

Royal Air Force Ornithological Society Wetland Bird Survey (WeBS)

Collation of Data on Three Diver Species for WeBS in Northwest and North Scotland

2009 to 2013

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Introduction:

The Royal Air Force Ornithological Society (RAFOS) has continued to undertake yearly monitoring, via 'Winter Duck' surveys, of non-breeding water-birds in support of national surveys in the far north of Scotland during the winter months of January-February. This account depicts the diver species data from 2009 to 2013 inclusive. RAFOS has built a close working relationship with The British Trust for Ornithology WeBS office such that this relationship has enabled the society to function in the field by targeting specific requirements of the BTO to ensure that we supply meaningful and most importantly on a survey of this type, continuous data.

As well as WeBS, during the period of this account the RAFOS team supplied data via the BTO BirdTrack scheme towards the coordinated efforts of The Bird Atlas (The Breeding and Winter Birds of Britain and Ireland 2007-2011) [1]. Some records from this data will be included where considered of interest or benefit to the reader. This paper will present data of scientific interest on the WeBS species that in future years can help to build up a picture of overwintering water-birds to our northernmost shores from Arctic waters including, it is thought, birds overwintering in GB waters from Scandinavia, as well as migratory species that use our island for winter feeding, roosting and shelter.

All WeBS data and BirdTrack data remain with the BTO as the national co-ordinating body with their partners of both surveys; Calbrade N.A. et al (2010). We thank them for permission in reproducing data here from the electronic WeBS (e-WeBs) database.

Survey background

The WeBS counts monitor non-breeding waterbirds across the UK at approximately 2000 wetland sites via Monthly Core Counts. The UK is of outstanding international importance for waterbirds as it lies on some of the major flyways for arctic breeding species. Large numbers are attracted to our coasts, rivers and inland wetland sites especially during winter, with a generally milder climate compared to continental Europe and extensive areas of wetland notably estuaries. The UK thus has both moral and legal obligations to conserve these waterbirds and the wetlands upon which they depend. Calbrade N.A. et al (2010). [2].

RAFOS conduct Single Visit Core Count surveys in lieu of the monthly counts due to the remoteness of the area and the restricted time available for surveys. The BTO recognise that this remoteness coupled with a low population density has led to very little knowledge of the wetland bird population wintering in the area apart from data from a few co-ordinated counts by BTO/WWT volunteers. RAFOS surveys cover open stretches of sea, rugged shorelines, sea lochs and some slightly inland large, medium and small lochs down to very small lochans.

Logistics and sponsors.

The logistics and conducting of the surveys generally follow the pattern described in the Winter Duck 2005 – 2008 report but with small changes to the accommodation locations and to the detailed itineraries of each team.

The survey counting commences usually on a Sunday and ends the following Friday but the preparation and recovery period of the expedition takes in the region of a week to ten days from hire vehicle collection to vehicle return to their home RAF bases. Financial support over this five year period has in some years been through sponsorship from both Air BP International and Aircraft Services International Group (ASIG). The key inputs of these two organisations are instrumental in ensuring that we can mount our field study from a financially sound footing. The other 'prime' sponsors are the Society members, by way of their yearly subscriptions to support the Society's fieldwork. This financial backing is recognised in this report. The remainder of the survey finances are made-up from the participants contributions.

The team was split into three sub-teams to cover the extensive survey area with accommodation being widely spread in order to minimise travel logistics and fuel costs.

The three teams utilised four base locations which were a mix of military and civilian self-catering accommodation as follows:

- Team 1 - Joint Service Mountain Training Centre, Dundonnell (Base HQ)
- Team 2 - Knockan Crag Cottage, Elphin (2009-2012) and Glencoul Cottage, Unapool (2013)
- Team 3 – Freswick, Tofts House & Defence Estates (now structured as The Defence Infrastructure Organisation (DIO) at Cape Wrath Range Hut, Faraid Head, near Durness.

After four days surveying in their assigned areas, on day five Team 2 moved south to cover part of the southern survey area of Loch Carron, Strathcarron to Applecross and along the coast to Calliekillie whilst team 1 covered Upper Loch Torridon, Annat and Inveralligin to Lower Diabaig. Team 3 continued surveying from John O' Groats to Durness, including Lochs Heilen and Mey, and in some years extending out to Cape Wrath if no range activities were planned and if deer culling or weather conditions permitted.

Participants - Team Members

Name	2009	2010	2011	2012	2013
George Adams				3	
Gerry Bilbao	1	1	1		
Alan Brimmell			3	2	
Jim Bryden	2L	2L	2L	2L	2
Kevin Cairns	1	1			
Richard Clement					1
Keith Cowieson					2
Tom Dewick	3	3	3	3	3
John Harry		3			
Steve Heather	2	2	2	2	
Jerry Knights	1	2	2		2L
Alan Kennedy					3
Janet Mew		1			
Al Monkman				1	1

Martin Routledge		1	1	1	1
Maggie Sheddan	3	3	1	3	3
Peter Tithecott	1				
John Wells	3L	3L	3L	1L	1L
Veronica Wooton	1	1	1	1	1
Team Total	10	12	10	10	11

*L = Denotes; Leader/Co-Leader. Number; 1/2/3 = Team allocated and team composition

[1-Team1, 2-Team 2, 3-Team 3].

e-WeBS. Webs data is now available on the BTO web site via e-WeBS not only for contributors, but researchers and personnel interested in checking data on bird totals; their fluctuations or site dependency.

Birdtrack 2009-2013 and Atlas 2007-2011 records. Records of those passerines and other species outwith WeBS were recorded at the 10Km Grid Square as Roving Records during the Atlas recording years or thereafter as Birdtrack 10km records.

Survey Dates. The weeks chosen for each year's survey were as follows:

2009	2010	2011	2012	2013
WD08	WD09	WD10	WD11	WD12
05 February – 16 February	26 January – 06 February	28 January – 05 February	11 February – 19 February	31 January – 09 February

Records of Importance. In line with 'Water-birds in the UK' Calbrade, N.A. et al (2010), records are tabulated into five categories:

- Sites of international importance in the UK.
- Sites of national importance in Great Britain.
- Sites of all importance in Northern Ireland.
- Sites no-longer meeting table qualifying levels in WeBS year (Date of Report).
- Sites below table qualifying levels but exceeding threshold levels in WeBS Year [Date of Report] {GB and NI}.

In line with the WeBS Report each species is annotated a threshold value to allow the reader to gauge the importance of each Site/Sector referenced in this paper.

GB Mean threshold values: A wetland in Britain is considered nationally important if it regularly holds 1% or more of the estimated British numbers of one species or subspecies of waterbird. The 1% threshold levels are quoted for each of the diver species tables.

Qualifying Level: The minimum number of a species present at a site to allow for inclusion of the record in the BTO WeBS annual journal.

Tables of Observations

Red-throated Diver

Gavia stelata.

GB Threshold 170

None of the RAFOS WD site survey counts come close to meeting either the UK threshold or the qualifying level [i.e. the minimum count reflected in the WeBSs report tables]. An example being – the qualifying level of 50 birds was used in the 2009 WeBS Report. Widespread at coastal locations throughout the UK during the winter, with an estimated population of 17,000 in British waters (O'Brien et al. 2008).

All counts of this species are shown to allow the reader to make comparisons of birds seen on Winter Duck against those of other diver species and those sites in southern UK that hold divers throughout the winter in offshore waters. This species of diver was not found, on the survey, in any great numbers. It is quite a highlight when this species is located, as the statistics appear to support the view that birds must over-winter further south in the UK.

Site	WD 08	WD 09	WD 10	WD 11	WD 12
	2009	2010	2011	2012	2013
Loch Ewe	0	0	1	0	0
Loch Gairloch	0	0	0	1	1
Loch Inver	1	0	1	0	0
Loch Eriboll	0	1	0	0	1
Thurso Bay	2	1	0	0	0
Kyle of Tongue	0	0	0	0	0
Loch Gairloch - Port Henderson	0	0	0	1	0
Harrow Harbour	1	0	0	0	0
Ness of Duncansby – John O'Groats	1	0	1	0	0
Kanaird Mouth	1	0	0	0	0
Bay of Sannick	1	0	1	0	0
Bay of Clachtoll	1	0	0	0	0
Dunnet Bay	2	0	1	0	0
Thurso Bay	2	1	0	0	0
Bagh-a-Phollain	1	0	0	0	0
Faraid Head	1	0	0	0	0
Balnakeil Bay	1	0	1	0	0
Old Dornie Bay	0	2	0	1	0
Kyle of Durness – Eilean Dubh to Keoldale	0	1	0	0	0

Loch Eriboll 2 – Rubh’ Armlì	0	1	0	0	0
Foindle Bay	0	1	0	0	0
Melvich	0	1	0	0	0
Clardon Haven	0	2	0	0	0
Laxford Bay	0	1	0	0	0
Murkle Bay	0	2	0	0	1
Loch Ewe – An Sguiteach – Naast	0	1	0	0	0
Bay of Culkein	0	1	0	0	0
Loch Inver – Strathan and Badnaban	0	1	0	0	0
Little Loch Broom - Dundonnell	0	0	1	0	0
Polbain	0	0	1	1	0
Achlochan	0	0	1	0	0
Gills Bay	0	0	2	0	0
Raa Estuary and Achnahaird Bay	0	0	1	0	0
Inveralligin and Ob a’ Bhraighe	0	0	0	2	0
Upper Loch Torridon-Torridon	0	0	0	1	0
Loch Broom-River mouth	0	0	0	2	0
Raa Estuary and Achnahaird Bay	0	0	0	1	0
Loch Thurnaig	0	0	0	1	0
Scourie Bay	0	0	0	1	0
Loch A Chadh-Fi – Skerricha	0	0	0	2	0
Oldshoremore Bay	0	0	0	1	0
Port Chilligaig	0	0	0	1	0
West side of Inner Kyle of Tongue	0	0	0	1	0
Talmine	0	0	0	0	2
Badentarbat Bay (Achiltibuie)	0	0	0	0	1
Loch Kishorn – Achintraid	0	0	0	0	2
Loch Carron (Strome Castle to Ardaneaskan)	0	0	0	0	1
TOTALS	15	17	11	16	8

All records are shown for comparison purposes.

Key:

0 = Sites with Zero (0) counts in some or all years, are shown for comparison purposes with *Wells, J.N., Wightman, M.K. 2012.*

Black-throated Diver

Gavia arctica

GB Threshold = 7

Black-throated divers appear in the main, to use those same favoured sites as found on previous Winter Duck years. The tendency is to see them in small parties, and usually these groups are often located as the birds go to roost at dusk; these birds favouring to fish together as pre-roost groups. The assembled groups appear to have very coordinated behaviour patterns as fishing parties, undertaking collective and coordinated diving and submerged hunting; twisting and turning to gather fish, shellfish and other quarry. During the main part of the day birds appear to favour their own company or at most as a pair, before seemingly grouping together later in the day pre-dusk and usually from 15:00-17:00. The key sites seem to be: Loch Gruinard, Gruinard Bay, Callakille, an open sea stretch north of Applecross, and the top northeasternmost part of Loch Ewe around the bay from Aultbea - Mellon Charles, where an impressive 24 were located at Loch Ewe - Aultbea - Gob A Gheodha on 24 Feb 2010. This behaviour again showed the grouping tendency. The day was a non-survey free bird watching day but the record was submitted because of its importance. This record was also submitted as an Atlas 2007-11 Roving Record.

2009-All Records

Site	Grid	Date	Time	Number	Code
Loch Gairloch - Badachro – Gairloch	NG807744	08/02/2009	11:42	1	914S8
Loch Gairloch - Port Henderson - Aird	NG753745	08/02/2009	11:05	1	914S4
Red Point to Port Henderson	NG730710	08/02/2009	09:02	6	914V2
Harrow Harbour	ND287747	08/02/2009	13:15	1	954L1
Loch Gairloch - Gairloch - Caolos Beag West	NG757776	08/02/2009	13:10	8	914S9
Dunnet Bay	ND208695	09/02/2009	14:10	8	954M0
Loch Ewe - Aultbea - Gob A Gheodha	NG848910	09/02/2009	14:50	7	914T9
Loch Ewe - Rubha Thurnaig - Aultbea	NG866869	09/02/2009	13:35	4	914T8
Murkle Bay	ND173697	09/02/2009	16:10	1	954M2
Gruinard Bay - Laide	NG899935	10/02/2009	10:05	4	914U1
Thurso Bay	ND113688	10/02/2009	08:45	4	954M3
Little Loch Broom - Badcaul to Leac An Ime	NH005951	11/02/2009	08:05	4	91444
Little Loch Broom - Camasnagaul to Badcaul	NH049911	11/02/2009	09:45	1	91443
Loch Eriboll 2 - Rubh'Armlì	NC419565	11/02/2009	11:45	2	954S3
Port of Tarbert	NC161487	11/02/2009	14:05	5	954X2
Balnakeil Bay	NC387694	12/02/2009	16:55	1	954V0
Old Dornie Bay	NB984120	12/02/2009	14:30	1	954R6
Caolos Beag West to Melvaig	NG735830	13/02/2009	09:30	1	914V1
Loch Carron (Strome Castle to Ardaneaskan)	NG839345	13/02/2009	09:30	2	919N4

Loch Kishorn - Achintraid	NG834390	13/02/2009	11:05	1	914N9
Applecross - Inner Bay	NG703450	13/02/2009	14:45	7	914P5
Applecross - Milton	NG703437	13/02/2009	13:20	2	914P4
Sand Bay	NG681484	13/02/2009	15:15	6	914P3
Total				78	

2010 – All Records

Site	Grid	Date	Time	number	Code
Old Dornie Bay	NB984120	05/02/2010	13:30	1	954R6
Polbain	NB993095	05/02/2010	12:15	2	954R4
Applecross - Inner Bay	NG703450	04/02/2010	15:40	6	914P5
Applecross - Milton	NG703437	04/02/2010	15:20	1	914P4
Balnakeil Bay	NC387694	04/02/2010	15:15	1	954V0
Poll Creadha	NG709407	04/02/2010	14:30	5	914P1
Upper Loch Torridon - Balgy	NG856550	04/02/2010	12:25	1	919R9
Loch Kishorn - Achintraid	NG834390	04/02/2010	10:30	1	914N9
Sango Bay	NC412682	04/02/2010	09:20	1	954V4
Loch Eriboll 2 - Rubh'Armlì	NC419565	03/02/2010	11:50	2	954S3
Armadaile Bay	NC791650	02/02/2010	14:50	1	954Q2
Fanagmore Bay	NC180497	02/02/2010	15:30	1	954X3
Gruinard Bay - Leac Innis Nan Gobhar - An T-saothair	NG926912	02/02/2010	12:30	1	914U4
Melvich	NC888646	02/02/2010	12:15	2	954N1
Gruinard Bay - Laide	NG899935	02/02/2010	10:25	2	914U1
Thurso Bay	ND113688	02/02/2010	08:55	2	954M3
Clardon Haven	ND159700	01/02/2010	15:40	3	95404
Loch Ewe - Rubha Thurnaig - Aultbea	NG866869	01/02/2010	13:50	4	914T8
Murkle Bay	ND173697	01/02/2010	14:35	1	954M2
Loch Ewe - Boor	NG852823	01/02/2010	11:50	4	914T4
Loch Ewe - Sgeir Maol Mhoraidh Shuas to An Sguiteach	NG812904	01/02/2010	08:15	1	914T5
Total				44	

The survey totals in 2010, were very low and early in the week it was identified between the teams that although there were reasonable totals of ducks, swans and geese at water bodies, very few divers, in particular Great-Northern Divers, were being seen.

2011 – All Records

Site	Grid	Date	Time	number	Code
Dunnet Bay	ND208695	31/01/2011	08:00	1	954M0
Loch Gairloch - Gairloch - Caolos Beag West	NG757776	30/01/2011	11:47	4	914S9
Polbain	NB993095	30/01/2011	13:00	3	954R4

Gruinard Bay - Laide	NG899935	01/02/2011	10:30	2	914U4
Total				10	

2011 was an unusual year in both the weather and in bird numbers counted, in particular for the diver species. Extreme winds produced choppy waters which hindered observations and greatly affected the numbers of birds seen. Reasons for the low numbers as considered by the teams included: poor visibility particularly with telescope use, bird movements to areas of less harsh conditions and limited observation time on site due to the weather. In an attempt to answer these questions Friday 5th Feb 2011 was a free day for general observations so a concerted effort was made to count divers in the Loch Gairloch – Loch Ewe area ending up near Mellon Charles. The Loch itself was much quieter, almost mill-pond like in comparison to the rest of the week. The points of poor visibility and observer's time on site were addressed. Here are the coordinated Atlas 2011 – Roving Records for Black-throated Diver that we submitted on that day amassing a grand total of 47 birds

Site [at 10KM Level] –Atlas RR's	Grid-10KM	Date	Time	number
Loch Gairloch	NG77	05/02/2011	am	13
*Rubha Mor (Loch Ewe – Mellon Charles)	NG89	05/02/2011	pm	34
Loch Gruinard – (Gruinard Island Watchpoint)	NG99	05/02/2011	Late pm	0
Total				47

Comparison with the earlier survey day results: The WeBS sector in question, where the 34 birds were located is Loch Ewe – Aultbea – Gob A Gheodha to Mellon Charles, specifically near to the soap studio at Mellon Charles. Good weather played its part in totals due to the increased visibility of the large sea loch areas. Posing the thought; were the 34 birds there 5 days previously ? Doubtful, but sometime during the following days a collective movement of birds to shelter appears to have occurred.

2012 – All Records

Site	Grid	Date	Time	number	Code
Raa Estuary and Achnahaird Bay	NC019137	16/02/2012	13:20	2	954Y8
Little Loch Broom - Badcaul to Leac An Ime	NH005951	16/02/2012	08:00	1	91444
Loch Eriboll 2 - Rubh'Armlì	NC419565	16/02/2012	11:15	1	954S3
Polbain	NB993095	16/02/2012	10:40	2	954R4
Talmine	NC586628	15/02/2012	13:35	1	95408
Loch Ewe - An Sguiteach - Naast	NG827861	14/02/2012	09:50	3	914T6
Loch Ewe - Sgeir Maol Mhoraidh Shuas to An Sguiteach	NG812904	14/02/2012	08:10	1	914T5
Caolos Beag West to Melvaig	NG735830	13/02/2012	15:00	2	914V1
Dunnet Bay	ND208695	13/02/2012	11:50	1	954M0
Loch Gairloch - Port Henderson - Aird	NG753745	13/02/2012	09:30	2	914S4
Port Chiligaig	NC183591	13/02/2012	09:30	2	954W1
Red Point to Port Henderson	NG730710	13/02/2012	08:04	1	914V2
Loch Gairloch - Gairloch - Caolos Beag West	NG757776	12/02/2012	13:00	1	914S9
Total				21	

2013 All Records

Site	Grid	Date	Time	number	Code
Loch Ewe - Boor	NG852823	22/01/2013	13:30	1	914T4
Gruinard Bay - An Dubh Airde - Rubha Beag	NG896965	02/02/2013	13:00	1	914U5
Gruinard Bay - Laide	NG899935	03/02/2013	09:50	2	914U1
Gruinard Bay - Camas A Chruthaich - Leac Innis Nan Gobhar	NG950907	03/02/2013	12:10	2	914U3
Gruinard Bay - Sron Na Faire Moire - Camas A Chruthaich East	NG959930	03/02/2013	13:10	2	914U2
Thurso Bay	ND113688	04/02/2013	09:50	1	954M3
Loch Ewe - Sgeir Maol Mhoraidh Shuas to An Sguiteach	NG812904	05/02/2013	08:10	1	914T5
Loch Ewe - Aultbea - Gob A Gheodha	NG848910	05/02/2013	14:00	1	914T9
Bay of Stoer	NC036281	06/02/2013	11:40	1	954T6
Loch Broom - River Broom Mouth - Ardcharnich	NH171867	06/02/2013	11:50	1	914X1
Cluas Deas	NC002328	06/02/2013	12:40	1	954O1
Kanaird Mouth	NH113990	06/02/2013	15:00	1	954Z4
Loch A Chairn Bhain	NC203340	06/02/2013	16:00	1	954X1
Talmine	NC586628	06/02/2013	12:40	3	954O8
Traigh Allt Chailgeag	NC443660	06/02/2013	15:20	1	954O7
Loch Carron (Strome Castle to Ardaneaskan)	NG839345	07/02/2013	10:20	1	919N4
Loch Eriboll 2 - Rubh'Armlì	NC419565	07/02/2013	09:20	8	954S3
Applecross - Inner Bay	NG703450	07/02/2013	15:10	7	914P5
Applecross - Milton	NG703437	07/02/2013	14:50	5	914P4
Callakille	NG688545	07/02/2013	16:20	23	919R4
Kishorn Bay	NG829412	07/02/2013	12:10	2	914N7
Poll Creadha	NG709407	07/02/2013	14:20	2	914P1
ULT Inveralligin and Ob a' Bhraighe	NG848571	07/02/2013	13:40	1	919S1
Total				71	

Discussion. The 23 birds located at Callakille are good evidence based records of communal roosting activity reference earlier in the paper. Note the timing of the sighting by Team 2, as they closed off their days' work

Great Northern Diver

Gavia immer

GB Threshold = 25

This was the most numerous of the diver species recorded by RAFOS across these Winter Duck surveys. Most sightings were of solitary birds, which sometimes were spread widely on the larger lochs with typically some 500 metres between individuals, however Loch Ewe held 25 in 2009 and 45 in 2010. They were usually located close to the shoreline feeding particularly on crabs and crustaceans in the shallower, sheltered bays often close to human habitation, harbours, fish-farms, etc. When doing so, birds often afforded fairly close views on being located before eventually chugging away when approached too closely. They often dived and covered great distances under water to get away and were rarely seen to fly if feeding or

sheltering close inshore. Views of flying birds were very few and far between, e.g. an occasional sighting early morning from headlands as birds fly up the sea-loch into calmer waters. The areas covered by Team 1, being the west coast element of the survey area, held the greatest quantity of these divers as evidenced from the records below.

2009 Records

Site	Grid	Date	Time	number	Code
Gills Bay	ND333736	08/02/2009	11:00	2	954K1
Kanaird Mouth	NH113990	08/02/2009	09:00	3	954Z4
Loch Gairloch - Badachro - Gairloch	NG807744	08/02/2009	11:42	1	914S8
Loch Gairloch - Gairloch - Caolos Beag West	NG757776	08/02/2009	13:10	2	914S9
Loch Gairloch - Port Henderson - Aird	NG753745	08/02/2009	11:05	3	914S4
Loch Inver - Inner Bay	NC089226	08/02/2009	12:00	2	959Y1
Loch Kirkaig	NC071196	08/02/2009	14:30	1	954Y7
Red Point to Port Henderson	NG730710	08/02/2009	09:02	6	914V2
Achlochan	NC023064	12/02/2009	12:50	3	954Z1
Achmelvich Bay and Port An Tairbh	NC052250	09/02/2009	10:00	4	954T2
Applecross - Inner Bay	NG703450	13/02/2009	14:45	13	914P5
Applecross - Milton	NG703437	13/02/2009	13:20	1	914P4
Ard Skinid to Tongue Bridge	NC586604	11/02/2009	15:25	1	954S7
Badentarbat Bay (Achiltibuie)	NC015081	12/02/2009	11:30	11	954Z0
Balchladich Bay	NC019301	09/02/2009	12:35	2	954T4
Balnakeil Bay	NC387694	12/02/2009	16:55	2	954V0
Bay of Clachtoll	NC037269	09/02/2009	10:45	4	954T3
Bay of Culkein	NC043334	09/02/2009	14:30	3	954Y5
Bay of Stoer	NC036281	09/02/2009	11:45	2	954T6
Borgie Estuary	NC684616	12/02/2009	12:50	1	954Q0
Callakille	NG688545	13/02/2009	15:36	3	919R4
Caolos Beag West to Melvaig	NG735830	13/02/2009	09:30	3	914V1
Clardon Haven	ND159700	09/02/2009	16:55	3	95404
Clashnessie Bay	NC061314	09/02/2009	15:15	2	954Y2
Cluas Deas	NC002328	09/02/2009	13:00	2	95401
Culkein Drumbeg	NC116340	09/02/2009	16:00	3	954Z3
Dunnet Bay	ND208695	09/02/2009	14:10	18	954M0
Gruinard Bay - Camas A Chruthaich - Leac Innis Nan Gobhar	NG950907	10/02/2009	13:00	3	914U3
Gruinard Bay - Laide	NG899935	10/02/2009	10:05	20	914U1
Gruinard Bay - Leac Innis Nan Gobhar - An T-saothair	NG926912	10/02/2009	12:15	4	914U4
Gruinard Bay - Sron Na Faire Moire - Camas A Chruthaich East	NG959930	10/02/2009	13:27	2	914U2
Horse Sound - South of Badenscallie	NC036047	12/02/2009	12:30	4	954R3
Laxford Bay	NC228475	11/02/2009	12:30	2	954X0
Little Loch Broom - Badcaul to Leac An Ime	NH005951	11/02/2009	08:05	16	91444
Little Loch Broom - Camasnagaul to Badcaul	NH049911	11/02/2009	09:45	4	91443
Little Loch Broom - Dundonnell	NH080894	11/02/2009	10:25	2	91441
Loch a'Chracaich	NG764570	12/02/2009	09:26	2	919R6
Loch Beag	NG777568	12/02/2009	10:00	1	919R7

Loch Broom - Corry Point - Ullapool Point	NH128927	11/02/2009	13:03	1	914X4
Loch Broom - Rhue	NH093965	11/02/2009	14:38	1	914X6
Loch Broom - Ullapool Point - Morefield	NH109947	11/02/2009	13:50	2	914X5
Loch Carron (Strome Castle to Ardaneaskan)	NG839345	13/02/2009	09:30	2	919N4
Loch Diabaig	NG787596	12/02/2009	14:47	5	914R8
Loch Eriboll 1 - Laid	NC425598	11/02/2009	09:05	7	954S2
Loch Eriboll 2 - Rubh'Armlì	NC419565	11/02/2009	11:45	4	954S3
Loch Eriboll 3 - Camas an Duin	NC450605	11/02/2009	13:10	5	954S4
Loch Ewe - An Sguiteach - Naast	NG827861	09/02/2009	10:25	5	914T6
Loch Ewe - Aultbea	NG868888	09/02/2009	14:20	2	914T3
Loch Ewe - Aultbea - Gob A Gheodha	NG848910	09/02/2009	14:50	4	914T9
Loch Ewe - Rubha Thurnaig - Aultbea	NG866869	09/02/2009	13:35	7	914T8
Loch Ewe - Sgeir Maol Mhoraidh Shuas to An Sguiteach	NG812904	09/02/2009	08:55	7	914T5
Loch Kishorn - Achintraid	NG834390	13/02/2009	11:05	1	914N9
Loch Thurnaig	NG865842	09/02/2009	13:05	3	914T7
Murkle Bay	ND173697	09/02/2009	16:10	3	954M2
Naver Estuary	NC700613	12/02/2009	11:35	1	954Q1
Old Dornie Bay	NB984120	12/02/2009	14:30	9	954R6
Polbain	NB993095	12/02/2009	14:00	4	954R4
Poll Creadha	NG709407	13/02/2009	14:05	2	914P1
Pool Ewe	NG856805	09/02/2009	11:55	1	91330
Port Chiligaig	NC183591	10/02/2009	09:45	1	954W1
Raa Estuary and Achnahaird Bay	NC019137	12/02/2009	16:10	2	954Y8
Reiff Bay and Coast	NB966135	12/02/2009	15:15	4	954R1
Rubha Beag - Leac Mhor	NG886974	10/02/2009	08:40	3	914U6
Sand Bay	NG681484	13/02/2009	15:15	4	914P3
Scourie Bay	NC151449	10/02/2009	15:30	2	954P4
Talmine	NC586628	11/02/2009	14:20	13	95408
Thurso Bay	ND113688	10/02/2009	08:45	3	954M3
ULT - Inveralligin and Ob a'Bhraighe	NG848571	12/02/2009	13:27	1	919S1
Upper Loch Torridon - Torridon	NG883566	12/02/2009	12:53	1	914R5
Total				271	

2010 Records

Site	Grid	Date	Time	number	Code
Achlochán	NC023064	05/02/2010	10:30	1	954Z1
Achmelvich Bay and Port An Tairbh	NC052250	31/01/2010	11:30	1	954T2
Applecross - Inner Bay	NG703450	04/02/2010	15:40	2	914P5
Applecross - Milton	NG703437	04/02/2010	15:20	1	914P4
Badentarbat Bay (Achiltibuie)	NC015081	05/02/2010	09:45	3	954Z0
Balchladich Bay	NC019301	31/01/2010	15:00	1	954T4
Balnakeil Bay	NC387694	04/02/2010	15:15	7	954V0
Callakille	NG688545	04/02/2010	16:45	4	919R4
Clardon Haven	ND159700	01/02/2010	15:40	2	95404

Dunnet Bay	ND208695	01/02/2010	12:00	5	954M0
Fanagmore Bay	NC180497	02/02/2010	15:30	1	954X3
Faraid Head	NC391707	01/02/2010		1	954V2
Gruinard Bay - An Dubh Airde - Rubha Beag	NG896965	02/02/2010	09:20	3	914U5
Gruinard Bay - Camas A Chruthaich - Leac Innis Nan Gobhar	NG950907	02/02/2010	13:15	3	914U3
Gruinard Bay - Laide	NG899935	02/02/2010	10:25	5	914U1
Gruinard Bay - Leac Innis Nan Gobhar - An T-saothair	NG926912	02/02/2010	12:30	4	914U4
Gruinard Bay - Sron Na Faire Moire - Camas A Chruthaich East	NG959930	02/02/2010	13:50	20	914U2
Horse Sound - South of Badenscallie	NC036047	05/02/2010	10:00	2	954R3
Kyle of Durness - Eilean Dubh to Keoldale	NC368674	04/02/2010	11:05	4	954W5
Little Loch Broom - Badcaul to Leac An Ime	NH005951	03/02/2010	08:15	19	91444
Loch A Chairn Bhain	NC203340	01/02/2010	14:30	1	954X1
Loch a'Chracaich	NG764570	04/02/2010	09:40	5	919R6
Loch An Obain	NC166398	03/02/2010	11:30	4	954P1
Loch Beag	NG777568	04/02/2010	10:15	1	919R7
Loch Broom - Ullapool Point - Morefield	NH109947	03/02/2010	13:55	1	914X5
Loch Carron (Strome Castle to Ardaneaskan)	NG839345	04/02/2010	09:20	1	919N4
Loch Diabaig	NG787596	04/02/2010	15:13	3	914R8
Loch Eriboll 1 - Laid	NC425598	03/02/2010	09:30	15	954S2
Loch Eriboll 2 - Rubh'Armlì	NC419565	03/02/2010	11:50	20	954S3
Loch Eriboll 3 - Camas an Duin	NC450605	03/02/2010	13:35	1	954S4
Loch Ewe - An Sguiteach - Naast	NG827861	01/02/2010	10:15	11	914T6
Loch Ewe - Aultbea	NG868888	01/02/2010	14:18	1	914T3
Loch Ewe - Aultbea - Gob A Gheodha	NG848910	01/02/2010	14:50	7	914T9
Loch Ewe - Boor	NG852823	01/02/2010	11:50	1	914T4
Loch Ewe - Rubha Thurnaig - Aultbea	NG866869	01/02/2010	13:50	4	914T8
Loch Ewe - Sgeir Maol Mhoraidh Shuas to An Sguiteach	NG812904	01/02/2010	08:15	21	914T5
Loch Gairloch - Gairloch - Caolos Beag West	NG757776	31/01/2010	12:37	15	914S9
Loch Inver - Strathan and Badnaban	NC075216	31/01/2010	09:30	1	959Y4
Loch Nedd	NC138325	01/02/2010	15:30	1	954Y0
Loch Roe	NC055239	31/01/2010	11:00	1	954T1
Loch Shieldaig - Aird to Rhuroin	NG792560	04/02/2010	10:37	3	919R8
Loch Thurnaig	NG865842	01/02/2010	13:05	2	914T7
Loch Toscaig	NG709373	04/02/2010	14:00	1	914P0
Melvich	NC888646	02/02/2010	12:15	1	954N1
Murkle Bay	ND173697	01/02/2010	14:35	1	954M2
Old Dornie Bay	NB984120	05/02/2010	13:30	13	954R6
Polbain	NB993095	05/02/2010	12:15	1	954R4
Poll Creadha	NG709407	04/02/2010	14:30	2	914P1
Red Point to Port Henderson	NG730710	31/01/2010	08:35	35	914V2
Reiff Bay and Coast	NB966135	05/02/2010	14:00	1	954R1
Rispond Bay	NC455651	04/02/2010	07:55	1	954S5

Sango Bay	NC412682	04/02/2010	09:20	1	954V4
Strathy Bay	NC840664	02/02/2010	13:15	1	954Q3
Talmine	NC586628	03/02/2010	14:55	6	95408
Thurso Bay	ND113688	02/02/2010	08:55	4	954M3
ULT - Inveralligin and Ob a'Bhraighe	NG848571	04/02/2010	14:35	1	919S1
Upper Loch Torridon - Balgy	NG856550	04/02/2010	12:25	1	919R9
Upper Loch Torridon - Torridon	NG883566	04/02/2010	13:53	4	914R5
Total				283	

2011 Records

Site	GridRef	Date	Time	Count	Code
Achlochan	NC023064	30/01/2011	11:00	3	954Z1
Badcall Bay	NC160413	02/02/2011	10:50	2	954P2
Bay of Culkein	NC043334	01/02/2011	13:15	2	954Y5
Caolos Beag West to Melvaig	NG735830	30/01/2011	13:15	1	914V1
Clashnessie Bay	NC061314	01/02/2011	14:10	2	954Y2
Dunnet Bay	ND208695	31/01/2011	08:00	3	954M0
Gills Bay	ND333736	30/01/2011	09:20	1	954K1
Gruinard Bay - Camas A Chruthaich - Leac Innis Nan Gobhar	NG950907	01/02/2011	13:57	1	914U3
Gruinard Bay - Laide	NG899935	01/02/2011	10:30	8	914U1
Gruinard Bay - Leac Innis Nan Gobhar - An T-saothair	NG926912	01/02/2011	12:45	10	914U4
Gruinard Bay - Sron Na Faire Moire - Camas A Chruthaich East	NG959930	01/02/2011	14:27	2	914U2
Kanaird Mouth	NH113990	02/02/2011	14:35	1	954Z4
Little Loch Broom - Badcaul to Leac An Ime	NH005951	02/02/2011	08:35	6	91444
Little Loch Broom - Camasnagaul to Badcaul	NH049911	02/02/2011	09:20	1	91443
Loch A Chairn Bhain	NC203340	02/02/2011	13:30	1	954X1
Loch An Eisg-Brachaidh	NC072176	01/02/2011	08:40	1	954Y6
Loch Broom - Rhue	NH093965	02/02/2011	14:05	1	914X6
Loch Eriboll 1 - Laid	NC425598	01/02/2011	13:30	1	954S2
Loch Eriboll 3 - Camas an Duin	NC450605	01/02/2011	12:50	1	954S4
Loch Ewe - An Sguiteach - Naast	NG827861	31/01/2011	10:20	1	914T6
Loch Ewe - Aultbea	NG868888	31/01/2011	13:25	1	914T3
Loch Ewe - Aultbea - Gob A Gheodha	NG848910	31/01/2011	13:58	5	914T9
Loch Ewe - Boor	NG852823	31/01/2011	11:20	3	914T4
Loch Ewe - Sgeir Maol Mhoraidh Shuas to An Sguiteach	NG812904	31/01/2011	08:15	3	914T5
Loch Gairloch - Gairloch - Caolos Beag West	NG757776	30/01/2011	11:47	3	914S9
Loch Gairloch - Port Henderson - Aird	NG753745	30/01/2011	09:15	1	914S4
Loch Inchard - Inner	NC246534	31/01/2011	13:10	1	954W3
Loch Shieldaig - Aird to Rhuroin	NG792560	03/02/2011	09:25	3	919R8
Loch Shieldaig - Shieldaig	NG808537	03/02/2011	10:35	1	914R7

Loch Thurnaig	NG865842	31/01/2011	12:35	2	914T7
Murkle Bay	ND173697	31/01/2011	09:45	1	954M2
Old Dornie Bay	NB984120	30/01/2011	13:40	1	954R6
Port of Tarbert	NC161487	02/02/2011	09:15	1	954X2
Raa Estuary and Achnahaird Bay	NC019137	30/01/2011	09:30	1	954Y8
Red Point to Port Henderson	NG730710	30/01/2011	08:10	5	914V2
Rubha Beag - Leac Mhor	NG886974	01/02/2011	08:10	1	914U6
Sandside Bay	NC964659	31/01/2011	13:55	1	954N0
Sango Bay	NC412682	02/02/2011	09:47	1	954V4
Scourie Bay	NC151449	02/02/2011	10:00	1	954P4
Talmine	NC586628	01/02/2011	11:05	1	95408
Thurso Bay	ND113688	31/01/2011	10:39	1	954M3
Traigh Allt Chailgeag	NC443660	01/02/2011	14:52	1	95407
Total				88	

2012 Records

Site	GridRef	Date	Time	Count	Code
Achlochlan	NC023064	16/02/2012	11:55	1	954Z1
Applecross - Milton	NG703437	17/02/2012	13:55	3	914P4
Balchladich Bay	NC019301	12/02/2012	10:50	1	954T4
Bay of Clachtoll	NC037269	15/02/2012	13:25	1	954T3
Borgie Estuary	NC684616	14/02/2012	16:15	1	954Q0
Camas an Eilean	NG758580	17/02/2012	15:50	1	919R5
Clashnessie Bay	NC061314	15/02/2012	10:20	2	954Y2
Dunnet Bay	ND208695	13/02/2012	11:50	3	954M0
Fanagmore Bay	NC180497	14/02/2012	08:50	1	954X3
Gills Bay	ND333736	13/02/2012	10:00	1	954K1
Gruinard Bay - An Dubh Airde - Rubha Beag	NG896965	15/02/2012	09:20	1	914U5
Gruinard Bay - Camas A Chruthaich - Leac Innis Nan Gobhar	NG950907	15/02/2012	13:05	5	914U3
Gruinard Bay - Laide	NG899935	15/02/2012	10:30	8	914U1
Gruinard Bay - Leac Innis Nan Gobhar - An T-saothair	NG926912	15/02/2012	12:30	2	914U4
Gruinard Bay - Sron Na Faire Moire - Camas A Chruthaich East	NG959930	15/02/2012	14:10	5	914U2
Horse Sound - South of Badenscallie	NC036047	16/02/2012	12:25	1	954R3
Kanaird Mouth	NH113990	16/02/2012	15:10	1	954Z4
Kyle of Tongue - north of causeway	NC590600	15/02/2012	11:50	2	954U5
Kyle of Tongue - south of causeway	NC570570	15/02/2012	12:00	2	954U6
Little Loch Broom - Badcaul to Leac An Ime	NH005951	16/02/2012	08:00	6	91444
Little Loch Broom - Dundonnell	NH080894	16/02/2012	10:35	1	91441
Loch a'Chracaich	NG764570	17/02/2012	08:05	1	919R6
Loch Ardbhair	NC167336	15/02/2012	08:20	1	954X7
Loch Broom - Tir-Alluin - Corry Point	NH153909	16/02/2012	13:05	2	914X3
Loch Carron (Strome Castle to Ardaneaskan)	NG839345	17/02/2012	09:55	2	919N4

Loch Dhrombaig	NC119335	13/02/2012	09:20	2	954Y3
Loch Diabaig	NG787596	17/02/2012	14:30	1	914R8
Loch Eriboll 1 - Laid	NC425598	16/02/2012	13:35	6	954S2
Loch Eriboll 2 - Rubh'Armlì	NC419565	16/02/2012	11:15	2	954S3
Loch Ewe - Sgeir Maol Mhoraidh Shuas to An Sguiteach	NG812904	14/02/2012	08:10	5	914T5
Loch Gairloch - Gairloch - Caolos Beag West	NG757776	12/02/2012	13:00	6	914S9
Loch Gairloch - Port Henderson - Aird	NG753745	13/02/2012	09:30	1	914S4
Loch Nedd	NC138325	15/02/2012	08:50	1	954Y0
Loch Shieldaig - Aird to Rhuroin	NG792560	17/02/2012	09:10	2	919R8
Loch Thurnaig	NG865842	14/02/2012	13:15	1	914T7
Murkle Bay	ND173697	14/02/2012	12:25	2	954M2
Ness of Duncansby to John o'Groats	ND380736	13/02/2012	08:25	2	954I2
Ness of Huna	ND357737	13/02/2012	09:20	1	954I1
Oldshoremore Bay	NC197582	13/02/2012	11:15	2	954V8
Polbain	NB993095	16/02/2012	10:40	2	954R4
Poll Creadha	NG709407	17/02/2012	13:30	2	914P1
Raa Estuary and Achnahaird Bay	NC019137	16/02/2012	13:20	6	954Y8
Red Point to Port Henderson	NG730710	13/02/2012	08:04	5	914V2
Reiff Bay and Coast	NB966135	16/02/2012	08:25	1	954R1
Rispond Bay	NC455651	14/02/2012	08:50	3	954S5
Sand Bay	NG681484	17/02/2012	14:40	1	914P3
Sango Bay	NC412682	17/02/2012	09:10	1	954V4
Thurso Bay	ND113688	13/02/2012	13:30	2	954M3
Upper Loch Torridon - Balgy	NG856550	17/02/2012	11:20	1	919R9
West side of Inner Kyle of Tongue	NC566563	12/02/2012	09:30	1	954S8
Total				114	

2013 Records

Site	GridRef	Date	Time	Count	Code
Achlocan	NC023064	05/02/2013	10:30	4	954Z1
Applecross - Inner Bay	NG703450	07/02/2010	15:12	2	914P5
Applecross - Milton	NG703437	07/02/2013	13:55	8	914P4
Armadale Bay	NC791650	05/02/2010	11:55	2	954Q2
Badcall Bay	NC160413	04/02/2013	12:25	1	954P2
Balnakeil Bay	NC387694	08/02/2013	08:50	7	954V0
Bay of Clachtoll	NC037269	06/02/2013	13:25	1	954T3
Bay of Stoer	NC036281	06/02/2013	11:40	4	954T6
Borgie Estuary	NC684616	05/02/2013	14:00	1	954Q0
Callakille	NG688545	07/02/2013	16:20	10	919R4
Camas An Eilean	NG758580	07/02/2013	08:40	2	919R5
Clardon Haven	ND159700	03/02/2013	09:30	1	95404
Clashnessie Bay	NC061314	06/02/2013	14:40	1	954Y2
Cluas Deas	NC002328	06/02/2013	12:40	2	95401

Dunnet Bay	ND208695	03/02/2013	11:45	2	954M0
Farr Bay	NC709628	05/02/2013	12:35	1	954Q4
Gruinard Bay - An Dubh Airde - Rubha Beag	NG896965	03/-2/2013	09:00	2	914U5
Gruinard Bay - Camas A Chruthaich - Leac Innis Nan Gobhar	NG950907	03/02/2011	12:10	2	914U3
Gruinard Bay - Laide	NG899935	03/02/2013	09:50	7	914Y1
Gruinard Bay - Sron Na Faire Moire - Camas A Chruthaich East	NG959930	03/02/2013	13:10	1	914U2
Little Loch Broom - Badcaul to Leac An Ime	NH005951	06/02/2012	08:10	10	91444
Little Loch Broom - Camasnagaul to Badcaul	NH049911	06/02/2011	09:20	1	91443
Little Loch Broom - Dundonnell	NH080894	06/02/2012	09:30	1	91441
Loch Shieldaig – Aird to Rhuroin	NG792560	07/02/2013	09:30	1	919R8
Loch Shieldaig - Shieldaig	NG808537	07/02/2013	10:30	1	914R7
Loch A Chairn Bhain	NC203340	06/02/2013	16:00	2	954X1
Loch An Eisg-Brachaidh	NC072176	05/02/2011	15:25	3	954Y6
Loch Borralie	NC3833670	07/02/2013	14:55	1	950V0
Loch Carron (Strome Castle to Ardaneaskan)	NG839345	07/02/2012	10:20	1	919N4
Loch Clash	NC216566	03/02/2013	12:00	1	954U4
Loch Diabaig	Ng787596	07/02/2013	14:50	4	914R8
Loch Eriboll 1 - Laid	NC425598	07/02/2013	11:15	17	954S2
Loch Eriboll 2 - Rubh'Armlì	NC419565	07/02/2013	09:20	14	954S3
Loch Eriboll 3 – Camas an Duin	NC450605	07/02/2013	08:05	6	954S4
Loch Ewe - An Sguiteach - Naast	NG827861	05/02/2011	10:00	6	914T6
Loch Ewe - Aultbea - Gob A Gheodha	NG848910	05/02/2011	14:00	3	914T9
Loch Ewe - Rubha Thurnaig - Aultbea	NG866869	01/02/2010	13:50	3	914T8
Loch Ewe - Sgeir Maol Mhoraidh Shuas to An Sguiteach	NG812904	05/02/2013	08:10	5	914T5
Loch Gairloch – Aird Bay	NG783742	04/02/2013	09:30	2	914S7
Loch Gairloch - Gairloch - Caolos Beag West	NG757776	04/02/2012	12:10	2	914S9
Loch Inchard - Inner	NC246534	03/02/2011	12:50	2	954W3
Loch Thurnaig	NG865842	05/02/2012	12:50	1	914T7
Melvich	NC888646	05/02/2010	09:30	4	954N1
Murkle Bay	ND173697	03/02/2013	10:35	3	954M2
Ness of Duncansby to John o'Groats	ND380736	04/02/2013	15:35	1	954I2
Old Dornie Bay	NB984120	05/02/2010	12:40	2	954R6
Poll Creadha	NG709407	07/02/2010	14:20	10	914P1
Sand Bay	NG681484	07/02/2013	15:15	5	914P3
Skerry Bay	NC660640	05/02/2013	14:40	5	95409
Talmine	NC586628	06/02/2013	12:45	22	95408
Traigh Allt Chailgeag	NC443660	06/02/2013	15:25	14	95407
ULT – Ob Mheallaidh	NG829543	07/02/2013	15:00	1	914R6
Total				215	

Great Northern Diver counts over the period report:

Year	2009	2010	2011	2012	2013	Average
No.	271	283	88	114	215	194

Discussion. Another behavioural pattern we have witnessed on Winter Duck is Great Northern Diver semi-submerging if alarmed or an over-head or water borne predator appears. The behavioural pattern seen is where the bird lowers its head and full body length down into the water, the head and neck often seen elongated and lowered in a pose, that appears to make them smaller or hidden from the danger. In summer birds naturally lower themselves in the water to allow young to ride on their backs, but this behaviour appears different and only undertaken when alarmed. When the danger can be escaped from the birds paddle away rapidly.

One of our group has witnessed similar behaviour with Grebe species, in particular Pied-billed Grebe, *Podilymbus podiceps*, but this particular species submerged totally apart from its head. (*Christophers .S., 2001.*)

Conclusions.

The records of three diver species seen on survey in NW/N Scotland by RAFOS as part of the WeBS survey in winter are proving very valuable in support of The WeBS National Survey, as well as providing much needed kudos for the Society. Furthermore, input from 10km squares during the winter months has also provided data that has been assessed as part of Bird Atlas 2007-11 The Breeding and Wintering Birds of Britain and Ireland (Balmer, D.E., et al BTO Books, Thetford), where for example winter records of Red-throated Diver have undergone a 32% expansion range since the *1981-84 Winter Atlas*, with a large part of the expansion being off NW Scotland and Ireland. Some of the increase may be due to better coverage but some gains are likely to be real.

The Bird Atlas 2007-11, also contains new data on Black-throated Diver. The winter distribution of Black-throated Diver also has a strong westerly emphasis per the winter distribution map, with hotspots in Cornwall and Northwest Scotland; it is surprising that the species is so scarce around the Irish coastline and Irish Sea. There has been a 51% range expansion since the *1981-84 Winter Atlas* but some gains are undoubtedly due to improved coverage, for example in Northwest Scotland.

Fluctuation of survey maximum counts should be considered. These totals are interesting and could mainly be due to adverse weather well north of the survey area and birds moving south to more hospitable waters. Potential consideration to the possibility that we see birds that regularly return to the NW of Scotland yearly and regularly return to their normal favoured haunts and in severe winters are supplemented by additional birds who are pushed south by weather. The sheltered sea lochs and large open water areas are most certainly to their liking.

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