN	UN			AS		
19	CBY		10/09/13							D		10/09/2013

20	CBY		09/09/13		4.0	ca 26.09.2013	UN			SBM			
21	MWK		09/09/13		2.5	18/09/2013	ca 27.09.2013	10		SW			
22	MWK		10/09/13		3.0	21/09/2013	UN	12		SBM			
23	NHV		10/09/13		UN	UN	UN			SW			
24	CBY		10/09/13							D			11/09/2013
25	CBY		10/09/13		2.5	15/09/2013	ca. 30.09.2013			SW			
27	DWB		11/09/13							D			13/09/2013
28	DWB		13/09/13							D			18/09/2013
29	SHV		13/09/13		1.0	16/09/2013		4		SW			
30	SHV		13/09/13		2.5	21/09/2013		9		SW			
31	WCK		14/09/13		4.0	01/10/2013	06/10/2013	18	5	SW			
32	DWB		15/09/13		2.0	01/10/2013	06/10/2013	17	5	SW			
33	SHV		15/09/13		UN	UN	UN			SW			
34	SHV later DWB		13/09/13		1.5	26/09/2013	14/01/1900	14	18	AS			
35	CBY		16/09/13		1.0	16/09/2013	25/09/2013	1	9	SW			
36	HCB	ca	26/09/13	18/09/13	UN	UN	UN			SW			
37	MWK		17/09/13		4.0	07/10/2013	10/10/2013	21	3	SW			
38	CBY		17/09/13							D			18/09/2013
39	MWK		19/09/13							D			20/09/2013
40	SHV		18/09/13							D			19/09/2013
41	MWK		19/09/13		4.0	04/10/2013	ca. 9.10.2013	16		SW			
43	SHV	ca	03/09/13	20/09/13	UN	UN	ca 26.09.2013			SW			
44	DWB	ca	20/09/13	21/09/13						D			22/09/2013
45	SCBC	ca	17/09/13	22/09/13	UN	UN	UN			AS			
46	SCBC		22/09/13	22/09/13	UN	UN	UN			AD		ca	27/09/2013
47	SCBC	ca	09/09/13	22/09/13	UN	UN	UN			AS			

48	NHV		23/09/13		5.0	08/10/2013	15/10/2013	16	7	SW		
49	MWK		22/09/13		4.0	02/10/2013	ca 09.10.2013	11		SW		
50	MWK		24/09/13							D		04/10/2013
51	SHV		24/09/13		3.5	06/10/2013	UN	13		SBM		
52	SHV		24/09/13		2.0	10/10/2013	14/10/2013	17	4	SW		
53	CBY		20/09/13		4.0	30/09/2013	06/10/2013	11	6	SW		
54	CBY		24/09/13		3.0	04/10/2013	14/10/2013	11	10	SW		
55	MWK		24/09/13		2.0	02/10/2013	15/10/2013	9	13	SW		
56	AMR		26/09/13		3.0	07/10/2013	11/10/2013	12	4	SW		
57	CBY		25/09/13							D		25/09/2013
58	SHV		26/09/13		2.5	01/10/2013	UN	6		SW		
59	NHV		26/09/13		1.0	26/09/2013	01/10/2013	1	5	SW		
60	NHV		28/09/13							D		28/09/2013
61	SHV later DWB		28/09/13							D		05/10/2013
62	SHV		29/09/13		3.5	16/10/2013	UN	18		SBM		
63	WCK		28/09/13							AD		12/10/2013
64	SHV		29/09/13		2.5	13/10/2013	15/10/2013	15	2	SBM		
65	MWK		28/09/13							D		01/10/2013
66	MWK		30/09/13		4.0	17/10/2013		18		SBM		
67	WCK		30/09/13		UN	UN	UN			SBM		
68	SHV		01/10/13		4.0	19/10/2013	UN	19		SBM		
69	CBY	ca	27/09/13	02/10/13	UN	UN	UN			AD		03/10/2013
71	SHV		02/10/13		3.5	20/10/2013	22/10/2013	19	2	SW		
72	DWB		02/10/13							AD		09/10/2013
73	CBY		02/10/13		2.5	16/10/2013		15		SBM		
74	LAN	ca	27/09/13	04/10/13	UN	UN	UN			AS		
75	LAN	ca	01/10/13	04/10/13	UN	UN	UN			SW		
76	SCBC	ca	01/10/13	04/10/13	UN	UN	UN			AS		
77	WCK		03/10/13							D		03/10/2013

78	SHO		04/10/13	05/10/13						AD	ca	12/10/2013
79	SBS		04/10/13							D		16/10/2013
80	HCB	ca	20/09/13	05/10/13						AS		
81	HCB	ca	22/10/13	05/10/13	4.0	UN	UN			SW		
82	SSC	ca	03/10/13	06/10/13		UN	UN			AS		
83	NHV		05/10/13							D		06/10/2013
84	SHV later DWB		06/10/13		2.5	16/10/2013	31/10/2013	11	15	SW		
85	CBY		06/10/13		3.0	16/10/2013	26/10/2013	11	10	SW		
86	SHV		07/10/13		3.0	19/10/2013	UN	13		SBM		
87	SBS	ca	05/10/13	08/10/13		UN	UN			AS		
88	SHV later DWB		08/10/13		3.5	22/10/2013	31/10/2013	15	9	SW		
89	CBY		08/10/13		4.0	20/10/2013	UN	13		SBM		
90	SHV		08/10/13							AD		11/10/2013
91	MWK		09/10/13							D		19/10/2013
92a	NHV		09/10/13		3.0	22/10/2013	24/10/2013	16	2	SW		
92b	SHV		11/10/13		3.0	29/10/2013	03/11/2013	19	5	SW		
93	SHV		10/10/13		4.0	30/10/2013	UN	21		SBM		
95	MWK		10/10/13		3.5	31/10/2013	03/11/2013	22	3	SW		
96	NHV		12/10/13							AD		15/10/2013
97	DWB		11/10/13		4.5	01/11/2013	04/11/2013	22	3	SW		
98	CBY		14/10/13		2.5	19/10/2013	UN	6		SBM		
99	DWB later SHV		16/10/13		4.0	29/10/2013	UN	14		SW		
100	NHV		16/10/13			UN	UN			AS		
101	MWK		16/10/13		3.0	28/10/2013	11/11/2013	13	13	SW		
102	MWK	ca	12/10/13	17/10/13	2.5	20/10/2013	26/10/2013		6	SW		
103	CBY		17/10/13			UN	UN			AS		
104	DWB	ca	06/10/13	16/10/13		UN	01/11/2013			SW		
105	DWB	ca	06/10/13	16/10/13		UN	27/10/2013			SW		
106	DWB		16/10/13		4.5	02/11/2013	07/11/2013	18	5	SW		
107	DWB		16/10/13		4.5	03/11/2013	10/11/2013	19	7	SW		

108	DWB		17/10/13		2.5	30/10/2013	01/11/2013	14	2	SW		
109	DWB		17/10/13		2.5	06/11/2013	09/11/2013	21	3	SW		
110	DWB		17/10/13		2.0	30/10/2013	05/11/2013	14	5	SW		
111	CBY		18/10/13							D		23/10/2013
112	SHO	ca	18/10/13	20/10/13		UN	UN			AS		
113	SHO	ca	10/10/13	20/10/13		UN	UN			AS		
114	SCBC		18/10/13	20/10/13		UN	UN			AS		
115	MWK		19/10/13		4.0	05/11/2013	15/10/2013	18	10	SW		
116	WCK		17/10/13		4.0	ca 29/11/2013	02/11/2013			SW		
117	WCK		17/10/13							D		21/10/2013
118	CBY		20/10/13							D		20/10/2013
120	HCB	ca	20/10/13	21/10/13						AS		
121	PDK	ca	03/10/13	21/10/13		UN	UN			SW		
122	PDK	ca	07/10/13	21/10/13						SBM		
123=135	DWB		21/10/13		2.5	29/10/2013	12/11/2013	9	14	SW		
124	DWB	ca	15/10/13	22/10/13						AD		23/10/2013
125	SHV	ca	21/10/13							AD		22/10/2013
126	NHV		21/10/13							AD		23/10/2013
127	MWK		21/10/13		2.0	01/11/2013	14/11/2013	12	13	SW		
128	MWK		21/10/13		3.5	03/11/2013	UN	14		SW		
129	MWK		23/10/13		2.0	31/10/2013	UN	9		SW		
130	SHV	ca	16/10/13	23/10/13	UN	UN	UN			SW		
131	NHV	ca	15/10/13	23/10/13		UN	UN			AS		
132	SHV		24/10/13							AD		26/10/2013
133	SHV		23/10/13		3.0	08/11/2013	14/11/2013	17	6	SW		
134	SHV		23/10/13		4.5	05/11/2013	12/11/2013	21	7	SW		
136	SHV	ca	14/10/13	25/10/13	3.0	04/11/2013	UN			SW		
137	MWK		23/10/13		2.0	29/10/2013	08/11/2013	6	10	SW		
138	SBS	ca	23/10/13	25/10/13						D		25/10/2013

139	SHO	ca	20/10/13	23/10/13						AS		
140	SHV		26/10/13	27/10/13						AD		28/10/2013
141	MWK		25/10/13	26/10/13						AD		27/10/2013
142	WCK	ca	20/10/13		3.0	ca 31.10.12	ca 02.11.12			SW		
143	WCK		23/10/13		3.0	ca 31.10.12	??			SBM		
144	WCK		26/10/13		2.0					SBM		
145	DWB		23/10/13	23/10/13						D		30/10/2013
146	MWK		26/10/13		4.0	09/11/2013	11/11/2013	15	2	SW		
147	MWK		26/10/13							D		04/11/2013
148	SHV		27/10/13		4.0	11/11/2013	UN			SW		
149	AMR		27/10/13							AD		03/11/2013
150	CBY		28/10/13		3.0	07/01/2013	UN			SBM		
151	AMR		30/10/13							AD		03/11/2013
152	SHV	ca	29/10/13	30/10/13						AD		31/10/2013
153	MWK later DWB	ca	20/10/13	30/10/13	3.0	UN	UN			SW		
154	SHV		30/10/13							AD		01/11/2013
155	SHV	ca	28/10/13	31/10/13	UN	UN	UN			SW		
156	NHV		31/10/13							D		31/10/2013
157	NHV		30/10/13		3.5	12/11/2013	UN	14		SBM		
158	NHV	ca	14/10/13	30/10/13	2.0	UN	UN			SBM		
159	NHV		01/11/13							AD		03/11/2013
160	SS	ca	16/10/13		UN	UN	UN			AS		
161	WCK		30/10/13							D		03/11/2013
162	WCK		02/11/13		1.0					D		03/11/2013
163	MWK		02/11/13							AD		06/11/2013
164	MWK		02/11/13		UN	UN	UN			AS		
165	MWK		03/11/13		3.0	15/11/2013	UN	13		SBM		
166	DWB	ca	02/11/13	04/11/13	3.0	15/11/2013	UN			SBM		
167	CBY		04/11/13		2.5	15/11/2013	UN	12		SBM		
168	NHV	ca	02/11/13	04/11/13						AD		06/11/2013

169	DWB	ca	21/10/13		4.0	UN	UN			AS			
170=174	SHV later DWB		04/11/13		4.0	UN	UN			AS			
171	SCBC	ca	28/10/13	05/11/13	UN	UN	UN			AS			
172	SCBC	ca	01/11/13	05/11/13						D		07/11/2013	
173	AMR		04/11/13			UN	UN			AS			
175	MWK		06/11/13							AD		10/11/2013	
176	MWK		06/11/13		3.0	UN	UN			AS			
177	MWK		07/11/13							D		07/11/2013	
178	MWK		09/11/13							AS			
179	MWK	ca	26/10/13		4.0	12/11/2013	15/11/2013		3	SW			
180	WCK		07/11/13							AD	ca	10/11/2013	
181	SHV later CBY,NHV, DWB,MWK	ca	28/10/13		2.5	UN	UN			AS			
182	NHV		12/11/13							D		13/11/2013	
183	DWB		13/11/13							AS			
184	NHV	ca	10/11/13	13/11/13						AD	ca	15/11/2013	
185	BSN	ca	17/10/13							AD	ca	22/10/2013	

APPENDIX 3. SKOMER HAUL-OUT DETAILS 2013

	AUG													SEP																										
	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Rye Rocks																																										
Bull			6	2	4	4	1	5	2	5	1	1		3	2	3	3	2	4	5	8	3	2	4	4	2	5	5	4	4	12	12	7	15	9	9	6	2		6		2	8
Cow			8	11	1	8	5	3	4	3				2	4	3	5	1	1	3	3	13	8	7	8	14	11	3	3	11	26	22	17	22	10	17	10	13		14			12
Imm			14	5	7	5	3	8	5	6		4		6	5	5	6	4	5	11	10	5	11	6	4	2	5		2	6	4	13	9	6	1	5	0	6		7		6	4
Total	**0**	**0**	**28**	**18**	**12**	**17**	**9**	**16**	**11**	**14**	**1**	**5**	**0**	**11**	**11**	**11**	**14**	**7**	**10**	**19**	**21**	**21**	**21**	**17**	**16**	**18**	**21**	**8**	**9**	**21**	**42**	**47**	**33**	**43**	**20**	**31**	**16**	**21**	**0**	**27**	**0**	**8**	**24**
North Haven																																										
Bull								1		1	1	2			1					1			1	1					3	1	2		1	1	2	1	2	1		2	1	6	1
Cow							1	1		1	1												1		1	1		2	7	4	7	1	3	2	2		3	2	2	7	8	3	4
Imm				1			4		1														1						1						1	1		1	4	1	2	
Total	**0**	**0**	**0**	**1**	**0**	**0**	**5**	**2**	**1**	**2**	**2**	**2**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**3**	**1**	**1**	**1**	**0**	**2**	**11**	**5**	**9**	**1**	**4**	**3**	**4**	**2**	**6**	**3**	**3**	**13**	**10**	**11**	**5**
Total RR+ NHV	**0**	**0**	**28**	**19**	**12**	**17**	**14**	**18**	**12**	**16**	**3**	**7**	**0**	**11**	**12**	**11**	**14**	**7**	**10**	**20**	**21**	**21**	**24**	**18**	**17**	**19**	**21**	**10**	**20**	**26**	**51**	**48**	**37**	**46**	**24**	**33**	**22**	**24**	**3**	**40**	**10**	**19**	**29**
South Haven																																										
Bull						1			1	2	1		3							1	1						1					1			1			2	2	1	2	1
Cow						1	1		1	1	2		1				1			1	1		1	1	1	5	5		1		**2**	1	4	4	2	4	6	4	5	8	11	7	9
Imm																													1					1				1		2			
Total	**0**	**0**	**0**	**0**	**0**	**2**	**1**	**0**	**2**	**3**	**3**	**0**	**4**	**0**	**0**	**0**	**1**	**0**	**0**	**2**	**2**	**0**	**1**	**1**	**1**	**5**	**6**	**0**	**2**	**0**	**2**	**1**	**5**	**5**	**2**	**5**	**6**	**4**	**8**	**10**	**14**	**9**	**10**
Driftwood Bay																																										
Bull																									1		1	1		1							1						
Cow																					1				1		1	2	2	3	2	2	1		1	1			1	2			1
Imm																											1			1	2												
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**2**	**0**	**2**	**3**	**2**	**5**	**4**	**2**	**1**	**0**	**1**	**1**	**1**	**0**	**1**	**2**	**0**	**0**	**1**
Slabs																																										
Bull																																			1	1	1				1	
Cow																								1			1										1				1	
Imm											2	3																														1
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**2**	**0**	**0**	**0**	**0**	**2**	**1**
Seal Hole																																										
Bull													1							1			1			1					1				1	1	1					
Cow											2					1	3			1	1		3	2		4	1				1				2				1		2	
Imm						1							4				1										1				3										
Total	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**2**	**0**	**5**	**0**	**0**	**1**	**4**	**0**	**0**	**2**	**1**	**0**	**4**	**2**	**0**	**5**	**2**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**3**	**1**	**1**	**0**	**1**	**0**	**0**	**2**	**0**

	OCT																													NOV													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Rye Rocks																																													
Bull	1	13	8	7	11	8	12	17	9	8	7	2	2	6	13	3	6	8	7	12	19	7	4	14	6	2	2	7	10	6	7	3	2	6	6	3	4	6	10	1	6	2	4	7	3	4
Cow	5	20	28	3	38	18	16	26	19	19	23	13	3	9	28	7	10	14	17	18	12	12	16	14	11	2	1			4		1		3	1		4	3	3				1	9		
Imm	3	4	2		5	3	1	2	2	3	1		1		1		1	4	3	3	1	2		10							1			4								1	2		
Total	**9**	**37**	**38**	**10**	**54**	**29**	**29**	**45**	**30**	**30**	**31**	**15**	**6**	**15**	**42**	**10**	**17**	**26**	**27**	**33**	**32**	**21**	**20**	**38**	**17**	**4**	**3**	**7**	**10**	**10**	**8**	**4**	**2**	**13**	**7**	**3**	**8**	**9**	**13**	**1**	**6**	**2**	**6**	**18**	**3**	**4**
North Haven																																												
Bull	1		1	2	1	3	2	3	3	2	1	2		1	1	2	5	1	4	15	14	13	8	9	6	10	9	8	11	9	9	4	3	13	4	6	2	10	4	7	3	6	4	4	7	4
Cow	7	8	12	7	2	6	4	3	7	4	6	4	6	3	5	11	19	12	21	17	7	40	9	5	42	21	7	4	48	9	16	6	2	7	5	3	3	4	33	19	15	10	8	15	13	7
Imm	3					1	1	1	1		2					1	31	21	8	47	54	30	49	61	6	23	23	30	4	42	18	9	6	29	15	15	3	27	16	17	12	24	42	40	14	11
Total	**11**	**8**	**13**	**9**	**3**	**10**	**7**	**7**	**11**	**6**	**9**	**6**	**6**	**4**	**6**	**14**	**55**	**34**	**33**	**79**	**75**	**83**	**66**	**75**	**54**	**54**	**39**	**42**	**63**	**60**	**43**	**19**	**11**	**49**	**24**	**24**	**8**	**41**	**53**	**43**	**30**	**40**	**54**	**59**	**34**	**22**
Total RR+ NHV	**20**	**45**	**51**	**19**	**57**	**39**	**36**	**52**	**41**	**36**	**40**	**21**	**12**	**19**	**48**	**24**	**72**	**60**	**60**	**112**	**107**	**104**	**86**	**113**	**71**	**58**	**42**	**49**	**73**	**70**	**51**	**23**	**13**	**62**	**31**	**27**	**16**	**50**	**66**	**44**	**36**	**42**	**60**	**77**	**37**	**26**
South Haven																																												
Bull	2	2	2	1	1	2	2	1		1	2	1	1	3	3	2	2	2	2	1		2			1		2		1		1			2	1			1	2	1		1	1	2		2
Cow	5	7	7	6	6	9	9	8	8	5	9	8	12	10	8	3	5	8	7	1		3	1	5	7		7	5	3	5	2	4	4	5	4	2	5	1	4	2	2	4	2	3	1	3
Imm												1												1				1				2								1			1		
Total	**7**	**9**	**9**	**7**	**7**	**11**	**11**	**9**	**8**	**6**	**11**	**10**	**13**	**13**	**11**	**5**	**7**	**10**	**9**	**2**	**0**	**5**	**1**	**6**	**8**	**0**	**9**	**6**	**4**	**5**	**3**	**6**	**4**	**7**	**5**	**2**	**5**	**2**	**6**	**3**	**3**	**5**	**3**	**6**	**1**	**5**
Driftwood Bay																																												
Bull	1	1	1			1				1										1	1	1	1		1								1	1	3	1	1		1	1					
Cow		1	1	2	2	1	2	1		1		1	2	2	2	3	8	10	8	5	14	26	17	28	9	13	11	8	31	20	6	6	4	18	7	16	15	19	35	18	31	9	18	30	17	23
Imm																	2			1		2					1		2		1					2	1				2	2	2			2
Total	**1**	**2**	**2**	**2**	**2**	**2**	**2**	**1**	**0**	**2**	**0**	**1**	**2**	**2**	**2**	**3**	**10**	**10**	**8**	**7**	**15**	**29**	**18**	**28**	**10**	**13**	**12**	**8**	**33**	**20**	**7**	**6**	**4**	**19**	**8**	**21**	**17**	**20**	**35**	**19**	**34**	**11**	**20**	**30**	**17**	**25**
Slabs																																												
Bull	1								1	1		1		1	1																													
Cow	2		1	4		2	2	2	6	3	1	2	2	2	3	1			1												1			1							1	
Imm																															2														
Total	**3**	**0**	**1**	**4**	**0**	**2**	**2**	**2**	**7**	**4**	**1**	**3**	**2**	**3**	**4**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	
Seal Hole																																												
Bull			1	1			1			1		1					1																											
Cow		1	1	1	5					1							1		1	6										1													
Imm	1				1																																							
Total	**1**	**1**	**2**	**2**	**6**	**0**	**1**	**0**	**0**	**2**	**0**	**1**	**0**	**0**	**0**	**0**	**2**	**0**	**1**	**6**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	AUG												
Castle Bay													
Bull					1		1		1	1		1	1
Cow					1		5		2	2	1	6	5
Imm							1		0	1	1	4	4
Total	**0**	**0**	**0**	**0**	**2**	**0**	**7**	**0**	**3**	**4**	**2**	**11**	**10**
Shag Rock													
Bull													
Cow													
Imm													
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Total CBY +SR	**0**	**0**	**0**	**0**	**2**	**0**	**7**	**0**	**3**	**4**	**2**	**11**	**10**
Matthew's Wick													
Bull										1			
Cow									1	1			2
Imm													
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**2**	**0**	**0**	**2**

	SEP																													
Castle Bay																														
Bull			2	2	1	1	3	2	1	1	1		1	1	1	1		1	1	1	1	1	1	1	1	2	2	1	4	2
Cow			9	6	1	1	3	12	12	17	8	6	5	11	22	29	29	34	31	23	24	17	23	28	22	22	36	30	42	45
Imm			1	4	2	2	2	2	1	1	5	1		5	3	3	1	4	2	1	3	1	1	2		1		2	2	2
Total	**0**	**0**	**12**	**12**	**4**	**4**	**8**	**16**	**14**	**19**	**14**	**7**	**6**	**17**	**26**	**33**	**30**	**39**	**34**	**25**	**28**	**19**	**25**	**31**	**23**	**25**	**38**	**33**	**48**	**49**
Shag Rock																														
Bull										1		1			1					2										
Cow									1	2	1	1	1					3		4		2								
Imm									1	2	1							2			2	1								
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**5**	**2**	**2**	**1**	**0**	**1**	**0**	**0**	**5**	**0**	**6**	**2**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Total CBY +SR	**0**	**0**	**12**	**12**	**4**	**4**	**8**	**16**	**16**	**24**	**16**	**9**	**7**	**17**	**27**	**33**	**30**	**44**	**34**	**31**	**30**	**22**	**25**	**31**	**23**	**25**	**38**	**33**	**48**	**49**
Matthew's Wick																														
Bull							2	1		1	1	1				5				1		1	1		1	1		1		1
Cow							4	2		7	5	5	6	6	6		2	8	5	2	5	4	5	10	12	12	11	11	1	3
Imm											1													1						
Total	**0**	**0**	**0**	**0**	**0**	**0**	**6**	**3**	**0**	**8**	**7**	**6**	**6**	**6**	**6**	**5**	**2**	**8**	**5**	**3**	**5**	**5**	**6**	**11**	**13**	**13**	**11**	**12**	**1**	**4**

	OCT																														
Castle Bay																															
Bull	1	2	1	1	1	1	4	3	1	2	1	2	2	1	3		2		1	1	1	2	2	1	2	1	3	1	5	1	4
Cow	18	34	10	39	30	32	48	45	36	45	42	33	34	30	17	18	64	27	65	55	40	30	76	77	5	24	57	69	119	79	62
Imm	1	1						2	2	3	1				1		2	1		2	1	3	5		2		2	2	15	3	7
Total	**20**	**37**	**11**	**40**	**31**	**33**	**52**	**50**	**39**	**50**	**44**	**35**	**36**	**31**	**21**	**18**	**68**	**28**	**66**	**58**	**42**	**35**	**83**	**78**	**9**	**25**	**62**	**72**	**139**	**83**	**73**
Shag Rock																															
Bull																															
Cow												1																			
Imm																															
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Total CBY +SR	**20**	**37**	**11**	**40**	**31**	**33**	**52**	**50**	**39**	**50**	**44**	**36**	**36**	**31**	**21**	**18**	**68**	**28**	**66**	**58**	**42**	**35**	**83**	**78**	**9**	**25**	**62**	**72**	**139**	**83**	**73**
Matthew's Wick																															
Bull	1	1		1		1			1		2			1							1	2	1	1	2		1		1	1	
Cow	3	6	5	4	7	5	11	3	4	6	3	6	4	4	2	2	1	10	10	15	17	27	57	42	31	14	30	31	54	48	21
Imm											1										1		5			1	1		2		1
Total	**4**	**7**	**5**	**5**	**7**	**6**	**11**	**3**	**5**	**6**	**6**	**6**	**4**	**5**	**2**	**2**	**1**	**10**	**10**	**15**	**19**	**29**	**63**	**43**	**33**	**15**	**32**	**31**	**57**	**49**	**22**

	NOV														
Castle Bay															
Bull		1	2	1	5	1	4	1	3	1			3	1	3
Cow	55	41	56	18	61	64	78	64	56	52	32	93	34	28	52
Imm	1	2	5	4	11	1	5	15	5	3	4		5	4	2
Total	**56**	**44**	**63**	**23**	**77**	**66**	**87**	**80**	**64**	**56**	**36**	**93**	**42**	**33**	**57**
Shag Rock															
Bull															
Cow															
Imm															
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Total CBY +SR	**56**	**44**	**63**	**23**	**77**	**66**	**87**	**80**	**64**	**56**	**36**	**93**	**42**	**33**	**57**
Matthew's Wick															
Bull		2	1		1			1		1	1	1	1	1	1
Cow	33	21	36	31	47	42	42	52	41	49	16	42	61	47	60
Imm		1	1			1		2	8	1	1		3	3	1
Total	**33**	**24**	**38**	**31**	**48**	**43**	**42**	**55**	**49**	**51**	**18**	**43**	**65**	**51**	**62**

Apppendix 3.1 Seal Haul out totals

DATE	TOTAL
19-Aug	0
20-Aug	0
21-Aug	28
22-Aug	19
23-Aug	14
24-Aug	20
25-Aug	22
26-Aug	18
27-Aug	18
28-Aug	25
29-Aug	12
30-Aug	21
31-Aug	21
01-Sep	11
02-Sep	12
03-Sep	24
04-Sep	31
05-Sep	11
06-Sep	14
07-Sep	38
08-Sep	44
09-Sep	37
10-Sep	61
11-Sep	45
12-Sep	35
13-Sep	42
14-Sep	55
15-Sep	46
16-Sep	62
17-Sep	63
18-Sep	114
19-Sep	90
20-Sep	77
21-Sep	86
22-Sep	58
23-Sep	72
24-Sep	74
25-Sep	64
26-Sep	51
27-Sep	101
28-Sep	69
29-Sep	81
30-Sep	94
01-Oct	56
02-Oct	101
03-Oct	81
04-Oct	79
05-Oct	110
06-Oct	93
07-Oct	115
08-Oct	117
09-Oct	100
10-Oct	106
11-Oct	102
12-Oct	78
13-Oct	69
14-Oct	73
15-Oct	88
16-Oct	53
17-Oct	160
18-Oct	118
19-Oct	155
20-Oct	200
21-Oct	183
22-Oct	202
23-Oct	251
24-Oct	268
25-Oct	131
26-Oct	111
27-Oct	157
28-Oct	166
29-Oct	306
30-Oct	227
31-Oct	160
01-Nov	124
02-Nov	89
03-Nov	190
04-Nov	98
05-Nov	175
06-Nov	147
07-Nov	201
08-Nov	242
09-Nov	179
10-Nov	180
11-Nov	112
12-Nov	219
13-Nov	220
14-Nov	140
15-Nov	175