

Lewis Wave Power Limited



40MW Oyster Wave Array

North West Coast, Isle of Lewis

Addendum to the Environmental Statement

Year 2 Wildlife Monitoring Report

October 2012

40MW LEWIS WAVE ARRAY: ADDENDUM TO THE ENVIRONMENTAL STATEMENT

WILDLIFE MONITORING YEAR 2 SUMMARY REPORT

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Introduction

1. This report has been prepared by Natural Research projects and summarises the key results of the second year of wildlife monitoring survey work undertaken by Lewis Wave Power Limited at the proposed Oyster wave array site in north-west Lewis. This report is supported by two technical appendices giving full details of the Year 2 surveys of birds, marine mammals and basking sharks:
 - Appendix 1: Year 2 Bird Surveys Technical Report, Natural Research Projects, October 2012 (NRP, 2012d); and
 - Appendix 2: Year 2 Marine Mammals and Basking Sharks Surveys Technical Report, Natural Research Projects, October 2012 (NRP, 2012e).
2. Lewis Wave Power submitted an application to the Marine Scotland Licensing Operations Team (MS LOT) in March 2012 for consent under Section 36 of the Electricity Act 1989 and the Marine (Scotland) Act 2010 for the construction and operation of a 40MW Oyster Wave Array in North-west Lewis.
3. The application was supported by an Environmental Statement (ES) which was the formal report of an Environmental Impact Assessment (EIA) which was undertaken by Lewis Wave Power into the potential impacts of the construction, operation and eventual decommissioning of the Oyster wave array development.
4. Potential impacts on birds (Chapter 10), marine mammals and basking sharks (Chapter 11) were considered in the EIA (NRP, 2012a; Royal Haskoning 2012a). One year of site specific wildlife monitoring data was used to inform the assessment. The EIA concluded that for birds the impacts were considered to be of negligible magnitude to all species of birds and were judged to be of negligible significance. For marine mammals and basking sharks the EIA concluded that overall the impacts were considered to be of minor significance based on their ability to avoid the relatively small development area and the unobtrusive nature of the construction activities.
5. MS LOT requested that Lewis Wave Power provide an addendum to the ES which reports on the results of the second year of wildlife monitoring which has been undertaken between October 2011 and September 2012 at the site in north-west Lewis to confirm the results of the wildlife monitoring data collected in Year 1.
6. Natural Research Projects have prepared this report and summarise that the wildlife monitoring data collected at the site in Year 2 confirms the data collected in Year 1 and does not change the conclusions reported in the Lewis Wave Power 40MW Oyster Wave Array ES, March 2012.

Summary of results

Survey effort

7. The target amount of watch effort for the Year 2 of baseline surveys was broadly achieved, although there was a small shortfall in April and May, and a larger shortfall in September caused by prolonged periods of unsuitable sea states for survey work (greater than sea state 4) (NRP, 2012d). With the

exception of September, it was possible to make up some for all of a shortfall by undertaking additional survey work in the next month.

8. A high proportion (ca 76%) of all survey worked was conducted in good or very good conditions (sea state of 3 or less); conditions likely to result in high levels of detection of species.

Birds

9. On the basis of the Year 1 survey results (NRP, 2012b), the ES concluded that overwintering red-throated diver, great northern diver and eider were the most important ornithological features of relevance to the proposed wave power development (NRP, 2012a). The numbers of these three species using the survey area (this includes the marine extent of the development area and a surrounding buffer) were considered likely to be of regional significance. It was also concluded that the proposed development was not likely to have a significant adverse effect on the populations of these species.
10. Red-throated divers were present in very low numbers in the winter of Year 2, with typically only one or fewer birds present in the Mealabost/Siadar survey area (NRP, 2012d). The abundance of red-throated diver recorded in the survey area in Year 2 winter was only about one third of that recorded in the winter of Year 1. The reasons for this difference are not known. The Year 2 results for wintering red-throated diver do not change the conclusions reported in the Lewis Wave Power 40MW Oyster Wave Array ES.
11. The Year 1 survey results showed that the survey area was of low importance as a feeding site for red-throated divers in the breeding season (NRP, 2012d). In their response to the Lewis Wave Power ES, SNH requested that Year 2 studies should continue to address the potential importance of the survey area to foraging red-throated diver from the nearby Lewis Peatlands SPA.
12. Red-throated divers were not recorded on the sea in the survey area from April to August (the red-throated diver breeding season) of Year 2. Nor was there any evidence that the few red-throated divers seen in flight over the survey area in the spring and summer months were breeding locally.
13. Other data sources on where red-throated divers breeding on Lewis feed, including for those on the Lewis Peatlands Special Protection Area (SPA), also indicate that the Siadar to Mealabost coast is little used by red-throated divers in the breeding season (NRP unpublished summer survey of feeding divers of 2003, Lewis Wind Power Limited, June 2011, Stornoway Windfarm ES baseline studies on diver flight paths, 2012 aerial survey and shore count data for NW Lewis collected by WWT Consulting/Hi-Def/NRP). These data show that some stretches of the NW Lewis coast to the north and to the south of the Siadar/Mealabost survey area are used more frequently, particularly sandy bays. It is concluded that the data collected in Year 2 does not change the conclusions reported in the Lewis Wave Power 40MW Oyster Wave Array ES and that the Siadar to Mealabost coast is of very low importance as a foraging area to red-throated divers breeding on the Lewis Peatlands SPA.
14. The average number of great northern diver present in the early winter period of Year 2 was slightly less than in the same period for Year 1, whereas the average numbers in the late winter period were about 50% greater than in Year 1 (NRP, 2012b; NRP, 2012d). The numbers typically present in the Siadar/Mealabost survey area in late winter period were at least nine birds (uncorrected data) and possibly as many as 17 birds (corrected using Year 1 correction factor).

15. Small numbers of immature great northern divers over summered in the Siadar/Mealabost survey area. Small numbers of adults were also present during the spring passage period in April and May. This corroborates the Year 1 results and does not change the conclusions reported in the Lewis Wave Power 40MW Oyster Wave Array ES. Establishing the true importance of the survey area for summering great northern divers is limited by the paucity of summer survey data from elsewhere in Lewis, something that is being partly addressed by aerial survey work in 2012 commissioned by Marine Scotland.
16. The numbers of eiders ducks in the early winter period of Year 2 was lower than in Year 1, but the peak numbers present in the late winter period of Year 2 was approximately 50% greater than in Year 1 (NRP, 2012b; NRP, 2012d) .
17. No eider ducks were recorded on the sea in the Siadar/Mealabost survey area in the April to July period of Year 2. This corroborates the Year 1 results and does not change the conclusions reported in the Lewis Wave Power 40MW Oyster Wave Array ES. It is concluded that the survey area is only of value to this species in the winter period.
18. The numbers of other seabird species recorded using the Mealabost/Siadar survey area in Year 2 was generally low and broadly similar to Year 1, with the exception of Manx shearwaters which were notably less abundant (NRP, 2012b; NRP, 2012d; NRP, 2012b; NRP, 2012d). Similarly, the numbers of other seabird species recorded flying over the survey area was broadly similar to Year 1. Overall, the Year 2 vantage point surveys identified no additional ornithological sensitivities to those identified in Year 1. Therefore the conclusions reported in the Lewis Wave Power 40MW Oyster Wave Array ES remain unchanged.
19. The variety and abundance of birds breeding and wintering along the coast in Year 2, including in the vicinity of the proposed shore station at Siadar, were broadly similar to Year 1 (NRP, 2012b; NRP, 2012d; NRP, 2012b; NRP, 2012d). No sensitive species were recorded breeding in the vicinity of the shore station. A corncrake was heard calling on croftland about 400 m away but this was not in a location that is likely to be disturbed by the proposed development. Therefore the conclusions reported in the Lewis Wave Power 40MW Oyster Wave Array ES remain unchanged.

Marine mammals

20. The only cetacean species positively identified in Year 2 were Risso's dolphin (positively identified on two dates) and harbour porpoise (recorded on one date) (NRP, 2012e). Unlike in Year 1, there were no records of Minke whale, nor were common dolphin positively identified in Year 2. Two unidentified dolphins seen passing through the survey area in June approximately 2.3 km offshore were possibly bottlenose dolphin.
21. Overall, the activity by cetacean species in the Mealabost/Siadar survey area during Year 2 was very low and broadly similar to that recorded in Year 1 (NRP, 2012e; Royal Haskoning, 2012a). Therefore the conclusions reported in the Lewis Wave Power 40MW Oyster Wave Array ES remain unchanged.
22. Activity by seal species in the Mealabost/Siadar survey area during Year 2 was low and broadly similar to that recorded in Year 1 (NRP, 2012e; Royal Haskoning, 2012a). As in Year 1, the only species positively identified was grey seal and this occurred regularly but only in very small numbers (approximately <5 individuals). Therefore the conclusions reported in the Lewis Wave Power 40MW Oyster Wave Array ES remain unchanged.

Basking shark

23. Activity by basking shark in the Mealabost/Siadar survey area during Year 2 was very low and broadly similar to that recorded in Year 1 (NRP, 2012e; Royal Haskoning 2012a). Up to two individuals were seen on four dates in July and August. Therefore the conclusions reported in the Lewis Wave Power 40MW Oyster Wave Array ES remain unchanged.

Conclusions

24. The second year of baseline survey work was successfully completed. Although there was slightly less survey effort in some months than planned for, it is not considered that this shortfall significantly effects the study conclusions. The months with the greatest shortfall of planned effort (September, October and April) are periods when priority bird species are generally least abundant in the survey area. Furthermore, a high proportion of surveys were completed in good or very good surveys conditions.
25. The Year 2 survey results for priority species (red-throated diver, great northern diver and eider) essentially corroborate the results of the surveys undertaken in Year 1. The small differences between Year 1 and Year 2 in the numbers of red-throated diver, great-northern diver and eider using the sites are likely to reflect a combination of natural year-to-year fluctuations in population size, site use, and sampling variation. The differences to the Year 1 results are not so large as to undermine or change the conclusions reached in the Lewis Wave Power ES for these species. Although the Year 2 results provide an additional year of baseline information for divers and eider, the uncertainties regarding the size of the regional overwintering populations of these species continues to be a limitation in assessing the importance of survey area.
26. The Year 2 survey results for all other bird species, marine mammal species and basking shark also essentially corroborate the results of the surveys undertaken in Year 1. The differences to the Year 1 results are not so large as to undermine the conclusions reached in the Lewis Wave Power 40MW Oyster Wave Array ES for any bird species.
27. The Year 2 surveys did not identify any new marine wildlife features or sensitivities not previously identified. Therefore it is considered that the assessments undertaken in the Lewis Wave Power 40MW Oyster Wave Array ES are complete in their coverage of species and issues.

References

- NRP 2012a. Lewis Wave Power Ltd 40MW Oyster Wave Array Environmental Statement: Chapter 10 Ornithology.
- NRP 2012b. Lewis Wave Power Ltd 40MW Oyster Wave Array Environmental Statement: Appendix I0.1: Year 1 Bird Surveys Technical Report.
- NRP 2012c. Lewis Wave Power Ltd 40MW Oyster Wave Array Environmental Statement Addendum: Wildlife Monitoring Year 2 Summary Report (this report)
- NRP 2012d. Lewis Wave Power Ltd 40MW Oyster Wave Array Environmental Statement Addendum: Appendix I: Year 2 Bird Surveys Technical Report
- NRP 2012e. Lewis Wave Power Ltd 40MW Oyster Wave Array Environmental Statement Addendum: Appendix II: Year 2 Marine Mammal and Basking Shark Surveys Technical Report.

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- Royal Haskoning 2012a. Lewis Wave Power Ltd 40MW Oyster Wave Array Environmental Statement: Chapter 11 Marine Mammals and Basking Sharks.
- Royal Haskoning 2012b. Lewis Wave Power Ltd 40MW Oyster Wave Array Environmental Statement: Appendix 11.1: Year 1 marine mammals and basking shark survey report.

**LEWIS WAVE POWER LTD
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Appendix 1

**Year 2 Bird Surveys
Technical Report**

Natural Research Projects Ltd

October 2012

Authors: Digger Jackson and Simon Hulka



Natural Research Projects Ltd
Brathens Business Park
Hill of Brathens
Glassel
Banchory
AB31 4BY

0844 9060200

Introduction

1. This document reports the results of the second and final year of ornithological studies from north-west Lewis conducted to give baseline data to inform the Environmental Impact Assessment (EIA) of Lewis Wave Power's proposed Oyster wave power development (Fig. 1). It covers the period from October 2011 to the end of September 2012 when regular observations ended.
2. It also follows the Year 1 Bird Surveys Technical Report (NRP, 2012b) that formed a technical appendix to Chapter 10 of the Environmental Statement (NRP, 2012a (in Lewis Wave Power Limited, March 2012)) which was submitted to Marine Scotland Licensing Operations Team (MS LOT) in support of a consents application for a 40MW Oyster wave array in March 2012.
3. This report covers the marine areas and adjacent coastlines within 2 km of the two vantage points (VPs) situated at Siadar and Mealabost, together covering a continuous section of coast approximately 7 km in length. The proposed Oyster wave array project is located approximately centrally within this survey area (Fig. 2). Results from the second survey area at Labost (located approximately 10 km to the south west) are not presented as observations here were terminated part way through the year following Lewis Wave Power's decision not to proceed with development plans there at this stage. The report also covers walkover and breeding bird surveys undertaken in Year 2 along the adjacent coast.
4. This Year 2 report follows the same format as the Year 1 report (NRP, 2012b). The sections on aims, study design and methods are almost identical but are included again for completeness. Information on the likely breeding origins of bird species and regional population sizes are not presented as these subjects are covered in detail in the Year 1 report.

Survey scope and aims

5. Marine wave energy developments are a novel technology and at present there are no commercial scale developments operating in the UK. At the time of commencing surveys in Year 1 there was no official guidance on the ornithological survey work that is considered necessary to inform the assessment of effects. However in 2011 draft guidance was produced by SNH (Jackson and Whitfield 2011) and the recommendations in this were followed. There are also useful parallels that can be drawn with recent survey work undertaken for the Sound of Islay Demonstration Tidal Array (also by NRP) to inform EIA and monitoring. This project received consent in April 2011.
6. This survey programme covers birds, marine mammals and basking shark, the same approach that was successively used for baseline studies at the Sound of Islay. The survey programme draws heavily from the Sound of Islay work programme but has been modified to take account of local circumstances, differences in the species interests and practical lessons learnt from the Islay study.
7. Although the results for marine mammals and basking shark are reported separately (NRP, 2012e), the survey methods for these mammals and sharks is also

described here, alongside the methods for birds, because the survey programme was designed to collect information for all these groups as a single exercise.

8. The aim of the baseline survey work is to collect quantitative and qualitative information to serve two purposes. These are:

- To characterise baseline conditions and inform the assessment of impacts for the Environmental Statement; and
- To establish baseline conditions against which results of any future (post-consent) monitoring studies can be compared.

To a large extent the same baseline information can serve both these functions, although not in all cases.

9. The ES for the project was submitted in March 2012, after one year of baseline survey had been completed. The Year 2 survey work reported here aimed to establish if the Year 1 results were representative and check that there were no additional sensitivities that should be taken into account that had not been identified in Year 1. The results of the Year 1 studies are fully described in the Year 1 Birds Technical Report which is an appendix to the ES submitted in March 2012.

10. The information collected by the surveys is used to:

- Identify the species present;
- Estimate the absolute or relative numbers of each species (as appropriate for the species concerned);
- Map the distribution of each species' activity;
- Record seasonal changes in species occurrence; and
- Identify the life-cycle stages and behavioural activities that a species undertakes in the survey area.

Survey design and survey area

11. The survey area is located on the north-west coast of Lewis and has an open and very exposed aspect. The survey area comprises the coast and adjacent sea between the crofting townships of Siadar to Mealabost (Fig. 2).

12. Pilot work undertaken in September 2010 showed that the survey area lends itself to shore-based survey methods. Shore-based methods were chosen in preference to boat-based or aerial methods because, where practical, they have significant advantages in terms of the quality and quantity of data collected, organisational logistics and generally lower costs. The pilot work showed that under reasonable conditions (sea state 4 or less) and, with the aid of a x25 spotting scope mounted on a tripod, it is practical to detect and identify birds and marine mammals up to at least 2 km from the coast. This distance comfortably allows the proposed development sites to be included. Beyond this detection and identification of animals becomes increasingly difficult. For this practical reason it was considered that the seaward extent of the survey area should be 2 km from the coast. Nevertheless, any scarce species, including all cetaceans, which were detected beyond 2 km were also recorded.

13. The marine extent of the survey area includes the potential development area plus a surrounding buffer area (Fig. 2). The width of the buffer in front and behind the development sites varies somewhat according to distance of the development site from the shore and local depth of water. The buffer includes all the area between the proposed development sites and the coast; a strip about 0.3 to 0.6 km wide. Parallel to the coast it extends in both directions for about 2 km beyond the proposed development sites.

14. The suitable depth range for Oyster devices lies between approximately 0.6 and 1.2 km from the shore. Therefore, the buffer in this part of the site extends for approximately 0.8 km seaward, beyond the proposed development area.

Survey methods

15. Information on birds, marine mammals and basking shark using the marine parts of the survey area was collected through a programme of vantage point (VP) watches. Information on birds using and breeding along the coast was also collected by periodic walkover surveys.

16. Information was routinely collected during VP watches on all marine mammal species, basking shark and all species of seabird, raptor, wader, wildfowl and heron. Some species were only recorded during certain VP survey activities (see below) but scarce species were recorded whenever seen, irrespective of survey activity. Scarce species included all cetacean species, basking shark, all diver species and raptor species listed on Annex 1 of the EU Birds Directive.

17. Some common wildfowl and duck species of relatively low conservation importance were regularly present but in very small numbers and therefore recording them could potentially take up a disproportionate amount of VP watch time. Therefore, during VP watches these species were recorded only if the flock size was greater than four birds. These species were oystercatcher, redshank, turnstone, curlew, golden plover, lapwing, greylag goose, mallard, teal, wigeon and red-breasted merganser. These species were always recorded in walkover surveys irrespective of flock size.

18. The vast majority of survey work in Year 2 was undertaken by Tristan ap Rheinallt. Digger Jackson undertook the surveys in July 2012.

Vantage point watches

19. Watches are undertaken from two VP locations, Siadar (SI) and Mealabost (ME). These VPs were carefully selected to give optimal views of the areas of interest and provide adequate height (>10 m above sea level) for observations (Table 1, Fig. 2)

20. The target effort for each VP is 12 hours of watching per month (typically 4 x 3-hour sessions) spread over 4 days each month. Watches from the VPs are scheduled so that, as far as is practical, each month's sampling effort is evenly distributed with respect to the tidal cycle (six periods per ebb-flood cycle) and day light hours.

21. Weather and sea conditions are a major constraint to collecting VP data at the site and prevented the target hours being achieved in some months. When this occurs the shortfall is made up in the following month, if conditions allow.

22. The monthly programme of survey work from the VPs provides repeated information on the numbers, activity and fine-scale distribution of animals using the survey area. VP watch sessions normally last for three hours and consist of short bouts of three separate activities, namely:

- Marine mammal watches (MMW);
- Snapshot scans (SSS); and
- Flying bird watches (FBW).

23. A three-hour VP watch typically comprises 2x snap-shot scans (one at the start and the other at the end of the period, total of 45-50 minutes), 7x marine mammal watches (total 105 minutes) and 5x flying bird watches (total 25 minutes).

24. VP watch data on birds were primarily collected during the SSS and FBW sessions. In addition records of scarce birds and Annex 1 species were collected during the MMW sessions.

25. The weather and sea conditions during a VP are recorded at the start of the watch and periodically through the watch if conditions change. The details recorded are; wind force (Beaufort scale), wind direction, precipitation, visibility, sea state and extent and severity of sun glare.

26. VP watches are not undertaken in conditions greater than sea state 4 or in continuous heavy rain or when visibility is <2 km.

27. The six tidal periods used in planning watches are based on equal portions (one sixth) of the tidal cycle (high tide to high tide). This means that each period is of approximately two hours duration, the exact time depending on the actual length of the tidal cycle. Periods 1 to 3 cover the ebb part of the cycle; Period 1 commences at high tide and Period 3 ends at low tide. Periods 4 to 6 cover the flow part of the cycle starting at low tide and ending at high tide. The start and end times of tidal periods were calculated from tide tables for Carloway, Lewis.

Marine mammal watches

28. Marine mammal watches are for fixed periods of 15-minute. They aim to measure the activity of marine mammals and basking shark using the survey area during each the period and because they are designed to measure a rate of occurrence, their duration is fixed. The following details are recorded for all marine mammals and basking sharks seen: time, species, age/size, group size, activity when first seen, location and travel direction.

29. An animal's location is recorded in terms of a compass bearing (measured using compass binoculars) and an angle of declination from the VP. Trigonometry is later used to calculate the grid reference of locations from these field measurements and the height above sea level of VPs.

30. The angle of declination is measured using a digital level attached to a spotting scope firmly mounted on a tripod fitted with a levelling head. The digital level

measures angles to a precision of 0.05 degrees. The angle of declination of the horizon is also measured to provide a consistent reference.

31. Within each 15-min watch individual marine mammals (or groups) are given a sequential reference number to allow multiple records of the same individual (or group) to be distinguished from records of different individuals. The survey recording form also has space for the observer to record in detail any additional information they consider to be worth recording, e.g. comments on an animal's behaviour.

Snapshot scans

32. Snapshot scans (SSS) primarily aim to measure the instantaneous distribution of birds using survey areas. Cetaceans and basking shark are also searched for and recorded. A scan takes about 45 minutes to complete, depending on how many birds are present. Snap-shot scans are only conducted in conditions of sea state 4 or below. Flying birds passing through the survey areas, except those actively searching for food are ignored during SSS. SSS are undertaken by systematically searching the arc of the search area from one side to the other using a combination of telescope and binoculars, going sufficiently slowly so as to reduce the likelihood overlooking actively diving birds or cetaceans because they are underwater (dives by birds typically last <1 minute).

33. The following details are recorded for birds, cetaceans and basking sharks seen during SSS: species, age/size, group size, behaviour, activity when first seen, location and travel direction. The locations of animals on the sea are recorded as described under MMW above.

34. Successive SSSs within a session are always in different tidal periods (tidal periods last slightly over 2 hours) and are separated by a period of at least an hour to reduce pseudo replication of records. Two SSS are completed in each 3-hour VP session.

Flying bird watches

35. Flying bird watches (FBW) are periods of exactly five minutes in which the number of flying birds passing a notional line straight out from the VP are recorded. These watches aim to quantify the rate of seabird passage over the survey area. The species, age, distance band and direction of travel are recorded. Any cetaceans or basking shark seen in the five-minute period are also recorded, in the same way as during MMW and SSS.

36. FBWs are conducted approximately every 40 minutes during each VP sessions; this means that approximately sixty 5-minute watches are completed each month.

37. The position of flying birds is recorded using distance zones from the shore as detailed in Table 2.

Vessel activity

38. All ships and boats within 2 km of the shore seen during the course of VP survey work are recorded. The type of vessel, its distance zone from the shore (as defined for birds in FBW), activity and direction of travel are recorded. The vessel's name and registration code are also recorded if they are discernible.

Walkover surveys

Bi-monthly surveys of coastal sections

39. The coastline adjacent to the survey areas (Fig. 2) was walked approximately bi-monthly through the year. These walkover surveys had two main aims: to count the numbers of waders and wildfowl using the coast on passage or to overwinter, and to record breeding birds in particular seabirds, waders and any scarce species of high conservation value. Particular attention was paid to sections of cliff suitable for nesting raptors, and areas suitable for feeding shorebirds and geese.

40. Walkover visits were made on 13th October 2011, 15th December 2011, 11th February 2012, 25th April 2012, 12th June 2012 and 16th August 2012.

41. The walkover surveys that were conducted on 25th April and 12th June 2012 recorded breeding birds along the coast up to about 300 m inland. This included the area around the proposed shore installation at Siadar.

42. Incidental observations of scarce birds or notable flocks of other birds were also recorded during the breeding season during all fieldwork visits to the sites.

Data Analysis

Correction and presentation of Snapshot Scan data

43. The survey areas were defined as extending out to 2km from the coast at the VP locations. During SSS field observations it was not always possible to tell if birds seen on the sea were within 2 km of a VP or a little beyond this. Therefore, observers took a cautious approach by recording any birds seen that might have been just beyond 2 km survey area. Later the actual distance for each record was calculated using trigonometry from the angle measurements. Any records that were clearly well beyond 2 km were not used in the seasonal analyses of abundance, density calculations or on the abundance and distribution maps. The calculated distances are subject to small errors associated with measurement, sea swell and tide state. To err on the side of caution all records with a calculated distance below 2250 m were included rather than using a threshold of exactly 2 km.

44. The SSS data are summarised according to five seasons as follows: spring, April to June; summer, July and August; autumn, September and October; and early winter, November and December and late winter, January to March. The spring period broadly corresponds to the main part of the breeding season for most bird species and covers the period when most seabird species are most closely tied to breeding colonies. The summer period overlaps the breeding season of seabird species, but to a varying extent. Many seabird species depart from breeding colonies during July; gannet, puffin and Manx shearwater are notable exceptions and these typically depart from their breeding colonies later, in August or September.

Distance Detection Correction

45. It is apparent from the Year 1 SSS data that birds on the sea were subject to a bias in detection related to distance from the VP, especially smaller species such as auks (NRP, 2012b). This bias was mostly caused by the swell component of the sea-state which could cause birds at distance to be out of view for much of the time. To improve the accuracy of estimates of numbers and densities of birds present in the survey area, the detection bias was corrected using the same method used for the Year 1 report. This is described below.

46. The basis of the correction factors applied was the relative change in density (birds seen per unit area) in a series of 250 m wide distance bands out from the VPs. Data from the three VPs was pooled. To prevent the potentially confounding issues of distance detection bias and habitat selection (some species show preference/avoidance for sea areas related to distance from the shore or water depth) the examination of distance detection bias was restricted to records within 500 m of the shore. This restriction effectively overcame the confounding issue of distance-from-shore habitat selection effects but at the cost of a reduced sample size. To compensate data for similar species were pooled into species groups. The species groups examined were: diver species, shag & cormorant, gulls/terns/shearwaters and auks & eider duck.

47. Records for shag and black guillemot from the Labost VP were also excluded from the analysis to calculate correction factors. This was because these two species bred in small numbers close to this VP and birds there spent a disproportionate amount of time on the water in the 0-250 m and 250-500 m distance bands loafing below the breeding sites. If these records were included it would have caused a serious bias in the correction factors for these two species.

48. The density of birds in each distance category was compared and correction factors derived relative to the closest distance category (Table 3). As expected, for all species groups (except gannet) there were lower apparent densities in the distance bands furthest from the VP and this was most marked for the groups with smaller, less obvious species. It was also apparent that densities in the closest distance bands were very similar suggesting that these had detection rates at or close to 100% and therefore no correction was required for these distance bands.

49. Correction factors were only applied to records involving less than four individuals on the basis that larger flocks of birds were more easily detected. Whereas this group size cut off is arbitrary, in practice the only species that was commonly seen in groups of four or more birds was eider duck, a species that usually occurred in obvious flocks which were unlikely to be overlooked. All SSS records of red-throated diver, shag, cormorant, puffin, common guillemot and black guillemot were of less than four individuals, and only five (22%) records of razorbill and nine (3%) records of great northern diver on the sea involved four or more individuals.

50. The analysed results for the SSS records are presented in a single table for each species (Tables 15–27). These detail the results for each of the five defined season from each VP, and for the three VPs combined. The information in these tables refers only to birds seen on the sea, or in the case of some species that forage on the wing (e.g. gannet, gulls, terns, skuas, shearwaters, petrels), birds that were clearly actively foraging when seen and were thus definitely using the survey areas. Seven parameters are given in the tables. These are explained below.

51. '*Effort (No. of SSS)*', this is the number of snapshot scans completed each season at each VP. For the three VP combined, this value is the sum of the values for individual VPs.

52. '*% zero counts*', is the percentage of snapshot scans in the season in which the species was not recorded. This value was not calculated for the three VPs combined.

53. '*Maximum count*', is the maximum number of individuals recorded in any single snapshot scan during that season from a VP. This figure is uncorrected. For the three VP combined, this value is simply the sum of the maximum values from each VP, even though these may have occurred on different dates.

54. '*Mean count uncorrected*', is the mean of the number of individuals recorded from all SSS sessions during that season from a VP. This figure is also uncorrected.

For the three VPs combined, this value is the sum of the means for the individual VPs.

55. '*Standard deviation of mean*', is the standard deviation of the mean of individuals recorded from all SSS sessions during that season from a VP. For the three VPs combined, this value is the sum of the standard deviations for the individual VPs. The standard variations give an indication of the magnitude of the variation of the counts from a VP in a given season. In most cases the variation is large due to combination of the mobile nature of seabirds and the small size of the survey areas.

56. '*Mean (corrected)*', is the mean of the number of individuals corrected for distance detection bias recorded from all SSS sessions during that season from a VP. For the three VPs combined, this value is the sum of the corrected means for the individual VPs. The corrected mean count gives the best indication of the numbers of individuals typically present in the individual survey areas and the combined area during each season. Whenever corrected estimated numbers are presented the word 'corrected' is shown in parentheses.

57. '*Density bird/km² (corrected)*', is the mean corrected count but expressed as a density. This was calculated by dividing the mean corrected count by the area of sea visible from each VP out to 2 km (4.7 km sq to 2000 m, 5.3 km sq to 2250 m). The mean density figures are useful for comparing the relative importance of the survey areas with the published results on seabird densities at sea (specifically, Pollock *et al.* 2000)

58. Distribution maps (Figs. 3 - 10) show the locations of birds recorded on the sea or actively feeding for common species. The purpose of these maps is to visually show any patterns in distribution that might be relevant to the proposed development. The dot sizes vary according to the number of birds recorded. The maps do not account for any under recording in the parts of the survey areas furthest from the VPs and thus give a somewhat biased picture, especially for auk species. The likely extent of this bias can be judged from the correction factors (Table 3) and should be borne in mind when interpreting the maps. No account is made in the maps for the small amount of overlap (about 300 m) between the semi circles of coverage from the Siadar and Mealabost VPs (Fig. 2).

Analyses and presentation of Flying Bird Watch data

59. For regularly occurring seabird species and for wildfowl and waders species, the FBW data were used to calculate the mean number of individuals of each species flying through the survey area per (daylight) hour each month (Tables 13 and 14).

60. The relative frequency of the number of flying birds seen in each distance band was not examined. Data on the distance of flying birds from the shore are available should this information become pertinent in the future.

61. Compared to birds on the sea, flying birds were easy to detect and it is not thought that the FBW data are significantly affected by any distance detection bias. The only likely exception to this is the FBW data for storm petrel, a very small, dark species that habitually flies close to the sea surface. However even this species is quite easily detected in good survey conditions up to at least 2km away using a telescope.

Results

Survey effort

62. The Year 2 VP survey effort was spread across 57 days (Table 4) and was approximately equal at both VPs (Tables 6 to 8).

63. The target number of VP watches was achieved in the majority of months through the year (Tables 6 – 8). In some months there was a small shortfall in the target effort achieved, however, except for September 2012, surveyors were often able to entirely or partly make good a shortfall in the following month. The survey sites are very exposed and sea conditions were often unsuitable for survey work (i.e. sea-state >4). Lack of days in a month with suitable survey conditions was the cause of VP effort shortfalls.

64. Whenever possible, VP survey work was targeted for times when there were conditions with a sea-state 3 or below (Tables 9 - 11). Overall 76% of SSS VP watches were conducted in sea-state 3 or below. The remaining 24% were conducted in sea-state 4 (Table 9).

65. The VP survey work over the year was approximately evenly distributed with respect to the tidal cycle.

66. Walkover surveys of the coast sections were completed bi-monthly as planned, in October and December 2011 and February, April, June and August 2012 (Table 5). Breeding birds were surveyed on the April and June 2012 visits.

Species accounts

67. The species accounts below focus on the commoner species and species of high conservation importance. As well as reporting information on their seasonal abundance, distribution and behaviour, comparison is made with the results for these species obtained in Year 1. Results for less common species of low conservation importance are presented in the results tables but these do not merit further discussion in the text.

68. The regional status of regularly occurring species, breeding site origins and possible links to designated sites are summarised in the Year 1 Birds Technical Report (NRP, 2012b).

Divers

Red-throated diver

69. Red-throated divers were recorded in all months of Year 2 except August. None were recorded on the sea during the Year 2 breeding season (April to August); all birds seen in this period were simply flying over the survey area. The Year 2 results confirm that the survey area is regularly used by small numbers of overwintering and passage red-throated divers and that it is of low importance during the breeding season.

70. The highest SSS totals were recorded in the winter season with maximums of three individuals at Mealabost and four at Siadar (Table 15, Fig. 3). On average the total number present in the survey area in Year 2 was 1.0 bird in the early winter period and 2.1 birds in the late winter period. This is equivalent to densities of 0.07

and 0.14 birds per km², respectively. These numbers and densities are approximately half those recorded for the Year 1 winter. (Table 15).

71. The majority of red-throated divers recorded on the sea were distributed in a wide band parallel to, and less than 1.3 km from the coast (Fig. 3).

72. Red-throated divers were seldom recorded during FBW with only 11 individuals recorded during the year. All but two (82%) of these were in winter (November to January) (Table 13). These numbers and seasonal pattern are similar to that recorded in Year 1 FBW.

73. Red-throated divers from the Lewis Peatlands SPA could potentially use the survey areas for feeding. However, no red-throated divers were recorded on the sea during the April to July period of Year 2 and it is therefore concluded that at most the survey area had low or no importance as a feeding site in this period in 2012 (Table 3). This finding corroborates the results of Year 1 that also found this species to be extremely scarce on the sea at this time of year (there were only two records of birds on the sea during the April to August period in Year 1) (NRP 2011).

74. A few red-throated divers were recorded flying over the survey area during the spring and summer of Year 2, especially during May. All the birds seen in May were flying N/NE and well out to sea (at least 500 m); they were likely to be birds migrating to Arctic breeding grounds. All red-throated divers seen flying during the breeding season (May to August) were watched for as long as possible once they were detected. In all cases they did not land on the sea but continued flying on the same heading until out of view (typically when 2-3 km from the observer). No red-throated divers were seen flying to or from the moorland inland, nor were any calling or carrying fish prey when seen. Thus there was no evidence to suggest that the birds seen flying over the survey area were breeding locally, though this cannot be ruled out.

Great northern diver

75. Great northern divers were recorded on the sea in all months of Year 2 and in some months were also recorded flying over the survey area. The abundance and seasonal pattern were broadly similar to that recorded in Year 1.

76. Great northern divers were most numerous in the early and late winter periods (November to March) (Table 16, Fig. 4). In these periods up to 12 birds were recorded off Siadar and up to 11 off Mealabost. On average the estimated (corrected) number present in the survey area was 9.6 in the early winter period and 16.8 birds in the late winter period. These numbers translate to average densities of 0.6 and 1.1 birds per km² respectively. The average numbers present in the survey area in the early winter period of Year 2 were similar to this period for Year 1. For the late winter period, the numbers present in Year 2 were approximately 60% greater than that recorded in Year 1.

77. Great northern divers were present in small numbers throughout the spring and summer of Year 2 (Table 16). They were notably more common in April and May when around six to eight individuals were typically present. These birds probably comprised a mix of passage adults and summering immature birds. Most of these were in adult summer plumage. The months of April and May correspond to northwards migration period, a time when relatively large numbers of great northern divers are known to pass through the west side of the Outer Hebrides.

78. On average (corrected) there were approximately 1.6 individuals (peak count 3) present in the survey area in the summer period (July and August) (Table 16). These birds were in immature plumage and were assumed to be summering non-breeding

birds. The number recorded summering in Year 2 was similar to that recorded in Year 1.

79. In general great northern divers on the sea were most frequently recorded in a wide band parallel to, and less than 1 km from the shoreline (Fig. 4). On two occasions in Year 2 they were noted to take flatfish prey, indicating that they were foraging on the sea floor.

80. Great northern diver monthly totals for FBW were low with a total of only 14 birds recorded during Year 2 (Table 13). Most of these (71%) were seen in October and November, the period corresponding to autumn passage. Two birds were seen in April and May, the period corresponding to spring passage.

81. Small numbers of great northern diver were regularly recorded on the sea within approximately 500 m of the coast during the walkover surveys (Table 28). Four individuals were seen on each of the December, February and April surveys of the Siadar/Mealabost sections.

82. Great northern diver is listed on Annex 1 of the EU Birds Directive (European Parliament and Council 2010). There is no great-northern diver breeding population in British Isles and the majority of birds using Scottish coasts are likely to be from breeding grounds in Iceland, Greenland or possibly Canada (Wernham *et al.* 2002).

Shearwaters and petrels

83. Three shearwaters and petrel species were recorded during Year 2 surveys, namely fulmar, Manx shearwater and European storm petrel. As in Year 1, the numbers of these species seen to be actively foraging in the survey area were very small in the context of the regional population sizes.

84. Sooty shearwater was not recorded during Year 2.

Fulmar

85. The Year 2 survey results for fulmar are broadly similar to Year 1. Fulmar are one of the commonest species recorded in the survey area but the great majority of individuals seen were simply passing through and showed no evidence of actively using the area.

86. No fulmars were recorded on the sea or actively feeding in the survey area in the autumn and winter periods (September to March) of Year 2 (Table 17). Small numbers were occasionally seen on the sea or actively foraging in the spring and summer (April to August). In these seasons, the maximum number seen was 13 birds and the average (corrected) number present in the survey area was approximately three birds.

87. As in Year 1, flying fulmars recorded in FBW showed a strongly seasonal pattern (Table 13). None or very few birds were recorded in the autumn months (September to December). Moderate numbers passed by in all other months translating to passage rates of between 18 and 50 individuals per hour (Table 13).

88. Small numbers of fulmars were recorded breeding on cliffs along the coast. Twelve pairs of fulmar bred in Year 2 on low cliffs along the Siadar/Mealabost walkover sections, mostly Section 9 (Table 29).

Manx shearwater

89. Manx Shearwater is a summer visitor to Scotland and was only recorded in Year 2 between June and August. During this period small numbers were regularly

seen flying through the site in FBW (Table 13). This translated to an average rate of approximately nine birds passing per hour in these months, which is similar to that recorded in Year 1. All individuals seen in Year 2 were in flight passing through and showed no evidence of actively using the survey area.

90. No Manx shearwaters were seen on the sea inside the survey area in Year 2; this contrasts to Year 1, when moderate numbers were at times seen on the sea.

Storm petrel

91. Only two storm petrels were seen in Year 2. They were recorded several times in the space of two hours (presumably the same individuals) on the 26th July, actively foraging on the edge of the survey area about 2 km offshore from the Mealabost VP.

92. Storm petrels were also scarce in Year 1 and were also mainly seen in July.

93. Storm petrel is listed on Annex 1 of the EU Birds Directive (European Parliament and Council 2010).

Gannet

94. The Year 2 survey results for gannet are broadly similar to those for Year 1. Gannets are one of the commonest species recorded in the survey area but the great majority of individuals seen are simply passing through and showed no evidence of actively using the area. The Year 2 results confirm that the survey area is of very low importance to foraging gannets.

95. Almost no gannets were recorded on the sea or actively feeding in the survey area in the winter and spring periods (November to March) of Year 2 (Table 18, Fig. 5). Small numbers were occasionally seen on the sea or actively foraging in the summer and autumn periods (July to October). The maximum number seen in these seasons was seven birds and the average (corrected) number present in the survey area was 2.4 birds in the summer and 0.5 birds in the autumn. The average (corrected) number using the survey area in summer translates to an average density of 0.16 birds per km².

96. As in Year 1, flying gannets recorded in FBW showed a strongly seasonal pattern (Table 13). None or very few birds were recorded in the mid-winter months (December to February). There was a steady increase from March (12 birds/hour) to July and August (138 birds/hour). Passage rates peaked in September (173 birds/hour) and then dropped steadily up to December (3 birds/hour).

Cormorant and shag

Cormorant

97. Cormorants were recorded in very low numbers in Year 2 and only between October and March. Single birds were recorded on the sea on two occasions only, and two individuals were seen roosting on a rock on one occasion in November. The abundance and seasonal distribution of cormorant in Year 2 was similar to Year 1.

98. Cormorants were seen flying through the survey areas during FBW on nine occasions through Year 2, mainly in the autumn and winter months, and always just single birds (Table 13). On average passage rates each month were of well below 1 bird per hour.

99. No cormorants were recorded breeding in the walkover sections.

Shag

100. Shags were regularly present through the Year 2 in small numbers foraging in the survey area. Depending on the season, the numbers present in Year 2 were either appreciably lower (autumn and early winter) or similar (late winter to summer) to Year 1. The Year 2 results confirm that the survey area is of low importance to foraging shags.

101. Shags were recorded during SSS in all months of Year 2 (Table 19, Fig. 6). The highest numbers were recorded in the late winter period (Jan to March) when up to seven birds were seen off Mealabost and up to eight off Siadar. The estimated average (corrected) number present in the survey area was approximately five birds in the early winter and seven birds in the late winter. This translates to average densities in these seasons of 0.34 and 0.46 birds per km², respectively. In all other seasons the average (corrected) number present was <1 bird (Table 13).

102. The seasonal average (corrected) number present in the autumn period of Year 1 was 12 birds in contrast to <1 bird for the same period in Year 2. Similarly for the early winter period the average number for Year 1 was 14 birds in contrast to 5 birds in Year 2. The abundance in the late winter, spring and summer seasons, was similar in Year 1 and Year 2.

103. Shags were mainly recorded in a band parallel to, and approximately 0-600 m from the shorelines of the survey areas (Fig. 6). Single birds were occasionally seen roosting on the rocks named Sgeir nam Sgarbh, situated approximately mid-way between the two VPs.

104. Shags were recorded on FBWs in all months except July. Passage rates showed no clear seasonal pattern with typically around 2-5 birds passing per hour.

Swans and geese

105. As in Year 1, passage flocks of pink-footed goose, brent goose, greylag goose and whooper swan were seen flying over the survey area during spring and autumn migration periods. A few geese were also seen during walkover surveys. These records are summarised below. In contrast to Year 2 there were no records of barnacle goose or white-fronted goose migrating over the site in Year 2, this is likely a consequence of the low observation effort in September 2012.

106. A total of 13 whooper swans were seen flying over the survey area in Year 2: 10 on 8th November, 2 on 9th November and 1 on the 2nd March. No whooper swans were recorded on Year 2 walkover surveys. Whooper swan is listed on Annex 1 of the EU Birds Directive (European Parliament and Council 2010).

107. Migrant pink-footed geese were recorded flying over the survey area on five occasions in Year 2: 2 flocks totalling 14 birds on 16th April, 2 flocks totalling 114 birds on 18th April and a single bird on 20th September. Two flocks of unidentified grey geese seen on 16th April were also likely to be this species. Two pink-footed geese were seen during the walkover survey of 25th April feeding on croftland in Section 8.

108. Two greylag geese flying north east over the survey area on 27th March were probably migrating individuals. Moderate numbers of resident or overwintering greylags were recorded in walkover surveys (Table 28). The largest numbers encountered were; 78 birds in Section 8, 84 birds in Section 11 and 54 birds in Section 12.

109. Two brent geese flew north over the survey area on 7th June.

Ducks

110. As in Year 1, eider was the only duck species to commonly using the marine habitats of the survey area to any appreciable extent in Year 2. Small numbers of common scoter, long-tailed duck and red-breasted merganser were also occasionally seen.

Eider

111. Moderate numbers of eider overwintered within the survey area in Year 2. Although there were some notable differences (described below) the Year 2 counts of eider were broadly similar to the counts from Year 1 and confirm that the survey area is of regional importance for overwintering eider.

112. Peak numbers in Year 2 were recorded during SSS in the late winter period, with a maximum of 127 birds recorded off Mealabost and 195 birds recorded off Siadar (Table 20, Fig. 7). It was almost certainly the same overwintering 'flock' that was seen from both VPs and so the peak of 195 birds is likely to be a reasonable measure of the peak number in the survey area as a whole. The numbers seen in the late winter period in Year 2 were approximately 50% greater than in Year 1, when the peak count was 121 individuals.

113. The numbers of eider present in the early winter (November and December) period of Year 2 were much smaller than in the late winter period, with a maximum count of 38 birds. In contrast the peak counts for the early winter period in Year 1 was 92 birds, only slightly below the late winter maximum count.

114. Before correcting for potential under recording caused by distance bias, the data suggest that on average there were approximately 14 eiders present in the Mealabost/Siadar survey area in the early winter period and approximately 80 in the late winter period. After correcting for distance detection, the average (corrected) numbers are approximately 19 birds in the early winter and approximately 84 in the late winter period.

115. No eiders were recorded on the sea in the spring or summer periods of Year 2. Small numbers (maximum count 12) were present in the autumn period.

116. Eiders were infrequently seen during FBW. A total of 29 birds were seen flying past the VPs; almost all between January and March (Table 14).

Common scoter

117. The only common scoter seen on the sea in Year 2 were up to four birds (two males and two females) seen on four dates in late January and early February.

118. Common scoters were infrequently seen during FBW. A total of 31 birds were seen flying past the VPs; all between November and January (Table 14). A single flock of 26 birds was seen flying south west, presumably on migration, on 9th of November.

119. Common scoter is listed on Annex 1 of the EU Birds Directive (European Parliament and Council 2010).

Long-tailed duck

120. The only long-tailed ducks seen on the sea in Year 2 were three birds seen on 12th October. Small numbers of birds (maximum four) were occasionally seen flying over the survey area in the autumn and winter months.

Red-breasted merganser

121. The only red-breasted mergansers recorded on the sea in Year 2 were a pair of birds seen close inshore off Siadar on the 31st January and again on the 2nd February. On twelve occasions during FBW and other watches small numbers of red-breasted mergansers (1 to 12 birds) were seen flying over the survey area in the autumn and winter months.

Raptors

122. Buzzard, merlin and peregrine were all occasionally seen hunting along the coastal strip during the walkover surveys (Table 28). The occurrence of these species in Year 2 was similar to Year 1. No eagle species were recorded in Year 2.

Waders

123. Oystercatchers bred in small numbers (overall total of 9 pairs, in Sections 8, 9 and 10) along the coastal strip (Table 29), and small to moderate numbers of non-breeding birds (6 - 66 birds depending on season) occurred along the coasts throughout the year (Table 28).

124. A flock of up to 29 golden plover was regularly present during June and July on an area of acid grassland at Siadar. This area includes the proposed location of the shore station. The behaviour of these birds indicated they were non-breeding individuals.

125. Small numbers of non-breeding waders were recorded along the coast during the walkover surveys. The commonest species were: ringed plover (maximum 47 on spring passage), knot (maximum 6 on autumn passage), whimbrel (maximum 21 on spring passage), curlew (maximum 25, autumn and winter), purple sandpiper (maximum 28 winter), redshank (maximum 38 birds, autumn passage), turnstone (maximum 44 on spring passage), dunlin (maximum 82 on spring passage) and sanderling (maximum 27 on spring passage). In no case could the numbers present be considered to be of particular importance (Tables 28).

126. Two pairs of dunlin were recorded breeding during walkover surveys in June, one in Section 9 and the other in Section 10. (Table 29). These breeding dunlins are of the *Schinzii* race, which is listed on Annex 1 of the EU Birds Directive

Skuas

127. The Year 2 surveys confirmed that the survey area is of low importance to skua species.

Great skua

128. Great skuas were seen on the sea or actively foraging on four occasions. On two occasions on the 7th July the same individual was watched searching for and swooping ,apparently unsuccessfully,) at razorbill chicks. Great skuas were

occasionally recorded in FBW from March to September. The average passage rate in this period was approximately 1 bird per hour (Table 13). The abundance of great skua in Year 2 was similar to Year 1.

Arctic skua

129. Arctic skuas were seen on the sea or actively foraging on only two occasions in Year 2, a single on 5th July and a single on 14th August. No Arctic skuas were recorded during FBW, but single birds were noted flying through the site on seven occasions between early May and 14th August during SSS and MBW watches. The Year 1 survey results also showed that this species was uncommon in the survey area.

Gulls

130. Eight species of gull were recorded during Year 2. Of these, only herring gulls and great black-backed gull occurred regularly in moderate numbers, especially in the winter months. Kittiwake, common gull and black-headed gull and lesser black-backed gull were all regularly seen in small numbers. Glaucous gull and Iceland gull were scarce.

Black-headed gull

131. In Year 2, as in Year 1, black-headed gull were uncommon in the marine part of the survey area. The only records of birds using the sea were three birds amongst a mixed flock of gulls on 18th April and a single bird on 7th June. Most black-headed gulls recorded were seen flying over the survey area during FBW. They were recorded in FBW mainly in the spring and summer months, and at these times between 1 and 5 birds typically passed per hour (Table 13).

132. Black-headed gulls were recorded in small numbers throughout the year in the walkover surveys (Tables 28). The peak total of non-breeding birds was 14 birds in Section 7 in August.

133. A single pair of black-headed gulls was recorded breeding in walkover Section 9. Numbers breeding in the Loch Bacabhat gull colony were not surveyed in Year 2.

Common gull

134. The Year 2 survey results for common gull are broadly similar to Year 1. Common gull is one of the commonest species recorded in the survey area but the great majority of individuals seen are simply passing through and showed no evidence of actively using the area.

135. Except for a single individual in December, no common gulls were recorded on the sea or actively feeding in the survey area in the winter and spring periods of Year 2 (Table 21). In the autumn and summer small numbers were occasionally present. The combined peak count was 13 birds but on average (corrected) there were <3 birds present.

136. Common gulls recorded in FBW showed a weak seasonal pattern (Table 13). They were commonest in the breeding season (April to June) when on average about 13 birds passed per hour and during the late winter (January to March) when on average 9 birds passed per hour. In the remainder of the year typically <5 birds passed per hour.

137. Common gulls were commonly recorded in the walkover surveys throughout the year except in October (Tables 28). The peak totals of non-breeding birds were 52 birds for the Siadar/Mealabost sections.

138. Small numbers of breeding common gulls were recorded in Year 2, with four pairs in walkover Section 8 and four pairs in Section 10 (Table 29.) Numbers breeding in the Loch Bacabhat gull colony were not surveyed in Year 2.

Lesser black-backed gull

139. Lesser black-backed gulls are summer migrants to the Western Isles and were only recorded in Year 2 from March to September. As in Year 1, the great majority of individuals seen were flying through the survey area.

140. Lesser black-backed gulls were recorded on the sea or actively foraging on four occasions only. Three of these involved 1 - 3 individuals, but on 7th June a compact feeding flock of 44 adults was briefly present off Siadar, probably comprising local breeding birds.

141. Lesser black-backed gulls were recorded in small numbers in FBW from March to September. In this period typically between 1 and 4 birds passed per hour, similar rates to those recorded in Year 1 (Table 13).

142. No lesser black-backed gulls were recorded breeding in the coastal walkover section in Year 2. Numbers breeding in the Loch Bacabhat gull colony were not surveyed in Year 2.

Herring gull

143. The Year 2 survey results for herring gull are broadly similar to Year 1. Herring gull is one of the commonest species recorded in the survey area but the great majority of individuals seen are simply passing through and showed no evidence of actively using the area.

144. Small numbers of herring gulls were regularly recorded on the sea in the winter and spring period of Year 2, but they were almost never seen on the sea or foraging in the summer and autumn periods (Table 22). SSS maximum monthly counts of during winter were 14 birds and 32 birds in the spring period. In these periods there were on average (corrected) 3 to 7 birds present in the survey area. No birds were recorded on the sea in the autumn period and only two birds were seen on the sea in the summer period.

145. Herring gull was recorded in all months on FBWs. On average there were 10 birds passing per hour, with the highest rates during the mid and late winter (Dec: 24 birds/hour, and Feb: 23 birds/hour) and the lowest rate of 1.2 birds/hour in September (Table 14). A similar seasonal pattern was observed in Year 1.

146. Herring gull was commonly recorded in the walkover surveys throughout the year (Tables 28). The peak total of non-breeding birds was 20 birds for the Siadar/Mealabost sections.

147. Two herring gull pairs were recorded breeding in coastal walkover Section 10. Numbers breeding in the Loch Bacabhat gull colony were not surveyed in Year 2.

148.

Great black-backed gull

149. The Year 2 survey results for great black-backed gull are broadly similar to Year 1. Great black-backed gull is one of the commonest species recorded in the survey

area but the great majority of individuals seen are simply passing through and showed no evidence of actively using the area.

150. Great black-backed gull was recorded on the sea or actively foraging during SSS in all months, but only in small numbers. They were notably more common in the autumn and winter periods (Table 23) (September to March). The maximum seasonal count (sum of the maximums from both VPs) during this period was seven birds. The average (corrected) number present in the survey area was approximately just four birds. In the spring and summer months great black-backed gull was rarely recorded using the survey area with on average <1 bird present.

151. Great black-backed gull were recorded on FBWs in all months (Table 13). The average number of birds passing per hour in Year 2 was highest in mid-winter (December to February), with around 12 birds/hour passing over the survey area in this period. Peak passage rates in Year 1 also occurred in mid-winter but were nearly four times greater. During the rest of the year hourly passage rates varied between 1 and 8 birds per hour and are broadly similar to those recorded in Year 1.

152. Great black-backed gulls were recorded only in the October walkover surveys of Year 2, when nine birds were seen on the coast in Section 7 (Table 28).

153. No great black-backed gulls were recorded breeding in the Siadar-Mealabost coastal walkover sections in Year 2. Numbers breeding in the Loch Bacabhat gull colony were not surveyed in Year 2.

Kittiwake

154. Kittiwake was recorded in all months except February. The Year 2 survey results for kittiwake are broadly similar to Year 1. Although quite commonly seen in small numbers the majority of individuals were passing through and showed no evidence of actively using the survey area.

155. Kittiwake was rarely recorded on the sea or actively foraging in the survey area during Year 2 SSS watches; there were eight records involving 12 birds, mostly in November and December.

156. Kittiwake was recorded in all months during FBW surveys except February (Table 13). They were commonest in October and November when approximately 24 birds per hour passed by. At other times of year the numbers passing per hour were typically between one and eight individuals (Table 13).

Other gulls

157. Glaucous gull is an uncommon species in NW Scotland. It but was recorded much more frequently in Year 2 than in Year 1, reflecting the unusually large influx of this Arctic species, together with Iceland gulls, into northern Scotland in the 2011/12 winter. No glaucous gulls were recorded on the sea or actively foraging in the survey area. All 13 records were of single birds flying over the survey area during MMW watches (none were seen in FBW). Only one of the birds seen was in adult plumage, the others were immatures.

158. Iceland gull is an uncommon species in NW Scotland. It but was recorded much more frequently in Year 2 than in Year 1, reflecting the unusually large influx of this Arctic species into northern Scotland in the 2011/12 winter. Single immature birds were seen on the sea in January and March. There were five FBW records, all of single immature birds, between November and February. In addition, 48 individuals were seen flying over the survey area during SSS and MBW watches, almost all of which were single birds in immature plumage.

Breeding gull colonies

159. The gull colony near Siadar, inland from walkover Section 8 was not counted in Year 2, though the presence of breeding gulls in similar numbers to Year 1 was noted incidentally when driving past the site.

Terns

160. Two species of tern were recorded in small numbers; Arctic tern and common tern. Both these species are summer visitors and breed on Lewis.

161. All tern species are listed on Annex 1 of the EU Birds Directive (European Parliament and Council 2010).

Common tern

162. The only record of common tern in Year 2 was a group of six birds flying through SW on the 26th July. In Year 1 the only records were also of a few individuals passing through in late July.

Arctic tern

163. The numbers of Arctic terns seen foraging in the survey area in Year 2 was notably lower than in Year 1 with maximum counts of just two birds (Table 24). On average (corrected) there was <1 bird present in the survey area in the spring and summer periods in Year 2, compared with six in Year 1.

164. Small numbers of Arctic terns were recorded during FBW in May, June and July of Year 2, with typically 1 – 4 birds passing per hour in these months (Table 13). These rates are notably lower than in Year 1.

165. No Arctic terns were recorded breeding along the coasts during the Year 2 walkover surveys.

Auks

166. Four species of auk were recorded in Year 2: common guillemot, razorbill, black guillemot and puffin. The Year 2 results for all four species are broadly similar to those for Year 1 and confirm that the survey area is of low importance for foraging auks, especially in the winter months.

Common guillemot

167. Records of common guillemot on the sea were restricted to the spring summer and autumn periods: none were seen on the sea in the winter periods (Table 25, Fig. 8). The maximum count in the spring period was five birds and maximum in summer period was just three birds. In these periods the average (corrected) number present in the survey area was approximately 6 and 3 birds, respectively, and this translates to densities of well below 1 bird/km². A single bird only was seen on the sea in the autumn period.

168. Common guillemots were observed flying over the survey area during FBW in all months of Year 2 except August, September, December and January (Table 13). They were commonest in May to July when on average there were two to five birds passing per hour. The only other time when common guillemots were commonly seen flying through the area was October when approximately three birds passed per

hour. The above rates exclude birds recorded as 'unidentified guillemot/razorbill', some of which are likely to have been common guillemot (Table 13).

Razorbill

169. As in Year 1, the number of razorbills recorded during Year 2 survey work was over several times greater than the number of common guillemot. Razorbill showed a strongly seasonal pattern of occurrence, being much commoner in the spring and summer months, and very few records from September to February (Tables 13 and 26). The great majority of birds seen were flying over the survey area.

170. Razorbills were most commonly seen on the sea during the summer months, particularly in July (Table 26, Fig. 9). In this period the peak count was 15 birds (including juveniles) and the average (corrected) number present in the survey area was five birds. In other seasons the maximum number recorded was seven birds, and the estimated average (corrected) number present in the survey area was <1 bird in spring and winter, and approximately two birds in the autumn period.

171. Many of the birds seen in July were adult males with accompanying newly fledged young. All these birds were swimming NE through the site with only occasionally feeding dives observed. This behaviour was not noted in Year 1. The birds with chicks had probably originated from breeding colonies at the Flannan Islands, the closest large colony to the survey area and situated approximately 65 km to the SW.

172. Razorbill was recorded frequently during FBW watches between March and July (Table 13). Passage rates varied month to month; in April and May there were around 36 birds passing/hour which is somewhat lower than recorded for these months in Year 1. The rate peaked in July with an average 149 birds/hour passing, all heading NE. This is higher than the peak (June) summer rate recorded in Year 1. Most of the birds seen in July were in flocks of 10 to 60 birds heading NE about 500 - 1000 m off shore. These are likely to have been breeding birds travelling out from a breeding colony (probably the Flannan Islands, 65 km SW) to feeding grounds to the N of Lewis. None were observed carrying fish.

173. The actual numbers of razorbill flying over the survey areas in Year 2 will have been greater than reported above because a high proportion of the birds recorded as guillemot/razorbill are likely to have been razorbill, (based on the ratio of birds identified to the species level).

Black guillemot

174. The abundance and seasonal occurrence of black guillemot recorded in Year 2 was very similar to that recorded in Year 1.

175. Black guillemots were recorded on the sea in small numbers during SSS during all seasons except the autumn (Table 27, Fig. 10). The maximum number recorded was 15 birds but typically far fewer were present. The average number (corrected) present each season for the survey area varied between approximately two and nine birds.

176. Black guillemot was recorded during FBW watches only from March to August, and then only in low numbers. They were most frequently seen during May, when on average 7 birds/hour flew past the VPs (Table 13). In the other spring and summer months rates were typically <1 bird/hour.

177. No black guillemots were recorded breeding in the coastal walkover survey sections in Year 2.

Puffin

178. As in Year 1, puffins were uncommon in Year 2; a few were seen in April and May on the sea (but the great majority of records were birds flying over the survey area, mainly in June and July).

179. Puffins were only recorded on the sea during SSS watches on four occasions in Year 2, all between mid-April and the end of May. On one occasion 10 individuals were seen, otherwise all records were of 1-4 birds.

180. Apart from two birds recorded in April, the only months when puffin was recorded during FBW watches in Year 2 was June and July (Table 13). The numbers seen in these months translate to passage rates of 25 birds/hour and 57 birds/hour, respectively. All birds were flying NE, mostly in small flocks about 1.5 – 2 km offshore. They are likely to have been breeding birds travelling out from a breeding colony (perhaps the Flannan Islands, 65 km SW) to feeding grounds to the N of Lewis.

Other birds

Corncrake

181. A total of two calling (presumed breeding) male corncrakes were recorded during surveys in June, one in walkover Sections 8 near to the Siadar VP (at approximate grid reference NB385550) and the other in Section 11 (at approximate grid reference NB385550) (Table 29). This compares to three calling males heard along the Siadar/Mealabost coast in Year 1 (NRP, 2012b).

182. Corncrake is on Annex 1 of EU Birds Directive, Schedule 1 of Wildlife and Countryside Act and is on the Birds of Conservation Concern Red-list. It is also a UK Biodiversity Action Plan species.

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Tables and Maps

Table 1. Details of vantage points used in Year 2 watches.

VP name	Easting	Northing	Ht. above sea level (m)
Siadar	38748	55663	19
Mealabost	40974	57811	13

Table 2. Distance zones used for flying bird watch (FBW) records.

Distance zone	Definition (distance from shore)
A	<100m
B	100-300m
C	300-750m
D	750-2000m
E	2000-5000km (except for scarce species, birds in this distance are not recorded)
S	Shore (birds over shore and cliffs, i.e. not over the sea proper)
L	Land (birds flying inland of coast)

Table 3. Correction factors derived to correct for under detection of birds on the sea.

Bird group	Distance category (m)						
	0-500	500-750	750-1000	1000-1250	1250-1500	1500-1750	1750-2000
Auk and diving ducks	1	1	1.7	2	4	8	16
Divers	1	1	1	1	2	4	6
Gannet	1	1	1	1	1	1	1
Shag & cormorant	1	1	1	1.5	2	4	6
Gulls/terns/shearwaters	1	1	1.6	2.4	3	4	4

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Table 4. Dates on which VP watches were undertaken in Year 2.
 Watches were undertaken on 57 different dates over the year.

Month	Mealabost VP	Siadar VP
Oct 2011	12, 24	12, 24
Nov 2011	5, 8, 10, 14	8, 9, 14, 16
Dec 2011	16, 27	16, 27
Jan 2012	14, 24, 27, 28, 31	13, 14, 26, 30, 31
Feb 2012	3, 9, 11	2, 6, 11
Mar 2012	2, 5, 12, 23, 27	5, 13, 22, 24, 26
Apr 2012	16, 18	16, 18
May 2012	1, 5, 7, 30	1, 3, 7
Jun 2012	7, 19, 20, 21	7, 19, 20, 29,
Jul 2012	4, 5, 7, 26	4, 6, 26, 27,
Aug 2012	14, 17, 22	14, 15, 18, 21
Sep 2012	20	20

Table 5. Dates on which walkover surveys were undertaken in Year 2.

Month	Survey date
Oct 2011	13
Dec 2011	15
Feb 2012	11
Apr 2012	25
Jun 2012	12
Aug 2012	16

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Table 6. The number of snapshot scans (SSS) completed each month at each VP in Year 2.

Month	VP		Total
	ME	SI	
Oct-11	4	4	8
Nov-11	9	8	17
Dec-11	5	4	9
Jan-12	10	10	20
Feb-12	4	7	11
Mar-12	11	12	23
Apr-12	4	4	8
May-12	6	6	12
Jun-12	8	8	16
Jul-12	10	10	20
Aug-12	6	6	12
Sep-12	2	2	4
Year 2 total	79	81	160
%	49%	51%	100%

Table 7. The number of 5-minute flying bird watches (FBW) completed each month at each VP.

Month	VP		Total
	ME	SI	
Oct-11	10	10	20
Nov-11	21	20	41
Dec-11	11	10	21
Jan-12	25	25	50
Feb-12	10	15	25
Mar-12	26	30	56
Apr-12	10	10	20
May-12	15	15	30
Jun-12	23	22	45
Jul-12	23	22	45
Aug-12	15	15	30
Sep-12	5	5	10
Year 2 total	194	199	393
%	49%	51%	100%

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Table 8. The number of 15-minute marine mammal watches (MMW) completed each month at each VP in Year 2.

Month	VP		Total
	ME	SI	
Oct-11	14	14	28
Nov-11	28	28	56
Dec-11	14	14	28
Jan-12	35	35	70
Feb-12	14	21	35
Mar-12	35	42	77
Apr-12	14	14	28
May-12	21	21	42
Jun-12	28	28	56
Jul-12	25	29	54
Aug-12	21	21	42
Sep-12	7	7	14
Year 2 total	256	274	530
%	48%	52%	100%

Table 9. The number of snapshot scans (SSS) completed each month in different sea-state conditions in Year 2. Data are for both VPs combined.

Month	Sea state				Total
	1	2	3	4	
Oct-11	0	1	3	4	8
Nov-11	2	6	8	1	17
Dec-11	0	1	7	1	9
Jan-12	2	3	13	2	20
Feb-12	2	3	5	1	11
Mar-12	1	7	8	7	23
Apr-12	0	0	5	3	8
May-12	0	2	4	6	12
Jun-12	1	4	8	3	16
Jul-12	2	4	7	7	20
Aug-12	1	3	6	2	12
Sep-12	0	1	2	1	4
Year 2 total	11	35	76	38	160
%	7%	22%	48%	24%	100%

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Table 10. The number of 5-minute flying bird watches (FBW) completed each month in different sea-state conditions in Year 2. Data are for both VPs combined.

Month	Sea state				Total
	1	2	3	4	
Oct-11	0	2	8	10	20
Nov-11	6	15	16	4	41
Dec-11	0	0	17	4	21
Jan-12	5	8	30	7	50
Feb-12	5	8	8	4	25
Mar-12	5	15	17	19	56
Apr-12	0	0	12	8	20
May-12	0	9	8	13	30
Jun-12	2	11	25	7	45
Jul-12	4	8	16	17	45
Aug-12	3	6	15	6	30
Sep-12	0	0	8	2	10
Year 2 total	30	82	180	101	393
%	8%	21%	46%	26%	100%

Table 11. The number of 15-minute marine mammal watches (MMW) completed each month in different sea-state conditions in Year 2. Data are for both VPs combined.

Month	Sea state				Total
	1	2	3	4	
Oct-11	0	4	10	14	28
Nov-11	7	21	23	5	56
Dec-11	0	1	21	6	28
Jan-12	7	12	41	10	70
Feb-12	7	11	12	5	35
Mar-12	7	21	23	26	77
Apr-12	0	0	17	11	28
May-12	0	12	12	18	42
Jun-12	3	12	33	8	56
Jul-12	4	12	18	20	54
Aug-12	4	9	23	6	42
Sep-12	0	1	10	3	14
Year 2 total	39	116	243	132	530
%	7%	22%	46%	25%	100%

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Table 12. The number of VP snapshot scans (SSS) undertaken in each part of the tide cycle period each month in Year 2. The tidal cycle is divided into six equal parts (each of approximately two hours) with the start of Period 1 corresponding to high tide and the start of Period 3 to low tide.

Month	Tide period						Total
	1	2	3	4	5	6	
Oct-11	1	1	2	3	0	1	8
Nov-11	2	4	2	6	1	2	17
Dec-11	2	3	2	1	0	1	9
Jan-12	5	6	4	1	1	3	20
Feb-12	1	2	3	4	0	1	11
Mar-12	4	4	3	4	5	3	23
Apr-12	0	0	2	1	3	2	8
May-12	1	1	2	3	3	2	12
Jun-12	5	2	3	3	0	3	16
Jul-12	4	3	3	3	4	3	20
Aug-12	1	2	3	1	2	3	12
Sep-12	1	1	1	0	0	1	4
Year 2 total	27	29	30	30	19	25	160
%	17%	18%	19%	19%	12%	16%	100%

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Table 13. The total number and mean number passing per hour of seabird species recorded flying past the Siadar and Mealabost VPs each month during 5-minute Flying Bird Watch (FBW) sessions undertaken in Year 2, October 2011 to September 2012. (Species with <10 FBW records and all non-seabird species are not shown).

Species	Measure	2011			2012								
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Red-throated diver	Total	0	4	2	3	0	0	0	1	0	1	0	0
	Mean /hr	0	1.2	1.1	0.7	0	0	0	0.4	0	0.3	0	0
Great northern diver	Total	6	4	0	2	0	0	1	1	0	0	0	0
	Mean /hr	3.6	1.2	0	0.5	0	0	0.6	0.4	0	0	0	0
Fulmar	Total	0	0	1	158	38	147	70	42	169	178	125	5
	Mean /hr	0	0	0.6	37.9	18.2	31.5	42	16.8	45.1	47.5	50	6
Sooty shearwater	Total	0	0	0	0	0	0	0	0	0	0	0	0
	Mean /hr	0	0	0	0	0	0	0	0	0	0	0	0
Manx shearwater	Total	0	0	0	0	0	0	0	0	41	54	7	0
	Mean /hr	0	0	0	0	0	0	0	0	10.9	14.4	2.8	0
Storm petrel	Total	0	0	0	0	0	0	0	0	0	3	0	0
	Mean /hr	0	0	0	0	0	0	0	0	0	0.8	0	0
Gannet	Total	49	53	5	6	0	57	54	127	212	512	344	143
	Mean /hr	29.4	15.5	2.9	1.4	0	12.2	32.4	50.8	56.5	137	138	172
Cormorant	Total	2	1	0	3	0	0	1	1	1	0	0	0
	Mean /hr	1.2	0.3	0	0.7	0	0	0.6	0.4	0.3	0	0	0
Shag	Total	3	17	11	17	5	17	4	6	6	0	26	3
	Mean /hr	1.8	5	6.3	4.1	2.4	3.6	2.4	2.4	1.6	0	10.4	3.6
Great skua	Total	0	0	0	0	0	1	4	0	2	6	1	1
	Mean /hr	0	0	0	0	0	0.2	2.4	0	0.5	1.6	0.4	1.2
Black-headed gull	Total	1	1	0	0	0	8	8	4	4	1	0	3
	Mean /hr	0.6	0.3	0	0	0	1.7	4.8	1.6	1.1	0.3	0	3.6
Common gull	Total	5	16	14	17	42	13	39	24	27	14	8	2
	Mean /hr	3	4.7	8	4.1	20.2	2.8	23.4	9.6	7.2	3.7	3.2	2.4
Lesser black-backed gull	Total	0	0	0	0	0	3	2	10	7	2	5	2
	Mean /hr	0	0	0	0	0	0.6	1.2	4	1.9	0.5	2	2.4
Herring gull	Total	9	22	42	52	48	42	13	33	27	9	18	1
	Mean /hr	5.4	6.4	24	12.5	23	9	7.8	13.2	7.2	2.4	7.2	1.2
Great black-backed gull	Total	1	17	14	63	30	24	5	18	3	4	7	7
	Mean /hr	0.6	5	8	15.1	14.4	5.1	3	7.2	0.8	1.1	2.8	8.4

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Species	Measure	2011			2012								
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
<i>Table 13 continued</i>													
Kittiwake	Total	46	72	10	3	0	7	25	9	13	16	21	1
	Mean /hr	27.6	21.1	5.7	0.7	0	1.5	15	3.6	3.5	4.3	8.4	1.2
Arctic tern	Total	0	0	0	0	0	0	0	1	13	5	0	0
	Mean /hr	0	0	0	0	0	0	0	0.4	3.5	1.3	0	0
Guillemot	Total	5	4	0	0	1	1	0	12	13	8	0	0
	Mean /hr	3	1.2	0	0	0.5	0.2	0	4.8	3.5	2.1	0	0
Razorbill	Total	4	7	0	6	8	82	58	92	17	558	0	2
	Mean /hr	2.4	2	0	1.4	3.8	17.6	34.8	36.8	4.5	149	0	2.4
Guillemot/Razorbill	Total	6	18	0	8	1	23	29	19	7	2	1	0
	Mean /hr	3.6	5.3	0	1.9	0.5	4.9	17.4	7.6	1.9	0.5	0.4	0
Black guillemot	Total	0	0	0	0	0	1	4	18	4	2	1	0
	Mean /hr	0	0	0	0	0	0.2	2.4	7.2	1.1	0.5	0.4	0
Puffin	Total	0	0	0	0	0	0	2	0	93	212	0	0
	Mean /hr	0	0	0	0	0	0	1.2	0	24.8	56.5	0	0

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Table 14. The total number and mean number passing per hour of wildfowl and wader species recorded flying past the Siadar and Mealabost VPs each month during 5-minute Flying Bird Watch (FBW) sessions undertaken in Year 2, October 2011 to September 2012. (Species with <10 FBW records are not shown).

Species	Measure	2011			2012								
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Eider	Total	0	2	0	16	2	9	0	0	0	0	0	0
	Mean /hr	0	0.6	0	3.8	1	1.9	0	0	0	0	0	0
Common scoter	Total	0	27	2	2	0	0	0	0	0	0	0	0
	Mean /hr	0	7.9	1.1	0.5	0	0	0	0	0	0	0	0
Goldeneye	Total	0	16	0	0	0	0	0	0	0	0	0	0
	Mean /hr	0	4.7	0	0	0	0	0	0	0	0	0	0
Red-breasted merganser	Total	3	0	0	6	0	0	3	0	0	0	0	0
	Mean /hr	1.8	0	0	1.4	0	0	1.8	0	0	0	0	0
Oystercatcher	Total	0	0	0	3	1	15	5	9	15	3	32	0
	Mean /hr	0	0	0	0.7	0.5	3.2	3	3.6	4	0.8	12.8	0
Golden plover	Total	0	0	0	0	0	0	0	0	28	32	0	0
	Mean /hr	0	0	0	0	0	0	0	0	7.5	8.5	0	0
Curlew	Total	0	6	1	5	2	11	2	3	0	2	1	0
	Mean /hr	0	1.8	0.6	1.2	1	2.4	1.2	1.2	0	0.5	0.4	0
Redshank	Total	0	1	0	5	0	4	0	0	0	18	1	0
	Mean /hr	0	0.3	0	1.2	0	0.9	0	0	0	4.8	0.4	0

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Table 15. The seasonal abundance of **red-throated diver** recorded on the sea during snapshot scans (SSS) undertaken in Year 1 (Sept 2010 to Sept 2011) compared with the abundance recorded in SSS undertaken in Year 2 (Oct 2011 to Sept 2012).

VP	Measure	Year 1					Year 2				
		Autumn	Early winter	Late winter	Spring	Summer	Autumn	Early winter	Late winter	Spring	Summer
		Sp-Oc10, Sp 2011	Nv-Dc 2010	Ja-Mr 2011	Ap-Jn2011	Jy-Ag 2011	Oc 2011, Sp 2012	Nv-Dc 2011	Ja-Mr 2012	Ap-Jn2012	Jy-Ag 2012
Mealabost	Effort (No. SSS)	21	14	20	20	18	6	12	24	18	16
	% zero counts	86%	71%	35%	10%	94%	83%	67%	79.2%	100%	100%
	Max count	1	7	7	0	1	1	2	3	0	0
	Mean count	0.1	0.8	1.4	0	0.1	0.2	0.4	0.3	0	0
	Std. Dev.	0.4	1.9	1.8	0	0.2	0.4	0.7	0.7	0	0
	Mean (corrected)	0.2	0.8	1.9	0	0.1	0.2	0.8	0.5	0	0
Siadar	Effort (No. SSS)	21	12	24	22	16	6	12	28	18	16
	% zero counts	95%	33%	33%	10%	94%	17%	92%	50.0%	100%	100%
	Max count	1	5	6	0	1	3	2	4	0	0
	Mean count	0	1.8	2	0	0.1	1.2	0.2	0.9	0	0
	Std. Dev.	0.2	1.8	2.1	0	0.3	1	0.6	1.1	0	0
	Mean (corrected)	0.3	2.9	2.6	0	0.3	1.7	0.2	1.6	0	0
Combined	Effort (No. SSS)	42	26	44	42	34	12	24	52	36	32
	Sum of max count	2	12	13	0	2	4	4	7	0	0
	Sum of mean count	0.1	2.6	3.4	0.0	0.2	1.4	0.6	1.2	0.0	0.0
	Sum of Std. Dev.	0.6	3.7	3.9	0.0	0.5	1.4	1.2	1.8	0.0	0.0
	Sum of mean (corrected)	0.5	3.7	4.5	0.0	0.4	1.9	1.0	2.1	0.0	0.0
	Density birds/km ² (corrected)	0.03	0.24	0.30	0	0.03	0.13	0.07	0.14	0	0.00

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Table 16. The seasonal abundance of **great northern diver** recorded on the sea during snapshot scans (SSS) undertaken in Year 1 (Sept 2010 to Sept 2011) compared with the abundance recorded in SSS undertaken in Year 2 (Oct 2011 to Sept 2012).

VP	Measure	Year 1					Year 2				
		Autumn	Early winter	Late winter	Spring	Summer	Autumn	Early winter	Late winter	Spring	Summer
		Sp-Oc10, Sp 2011	Nv-Dc 2010	Ja-Mr 2011	Ap-Jn2011	Jy-Ag 2011	Oc 2011, Sp 2012	Nv-Dc 2011	Ja-Mr 2012	Ap-Jn2012	Jy-Ag 2012
Mealabost	Effort (No. SSS)	21	14	20	20	18	6	12	24	18	16
	% zero counts	67%	7%	10%	30%	72%	50%	25%	8%	28%	44%
	Max count	3	9	5	7	3	4	4	11	9	3
	Mean count	0.6	3.2	2.5	2.3	0.4	1.0	1.4	4.7	2.0	0.9
	Std. Dev.	0.9	2.8	1.7	2.1	0.8	1.5	1.3	3.0	2.4	1.1
	Mean (corrected)	1.3	4.2	3.9	3.4	0.4	1.0	3.0	9.5	2.9	1.3
Siadar	Effort (No. SSS)	21	12	24	22	16	6	12	28	18	16
	% zero counts	86%	0%	21%	41%	63%	67%	33%	4%	28%	88%
	Max count	1	7	9	10	1	2	11	12	8	2
	Mean count	0.1	3	3.3	2.3	0.4	0.5	2.5	4.6	2.1	0.2
	Std. Dev.	0.4	1.9	3.3	2.6	0.5	0.8	3.2	3.5	2.1	0.5
	Mean (corrected)	0.8	6.5	4.5	4.7	0.9	0.5	6.6	7.4	2.9	0.4
Combined	Effort (No. SSS)	42	26	44	42	34	12	24	52	36	32
	Sum of max count	4	16	14	17	4	6	15	23	17	5
	Sum of mean count	0.7	6.2	5.8	4.6	0.8	1.5	3.9	9.2	4.1	1.1
	Sum of Std. Dev.	1.3	4.7	5.0	4.7	1.3	2.4	4.5	6.5	4.5	1.7
	Sum of mean (corrected)	2.1	10.7	8.4	8.1	1.3	1.5	9.6	16.8	5.8	1.6
	Density birds/km ² (corrected)	0.14	0.70	0.55	0.53	0.09	0.10	0.63	1.11	0.38	0.11

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Table 17. The seasonal abundance of **fulmar** recorded on the sea during snapshot scans (SSS) undertaken in Year 1 (Sept 2010 to Sept 2011) compared with the abundance recorded in SSS undertaken in Year 2 (Oct 2011 to Sept 2012).

VP	Measure	Year 1					Year 2				
		Autumn	Early winter	Late winter	Spring	Summer	Autumn	Early winter	Late winter	Spring	Summer
		Sp-Oc10, Sp 2011	Nv-Dc 2010	Ja-Mr 2011	Ap-Jn2011	Jy-Ag 2011	Oc 2011, Sp 2012	Nv-Dc 2011	Ja-Mr 2012	Ap-Jn2012	Jy-Ag 2012
Mealabost	Effort (No. SSS)	21	14	20	20	18	6	12	24	18	16
	% zero counts	100%	100%	95%	95%	94%	100%	100%	100%	72%	94%
	Max count	0	0	1	1	1	0	0	0	3	1
	Mean count	0	0	0.1	0.1	0.1	0.0	0.0	0.0	0.4	0.1
	Std. Dev.	0	0	0.2	0.2	0.2	0.0	0.0	0.0	0.9	0.3
	Mean (corrected)	0	0	0.1	0.2	0.1	0.0	0.0	0.0	1.6	0.2
Siadar	Effort (No. SSS)	21	12	24	22	16	6	12	28	18	16
	% zero counts	100%	100%	83%	82%	88%	100%	100%	100%	83%	69%
	Max count	0	0	40	4	2	0	0	0	4	12
	Mean count	0	0	2.1	0.5	0.2	0.0	0.0	0.0	0.4	1.1
	Std. Dev.	0	0	8.2	1.2	0.5	0.0	0.0	0.0	1.1	3.0
	Mean (corrected)	0	0	2.7	1	0.6	0.0	0.0	0.0	1.6	2.2
Combined	Effort (No. SSS)	42	26	44	42	34	12	24	52	36	32
	Sum of max count	0	0	41	5	3	0	0	0	7	13
	Sum of mean count	0.0	0.0	2.2	0.6	0.3	0.0	0.0	0.0	0.9	1.1
	Sum of Std. Dev.	0.0	0.0	8.4	1.4	0.7	0.0	0.0	0.0	2.0	3.2
	Sum of mean (corrected)	0.0	0.0	2.8	1.2	0.7	0.0	0.0	0.0	3.1	2.4
	Density birds/km ² (corrected)	0.00	0.00	0.18	0.08	0.05	0.00	0.00	0.00	0.21	0.16

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Table 18. The seasonal abundance of **gannet** recorded on the sea during snapshot scans (SSS) undertaken in Year 1 (Sept 2010 to Sept 2011) compared with the abundance recorded in SSS undertaken in Year 2 (Oct 2011 to Sept 2012).

VP	Measure	Year 1					Year 2				
		Autumn	Early winter	Late winter	Spring	Summer	Autumn	Early winter	Late winter	Spring	Summer
		Sp-Oc10, Sp 2011	Nv-Dc 2010	Ja-Mr 2011	Ap-Jn2011	Jy-Ag 2011	Oc 2011, Sp 2012	Nv-Dc 2011	Ja-Mr 2012	Ap-Jn2012	Jy-Ag 2012
Mealabost	Effort (No. SSS)	21	14	20	20	18	6	12	24	18	16
	% zero counts	90%	100%	95%	90%	100%	83%	100%	100%	100%	50%
	Max count	3	0	1	2	0	1	0	0	0	6
	Mean count	0.2	0	0.1	0.2	0	0.2	0.0	0.0	0.0	1.3
	Std. Dev.	0.8	0	0.2	0.5	0	0.4	0.0	0.0	0.0	1.9
	Mean (corrected)	0.2	0	0.1	0.2	0	0.2	0.0	0.0	0.0	1.3
Siadar	Effort (No. SSS)	21	12	24	22	16	6	12	28	18	16
	% zero counts	90%	100%	96%	82%	88%	83%	92%	100%	100%	69%
	Max count	3	0	1	7	1	2	1	0	0	7
	Mean count	0.3	0	0	0.5	0.1	0.3	0.1	0.0	0.0	1.2
	Std. Dev.	0.9	0	0.2	1.5	0.3	0.8	0.3	0.0	0.0	2.3
	Mean (corrected)	0.3	0	0	0.5	0.1	0.3	0.1	0.0	0.0	1.2
Combined	Effort (No. SSS)	42	26	44	42	34	12	24	52	36	32
	Sum of max count	6	0	2	9	1	3	1	0	0	13
	Sum of mean count	0.5	0.0	0.1	0.7	0.1	0.5	0.1	0.0	0.0	2.4
	Sum of Std. Dev.	1.7	0.0	0.4	2.0	0.3	1.2	0.3	0.0	0.0	4.2
	Sum of mean (corrected)	0.5	0.0	0.1	0.7	0.1	0.5	0.1	0.0	0.0	2.4
	Density birds/km ² (corrected)	0.03	0.00	0.01	0.05	0.01	0.03	0.01	0.00	0.00	0.16

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Table 19. The seasonal abundance of **shag** recorded on the sea during snapshot scans (SSS) undertaken in Year 1 (Sept 2010 to Sept 2011) compared with the abundance recorded in SSS undertaken in Year 2 (Oct 2011 to Sept 2012).

VP	Measure	Year 1					Year 2				
		Autumn Sp-Oc10, Sp 2011	Early winter Nv-Dc 2010	Late winter Ja-Mr 2011	Spring Ap-Jn2011	Summer Jy-Ag 2011	Autumn Oc 2011, Sp 2012	Early winter Nv-Dc 2011	Late winter Ja-Mr 2012	Spring Ap-Jn2012	Summer Jy-Ag 2012
Mealabost	Effort (No. SSS)	21	14	20	20	18	6	12	24	18	16
	% zero counts	29%	7%	25%	75%	61%	67%	58%	33%	89%	88%
	Max count	10	10	6	1	7	1	5	7	1	2
	Mean count	2.4	3.4	1.7	0.3	0.8	0.3	1.2	1.8	0.1	0.2
	Std. Dev.	2.6	2.7	1.7	0.4	1.7	0.5	1.9	1.9	0.3	0.5
	Mean (corrected)	5.3	5.1	1.9	0.3	1.1	0.4	1.4	3.2	0.4	0.2
Siadar	Effort (No. SSS)	21	12	24	22	16	6	12	28	18	16
	% zero counts	29%	0%	4%	73%	63%	83%	25%	18%	83%	69%
	Max count	14	16	7	2	2	1	5	8	2	2
	Mean count	2.6	4.1	3.4	0.3	0.6	0.2	1.9	1.6	0.2	0.4
	Std. Dev.	3.6	4	1.8	0.6	0.8	0.4	1.7	1.7	0.5	0.6
	Mean (corrected)	6.6	8.8	5.9	0.4	0.8	0.2	3.8	3.7	0.3	0.4
Combined	Effort (No. SSS)	42	26	44	42	34	12	24	52	36	32
	Sum of max count	24	26	13	3	9	2	10	15	3	4
	Sum of mean count	5.0	7.5	5.1	0.6	1.4	0.5	3.1	3.5	0.3	0.6
	Sum of Std. Dev.	6.2	6.7	3.5	1.0	2.5	0.9	3.6	3.5	0.9	1.2
	Sum of mean (corrected)	11.9	13.9	7.8	0.7	1.9	0.6	5.2	6.9	0.7	0.6
	Density birds/km ² (corrected)	0.78	0.92	0.51	0.05	0.13	0.04	0.34	0.46	0.05	0.04

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Table 20. The seasonal abundance of **eider** recorded on the sea during snapshot scans (SSS) undertaken in Year 1 (Sept 2010 to Sept 2011) compared with the abundance recorded in SSS undertaken in Year 2 (Oct 2011 to Sept 2012).

VP	Measure	Year 1					Year 2				
		Autumn	Early winter	Late winter	Spring	Summer	Autumn	Early winter	Late winter	Spring	Summer
		Sp-Oc10, Sp 2011	Nv-Dc 2010	Ja-Mr 2011	Ap-Jn2011	Jy-Ag 2011	Oc 2011, Sp 2012	Nv-Dc 2011	Ja-Mr 2012	Ap-Jn2012	Jy-Ag 2012
Mealabost	Effort (No. SSS)	21	14	20	20	18	6	12	24	18	16
	% zero counts	100%	43%	30%	100%	100%	67%	50%	13%	100%	100%
	Max count	0	92	121	0	0	12	26	127	0	0
	Mean count	0	28.1	20.6	0	0	2.3	8.3	31.8	0.0	0.0
	Std. Dev.	0	34.7	31.4	0	0	4.8	9.8	33.5	0.0	0.0
	Mean (corrected)	0	28.1	20.7	0	0	2.6	10.9	32.2	0.0	0.0
Siadar	Effort (No. SSS)	21	12	24	22	16	6	12	28	18	16
	% zero counts	100%	58%	13%	100%	100%	83%	58%	0%	100%	100%
	Max count	0	73	51	0	0	12	38	195	0	0
	Mean count	0	11.8	17.9	0	0	2.0	5.8	48.0	0.0	0.0
	Std. Dev.	0	21.6	14.8	0	0	4.9	11.2	43.0	0.0	0.0
	Mean (corrected)	0	11.8	18.7	0	0	2.0	8.3	52.2	0.0	0.0
Combined	Effort (No. SSS)	42	26	44	42	34	12	24	52	36	32
	Sum of max count	0	165	172	0	0	24	64	322	0	0
	Sum of mean count	0.0	39.9	38.5	0.0	0.0	4.3	14.1	79.8	0.0	0.0
	Sum of Std. Dev.	0.0	56.3	46.2	0.0	0.0	9.7	21.0	76.5	0.0	0.0
	Sum of mean (corrected)	0.0	39.9	39.4	0.0	0.0	4.6	19.3	84.3	0.0	0.0
	Density birds/km ² (corrected)	0.00	2.63	2.59	0.00	0.00	0.30	1.27	5.55	0.00	0.00

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Table 21. The seasonal abundance of **common gull** recorded on the sea or actively foraging during snapshot scans (SSS) undertaken in Year 1 (Sept 2010 to Sept 2011) compared with the abundance recorded in SSS undertaken in Year 2 (Oct 2011 to Sept 2012).

VP	Measure	Year 1					Year 2				
		Autumn	Early winter	Late winter	Spring	Summer	Autumn	Early winter	Late winter	Spring	Summer
		Sp-Oc10, Sp 2011	Nv-Dc 2010	Ja-Mr 2011	Ap-Jn2011	Jy-Ag 2011	Oc 2011, Sp 2012	Nv-Dc 2011	Ja-Mr 2012	Ap-Jn2012	Jy-Ag 2012
Mealabost	Effort (No. SSS)	21	14	20	20	18	6	12	24	18	16
	% zero counts	90%	100%	95%	90%	100%	83%	100%	100%	100%	50%
	Max count	3	0	1	2	0	1	0	0	0	6
	Mean count	0.2	0	0.1	0.2	0	0.2	0.0	0.0	0.0	1.3
	Std. Dev.	0.8	0	0.2	0.5	0	0.4	0.0	0.0	0.0	1.9
	Mean (corrected)	0.2	0	0.1	0.2	0	0.2	0.0	0.0	0.0	1.3
Siadar	Effort (No. SSS)	21	12	24	22	16	6	12	28	18	16
	% zero counts	90%	100%	96%	82%	88%	83%	92%	100%	100%	69%
	Max count	3	0	1	7	1	2	1	0	0	7
	Mean count	0.3	0	0	0.5	0.1	0.3	0.1	0.0	0.0	1.2
	Std. Dev.	0.9	0	0.2	1.5	0.3	0.8	0.3	0.0	0.0	2.3
	Mean (corrected)	0.3	0	0	0.5	0.1	0.3	0.1	0.0	0.0	1.2
Combined	Effort (No. SSS)	42	26	44	42	34	12	24	52	36	32
	Sum of max count	6	0	2	9	1	3	1	0	0	13
	Sum of mean count	0.5	0.0	0.1	0.7	0.1	0.5	0.1	0.0	0.0	2.4
	Sum of Std. Dev.	1.7	0.0	0.4	2.0	0.3	1.2	0.3	0.0	0.0	4.2
	Sum of mean (corrected)	0.5	0.0	0.1	0.7	0.1	0.5	0.1	0.0	0.0	2.4
	Density birds/km ² (corrected)	0.03	0.00	0.01	0.05	0.01	0.03	0.01	0.00	0.00	0.16

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Table 22. The seasonal abundance of **herring gull** recorded on the sea or actively foraging during snapshot scans (SSS) undertaken in Year 1 (Sept 2010 to Sept 2011) compared with the abundance recorded in SSS undertaken in Year 2 (Oct 2011 to Sept 2012).

VP	Measure	Year 1					Year 2				
		Autumn	Early winter	Late winter	Spring	Summer	Autumn	Early winter	Late winter	Spring	Summer
		Sp-Oc10, Sp 2011	Nv-Dc 2010	Ja-Mr 2011	Ap-Jn2011	Jy-Ag 2011	Oc 2011, Sp 2012	Nv-Dc 2011	Ja-Mr 2012	Ap-Jn2012	Jy-Ag 2012
Mealabost	Effort (No. SSS)	21	14	20	20	18	6	12	24	18	16
	% zero counts	95%	71%	70%	95%	100%	100%	67%	58%	94%	100%
	Max count	3	10	18	2	0	0	4	14	5	0
	Mean count	0.1	1.6	1.6	0.1	0	0.0	0.7	1.8	0.3	0.0
	Std. Dev.	0.7	3.2	4.1	0.4	0	0.0	1.2	3.9	1.2	0.0
	Mean (corrected)	0.1	2.1	1.8	0.3	0	0.0	1.7	3.1	0.3	0.0
Siadar	Effort (No. SSS)	21	12	24	22	16	6	12	28	18	16
	% zero counts	95%	50%	54%	91%	81%	100%	50%	64%	72%	88%
	Max count	2	2	30	24	2	0	8	12	32	2
	Mean count	0.1	0.6	3.5	1.3	0.3	0.0	1.8	2.0	2.2	0.2
	Std. Dev.	0.4	0.7	6.9	5.2	0.7	0.0	2.7	3.7	7.5	0.5
	Mean (corrected)	0.2	1.1	4	1.3	0.8	0.0	2.8	3.8	2.8	0.4
Combined	Effort (No. SSS)	42	26	44	42	34	12	24	52	36	32
	Sum of max count	5	12	48	26	2	0	12	26	37	2
	Sum of mean count	0.2	2.2	5.1	1.4	0.3	0.0	2.5	3.8	2.5	0.2
	Sum of Std. Dev.	1.1	3.9	11.0	5.6	0.7	0.0	4.0	7.6	8.7	0.5
	Sum of mean (corrected)	0.3	3.2	5.8	1.6	0.8	0.0	4.5	6.9	3.1	0.4
	Density birds/km ² (corrected)	0.02	0.21	0.38	0.11	0.05	0.00	0.29	0.46	0.20	0.03

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Table 23. The seasonal abundance of **great black-backed gull** recorded on the sea or actively foraging during snapshot scans (SSS) undertaken in Year 1 (Sept 2010 to Sept 2011) compared with the abundance recorded in SSS undertaken in Year 2 (Oct 2011 to Sept 2012).

VP	Measure	Year 1					Year 2				
		Autumn	Early winter	Late winter	Spring	Summer	Autumn	Early winter	Late winter	Spring	Summer
		Sp-Oc10, Sp 2011	Nv-Dc 2010	Ja-Mr 2011	Ap-Jn2011	Jy-Ag 2011	Oc 2011, Sp 2012	Nv-Dc 2011	Ja-Mr 2012	Ap-Jn2012	Jy-Ag 2012
Mealabost	Effort (No. SSS)	21	14	20	20	18	6	12	24	18	16
	% zero counts	90%	57%	80%	100%	78%	33%	67%	42%	94%	81%
	Max count	2	3	2	0	1	4	3	3	2	4
	Mean count	0.1	0.6	0.3	0	0.2	1.3	0.6	1.0	0.1	0.4
	Std. Dev.	0.5	0.9	0.7	0	0.4	1.5	1.0	1.0	0.5	1.1
	Mean (corrected)	0.2	1.1	0.5	0	0.3	2.8	1.5	2.2	0.3	0.3
Siadar	Effort (No. SSS)	21	12	24	22	16	6	12	28	18	16
	% zero counts	71%	42%	46%	95%	75%	67%	33%	46%	89%	69%
	Max count	4	3	39	2	3	1	3	4	1	3
	Mean count	0.4	1	2.8	0.1	0.6	0.3	1.0	0.9	0.1	0.6
	Std. Dev.	0.9	1.1	7.8	0.4	1.1	0.5	1.0	1.0	0.3	1.1
	Mean (corrected)	1.3	2.1	4.3	0.4	0.9	0.9	2.4	2.0	0.1	0.6
Combined	Effort (No. SSS)	42	26	44	42	34	12	24	52	36	32
	Sum of max count	6	6	41	2	4	5	6	7	3	7
	Sum of mean count	0.5	1.6	3.1	0.1	0.8	1.7	1.6	1.9	0.2	1.1
	Sum of Std. Dev.	1.4	2.0	8.5	0.4	1.5	2.0	1.9	2.1	0.8	2.2
	Sum of mean (corrected)	1.5	3.2	4.8	0.4	1.2	3.7	3.9	4.1	0.5	0.9
	Density birds/km ² (corrected)	0.10	0.21	0.32	0.03	0.08	0.25	0.25	0.27	0.03	0.06

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Table 24. The seasonal abundance of **Arctic tern** recorded on the sea or actively foraging during snapshot scans (SSS) undertaken in Year 1 (Sept 2010 to Sept 2011) compared with the abundance recorded in SSS undertaken in Year 2 (Oct 2011 to Sept 2012).

VP	Measure	Year 1					Year 2				
		Autumn	Early winter	Late winter	Spring	Summer	Autumn	Early winter	Late winter	Spring	Summer
		Sp-Oct10, Sp 2011	Nv-Dc 2010	Ja-Mr 2011	Ap-Jn2011	Jy-Ag 2011	Oc 2011, Sp 2012	Nv-Dc 2011	Ja-Mr 2012	Ap-Jn2012	Jy-Ag 2012
Mealabost	Effort (No. SSS)	21	14	20	20	18	6	12	24	18	16
	% zero counts	100%	100%	100%	95%	72%	100%	100%	100%	94%	94%
	Max count	0	0	0	7	6	0	0	0	1	2
	Mean count	0	0	0	0.4	1	0.0	0.0	0.0	0.1	0.1
	Std. Dev.	0	0	0	1.6	2.1	0.0	0.0	0.0	0.2	0.5
	Mean (corrected)	0	0	0	0.4	2.1	0.0	0.0	0.0	0.2	0.1
Siadar	Effort (No. SSS)	21	12	24	22	16	6	12	28	18	16
	% zero counts	100%	100%	100%	100%	75%	100%	100%	100%	94%	94%
	Max count	0	0	0	0	17	0	0	0	1	2
	Mean count	0	0	0	0	1.9	0.0	0.0	0.0	0.1	0.1
	Std. Dev.	0	0	0	0	4.5	0.0	0.0	0.0	0.2	0.5
	Mean (corrected)	0	0	0	0	4.5	0.0	0.0	0.0	0.2	0.1
Combined	Effort (No. SSS)	42	26	44	42	34	12	24	52	36	32
	Sum of max count	0	0	0	7	23	0	0	0	2	4
	Sum of mean count	0.0	0.0	0.0	0.4	2.9	0.0	0.0	0.0	0.1	0.3
	Sum of Std. Dev.	0.0	0.0	0.0	1.6	6.6	0.0	0.0	0.0	0.5	1.0
	Sum of mean (corrected)	0.0	0.0	0.0	0.4	6.6	0.0	0.0	0.0	0.4	0.3
	Density birds/km ² (corrected)	0.00	0.00	0.00	0.03	0.43	0.00	0.00	0.00	0.03	0.02

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Table 25. The seasonal abundance of **common guillemot** recorded on the sea or actively foraging during snapshot scans (SSS) undertaken in Year 1 (Sept 2010 to Sept 2011) compared with the abundance recorded in SSS undertaken in Year 2 (Oct 2011 to Sept 2012).

VP	Measure	Year 1					Year 2				
		Autumn Sp-Oc10, Sp 2011	Early winter Nv-Dc 2010	Late winter Ja-Mr 2011	Spring Ap-Jn2011	Summer Jy-Ag 2011	Autumn Oc 2011, Sp 2012	Early winter Nv-Dc 2011	Late winter Ja-Mr 2012	Spring Ap-Jn2012	Summer Jy-Ag 2012
Mealabost	Effort (No. SSS)	21	14	20	20	18	6	12	24	18	16
	% zero counts	81%	93%	95%	95%	100%	50%	100%	100%	94%	100%
	Max count	1	0.3	0.5	1	0	1	0	0	1	0
	Mean count	0.1	0	0	0.1	0	0.5	0.0	0.0	0.1	0.0
	Std. Dev.	0.3	0.1	0.1	0.2	0	0.5	0.0	0.0	0.2	0.0
	Mean (corrected)	0.6	0.1	0.1	0.8	0	1.1	0.0	0.0	0.1	0.0
Siadar	Effort (No. SSS)	21	12	24	22	16	6	12	28	18	16
	% zero counts	81%	92%	100%	95%	94%	100%	100%	100%	83%	75%
	Max count	1	0.3	0	0.3	1	0	0	0	5	3
	Mean count	0.1	0	0	0	0.1	0.0	0.0	0.0	0.4	0.6
	Std. Dev.	0.3	0.1	0	0.1	0.3	0.0	0.0	0.0	1.2	1.1
	Mean (corrected)	0.5	0.3	0	0.2	1	0.0	0.0	0.0	6.2	3.4
Combined	Effort (No. SSS)	42	26	44	42	34	12	24	52	36	32
	Sum of max count	2	0.6	0.5	1.3	1	1	0	0	6	3
	Sum of mean count	0.2	0.0	0.0	0.1	0.1	0.5	0.0	0.0	0.5	0.6
	Sum of Std. Dev.	0.6	0.2	0.1	0.3	0.3	0.5	0.0	0.0	1.5	1.1
	Sum of mean (corrected)	1.1	0.4	0.1	1.0	1.0	1.1	0.0	0.0	6.3	3.4
	Density birds/km ² (corrected)	0.07	0.03	0.01	0.07	0.07	0.07	0.00	0.00	0.42	0.22

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Table 26. The seasonal abundance of **razorbill** recorded on the sea or actively foraging during snapshot scans (SSS) undertaken in Year 1 (Sept 2010 to Sept 2011) compared with the abundance recorded in SSS undertaken in Year 2 (Oct 2011 to Sept 2012).

VP	Measure	Year 1					Year 2				
		Autumn Sp-Oc10, Sp 2011	Early winter Nv-Dc 2010	Late winter Ja-Mr 2011	Spring Ap-Jn2011	Summer Jy-Ag 2011	Autumn Oc 2011, Sp 2012	Early winter Nv-Dc 2011	Late winter Ja-Mr 2012	Spring Ap-Jn2012	Summer Jy-Ag 2012
Mealabost	Effort (No. SSS)	21	14	20	20	18	6	12	24	18	16
	% zero counts	86%	93%	85%	85%	94%	67%	100%	92%	89%	63%
	Max count	3	0.7	5	2	2	2	0	7	2	15
	Mean count	0.2	0.1	0.5	0.2	0.1	0.5	0.0	0.3	0.2	1.7
	Std. Dev.	0.7	0.2	1.3	0.5	0.5	0.8	0.0	1.4	0.5	3.8
	Mean (corrected)	2.3	0.2	0.6	0.7	0.4	1.7	0.0	0.3	0.3	2.1
Siadar	Effort (No. SSS)	21	12	24	22	16	6	12	28	18	16
	% zero counts	86%	92%	92%	91%	100%	100%	100%	96%	94%	81%
	Max count	2.7	0.7	13	5	0	0	0	1	2	4
	Mean count	0.3	0.1	0.8	0.3	0	0.0	0.0	0.0	0.1	0.6
	Std. Dev.	0.7	0.2	2.9	1.1	0	0.0	0.0	0.2	0.5	1.3
	Mean (corrected)	3.8	1	1.4	0.8	0	0.0	0.0	0.0	0.4	2.9
Combined	Effort (No. SSS)	42	26	44	42	34	12	24	52	36	32
	Sum of max count	5.7	1.4	18	7	2	2	0	8	4	19
	Sum of mean count	0.5	0.2	1.3	0.5	0.1	0.5	0.0	0.4	0.3	2.3
	Sum of Std. Dev.	1.4	0.4	4.2	1.6	0.5	0.8	0.0	1.6	1.0	5.0
	Sum of mean (corrected)	6.1	1.2	2.0	1.5	0.4	1.7	0.0	0.4	0.8	5.0
	Density birds/km ² (corrected)	0.40	0.08	0.13	0.10	0.03	0.11	0.00	0.02	0.05	0.33

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Table 27. The seasonal abundance of **black guillemot** recorded on the sea or actively foraging during snapshot scans (SSS) undertaken in Year 1 (Sept 2010 to Sept 2011) compared with the abundance recorded in SSS undertaken in Year 2 (Oct 2011 to Sept 2012).

VP	Measure	Year 1					Year 2				
		Autumn	Early winter	Late winter	Spring	Summer	Autumn	Early winter	Late winter	Spring	Summer
		Sp-Oc10, Sp 2011	Nv-Dc 2010	Ja-Mr 2011	Ap-Jn2011	Jy-Ag 2011	Oc 2011, Sp 2012	Nv-Dc 2011	Ja-Mr 2012	Ap-Jn2012	Jy-Ag 2012
Mealabost	Effort (No. SSS)	21	14	20	20	18	6	12	24	18	16
	% zero counts	90%	71%	85%	25%	61%	100%	67%	92%	50%	69%
	Max count	3	11	1	4	12	0	15	1	3	1
	Mean count	0.2	1.4	0.2	1.4	1.7	0.0	2.2	0.1	0.8	0.3
	Std. Dev.	0.7	3.1	0.4	1.1	3.2	0.0	4.5	0.3	0.9	0.5
	Mean (corrected)	0.5	9.4	0.4	3.2	2.8	0.0	5.4	0.4	2.6	1.7
Siadar	Effort (No. SSS)	21	12	24	22	16	6	12	28	18	16
	% zero counts	90%	75%	100%	73%	63%	100%	83%	86%	67%	63%
	Max count	1	2	0	9	3	0	1	1	5	4
	Mean count	0.1	0.3	0	1.2	0.6	0.0	0.2	0.1	0.9	0.8
	Std. Dev.	0.3	0.7	0	2.5	0.9	0.0	0.4	0.4	1.6	1.2
	Mean (corrected)	0.3	4.7	0	3.4	1.6	0.0	1.4	1.2	6.7	2.3
Combined	Effort (No. SSS)	42	26	44	42	34	12	24	52	36	32
	Sum of max count	4	13	1	13	15	0	16	2	8	5
	Sum of mean count	0.3	1.7	0.2	2.6	2.3	0.0	2.3	0.2	1.7	1.1
	Sum of Std. Dev.	1.0	3.8	0.4	3.6	4.1	0.0	4.9	0.6	2.6	1.7
	Sum of mean (corrected)	0.8	14.1	0.4	6.6	4.4	0.0	6.8	1.6	9.3	3.9
	Density birds/km ² (corrected)	0.05	0.93	0.03	0.43	0.29	0.00	0.45	0.11	0.61	0.26

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Table 28. The maximum numbers of a species recorded in each coastal walkover section of the Siadar/Mealabost survey area from October 2011 to August 2012. Actively breeding birds are excluded as these are reported in Table 29. Percentages are rounded to nearest integer.

Species	Month/measure	7	8	9	10	11	12	All sections
Great Northern Diver	October	0	0	0	0	0	0	0
	December	1	0	0	0	3	0	4
	February	0	1	1	1	1	0	4
	April	1	0	0	2	1	0	4
	June	0	0	0	0	0	0	0
	August	0	0	0	0	0	0	0
	Maximum count	1	1	1	2	3	0	4
	% visits seen	33%	17%	17%	33%	50%	0%	50%
Grey Heron	October	1	0	0	0	0	0	1
	December	0	0	0	0	0	0	0
	February	1	0	0	0	0	0	1
	April	0	0	0	0	0	0	0
	June	1	0	0	0	0	0	1
	August	0	0	0	0	2	0	2
	Maximum count	1	0	0	0	2	0	2
	% visits seen	50%	0%	0%	0%	17%	0%	67%
Pink-footed Goose	October	0	0	0	0	0	0	0
	December	0	0	0	0	0	0	0
	February	0	0	0	0	0	0	0
	April	0	2	0	0	0	0	2
	June	0	0	0	0	0	0	0
	August	0	0	0	0	0	0	0
	Maximum count	0	2	0	0	0	0	2
	% visits seen	0%	17%	0%	0%	0%	0%	17%
Greylag Goose	October	0	55	0	4	4	26	89
	December	6	78	0	0	0	54	138
	February	0	43	7	0	58	30	138
	April	0	6	0	0	0	0	6
	June	0	0	0	0	0	0	0
	August	8	6	0	0	84	0	98
	Maximum count	8	78	7	4	84	54	138
	% visits seen	33%	83%	17%	17%	50%	50%	83%
Wigeon	October	17	0	0	0	0	0	17
	December	8	0	0	0	0	0	8
	February	50	0	0	0	0	0	50
	April	0	0	0	0	0	0	0
	June	0	0	0	0	0	0	0
	August	0	0	0	0	0	0	0
	Maximum count	50	0	0	0	0	0	50
	% visits seen	50%	0%	0%	0%	0%	0%	50%
Teal	October	0	0	0	0	0	0	0
	December	2	0	0	0	0	0	2
	February	27	0	0	0	0	0	27
	April	0	0	0	0	0	0	0
	June	0	0	0	0	0	0	0
	August	0	0	0	0	0	0	0

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Species	Month/measure	7	8	9	10	11	12	All sections
	August	0	0	0	0	0	0	0
	Maximum count	27	0	0	0	0	0	27
	% visits seen	33%	0%	0%	0%	0%	0%	33%
Mallard	October	36	0	0	0	4	0	40
	December	4	5	0	0	6	1	16
	February	4	0	0	0	6	0	10
	April	8	0	0	2	1	0	11
	June	17	0	0	0	11	0	28
	August	17	0	0	0	8	0	25
	Maximum count	36	5	0	2	11	1	40
% visits seen	100%	17%	0%	17%	100%	17%	100%	
Eider	October	0	0	0	0	0	0	0
	December	0	0	0	0	0	3	3
	February	0	5	4	8	0	0	17
	April	0	0	0	0	0	0	0
	June	0	0	0	0	0	0	0
	August	0	0	0	0	0	0	0
	Maximum count	0	5	4	8	0	3	17
% visits seen	0%	17%	17%	17%	0%	17%	33%	
Red-breasted Merganser	October	0	0	0	0	0	0	0
	December	0	0	0	0	0	0	0
	February	0	0	0	0	0	2	2
	April	0	0	0	0	0	0	0
	June	0	0	0	0	0	0	0
	August	0	0	0	0	0	0	0
	Maximum count	0	0	0	0	0	2	2
% visits seen	0%	0%	0%	0%	0%	17%	17%	
Buzzard	October	0	0	0	1	1	1	3
	December	0	0	0	0	0	0	0
	February	0	0	0	0	0	1	1
	April	0	0	0	0	0	0	0
	June	0	0	0	0	0	0	0
	August	0	0	0	0	0	0	0
	Maximum count	0	0	0	1	1	1	3
% visits seen	0%	0%	0%	17%	17%	33%	33%	
Merlin	October	0	0	0	0	0	0	0
	December	0	0	0	0	0	0	0
	February	0	0	0	0	0	0	0
	April	0	0	0	0	0	0	0
	June	0	0	0	0	0	0	0
	August	0	0	0	0	1	0	1
	Maximum count	0	0	0	0	1	0	1
% visits seen	0%	0%	0%	0%	17%	0%	17%	
Peregrine	October	0	0	0	0	1	0	1
	December	0	0	0	0	0	0	0
	February	0	0	0	0	0	0	0
	April	1	0	0	0	0	0	1

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Species	Month/measure	7	8	9	10	11	12	All sections
	June	0	0	0	0	0	0	0
	August	0	0	0	0	0	0	0
	Maximum count	1	0	0	0	1	0	1
	% visits seen	17%	0%	0%	0%	17%	0%	33%
Oystercatcher	October	4	0	0	1	1	0	6
	December	10	0	1	0	0	1	12
	February	3	2	0	14	4	0	23
	April	6	9	4	7	26	14	66
	June	13	11	0	2	15	4	45
	August	13	8	4	1	2	1	29
	Maximum count	13	11	4	14	26	14	66
% visits seen	100%	67%	50%	83%	83%	67%	100%	
Ringed Plover	October	0	0	0	0	0	0	0
	December	0	0	0	0	0	0	0
	February	0	0	0	0	0	0	0
	April	0	0	0	0	0	0	0
	June	25	0	0	0	22	0	47
	August	0	0	0	2	4	0	6
	Maximum count	25	0	0	2	22	0	47
% visits seen	17%	0%	0%	17%	33%	0%	33%	
Golden Plover	October	0	0	0	0	0	0	0
	December	0	0	0	0	0	0	0
	February	0	0	0	0	0	0	0
	April	0	4	0	0	0	13	17
	June	0	29	0	0	0	0	29
	August	3	0	0	0	0	0	3
	Maximum count	3	29	0	0	0	13	29
% visits seen	17%	33%	0%	0%	0%	17%	50%	
Knot	October	0	0	0	0	0	0	0
	December	0	0	0	0	0	0	0
	February	0	0	0	0	0	0	0
	April	0	0	0	0	0	0	0
	June	0	0	0	0	2	0	2
	August	6	0	0	0	0	0	6
	Maximum count	6	0	0	0	2	0	6
% visits seen	17%	0%	0%	0%	17%	0%	33%	
Sanderling	October	0	0	0	0	0	0	0
	December	0	0	0	0	0	0	0
	February	0	0	0	0	0	0	0
	April	0	0	0	0	0	0	0
	June	15	0	0	0	12	0	27
	August	6	0	2	0	0	0	8
	Maximum count	15	0	2	0	12	0	27
% visits seen	33%	0%	17%	0%	17%	0%	33%	
Purple Sandpiper	October	0	0	0	0	0	0	0
	December	28	0	0	0	0	0	28
	February	4	0	2	0	0	0	6

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Species	Month/measure	7	8	9	10	11	12	All sections
	April	6	0	0	0	0	0	6
	June	0	0	0	0	0	0	0
	August	0	0	0	0	0	0	0
	Maximum count	28	0	2	0	0	0	28
	% visits seen	50%	0%	17%	0%	0%	0%	50%
Dunlin	October	0	0	0	0	0	0	0
	December	0	0	0	0	0	0	0
	February	0	0	0	0	0	0	0
	April	3	0	0	0	0	0	3
	June	30	3	0	0	49	0	82
	August	9	0	0	0	0	0	9
	Maximum count	30	3	0	0	49	0	82
	% visits seen	50%	17%	0%	0%	17%	0%	50%
Common Snipe	October	0	0	0	0	0	0	0
	December	0	0	0	0	0	0	0
	February	1	0	0	0	0	0	1
	April	0	0	0	0	0	0	0
	June	0	0	0	0	0	0	0
	August	5	0	0	0	0	0	5
	Maximum count	5	0	0	0	0	0	5
	% visits seen	33%	0%	0%	0%	0%	0%	33%
Bar-tailed Godwit	October	0	0	0	0	0	0	0
	December	1	0	0	0	0	0	1
	February	0	0	0	0	0	0	0
	April	0	0	0	0	0	0	0
	June	0	0	0	0	0	0	0
	August	0	0	0	0	1	0	1
	Maximum count	1	0	0	0	1	0	1
	% visits seen	17%	0%	0%	0%	17%	0%	33%
Whimbrel	October	0	0	0	0	0	0	0
	December	0	0	0	0	0	0	0
	February	0	0	0	0	0	0	0
	April	8	2	0	0	0	11	21
	June	4	0	0	0	0	0	4
	August	0	0	0	0	0	0	0
	Maximum count	8	2	0	0	0	11	21
	% visits seen	33%	17%	0%	0%	0%	17%	33%
Curlew	October	6	0	1	2	1	2	12
	December	5	4	0	0	0	13	22
	February	7	0	0	0	6	2	15
	April	1	1	0	0	1	0	3
	June	6	5	0	0	0	0	11
	August	22	1	0	2	0	0	25
	Maximum count	22	5	1	2	6	13	25
	% visits seen	100%	67%	17%	33%	50%	50%	100%
Redshank	October	3	0	0	1	1	0	5
	December	9	1	0	0	2	0	12
	February	11	0	0	0	1	0	12
	April	28	0	1	5	7	1	42

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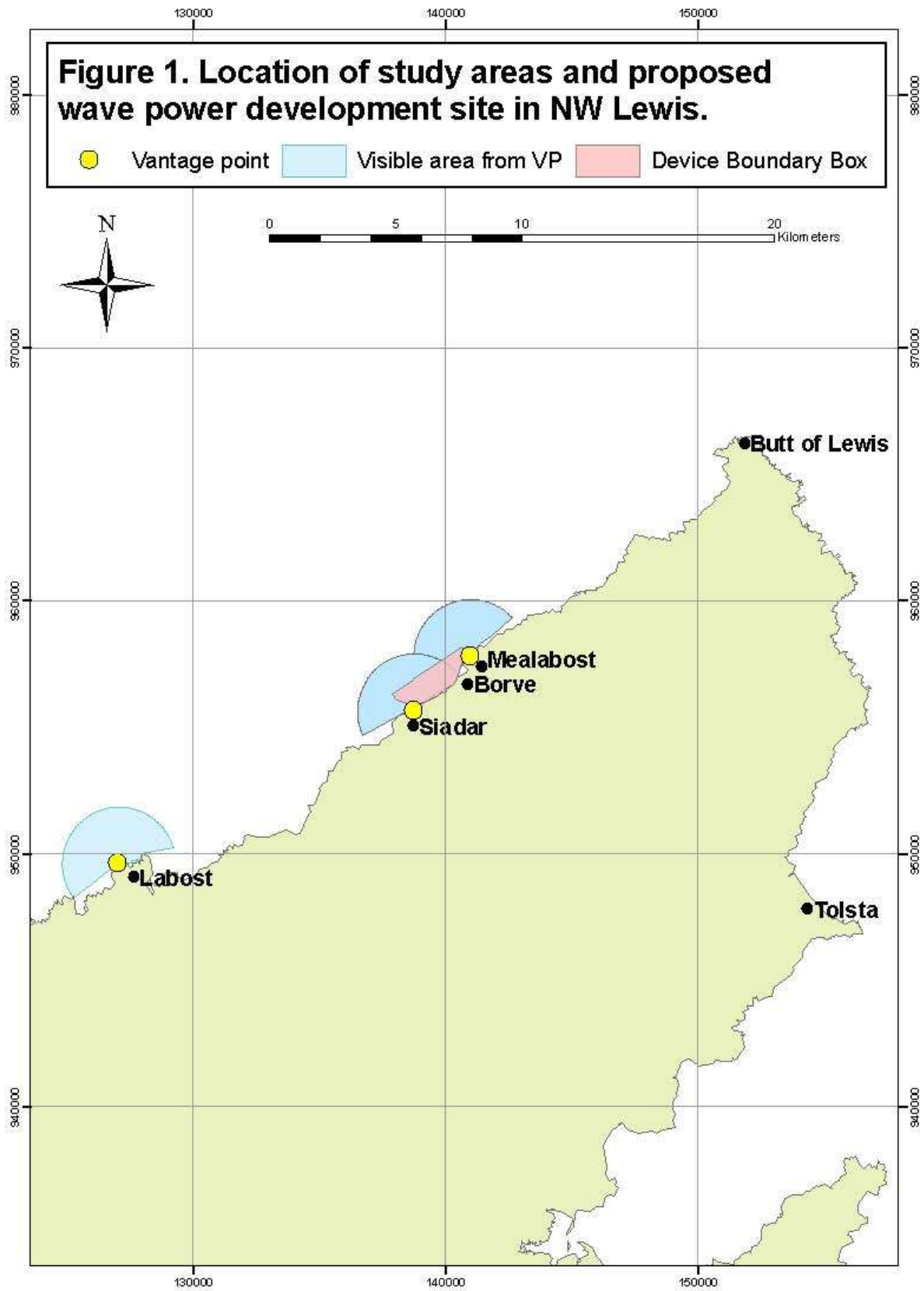
Species	Month/measure	7	8	9	10	11	12	All sections
	June	0	0	0	1	0	0	1
	August	37	0	0	0	0	1	38
	Maximum count	37	1	1	5	7	1	42
	% visits seen	83%	17%	17%	50%	67%	33%	100%
Greenshank	October	0	0	0	0	0	0	0
	December	0	0	0	0	0	0	0
	February	0	0	0	0	0	0	0
	April	2	0	0	0	1	0	3
	June	0	0	0	0	0	0	0
	August	0	0	0	0	1	0	1
	Maximum count	2	0	0	0	1	0	3
% visits seen	17%	0%	0%	0%	33%	0%	33%	
Turnstone	October	0	0	0	0	0	0	0
	December	7	0	0	3	2	0	12
	February	8	0	0	1	1	0	10
	April	44	0	0	0	0	0	44
	June	0	0	0	0	0	0	0
	August	7	1	0	0	1	0	9
	Maximum count	44	1	0	3	2	0	44
% visits seen	67%	17%	0%	33%	50%	0%	67%	
Black-headed Gull	October	0	0	0	0	0	0	0
	December	1	0	0	1	0	0	2
	February	0	0	0	0	0	0	0
	April	5	0	0	0	4	0	9
	June	0	0	0	0	6	2	8
	August	14	0	0	0	0	0	14
	Maximum count	14	0	0	1	6	2	14
% visits seen	50%	0%	0%	17%	33%	17%	67%	
Common Gull	October	0	0	0	0	0	0	0
	December	0	0	0	13	0	0	13
	February	9	0	0	4	18	0	31
	April	25	0	3	0	11	0	39
	June	0	0	0	0	8	0	8
	August	52	0	0	0	0	0	52
	Maximum count	52	0	3	13	18	0	52
% visits seen	50%	0%	17%	33%	50%	0%	83%	
Lesser Black-backed Gull	October	0	0	0	0	0	0	0
	December	0	0	0	0	0	0	0
	February	0	0	0	0	0	0	0
	April	0	0	0	0	0	0	0
	June	0	0	0	0	0	13	13
	August	0	0	0	0	0	0	0
	Maximum count	0	0	0	0	0	13	13
% visits seen	0%	0%	0%	0%	0%	17%	17%	
Herring Gull	October	20	0	0	0	0	0	20
	December	0	0	0	0	0	0	0
	February	6	0	0	0	0	0	6

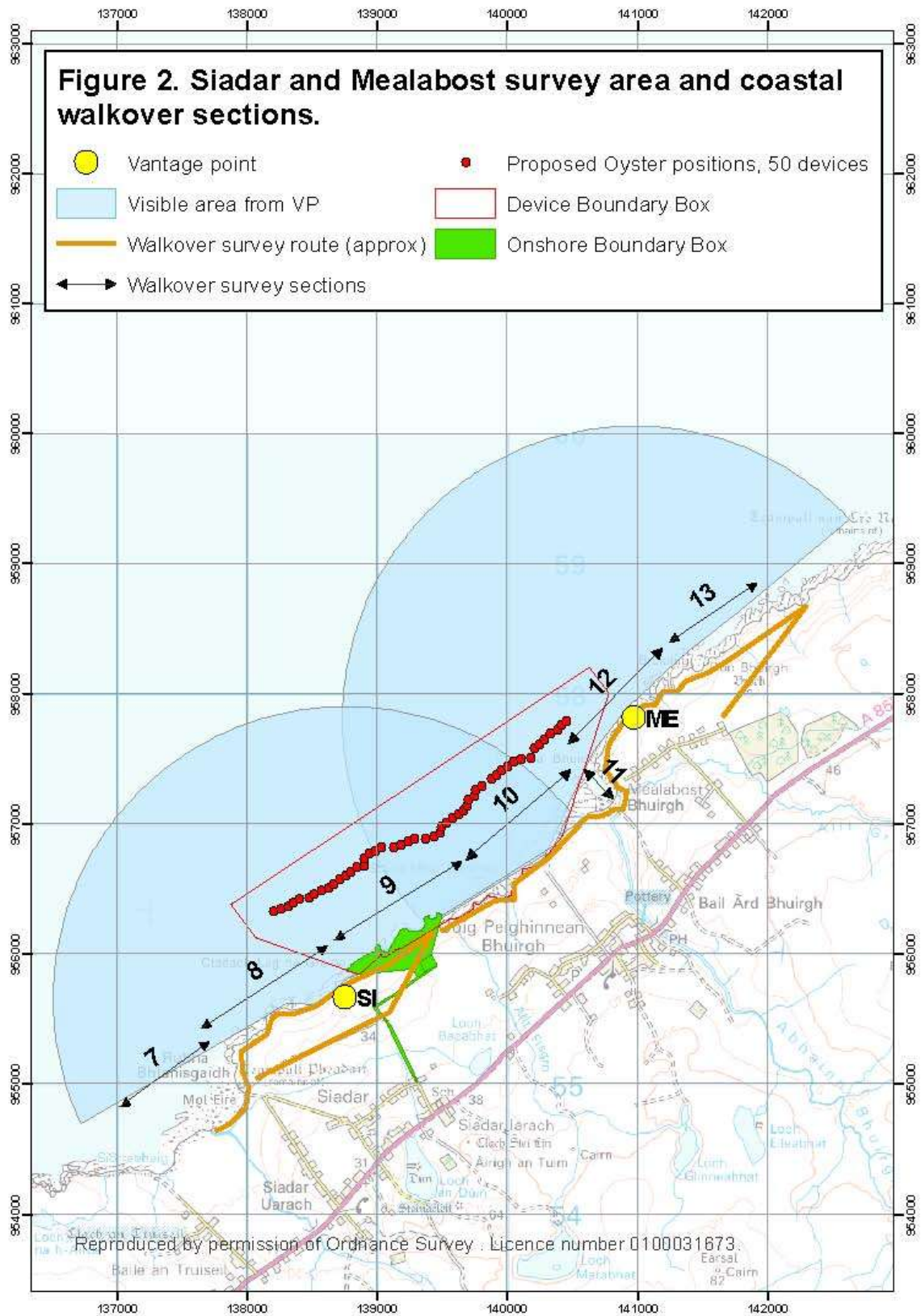
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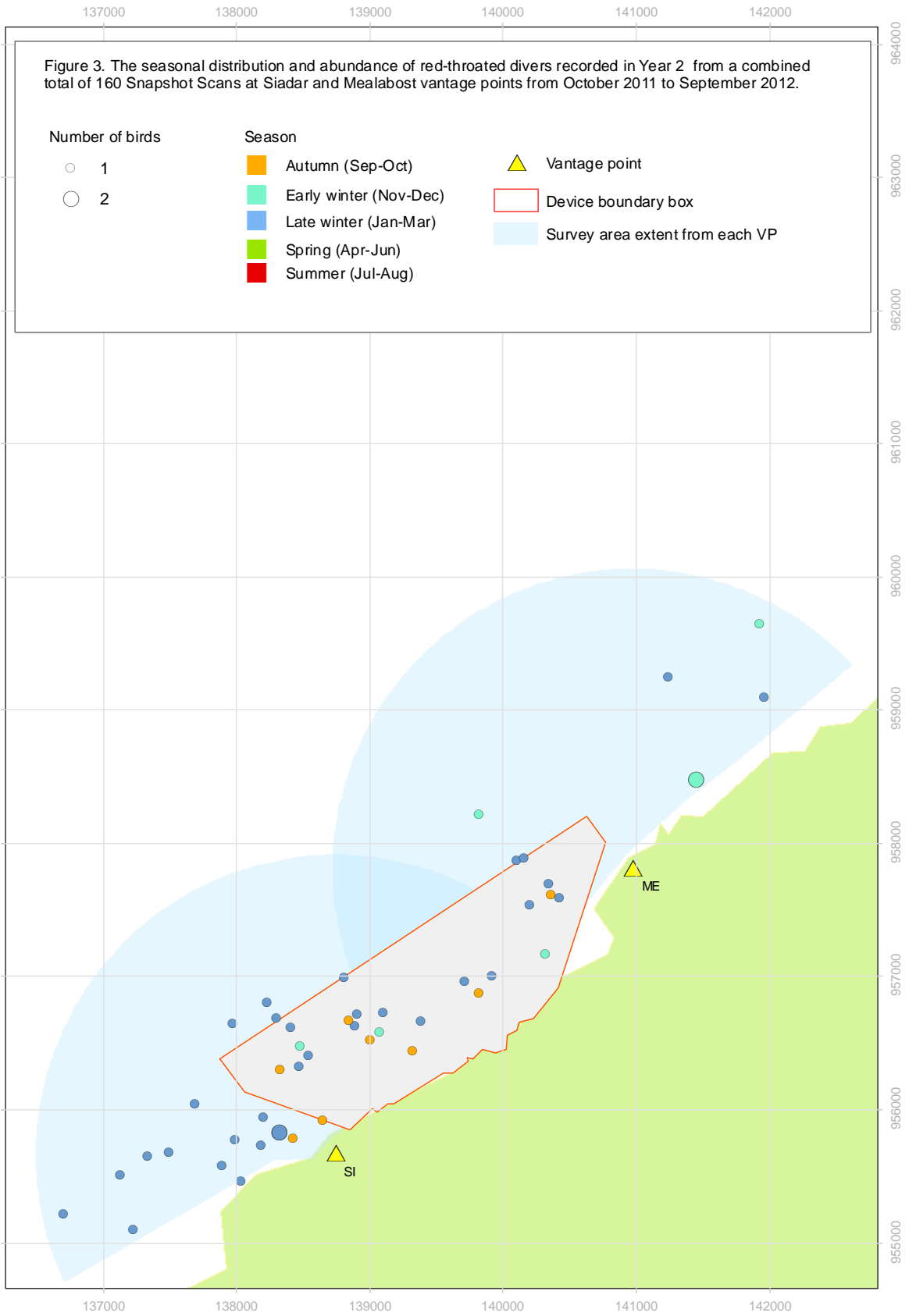
Species	Month/measure	7	8	9	10	11	12	All sections
	April	3	0	0	0	0	0	3
	June	0	0	0	0	0	0	0
	August	10	0	0	0	0	0	10
	Maximum count	20	0	0	0	0	0	20
	% visits seen	67%	0%	0%	0%	0%	0%	67%
Great Black-backed Gull	October	9	0	0	0	0	0	9
	December	0	0	0	0	0	0	0
	February	0	0	0	0	0	0	0
	April	0	0	0	0	0	0	0
	June	0	0	0	0	0	0	0
	August	0	0	0	0	0	0	0
	Maximum count	9	0	0	0	0	0	9
	% visits seen	17%	0%	0%	0%	0%	0%	17%

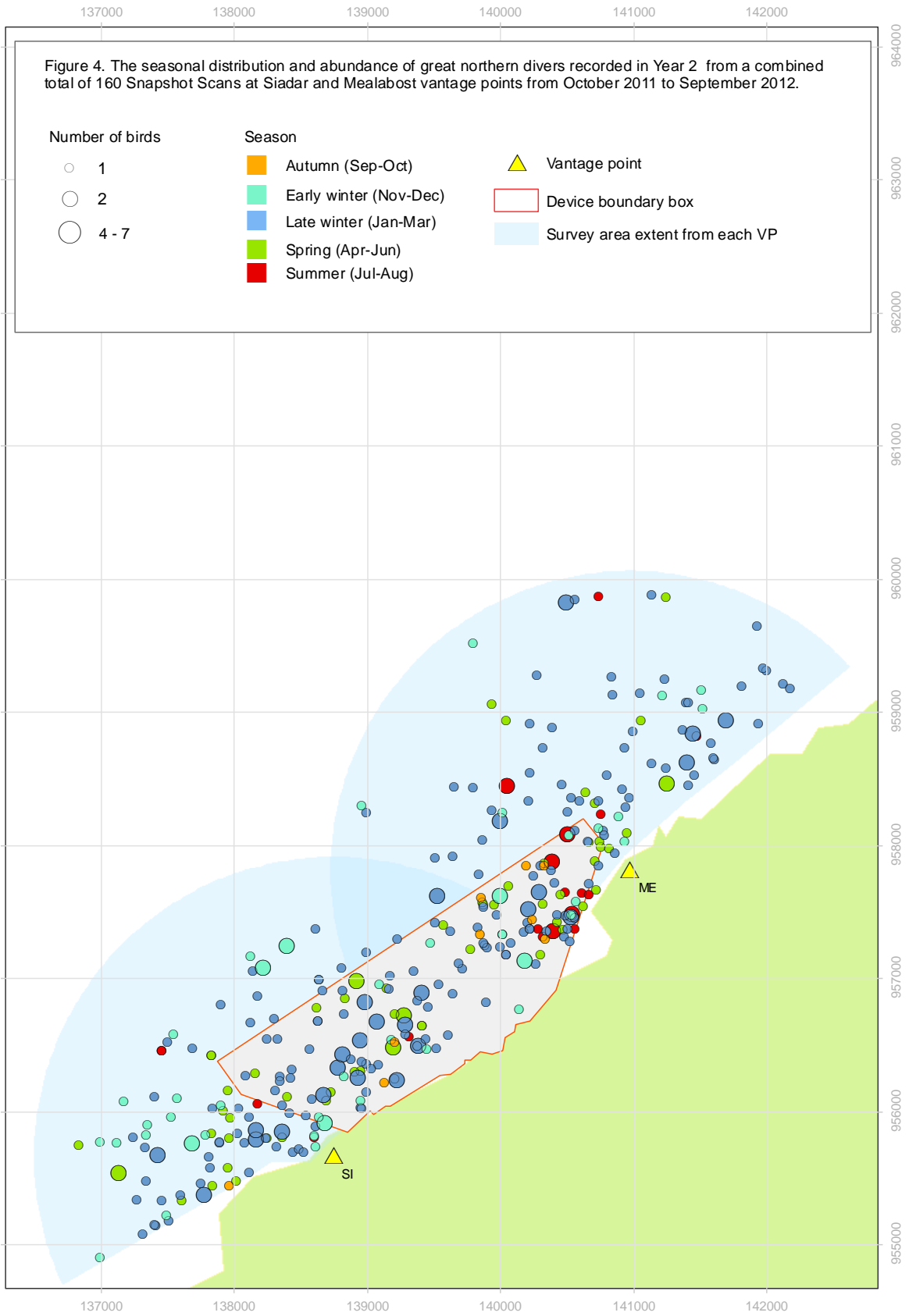
Table 29. The number of breeding bird recorded in the Siadar to Mealabost count sections in April-June 2012. The numbers indicated are pairs/territories unless stated otherwise.

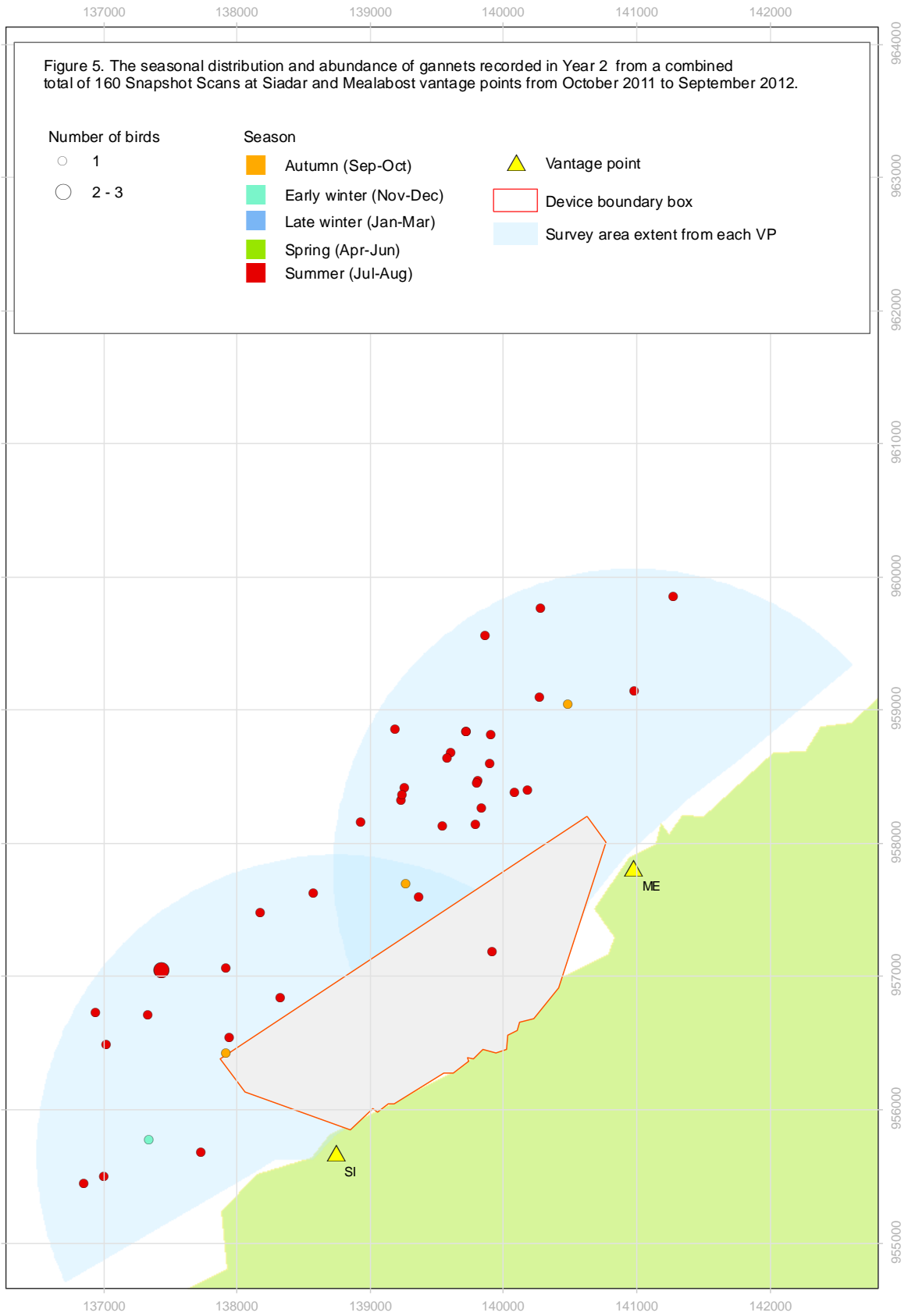
Species	Survey section						
	7	8	9	10	11	12	13
Fulmar	0	0	8	4	0	0	0
Corncrake		1	0	0	1	0	0
Common gull	0	4	0	4	0	0	0
Herring gull	0	0	0	2	0	0	0
Black-headed gull	0	0	1	0	0	0	0
Dunlin	0	0	1	1	0	0	0
Oystercatcher	0	2	5	2	0	0	0
Redshank	0	0	0	0	1	0	0

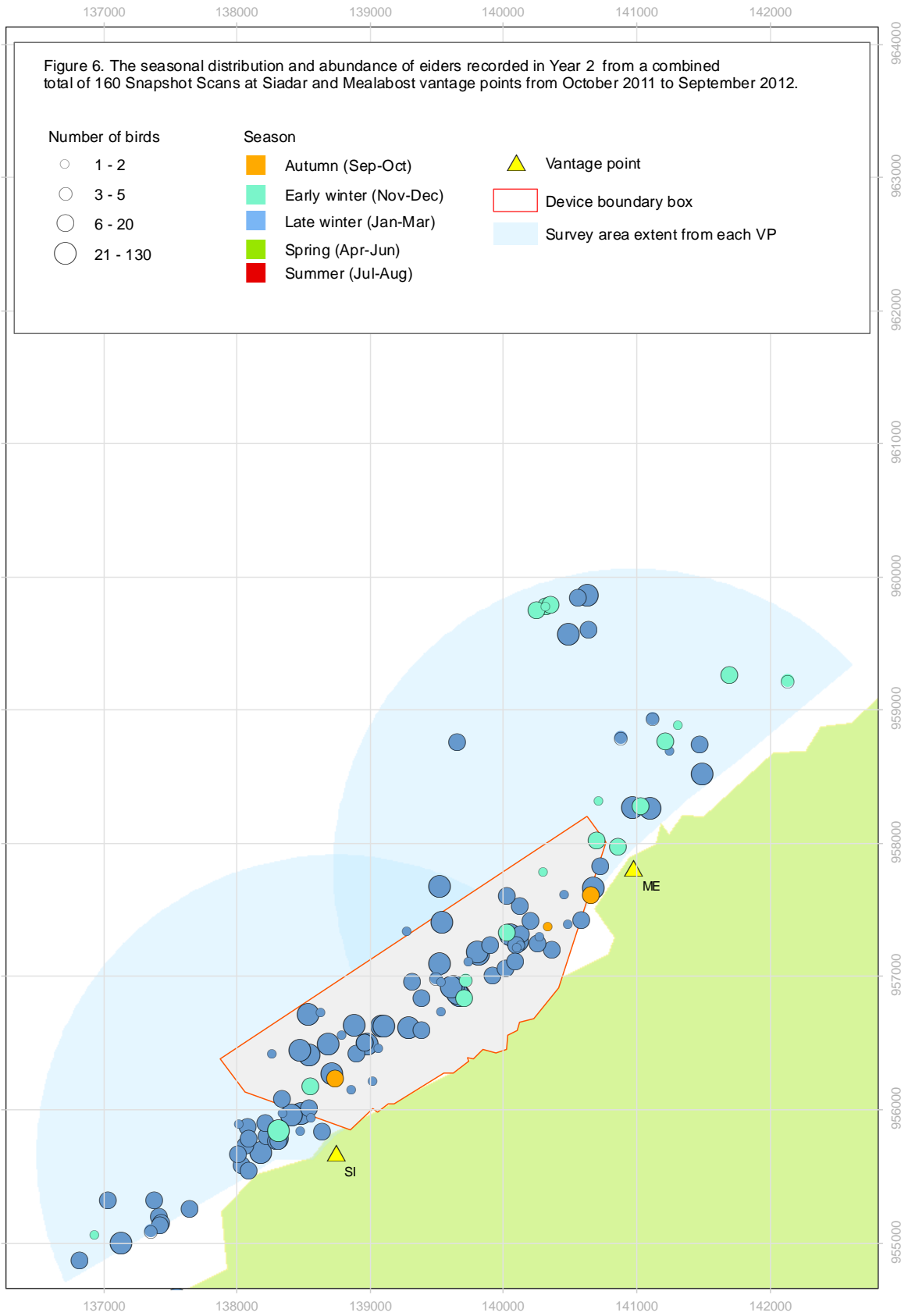


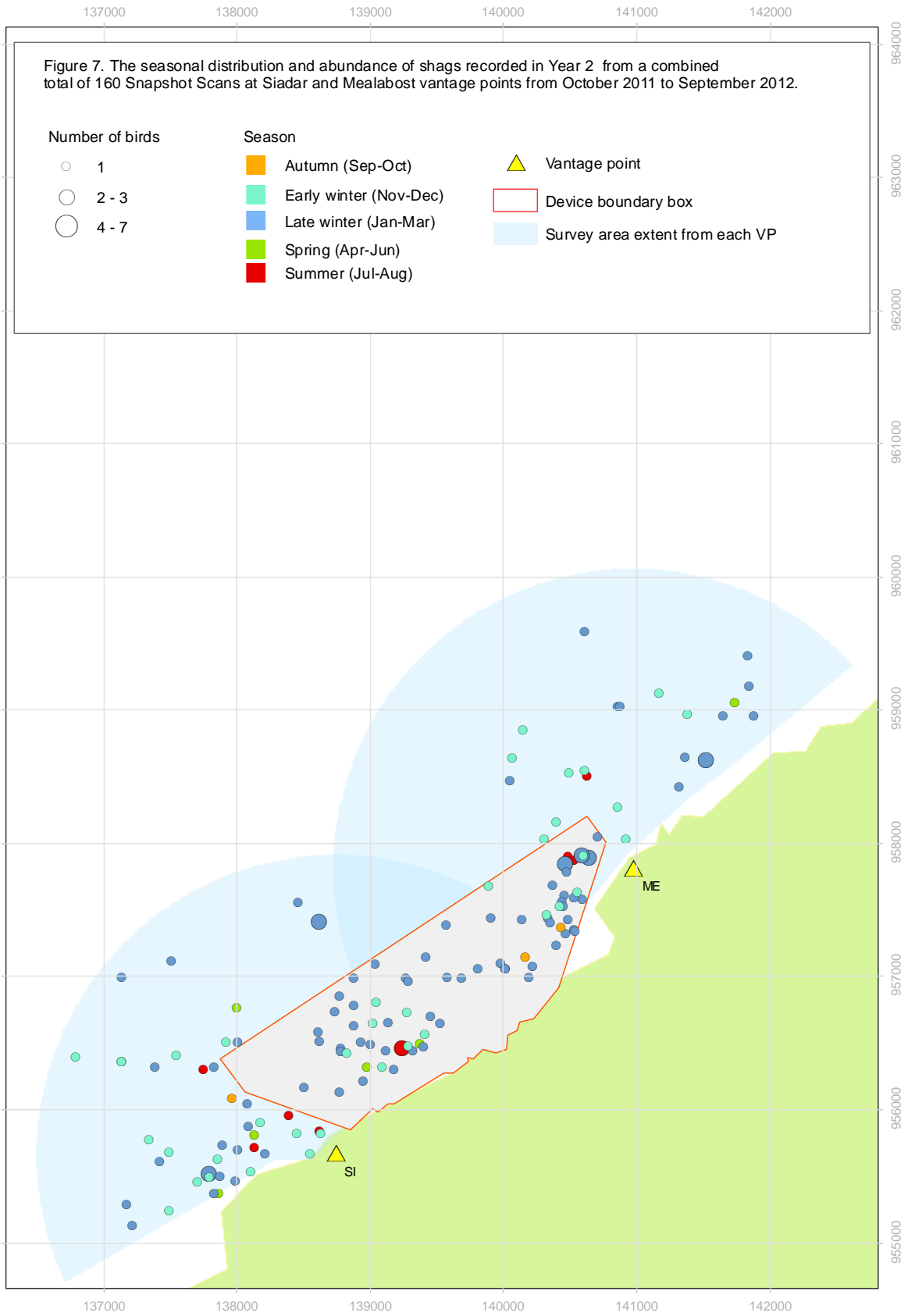


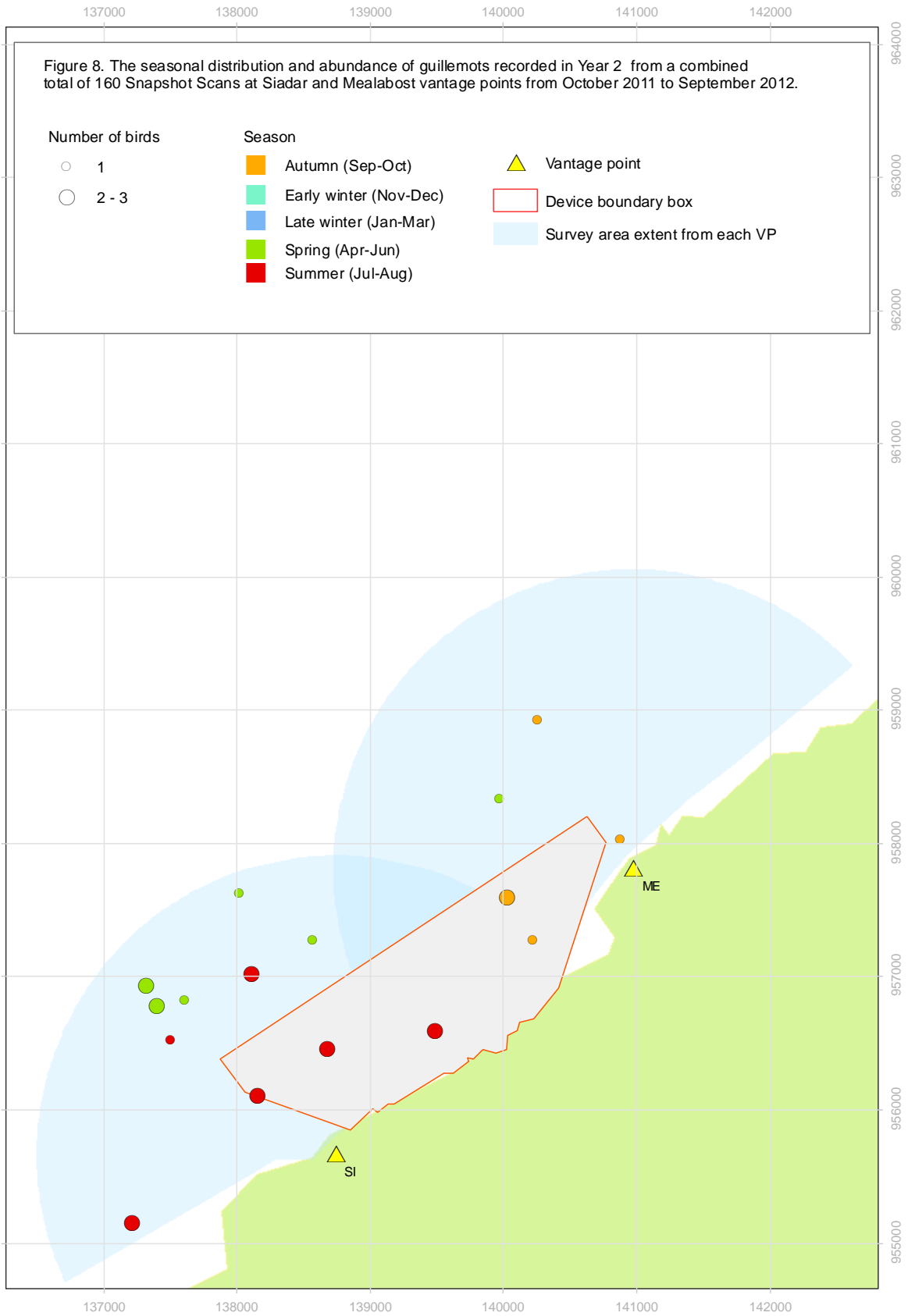


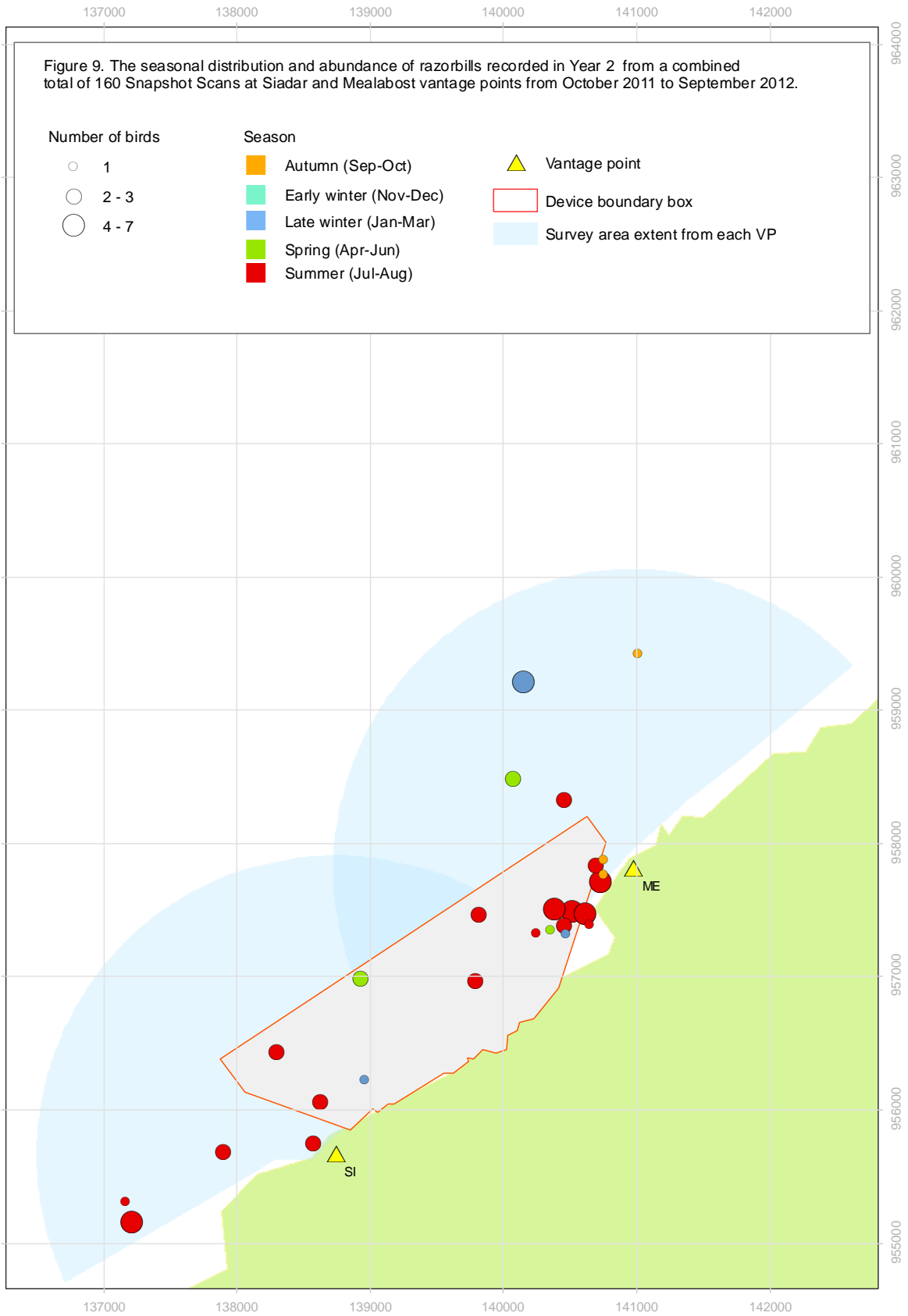


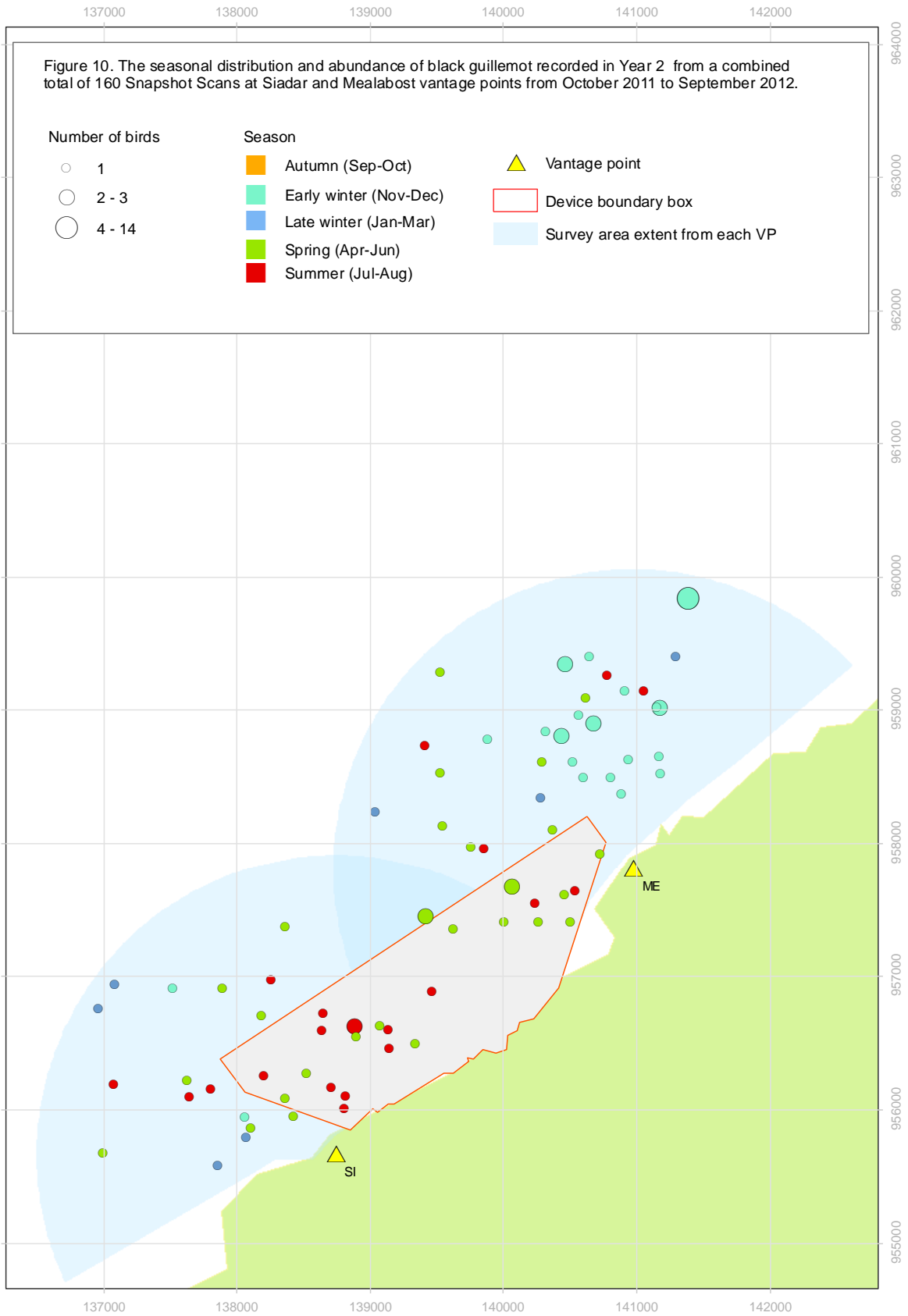












**LEWIS WAVE POWER LTD
40MW OYSTER WAVE
ARRAY**

Appendix 2

**Year 2 Marine Mammals &
Basking Shark Surveys
Technical Report**

Natural Research Projects Ltd

October 2012

Author: Digger Jackson



Natural Research Projects Ltd
Brathens Business Park
Hill of Brathens
Glassel
Banchory
AB31 4BY

0844 9060200

Introduction

1. This document reports the results of the second and final year of marine mammal and basking shark surveys from north-west Lewis conducted to give baseline data to inform the Environmental Impact Assessment (EIA) of Lewis Wave Power's proposed Oyster wave power development. It covers the period from October 2011 to the end of September 2012 when regular observations ended.
2. It also follows the Year 1 Marine Mammals and Basking Shark Surveys Report (Royal Haskoning, 2012b) that formed a technical appendix to the Lewis Wave Power Ltd 40MW Oyster Wave Array Environmental Statement Chapter 11: Marine Mammals and Basking Sharks (Royal Haskoning, 2012a) (Lewis Wave Power Limited, March 2012) which was submitted to Marine Scotland Licensing Operations Team (MS LOT) in support of a consents application for a 40MW wave array in March 2012.
3. Information of marine mammals and basking shark was collected alongside information on birds. Generic information for the Year 2 surveys (e.g., on survey design, survey aims, survey methods, maps of survey areas and tables of survey effort) is presented in detail in Appendix I: Year 2 Bird Surveys Technical Report (NRP 2012d), hereafter abbreviated to 'Y2 Birds TR'.
4. This report covers the marine areas and adjacent coastlines within 2 km of the two vantage points (VPs) situated at Siadar and Mealabost respectively. Together covering a continuous section of coast approximately 7 km. The proposed Oyster wave array project is located approximately centrally within this survey area (Fig. 2 in Y2 Birds TR).
5. Results from the second survey area at Labost (located approximately 10 km to the south west) are not presented in detail as observations here were terminated part way through the year following Lewis Wave Power's decision not to proceed with development plans there, at this stage. However, the few records of cetacean species and basking shark recorded at Labost in Year 2, 14 km to the south west are included and discussed as these provide additional context information on these scarce species.

Survey design, aims and methods

6. The survey design, aims and methods are described in full in the Y2 Birds TR, (see Appendix 1, NRP 2012d). The same methods were used to survey marine mammals and basking shark in Year 2 as were used in Year 1. Surveys were undertaken from two vantage points, located at Siadar (SI) and Mealabost (ME) respectively. Survey information on marine mammals and basking shark was collected during snapshot scans and 15-minute marine mammal watches (MMW). Any cetaceans or basking shark seen during the 5-minute flying-bird watches (FBW) were also recorded.

Results

Survey effort

7. The Year 2 VP survey effort was spread across 57 days (Table 4 in Y2 Birds TR) and was approximately equal at both VPs (Tables 6 - 8 of Y2 Birds TR).
8. The target number of VP watches was achieved in the majority of months through the year (Tables 6 - 8 in Y2 Birds TR). In some months there was a small shortfall in the target effort achieved, however, except for September 2012, surveyors were often able to entirely or partly make good a shortfall in the following month. The survey sites are very exposed and sea conditions were often unsuitable for survey work (i.e. sea-state >4). Lack of days in a month with suitable survey conditions was the cause of VP effort shortfalls.
9. Whenever possible, VP survey work was undertaken at times when there were conditions with a sea-state 3 or below (Tables 9 - 11 in Y2 Birds TR). Overall 76% of SSS VP watches were conducted in sea-state 3 or below. The remaining 24% were conducted in sea-state 4 (Table 9 in Y2 Birds TR).
10. The VP survey work over the year was approximately evenly distributed with respect to tide cycle.

Cetaceans

11. The Year 2 results corroborate the results for Year 1 and show that the Siadar/Mealabost coast is of generally low importance for cetaceans, with Risso's dolphin probably being the commonest species.
12. All sightings of cetaceans in Year 2 in the Siadar/Mealabost study area occurred between May 2012 and September 2012. No cetacean species were recorded during the October 2011 to April 2012 period.

Risso's dolphin

13. Risso's dolphins were seen on two, possibly three, dates in Year 2 off Siadar/Mealabost, all in May and August.
14. Two Risso's dolphins were seen on the 1st May off Siadar. They were approximately 1 km off shore and swam rapidly and directly through the survey area. Risso's dolphins were seen twice off Siadar on 14 August. The first sighting was of a pod of two at 14:43 hours swimming directly through the study area approximately 2.9 km offshore. Later, at 16:36 hours, a group of four was seen travelling quite slowly through in a NE direction, also at approximately 2.9 km off shore. It was possible this pod had a fifth and much smaller individual with them but this was not confirmed due to their long distance away from the observer.
15. An unidentified dolphin off Siadar on 7th May was considered most likely to be a Risso's dolphin (see below).
16. Risso's dolphins were also seen off Labost in Year 2: two, possibly three, were seen there on 26th March, and two pods totalling seven individuals were seen on 3rd May.
17. A dead Risso's dolphin measuring approximately 4 m in length was found in walkover Section 10 on 16th August.

18. The numbers and seasonal distribution of Risso's dolphins recorded in Year 2 in the Siadar/Mealabost survey area are broadly similar to that recorded in Year 1. In Year 1 there were two records of 5 and 6 animals in March and June respectively. Risso's dolphins were also seen off Labost on three dates in Year 2; in May, July and August respectively (Royal Haskoning, 2012b).

Common dolphin

19. There were no confirmed sightings of common dolphin recorded in the Siadar/Mealabost survey area during Year 2, nor were any seen off Labost. There were also no confirmed records for Siadar/Mealabost in Year 1, but they were seen off Labost on three dates, once in July and twice in October (Royal Haskoning, 2012b).

Unidentified dolphins

20. An unidentified dolphin on 7th May approximately 900 m off Siadar and heading NE was considered most likely to be a Risso's dolphin.

21. Two unidentified dolphins seen approximately 2.3 km off Siadar on 20th June heading NE were notably long-bodied, large and uniformly dark appearance. They were too far away and seen too briefly to identify positively but judging from their appearance were considered likely to be bottlenose dolphin. This species is scarce off the Lewis coast and was not seen during Year 1 surveys.

22. An unidentified dolphin was seen off Siadar on 29th June heading SW. No useful identification features were noted due to its distance away and brevity of time in view.

23. A pod of approximately ten unidentified dolphins were seen off Mealabost on 20th September approximately 4 km offshore associating with a mass of feeding gannets. Judging from their behaviour these were likely to have been either common, white-beaked or white-sided dolphin, but they were too far away to positively identify.

Porpoise

24. The only record of porpoise in Year 2 was a pod of three individuals seen off Siadar on the 18th August during a FBW watch. They were approximately 1900 m off the coast and recorded as swimming in a variable direction, which suggests they were foraging.

25. Porpoises were also rarely recorded off Siadar/Mealabost in Year 1, with only three records involving one to three animals (Royal Haskoning, 2012b). These were in December, January and March. There were also three Year 1 records off Labost, involving one to six animals; in September, December and August respectively.

26. Porpoises appear to be uncommon in the Siadar/Mealabost survey area and are clearly much less common than at some other sites around the Outer Hebrides, where they are regularly seen in moderate numbers (e.g. the Minch).

Minke whale

27. No minke whales were recorded in the Mealabost/Siadar study area during Year 2. This compares to two confirmed and one unconfirmed records of single individuals seen in Year 1, in October, April and June respectively (Royal Haskoning, 2012b).

28. A single minke whale was seen off Labost in June of Year 2.

Seals

The summary results for seals are restricted to animals seen during marine mammal watches.

Grey seal

29. Small numbers of grey seals were seen in the Siadar/Mealabost survey area throughout Year 2. They were recorded during 1.4% to 33% of the 15-minute marine mammal watches, depending on the month (Table 1), with a tendency for records to be more frequent in July, August and November.

30. The maximum number of grey seals seen in any single 15-minute marine mammal watch was two (eight occasions of 64 positive MMWs) but usually only a single individual was seen (56 occasions).

31. Although it was unusual for more than one individual to be visible at any one time it was clear from individual differences in pelage markings and their distribution that there were several individuals frequenting this stretch of coastline, but probably not more than five (at any one time).

32. Almost all grey seals seen were alone, swimming or loafing in the surf zone within approximately 25 m of rocky coast habitat or in small bays (e.g., Siadar bay and Barvas River bay). It was not unusual for a grey seal to 'pop-up' relatively close to a VP and watch the observer for a while.

33. Hauled-out seals along the coast were looked for but none were seen.

34. The numbers of grey seals frequenting the study area were similar to the number seen in the same period in Year 1 (Royal Haskoning, 2012b) and were very low in the context of the regional population (over 10,000) of this species.

Table 1. Summary of grey seals seen during 15-minute marine mammal watches (MMW) in the Siadar/Mealabost survey area during Year 2.

Month	No. MMW	Sum of no. seen	Maximum no. seen	No. +ve MMW	% +ve MMW
10	28	3	2	2	7.1%
11	56	17	2	14	25.0%
12	28	1	1	1	3.6%
1	70	1	1	1	1.4%
2	35	3	1	3	8.6%
3	77	9	1	9	11.7%
4	28	3	1	3	10.7%
5	42	2	1	2	4.8%
6	56	5	1	5	8.9%
7	54	10	2	9	16.7%
8	42	17	2	14	33.3%
9	14	1	1	1	7.1%

Basking shark

35. Basking sharks were recorded in the Siadar/Mealabost survey area on four dates only in Year 2, all between 26th July and 21st August. Two individuals were seen feeding together about 2 - 3km offshore off Mealabost on 26th July. Single

basking sharks were seen off Siadar on 15th, 18th and 21st August at approximately 1300 m, 2900 m and 300 m off the coast, respectively.

36. Single basking sharks were also seen off Labost on 29th June and 21st of August.

37. The number of basking sharks recorded in the study areas in Year 2 was similar to the number seen in the in Year 1 (Royal Haskoning, 2012b).

References

- NRP 2012d. Lewis Wave Power Ltd 40MW Oyster Wave Array Environmental Statement Addendum: Appendix I: Year 2 Bird Surveys Technical Report.
- Royal Haskoning 2012a. Lewis Wave Power Ltd 40MW Oyster Wave Array Environmental Statement: Chapter 11 Marine Mammals and Basking Sharks.
- Royal Haskoning 2012b. Lewis Wave Power Ltd 40MW Oyster Wave Array Environmental Statement: Appendix 11.1: Year 1 marine mammals and basking shark survey report.