



ABERDEEN HARBOUR
EXPANSION PROJECT
November 2015

*Volume 3:
Technical
Appendices*

APPENDIX 14-B MARINE ORNITHOLOGY SUPPORTING INFORMATION



14-B MARINE ORNITHOLOGY – SUPPORTING INFORMATION

14-B1 Survey Methodology Correspondence with SNH March and April 2014

Table 14-B1: Survey methodology correspondence with SNH

No.	SNH Comment	Fugro EMU Response
1	As mentioned in our advice of 29 May 2013, a minimum of one year's bespoke survey is likely to be required to characterise the site and quantify impacts. The desk based review must however be used to inform the thinking on this i.e. if the review or the results of the first years survey indicates the area is highly important for birds, two years data may be required.	AHB are aware that, subject to the results of the first year of survey, an additional year of survey may be required. This will be reviewed once the first 9 months of the first year of survey has been analysed - Data obtained from WeBS and the JNCCs aerial data indicate that Nigg Bay is no more important for marine birds than elsewhere along this area of coastline, but does demonstrate connectivity with SPAs designated for sea ducks.
2	Section 3.2 – the VPs appear to give good coverage of the development site itself. We recommend consideration is given to the 'adjacent areas' where marine mammals may be transiting through. Including a north looking VP1 and a south facing VP2 would help address this and wouldn't need to be surveyed as much as the development area.	Two additional VPs have been proposed (VP3 and VP4), which focus on any marine mammals and any other visible marine life including basking shark to the northeast and southeast of the development area and will be surveyed for 1 hour each for each month. The purpose of these vantage points is to complement and verify the C-Pod data. VP4 (to the south of the development site) will be trialled for a two month basis to determine the value of the data collected from this point. The conclusions of this will be discussed with SNH.
3	Section 3.2.1, First bullet point – The methodology seems to propose a single observer to record both birds and mammals. This is not ideal although a good, all round observer may be sufficient at this site providing that marine mammals are given equal footing with the birds. We would like to see the CV of the chosen surveyor(s). We suggest trialling this arrangement for a couple of months and then reviewing the results. It may also be useful for us to actually visit the site when monitoring is underway, to get a better understanding of the issues the observers face.	The following text has been added to section 3.3, in line with SNH's comment: <i>"If a single observer is regarded to meet these credentials the use of one observer only will be trialled to ensure that results are sufficient. It is considered beneficial to have a single observer to negate the need for coordinating site visits in advance. This would also allow the observer to utilise weather windows in an efficient manner".</i> Once an observer has been appointed, Fugro EMU will provide SNH with the observer's CV and contact details to allow SNH to make a site visit whilst surveys are in operation. Site visit made on 27 October 2014.
4	Section 3.2.1, First bullet point – It is not clear why dawn and dusk would be targeted for the VP work. As part of the site characterisation it is necessary to find out how it is used throughout the day and what species would usually be present when construction/operations work takes place. In addition, there are detection issues with surveying out to 2 km over the water at dusk. Consequently we recommend that watches are organised to sample all daylight hours.	Dawn and dusk surveys were proposed to allow data on roosting behaviour to be detected. However the wording has been revised to ensure that survey hours are organised to sample all daylight hours, including dawn and dusk.

Table 14-B1: Survey methodology correspondence with SNH continued

No.	SNH Comment	Fugro EMU Response
5	Section 3.2.2 – the breakdown of the survey period is unclear. In particular, whether birds alone would be surveyed for 10 minutes and then marine mammals. Splitting it into 10 minute segments is good for getting enough independent samples but it will be tricky at this site with the size of the viewsheds to cover everything. We would like to see this worked up a bit more and would suggest it includes walking round the coast from VP1 to overlook the bay (this could be VP3 that is done on a less rigorous time schedule).	More comprehensive breakdowns of the survey period and of each 3 hour watch have been provided in Tables 2 and 3. Additionally, the interval time has been doubled from 10 minutes to 20 minutes, in line with SNH's comment to allow more time to capture activity in Nigg Bay. However Fugro EMU acknowledges that this is not consistent with the bird surveys undertaken for the European Offshore Wind Deployment Centre, which used 10 minute intervals.
6	Section 3.2.2 – Noting just the 'aggregation' of birds will not produce useful data. The birds that are there will either need to be identified and counted (including records of zero counts), or not.	The wording has been revised for clarity. Notes of shorebirds will be undertaken in line with ESAS guidelines.
7	Section 3.2.2, Third bullet point – this is unclear and should be more detailed and specific. Assessing disturbance effects is a different task and it is not clear how useful ad-hoc records would be other than as contextual data.	Text vessel disturbance observations has been added to state that the observations will be used as contextual data only.
8	Section 3.2.2, Fourth bullet point – if bird behaviour is to be recorded, a set of standard categories should be defined and each record allocated to one of those.	Text has been added to clarify that behaviour will be recorded according to ESAS guidance behaviour codes where possible.
9	Section 3.2.3, Second bullet point – we strongly recommend the scope is fitted with an inclinometer or a laser rangefinder to enable you to carry out distance correction.	Text has been added state that the observer will be equipped with an inclinometer to allow calculations of distance.
10	Section 3.4 – we advise that surveys should only be carried out in sea state 3 or under. This site is easily accessible so there should be no need to survey in sea state 4.	Fugro EMU advise that capping survey conditions to allow sea state 3 or under only, will not allow surveys to be undertaken for the majority of the year, and will not allow the full survey effort proposed. The nearest grid site taken from a Fugro report for wave data for the North Sea shows that a sea state of 3 (0.5 m to 1.25 m wave height – in accordance with the Meteorological Organisation definition) is exceeded approximately 65% of the year (taking a conservative wave height of 1 m, as the data are unfortunately in 0.5m subsets). Some months a sea state of 3 is exceeded almost 85% of the time. Additionally, the chosen vantage points are >10 m above sea level, on a stable platform and therefore offer a significantly better visibility/ angle of view than from a vessel based platform, where the widely used Camphuysen et al. (2004) methodology is used (specifying sea state <=3 for marine mammals and <=4 for sea birds).



Table 14-B1: Survey methodology correspondence with SNH continued

No.	SNH Comment	Fugro EMU Response
10 Cont.	Section 3.4 – we advise that surveys should only be carried out in sea state 3 or under. This site is easily accessible so there should be no need to survey in sea state 4.	A review of the suitability of the methods will be undertaken and discussed with SNH after the first two months of survey. Site visit was undertaken with the surveyor, SNH and AHB on the 27 October 2014. Issues addressed at the meeting were marine mammal and bird surveys carried out at the same time, distance estimates rather than clinometers and sea states for the survey
11	Section 4.0 – the use of C-PODS appears to be crucial to this methodology and it is important to deploy them as soon as you are able.	The deployment of C-PODS has been identified as a critical path in the EIA programme and discussions with Marine Scotland are underway to progress the deployments and agree final locations.
12	Section 5.2 – the geographic extent of the terrestrial bird survey areas needs to be defined.	A plot showing the area to be covered by the terrestrial bird survey has been provided in Figure 7 (of the email dated 24 April 2014)
13	<p>SNH Email of 12 November 2014, in response to site visit Your alternative approach (to the distance measured by clinometer) seems a reasonable compromise and we would expect the plotting to be sufficiently accurate for the near-shore observations at least.</p> <p>For distances beyond, say, 1 km, it may be best to simply allocate birds to a broad distance band, rather than plot dots on a map, which could imply a level of spatial accuracy that just isn't being achieved.</p>	500 m band was suggested for birds recorded 1 km and beyond, this approach was agreed by SNH on the 13 November 2014

14-B2 Walk-over and Ad-Hoc Survey Counts, and Regional WeBS Data

Species diversity and maximum counts recorded during the ad hoc surveys are higher than those recorded on the walk-over surveys for Nigg Bay, which should be expected given the relative level of effort for each survey, and the wider temporal spread of the ad hoc counts over each month.

For the key species of wader, the ad hoc counts support the seasonal trends recorded by the walk-over survey data (Figure 14-B1 to Figure 14-B5). Both the ad hoc counts and the walkover counts indicate that the populations recorded in Nigg Bay are well below non-breeding SPA thresholds for all species recorded, and are not significant at the regional or national level.

The WeBS data confirm the relative importance of the SPAs to wader populations within the region (Table 14-B2 to Table 14-B14). Peak monthly counts in the SPAs for the majority of species are significantly higher overall than in Nigg Bay and the coastal sectors to the immediate north and south the bay (often by an order of magnitude). However, ruddy turnstone, whimbrel and purple sandpiper deviate from this general pattern.

The WeBS peak counts for ruddy turnstone are broadly similar across all five WeBS sectors (Figure 14-B6), although the Dee Mouth to Don Mouth sector had more than twice the overall peak counts of the Nigg Bay and Girdleness sector (Table 14-B6). The peak count recorded is 12% of the non-breeding SPA threshold for turnstone.

Whimbrel are a passage migrant up the east coast to breeding grounds in the north of Scotland, Orkney and Shetland. The low and infrequent WeBS peak counts in all five sectors demonstrate this migratory pattern. Whimbrel have only been recorded in Nigg Bay during August; however they have been recorded in the Ythan Estuary SPA during four months of the year, and in Montrose SPA during six months of the year (Table 14-B11). The peak count recorded is 14% of the non-breeding SPA threshold for whimbrel.

WeBS data show purple sandpiper are most frequently observed within the Dee Mouth to Don Mouth sector, with the Nigg Bay and Girdleness sector having the second overall highest peak monthly counts of the five sectors in the region (Table 14-B14). Peak counts are around 20% higher within the Dee Mouth to Don Mouth sector than Nigg Bay and Girdleness. The highest counts within Nigg Bay and Girdleness were recorded between November and March. The peak count recorded is 57% of the non-breeding SPA threshold for purple sandpiper. It should be noted that this WeBS sector includes the mouth of the River Dee and the existing harbour breakwaters. The population of purple sandpiper within this sector comprises a significant proportion of individuals that roost on the existing breakwaters, and may not be utilising Nigg Bay itself, as confirmed from their general absence from the dedicated wader walkovers conducted within the Bay, as opposed to the ad-hocs surveys which surveyed the greater area.

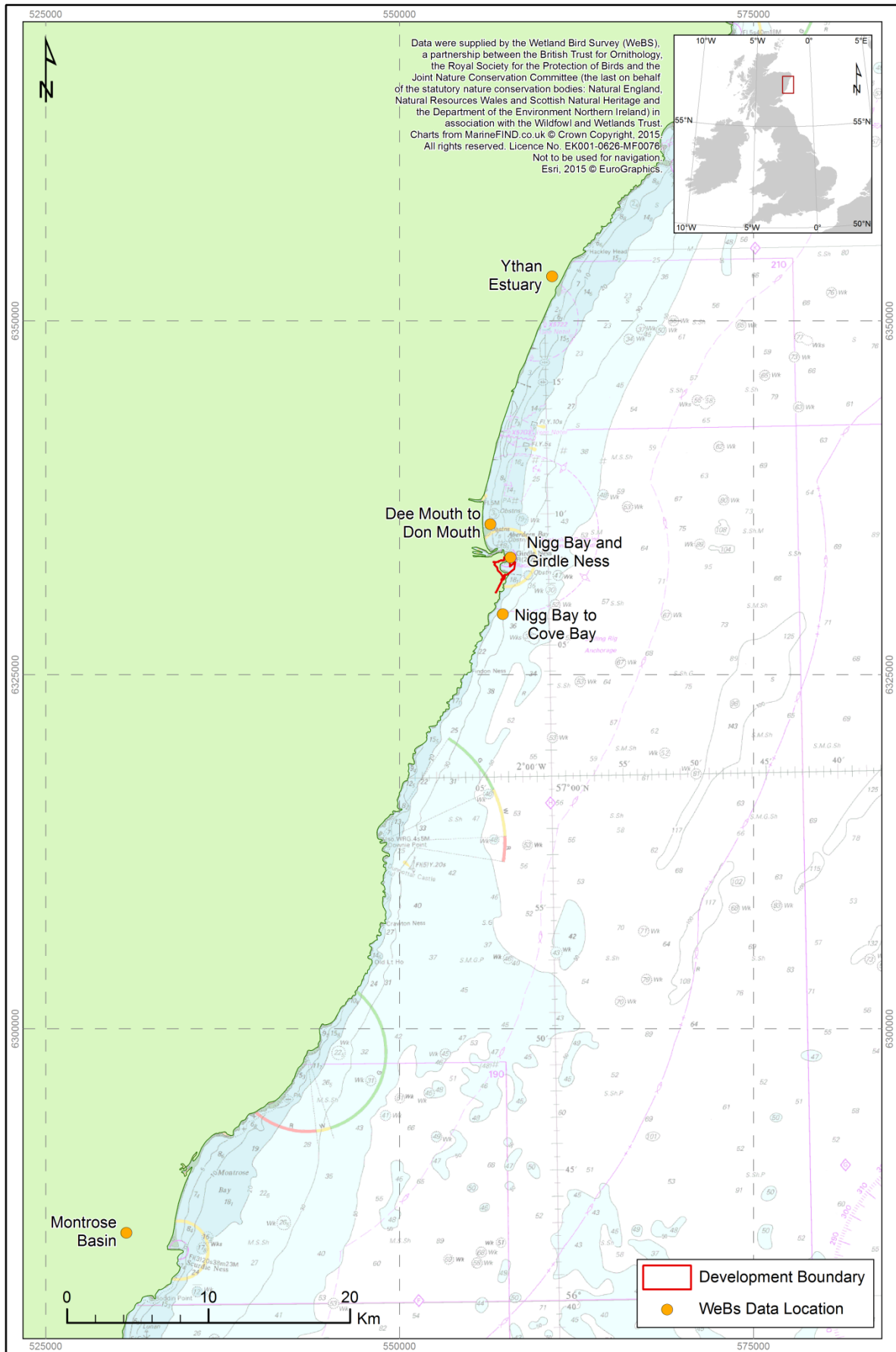


Figure 14-B6: WeBs sector locations

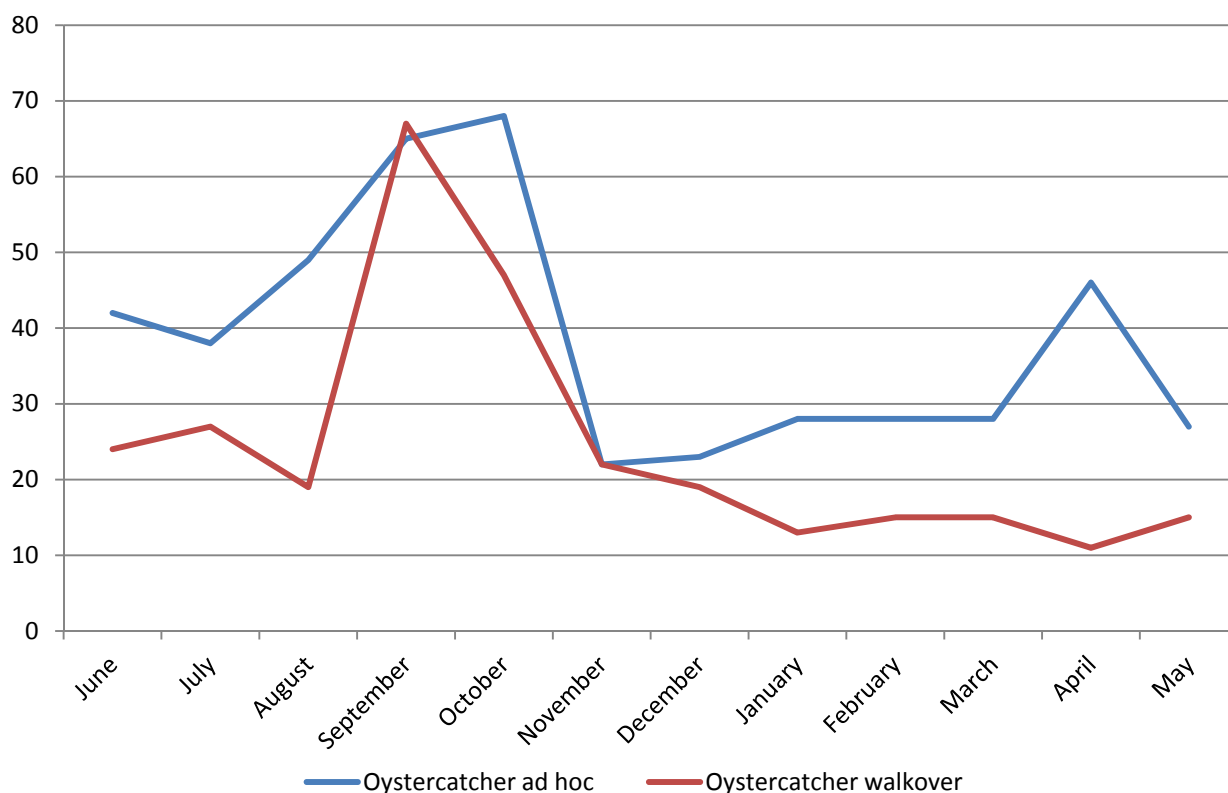


Figure 14-B1: Counts of oystercatcher from walk-over and ad hoc surveys

Table 14-B2: Five year peak monthly counts of oystercatcher (WeBS data*)

WeBS Sector	Nigg Bay and Girdleness	Ythan Estuary SPA	Montrose Basin SPA	Nigg Bay to Cove Bay	Dee Mouth to Don Mouth
June	43	274	376	20	34
July	68	579	718	80	342
August	164	537	1618	139	357
September	133	703	1964	86	168
October	187	752	1385	70	133
November	239	894	1490	45	21
December	70	874	1398	96	72
January	204	739	1333	124	61
February	124	600	1766	139	40
March	143	523	1029	101	21
April	37	340	400	50	52
May	41	243	377	38	53

Note:

Nigg Bay and Girdleness, Ythan Estuary SPA, and Montrose Bay SPA 5 year period covers period 2009/2014. Nigg Bay to Cove Bay and Dee Mouth to Don Mouth 5 year period covers period 2004/2009.

* "Data were supplied by the Wetland Bird Survey (WeBS), a partnership between the British Trust for Ornithology, the Royal Society for the Protection of Birds and the Joint Nature Conservation Committee (the last on behalf of the statutory nature conservation bodies: Natural England, Natural Resources Wales and Scottish Natural Heritage and the Department of the Environment Northern Ireland) in association with the Wildfowl and Wetlands Trust"

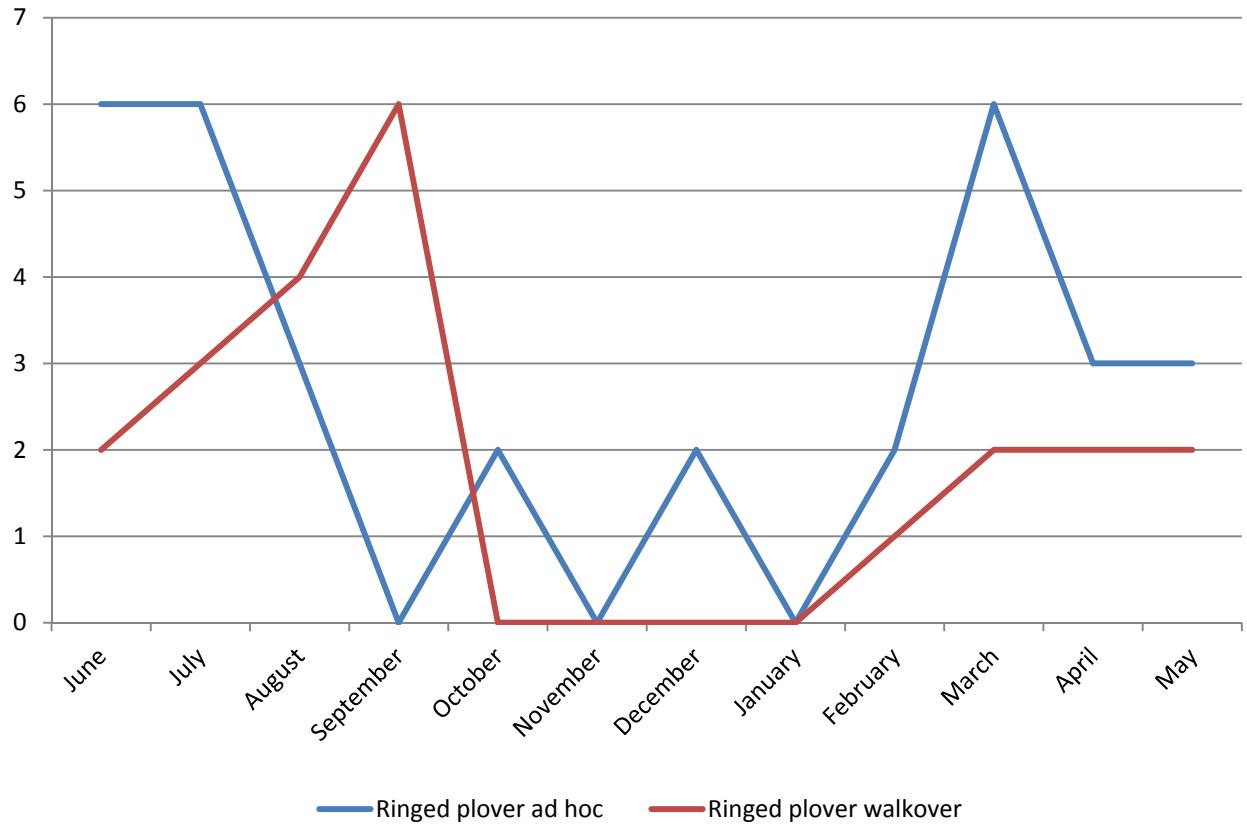


Figure 14-B2: Counts of ringed plover from walk-over and ad hoc surveys

Table 14-B3: Five year peak monthly counts of ringed plover (WeBS data*)

WeBS Sector	Nigg Bay and Girdleness	Ythan Estuary SPA	Montrose Basin SPA	Nigg Bay to Cove Bay	Dee Mouth to Don Mouth
June	6	12	51	1	2
July	4	10	43	0	0
August	21	171	28	0	0
September	17	17	15	0	26
October	19	1	7	0	0
November	6	5	29	0	25
December	3	6	11	0	39
January	11	9	2	0	29
February	19	16	0	0	6
March	1	0	0	0	0
April	0	1	40	0	0
May	0	200	25	0	0

Note:

Nigg Bay and Girdleness, Ythan Estuary SPA, and Montrose Bay SPA 5 year period covers period 2009/2014. Nigg Bay to Cove Bay and Dee Mouth to Don Mouth 5 year period covers period 2004/2009

* "Data were supplied by the Wetland Bird Survey (WeBS), a partnership between the British Trust for Ornithology, the Royal Society for the Protection of Birds and the Joint Nature Conservation Committee (the last on behalf of the statutory nature conservation bodies: Natural England, Natural Resources Wales and Scottish Natural Heritage and the Department of the Environment Northern Ireland) in association with the Wildfowl and Wetlands Trust"

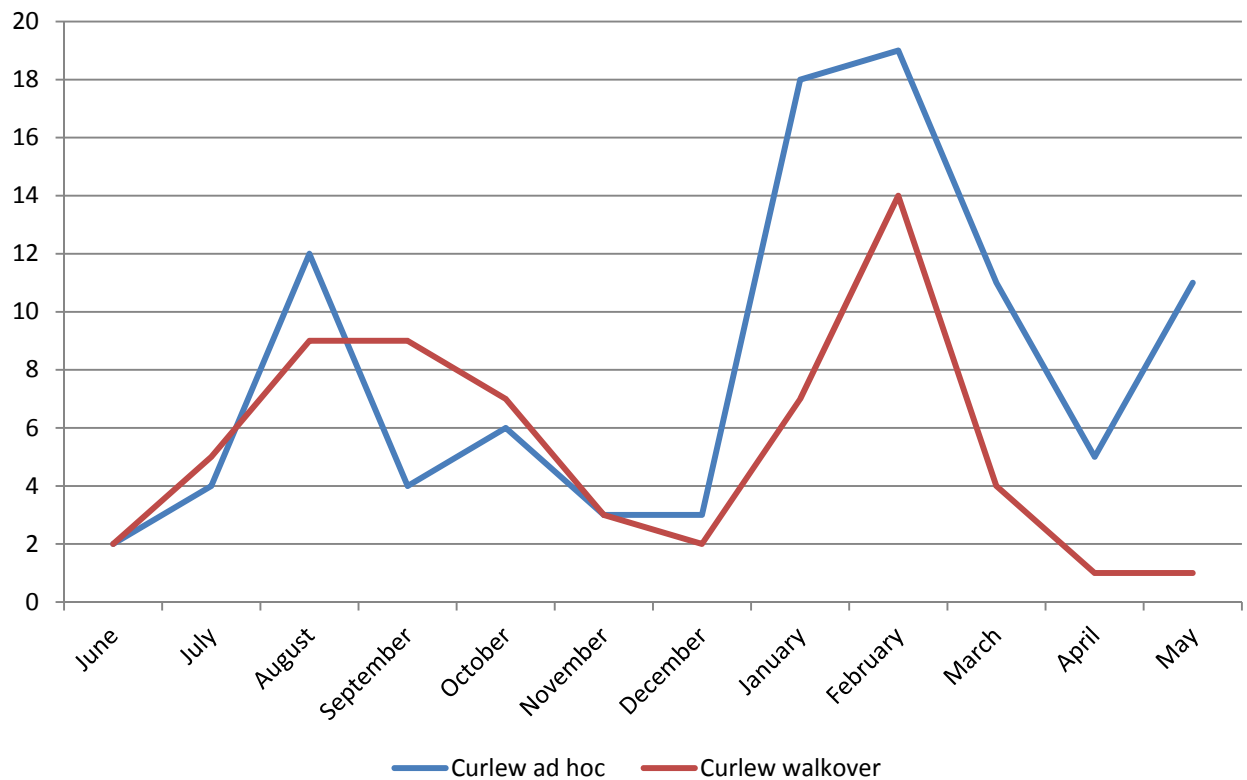


Figure 14-B3: Counts of curlew from walk-over and ad hoc surveys

Table 14-B4: Five year peak monthly counts of curlew (WeBS data*)

WeBS Sector	Nigg Bay and Girdleness	Ythan Estuary SPA	Montrose Basin SPA	Nigg Bay to Cove Bay	Dee Mouth to Don Mouth
June	1	271	283	1	1
July	5	686	980	36	2
August	2	730	1368	59	7
September	3	873	1094	67	1
October	4	766	1200	56	1
November	2	207	1034	6	0
December	3	518	708	51	0
January	7	1317	1092	27	2
February	35	901	1034	36	0
March	1	871	846	21	0
April	2	434	272	5	0
May	0	252	184	2	0

Note:

Nigg Bay and Girdleness, Ythan Estuary SPA, and Montrose Bay SPA 5 year period covers period 2009/2014. Nigg Bay to Cove Bay and Dee Mouth to Don Mouth 5 year period covers period 2004/2009

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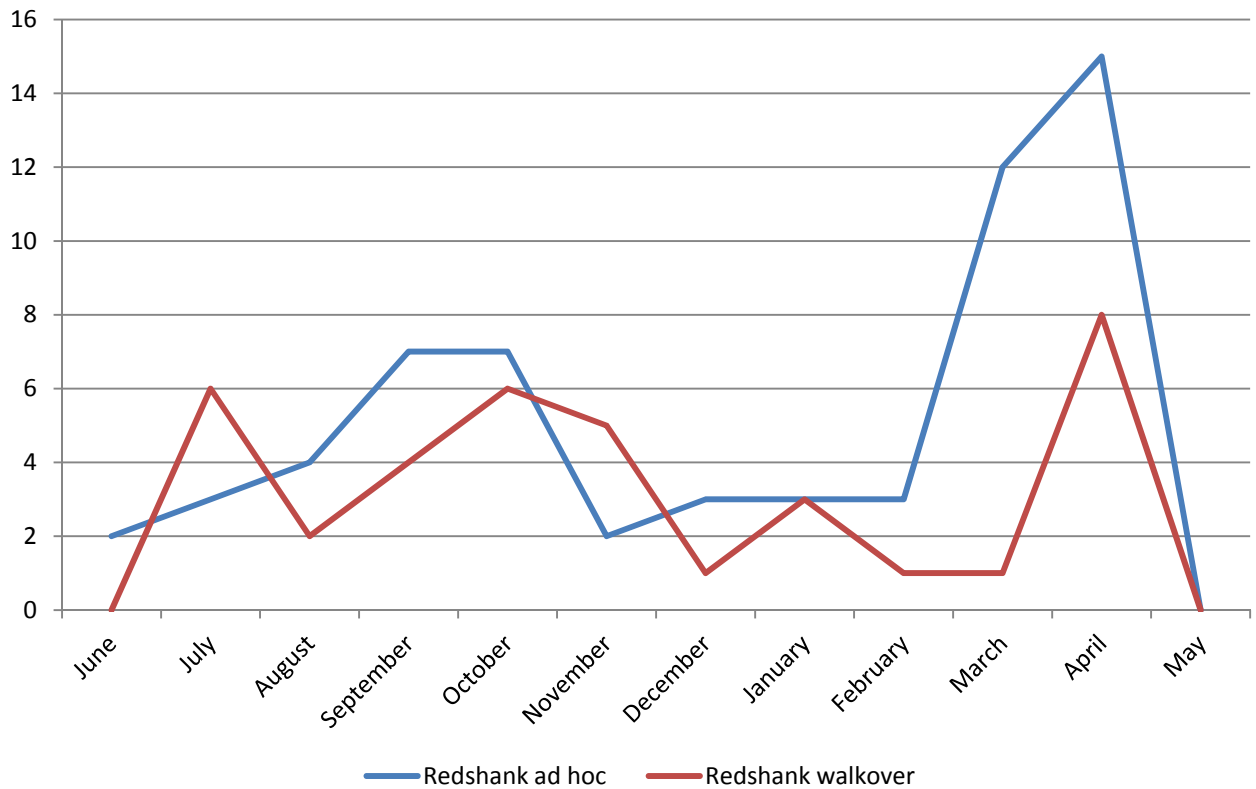


Figure 14-B4: Counts of redshank from walk-over and ad hoc surveys

Table 14-B5: Five year peak monthly counts of redshank (WeBS data*)

WeBS Sector	Nigg Bay and Girdleness	Ythan Estuary SPA	Montrose Basin SPA	Nigg Bay to Cove Bay	Dee Mouth to Don Mouth
June	0	44	52	0	0
July	4	899	1015	1	0
August	20	1752	1348	5	1
September	35	1706	2770	10	10
October	55	1532	1951	9	7
November	90	1295	1355	21	12
December	29	929	1401	33	11
January	35	557	863	20	0
February	73	841	666	9	3
March	54	394	733	14	0
April	14	943	808	0	1
May	0	3	11	0	0

Note:

Nigg Bay and Girdleness, Ythan Estuary SPA, and Montrose Bay SPA 5 year period covers period 2009/2014. Nigg Bay to Cove Bay and Dee Mouth to Don Mouth 5 year period covers period 2004/2009

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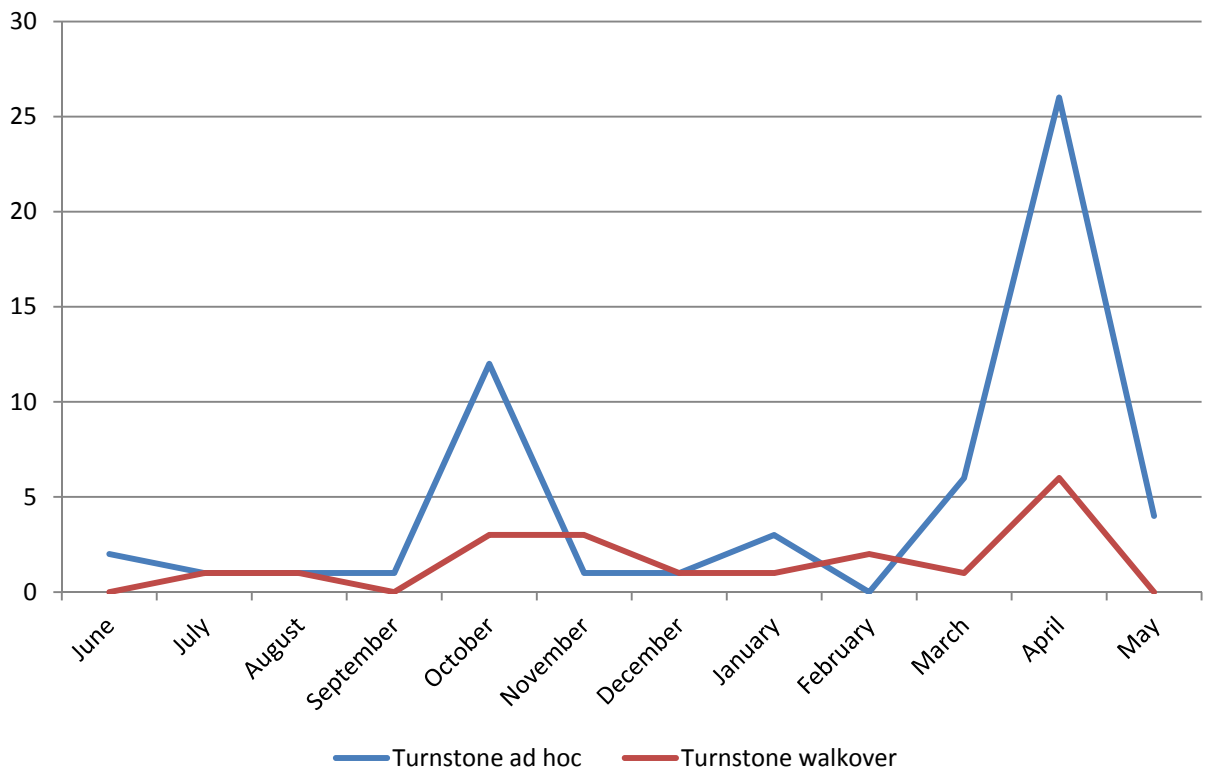


Figure 14-B5: Counts of turnstone from walk-over and ad hoc surveys

Table 14-B6: Five year peak monthly counts of ruddy turnstone (WeBS data*)

WeBS Sector	Nigg Bay and Girdleness	Ythan Estuary SPA	Montrose Basin SPA	Nigg Bay to Cove Bay	Dee Mouth to Don Mouth
June	1	0	0	0	0
July	0	1	3	0	4
August	8	5	19	12	47
September	44	11	10	22	51
October	75	72	33	25	56
November	19	25	28	12	61
December	15	22	12	16	87
January	55	52	16	15	37
February	23	14	16	17	40
March	15	25	17	16	70
April	3	13	4	10	65
May	0	1	18	0	12

Note:

Nigg Bay and Girdleness, Ythan Estuary SPA, and Montrose Bay SPA 5 year period covers period 2009/2014. Nigg Bay to Cove Bay and Dee Mouth to Don Mouth 5 year period covers period 2004/2009

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Table 14-B7: Five year peak monthly counts of sanderling (WeBS data*)

WeBS Sector	Nigg Bay and Girdleness	Ythan Estuary SPA	Montrose Basin SPA	Nigg Bay to Cove Bay	Dee Mouth to Don Mouth
June	0	1	0	0	0
July	0	45	0	0	0
August	10	205	0	0	0
September	0	42	0	0	0
October	0	57	0	0	58
November	0	180	0	0	110
December	0	110	0	3	59
January	0	15	0	0	103
February	0	80	2	0	86
March	0	35	0	0	123
April	0	175	0	0	51
May	0	17	0	0	73

Note:
Nigg Bay and Girdleness, Ythan Estuary SPA, and Montrose Bay SPA 5 year period covers period 2009/2014. Nigg Bay to Cove Bay and Dee Mouth to Don Mouth 5 year period covers period 2004/2009
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Table 14-B8: Five year peak monthly counts of dunlin (WeBS data*)

WeBS Sector	Nigg Bay and Girdleness	Ythan Estuary SPA	Montrose Basin SPA	Nigg Bay to Cove Bay	Dee Mouth to Don Mouth
June	0	6	25	0	0
July	0	126	133	0	0
August	0	1123	358	0	3
September	2	737	381	2	0
October	0	1252	583	1	0
November	0	1364	655	0	0
December	0	620	938	0	0
January	0	875	803	0	2
February	0	982	793	0	0
March	0	76	86	0	0
April	0	2	48	0	0
May	0	290	38	0	0

Note:
Nigg Bay and Girdleness, Ythan Estuary SPA, and Montrose Bay SPA 5 year period covers period 2009/2014. Nigg Bay to Cove Bay and Dee Mouth to Don Mouth 5 year period covers period 2004/2009
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Table 14-B9: Five year peak monthly counts of lapwing (WeBS data*)

WeBS Sector	Nigg Bay and Girdleness	Ythan Estuary SPA	Montrose Basin SPA	Nigg Bay to Cove Bay	Dee Mouth to Don Mouth
June	0	37	32	0	-
July	0	588	345	0	-
August	0	1757	764	17	-
September	0	1529	638	25	-
October	0	1549	884	1	-
November	0	827	87	0	-
December	0	932	403	0	-
January	0	612	111	13	-
February	0	575	1-2	1	-
March	1	207	20	0	-
April	0	6	10	3	-
May	0	14	15	1	-

Note:
Nigg Bay and Girdleness, Ythan Estuary SPA, and Montrose Bay SPA 5 year period covers period 2009/2014. Nigg Bay to Cove Bay and Dee Mouth to Don Mouth 5 year period covers period 2004/2009
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Table 14-B10: Five year peak monthly counts of golden plover (WeBS data*)

WeBS Sector	Nigg Bay and Girdleness	Ythan Estuary SPA	Montrose Basin SPA	Nigg Bay to Cove Bay	Dee Mouth to Don Mouth
June	-	0	1	0	-
July	-	21	2	0	-
August	-	565	9	0	-
September	-	609	268	0	-
October	-	1073	611	0	-
November	-	4500	39	0	-
December	-	91	6	1	-
January	-	0	500	0	-
February	-	267	10	0	-
March	-	0	0	0	-
April	-	0	0	1	-
May	-	1	1	0	-

Note:
Nigg Bay and Girdleness, Ythan Estuary SPA, and Montrose Bay SPA 5 year period covers period 2009/2014. Nigg Bay to Cove Bay and Dee Mouth to Don Mouth 5 year period covers period 2004/2009
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Table 14-B11: Five year peak monthly counts of whimbrel (WeBS data*)

WeBS Sector	Nigg Bay and Girdleness	Ythan Estuary SPA	Montrose Basin SPA	Nigg Bay to Cove Bay	Dee Mouth to Don Mouth
June	0	3	0	0	-
July	0	8	8	0	-
August	7	0	3	0	-
September	0	0	3	2	-
October	0	0	0	0	-
November	0	0	0	0	-
December	0	0	1	0	-
January	0	0	0	0	-
February	0	0	0	0	-
March	0	0	0	0	-
April	0	2	1	0	-
May	0	3	8	0	-

Note:
Nigg Bay and Girdleness, Ythan Estuary SPA, and Montrose Bay SPA 5 year period covers period 2009/2014. Nigg Bay to Cove Bay and Dee Mouth to Don Mouth 5 year period covers period 2004/2009
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Table 14-B12: Five year peak monthly counts of greenshank (WeBS data*)

WeBS Sector	Nigg Bay and Girdleness	Ythan Estuary SPA	Montrose Basin SPA	Nigg Bay to Cove Bay	Dee Mouth to Don Mouth
June	-	0	0	-	-
July	-	12	26	-	-
August	-	29	73	-	-
September	-	20	21	-	-
October	-	6	14	-	-
November	-	0	14	-	-
December	-	0	4	-	-
January	-	0	9	-	-
February	-	0	10	-	-
March	-	1	7	-	-
April	-	4	3	-	-
May	-	0	5	-	-

Note:
Nigg Bay and Girdleness, Ythan Estuary SPA, and Montrose Bay SPA 5 year period covers period 2009/2014. Nigg Bay to Cove Bay and Dee Mouth to Don Mouth 5 year period covers period 2004/2009
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Table 14-B13: Five year peak monthly counts of common sandpiper (WeBS data*)

WeBS Sector		Nigg Bay and Girdleness	Ythan Estuary SPA	Montrose Basin SPA	Nigg Bay to Cove Bay	Dee Mouth to Don Mouth
June		0	0	1	-	-
July		0	5	54	-	-
August		2	3	14	-	-
September		0	0	7	-	-
October		0	0	0	-	-
November		0	0	0	-	-
December		0	0	0	-	-
January		0	0	0	-	-
February		0	0	0	-	-
March		0	0	0	-	-
April		0	0	0	-	-
May		0	0	1	-	-

Note:

Nigg Bay and Girdleness, Ythan Estuary SPA, and Montrose Bay SPA 5 year period covers period 2009/2014. Nigg Bay to Cove Bay and Dee Mouth to Don Mouth 5 year period covers period 2004/2009

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Table 14-B14: Five year peak monthly counts of purple sandpiper (WeBS data*)

WeBS Sector	Nigg Bay and Girdleness	Ythan Estuary SPA	Montrose Basin SPA	Nigg Bay to Cove Bay	Dee Mouth to Don Mouth
June	0	-	0	0	0
July	0	-	0	0	0
August	0	-	0	3	0
September	3	-	0	1	0
October	16	-	4	1	28
November	60	-	0	1	50
December	30	-	20	11	71
January	120	-	0	10	64
February	65	-	0	4	55
March	105	-	25	21	110
April	37	-	7	13	120
May	0	-	0	0	24

Note:

Nigg Bay and Girdleness, Ythan Estuary SPA, and Montrose Bay SPA 5 year period covers period 2009/2014. Nigg Bay to Cove Bay and Dee Mouth to Don Mouth 5 year period covers period 2004/2009

* "Data were supplied by the Wetland Bird Survey (WeBS), a partnership between the British Trust for Ornithology, the Royal Society for the Protection of Birds and the Joint Nature Conservation Committee (the last on behalf of the statutory nature conservation bodies: Natural England, Natural Resources Wales and Scottish Natural Heritage and the Department of the Environment Northern Ireland) in association with the Wildfowl and Wetlands Trust"