A decline in oil rates consolidated

Monitoring and assessment of the proportion of oiled Common Guillemots in The Netherlands

winter 2018/19

C.J. Camphuysen 2019

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Front cover: Great Black-backed Gull as a scavenger feeding on a wrecked Common Guillemot on Terschelling in February 2019 (photo courtesy Jacob J. de Vries). Scavengers tend to destruct the evidence needed to assess oil rates and only sufficiently intact carcasses were used to estimate the proportion of stranded birds that is contaminated with oil

Summary - This is the annual update for OSPAR of the beached bird survey (BBS) results in The Netherlands winter 2018/19. The Dutch BBS provides data for OSPAR area's 8, 9 and 10, but data from Belgian and German colleagues will have to be merged to arrive at the final values for these areas. For the Dutch North Sea region, significant declines in oil rates were reported over a 60 year study period, but most notably in recent decades (~2005 to present). In recent seasons, consistently low oil rates are found in all species, and this includes the target species Common Guillemot *Uria aalge*, even though some hic-ups occurred in some species mostly as a result of small sample size.

In winter 2018/19, a seabird wreck occurred, mostly affecting Common Guillemots, and the proportion of oiled individuals was very low indeed. A small oil slick was seen and monitored in the March-April period off Texel, but the number of casualties remained very low. Numbers of Northern Gannets washing ashore were rather large in the last seasons, but oil did not play a role in this mortality. For coastal birds, oil pollution is history; oil rates are consistently around zero percent for a considerable series of years.

The sample size for Common Guillemots was larger than in most recent years and sufficient for OSPAR subregions covered in this study bordering the North Sea, just a bit too small for the interior Wadden Sea. The oil-rate (percentage of oiled Common Guillemots of all complete Common Guillemots found dead) reached a very low value of only 5.3% (n=433) for the North Sea coast of OSPAR areas 8 and 9 combined. This current figure, despite the large number of carcasses reported, is the second lowest value ever measured within The Netherlands and it consolidates the sharp drop in oil-rates that occurred after 2015. The five-year running mean in (Dutch) national Common Guillemot oil rates (over 2014/15-2018/19) arrived at 10.9 ± 12.1% (OSPAR 8-9) which is a further confirmation of a rapid decline. The results obtained over the last decade(s) suggest a continuation of low oil rates in Common Guillemots in Dutch waters. The OSPAR target of 20% over periods of at least 5 years for 2020 has evidently been exceeded and that for 2030 (now ~11%) has nearly been reached.

Het afnemend percentage olieslachtoffers geconsolideerd: jaarlijkse vaststelling van het percentage met olie besmeurde Zeekoeten in Nederland, winter 2018/19

Samenvatting - Dit is de jaarlijkse weergave voor OSPAR van de resultaten van systematische strandtellingen langs de Nederlandse kust, met een verslag over het seizoen 2018/19. Middels deze tellingen verzorgt Nederland haar bijdragen voor de OSPAR deelgebieden 8, 9, en 10. Om een compleet beeld te krijgen voor deze deelgebieden zullen Belgische en Duitse gegevens moeten worden toegevoegd en gecombineerd. In deze rapportage worden alleen de Nederlandse gegevens besproken. Voor de Nederlandse Noordzeekust kon de lange termijn afname in oliebevuilingspercentages bij de Zeekoeten worden bevestigd en alle laatste seizoenen hebben bijzonder lage waarden laten zien. Over 2018/19 werd langs de Noordzeekust een niveau van slechts 5.3% olieslachtoffers gevonden (n= 433). Het meerjarig gemiddelde is inmiddels op een niveau van 11% beland, waarmee de doelstellingen van OSPAR voor 2020 overschreden en die voor 2030 bijna bereikt zijn.

Introduction

The Marine Strategy Framework Directive now demands an indicator for oil pollution, in order to evaluate the effectiveness of measures to reduce chronic oil pollution (Commission Decision of 2010, Chapter 8.2, Effects of contaminants, EU 2010). The usefulness of beached bird surveys to monitor levels of chronic marine oil pollution had been demonstrated in the late 1990s (Camphuysen & Heubeck 2001), but the information need for the monitoring and assessment of oil fouling of seabirds was established much later, and first in OSPAR in the form of an Ecological Quality Objective (EcoQO). In the legal Dutch Kader Richtlijn Marien document (page 78; "Vervuilende stoffen"; Anon. 2012), the EcoQO indicator is explicitly implemented. In the EcoQOs for the North Sea, "the Proportion of oiled Common Guillemots among those found dead or dying on beaches" was subsequently listed Under Issue 4 (Seabirds), EcoQO element (f). The "Oiled Guillemot EcoQO", as agreed by the 5th North Sea Conference, was defined as: *"The proportion of such birds should be 10% or less of the total found dead or dying, in all areas of the North Sea"* (Anon. 2002), later refined to target mean proportions of 20% in 2020 and 10% in 2030 over periods of at least 5 years (Anon. 2012).

This is the annual update for The Netherlands for winter 2018/19. The emphasis of this study is on Common Guillemots, as usually and as required, but the same details are provided for also several other pelagic species (the Northern Fulmar *Fulmarus glacialis*, the Northern Gannet *Morus bassanus*, the Black-legged Kittiwake *Rissa tridactyla* and the Razorbill *Alca torda*) and three coastal species the Common Eider *Somateria mollissima*, the Herring Gull *Larus argentatus*, and the Great Black-backed Gull *Larus marinus*). The first group is meant to evaluate trends in chronic oil pollution at greater distances from the nearest coast, the second group would reflect the occurrence of nearshore oil pollution. Densities span the entire 60 years period (winter 1959/60 – winter 2019/20), whereas the analysis of oil rates spans a period of 42 years (winter 1977/78 to 2019/20).

Oil-rates (% oiled) of Common Guillemots are provided for the Dutch contributions to OSPAR areas 8, 9, and 10, and for the Dutch North Sea coast as a whole (areas 8 and 9 combined). Raw data are provided in Appendices, also for the more characteristic and commoner species of seabirds found in 2018/19 and included in this report. Given the nature of the underlying database (historical data can be merged with earlier published material whenever they emerge to enlarge earlier sample sizes), the exact values may deviate slightly from earlier publications.

Observer effort

In winter 2018/19, beached bird survey reports were received from A de Groot (3), Ad van den Berge (3), Addy Glas (1), Adriaan Dijksen (1), Adriaan Vos (1), Adriana Faber (2), Agnès Bimmel- Korstanje (1), Alie van Nijendaal-Postma (1), Alma de Groot (5), Alwin van Lubeck (1), Anko Fokkens (1), Anne Schoteldraaijer (1), Anne Schumacher (1), Annelies Marijnis (1), Arie Twigt (2), Arien Slagt (1), Arjan de Jong (1), Arnoud Heikens (2), Aron Sinke (1), Arthur Van Roey (2), Axel Garritsen (1), B.J.H.M. Possen (1), Bart Vastenhouw (2), Ben Kruijsen (1), Bernard Lucas (1), Bernd-Jan Bulsink (1), Boris Buecher (1), Carl Zuhorn (16), Casper Zuyderduyn (1), Chris Tiesinga (1), Christophe Reijman (2), CJ Camphuysen (7), Cock Dekker (1), Coen van Nieuwamerongen (1), Conny & Peter Das (2), D Veenendaal (13), D Vlugt (1), Daphne van Voorst (1), Dennis Dooper (1), Dht Gul (via MF Leopold) (1), Dick Hoek (1), Dick Slaa (1), Dook Vlugt (1), Edwin De Weerd (6), Erik de Waard (1), Erik van Dijk (1), Ernst-Jan van Haaften (1), F Arts (2), F Arts & Carlien Nijdam (1), F Janssens (3), Ferry van Jaarsveld (2), Fokke van der Weij (2), Frank Bloklander (1), Frans Lokker (1), Frans Nillesen (1), Fred Visscher (1), Freddy Van Damme (1), Geert Van den Heuvel (1), Ger Meesters (1), Gerard Westerhuis (4), Gerben Mensink (2), Gerben Mensink & Marnix Jonker (1), Gerben Oosterhuis (1), Germen Lont (3), Gerrie Hesp (1), Griet Nijs (1), Guus Lange (2), Han Goudappel (1), Hanna Haring (1), Hanno Steenbergen (1), Hans Sanders (1), Hans Semeins (1), Hans van Kersbergen (1), Hans van Oosterhout (2), Harm Jan Kiewiet (1), Harry K (1), Hennie Stienstra (1), Henri Bouwmeester (3), Herman Marinus (1), Hogeland Terschelling (1), Huub Verbeek (1), Isabelle Bossuyt (1), Ivan Leroy (1), J de Vries (1), J Krol (2), J Stuart plus Jeugdvogelclub (1), J ten Horn (4), J.van Dillen-Staal (2), JA van Franeker (7), Jaap Faber (1), Jaco Walhout (1), Jacob de Vries (5), Jacos Jes (2), Jan Bert Kanon (1), Jan Bos (2), Jan Koreneef (1), Jan Lok (1), Jeroen van der Zwan (1), Jeroen Veeken (1), Joaquim Pontes (1), Joey Braat (1), johan beek (1), Johan Bos (3), Johan E (1), Johan van der Vegt (1), Jonas Bergmans (1), Jonne Veldboom (1), Joop van Eerbeek (1), Joop Verkamman (1), J ten Horn S Ersoy LdeMonte ADekinga (1), Karel Boey (1), Karin van den Berg (1), Kees Kraaijeveld (1), Klaas Ophoff (1), Klaas Schepers (1), Koert Scholten (1), L Roozen (1), L vd Graaff (2), Larissa Bakker (1), Lenn van de Zande (1), Leon Kelder (7), Lieke Peper (1), Liesbeth Missel (1), Louis H. Zandbergen (5), Louis Schramme (2), Luc De Backer (1), Luc Elshout (1), Luca Giussani (1), Lucette Robertson-Proot (5), Luuk de Haan (1), M Klootwijk (1), M Klootwijk M Aspeslagh (1), M Smit Ecomare (2), Maarten Sluijter (1), Marc Hofman (1), Marc Nollet (1), Marc van der Kolk (1), Marcel Klootwijk (1), Marcel Ruijs (1), Marcel van Rooijen (1), Marchel Stienstra (1), Marco Leloux (1), Marijke Barhorst (1), Marnix Jonker (1), Martijn Bunskoek (1), Matthijs van Eerden (1), Maurice Knijnsberg (1), Menko Vlaardingerbroek (1), Merijn Maltha (3), MF Leopold (2), MF Leopold M Baptist (1), M den Boer (1), Michiel Muller (3), Mick Peerdeman (2), Nel Bekema (4), Niels Eimers (1), Onno Werkman (2), P de Boer (1), Patrick Agterberg (2), Patrick Snoeken (2), Paul van Eik (1), Peter Esselink (1), Peter Hoppenbrouwers (1), Peter Keune (1), Peter Rigterink (1), Peter Schaft (1), Peter van Brandwijk (1), Peter van Horssen (3), Piet Admiraal (1), Piet Gravestein (1), Piet Spoorenberg (2), Pieter Drenth (1), Pieter

Herremans (1), Pieter van Franeker (1), Pim Wolf (1), R.T.Z. NL (Archief J. vd.Hiele) (4), Remco Wester (5), René van Loo (2), René Vos (2), Renée Lejeune (1), Rik Wever (1), Rinse van der Vliet (1), Rinus van 't Hof (3), Rob Martens (1), Rob v Dorland (1), Rob Westerduijn (1), Robbin van Dijk (2), Roel Oost (1), Ruben Cornelisse (1), Rutger Rotscheid (1), Ruud Costers (1), Ruud van Beusekom (1), S Kühn (3), S Kühn & M van Veelen (1), S Kühn J ten Horn (3), S van den Berg-Blok T deBoer HBouma (3), S vd Berg-Blok H Bouma T de Boer (2), Sara Poppelaars (2), Saskia Verberne (1), Shirley O'Brien (3), Siep Luinenburg (1), Sjouke Scholten (4), Stefan Vogelzang (1), Sven Prins (2), T de Boer (1), T. Buren (2), TAW Schreurs (5), Ted van der Knaap (1), Theo Kiewiet (2), Theo M Kiewiet (1), Theunis Banga (1), Thijs Glastra (2), Thomas Ras (1), Thomas van der Es (1), Timothy Drane (1), Tom Damm (1), Tom Schrier (1), Tom van Spanje (2), Trienke de Haan (1), Valérie Goethals (1), Vasco van der Boon (3), W. van Gelder (3), Walter Van Spaendonk (1), Ward van Buul (1), Wijndeldt Boelema (1), Willem Bruul (2), Willie Smeenk (1), Willy Hebbink (1), Wim van Yperen (1), WMR data wrecksampling (17), WMR data wrecksampling Ecomare (1), Wouter Teunissen (1), Y Hermes (4), Yvan Cauwenberg (1), and Zeezoogdierenhulp Kop van Goeree (9).

Total observer effort comprised 410 reports of stranded wildlife which reflected ~1065km surveyed between 1 November 2018 and 30 April 2019 (Table 1).

Table 1. Beached surveys (*n* counts) and overall coverage (km surveyed) in winter (Nov-Apr) over the last 60 years. The effort in black was used for the analysis of trends in oiling. All effort was used to assess fluctuations in densities over the entire period.

Winter	Counts	Km surveyed	Winter	Counts	Km surveyed	Winter	Counts	Km surveyed
1959/60	7	43	1979/80	88	721	1999/00	350	1979
1960/61	38	452	1980/81	313	2125	2000/01	316	1730
1961/62	17	41	1981/82	287	1968	2001/02	397	1969
1962/63	48	145	1982/83	388	3126	2002/03	370	1869
1963/64	19	92	1983/84	336	2448	2003/04	262	1310
1964/65	7	28	1984/85	298	1869	2004/05	299	1499
1965/66	28	300	1985/86	287	1833	2005/06	241	1250
1966/67	19	164	1986/87	189	1420	2006/07	270	1109
1967/68	30	322	1987/88	207	1839	2007/08	246	934
1968/69	23	541	1988/89	231	1671	2008/09	204	921
1969/70	60	832	1989/90	237	1506	2009/10	164	776
1970/71	21	510	1990/91	215	1406	2010/11	126	685
1971/72	25	605	1991/92	164	1208	2011/12	310	1030
1972/73	19	465	1992/93	147	1182	2012/13	124	463
1973/74	30	138	1993/94	167	1128	2013/14	164	555
1974/75	49	393	1994/95	130	923	2014/15	150	481
1975/76	35	255	1995/96	138	956	2015/16	169	528
1976/77	20	244	1996/97	121	833	2016/17	301	529
1977/78	49	408	1997/98	141	953	2017/18	312	482
1978/79	93	579	1998/99	318	1795	2018/19	410	1065
	637	**6555**		**4402**	**30910**		**5185**	**21164**
							Counts	Km surveyed
Totals							**10224**	**58628**

Results

Numbers of pelagic seabirds washing ashore

The Common Guillemot is the indicator species for as far as oil contamination on European beaches is concerned, but it is always useful to evaluate the results in the context of other species of the open seas: the pelagic seabirds. The long term fluctuations in densities are shown in **Fig. 1**, and it can be seen that the densities in winter 2018/19 were higher than in most other recent years: the result of a wreck of guillemots that occurred in January 2019 and that lasted until well in February. Oil rates are expectedly low during wrecks, for most of the mortality is 'food driven' (the result of starvation of the birds involved). The size of the wreck was fairly small, certainly in comparison with numbers washing ashore in the 1980s and 1990s, when oil pollution was more widespread, but when the decline in oil rates became visible because the *amount* of oil on individual carcasses was already declining. Many birds involved in these wrecks were only slightly contaminated with oil. Nowadays, given low or given large numbers, the majority of the guillemots washing ashore does not show any oil in the feathers.

Guillemots, Razorbills and Black-legged Kittiwakes share particular resources within the North Sea ecosystem and can often be seen feeding in the same or in similar habitats, if not even in close association. Given the numbers of Common Guillemots found, higher-than-average numbers of Razorbills and kittiwakes would not have been surprising. This was not the case, however. While in the 1980s and during a wreck in 2011/12 these three species often co-occurred, only densities of Common Guillemots were above average in 2018/19.

More aerial pelagic seabirds, the Northern Fulmar and the Norther Gannet, less prone to oil contamination simply as a result of their lifestyle, tend to have much lower densities than the three species mentioned earlier. Numbers of gannets washing ashore tend to be fairly consistent, whereas densities of Northern Fulmar may fluctuate more widely, sometimes as a result of influxes of birds from elsewhere (e.g. from Arctic regions) into the North Sea. The famous fulmar-wreck of 1962 is still a ones-in-a-lifetime event, despite some irruptions in other years. In recent years, numbers of Northern Gannets washing ashore were rather high, not so much in 2018/19, but seemingly elevated in three to four subsequent seasons, for reasons that are unknown. Evidently, mineral oil played only a minor role in this, if any role at all.

Numbers of coastal seabirds washing ashore

For nearshore seabirds, winter 2018/19 was not a particular season in any respect. Overseeing the long-term fluctuations in recorded densities, particular mortality events were documented in Common Eiders as well as in the two large gull species. Serious oil-related events all date back to the 1960s, while some other and more recent mortality events were food- or disease rather than oil related. It should be noted that an important modern source of information for recent bird strandings (https://waarneming.nl) is a poor source for strandings data of commoner species such as Herring Gulls and Greater Black-backed Gulls, so that some strandings may have been overlooked. Yet, there is no evidence for oil-related mortality in any of the species shown in **Fig. 2**, let alone other coastal species and the trend of partly black (*i.e.* oiled) bars to predominantly pale grey (*i.e.* unoiled) bars is evident in all species depicted.

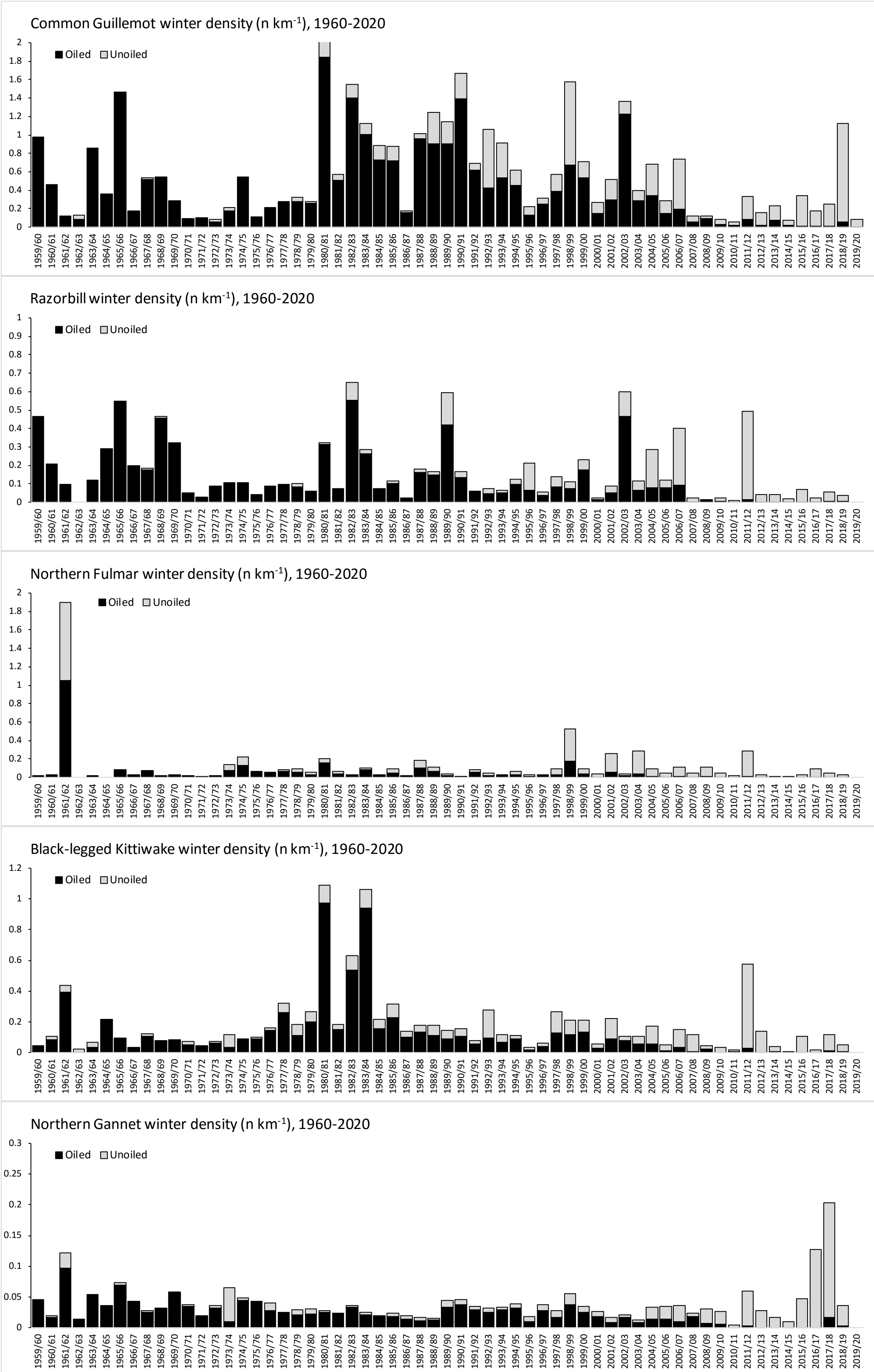

Fig. 1. Densities (n km^{-1}) of some pelagic seabirds washing ashore in winter, 1959/60-2018/19 (provisional data for 2019/20) in The Netherlands

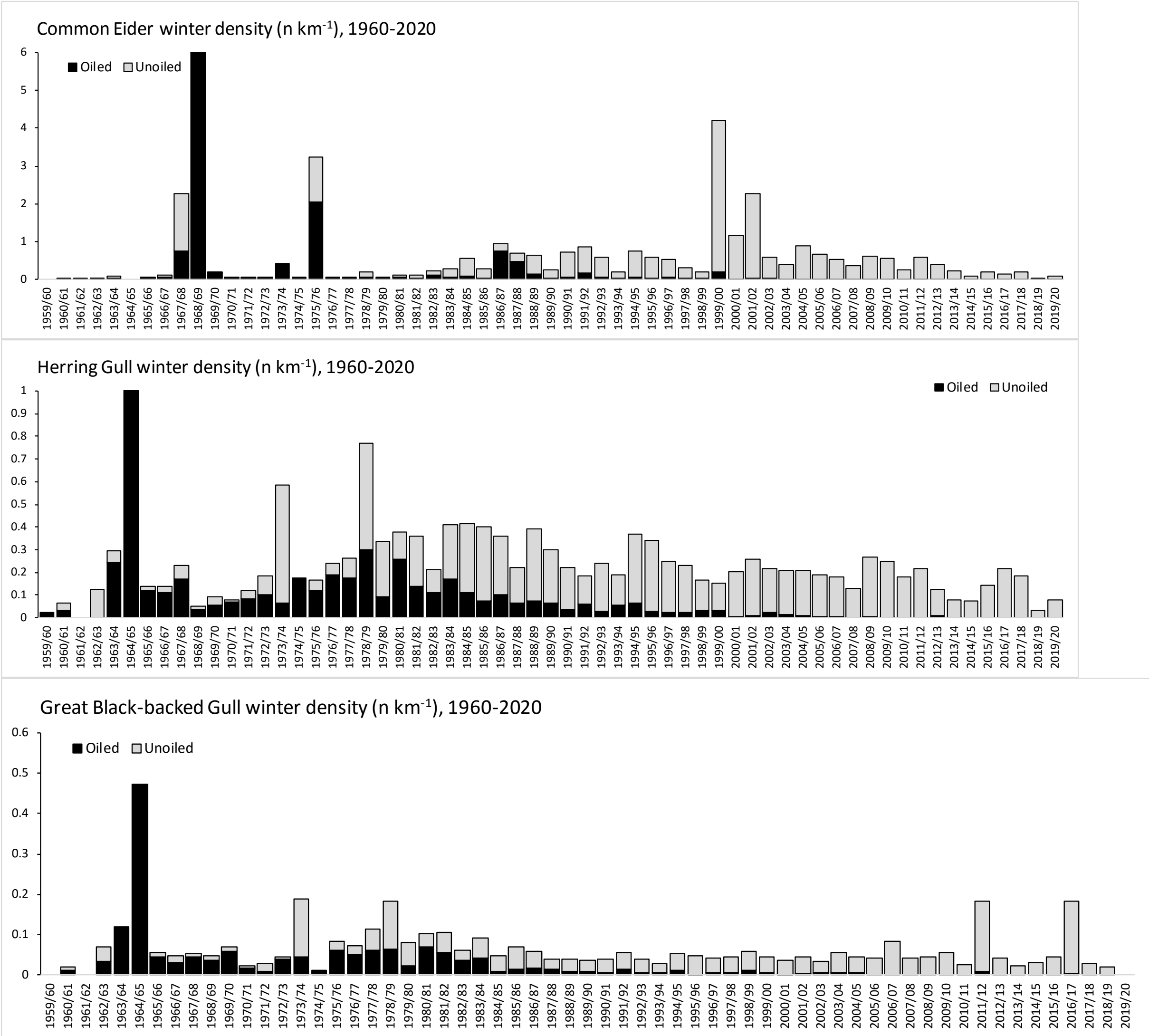

Fig. 2. Densities (n km^{-1}) of some nearshore seabirds washing ashore in winter, 1959/60-2018/19 (provisional data for 2019/20) in The Netherlands.

Oil rates updated

For the analysis, only intact carcasses were selected, since only these were considered fit for purpose: to assess the fraction of birds washing ashore that was, or was not, contaminated with mineral oil. The values produced are all tabulated in the Appendix, whereas the proportions and a long-term running mean and a logit-transformed presentation of the oil rates allowing a linear regression to examine the trends are shown in this chapter.

A warning beforehand, is that the logit transformation is impossible for any values equal to 100% or 0% (e.g. all birds oiled, or none of the birds oiled), for a logit transformation would lead to +∞ or -∞ respectively. In cases where 0% of the birds found were oiled, the outcome was therefore transformed to logit -2 (e.g. ~1% oiled), as a more reliable and workable quesstimate of the actual oil rate to be used in the regression analysis. The problem of ‘no oil’ is increasingly common in recent years, now that chronic oil pollution is really pushed back.

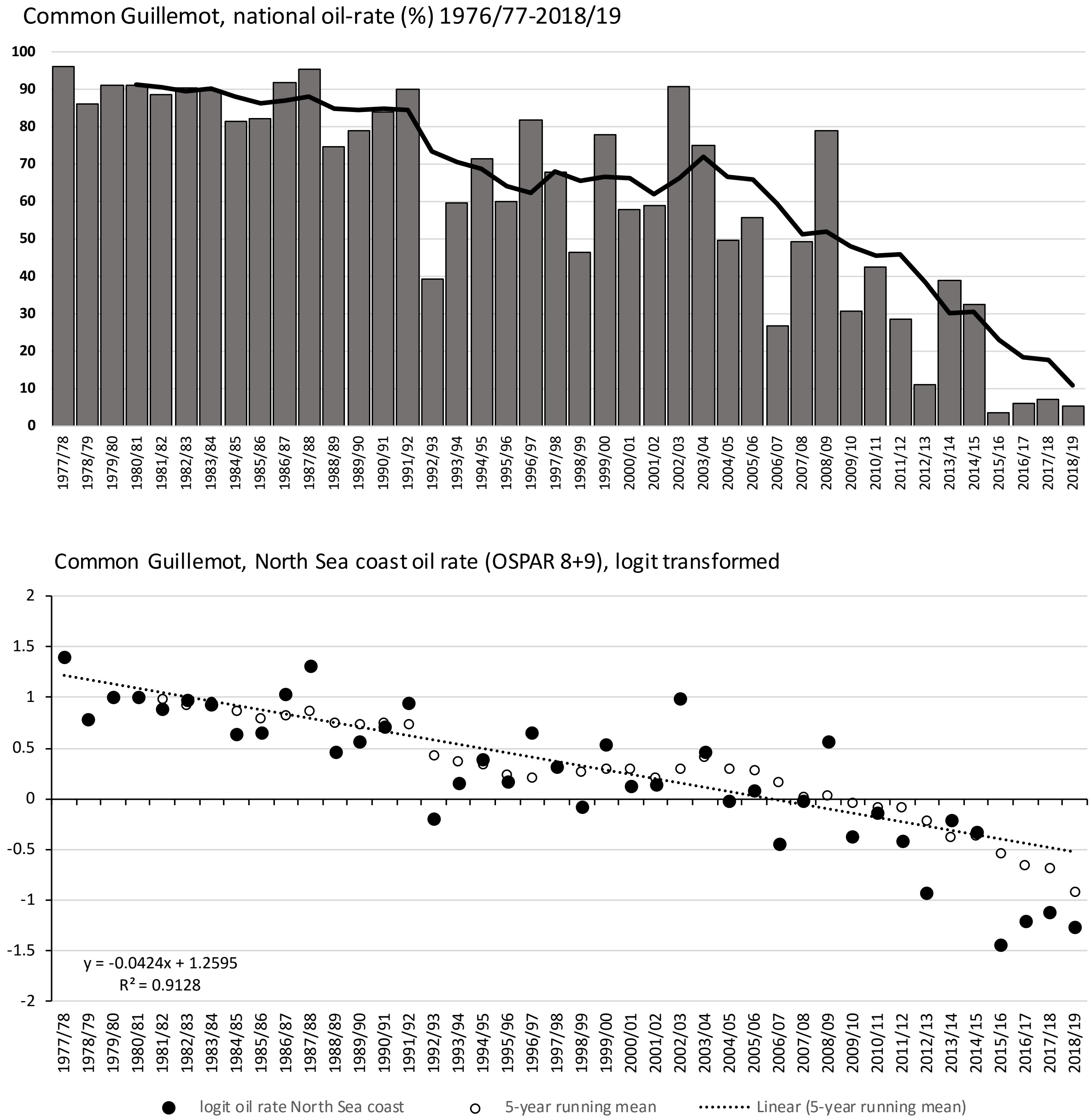

Fig. 3 Proportions oiled and 5-year running mean in oil rates (top panel) and a significant decline in logit-transformed oil rates in Common Guillemots, 1977/78-2018/19.

The significant decline in oil rates in Common Guillemots continued, and in winter 2018/19 the second lowest value (5.3% oiled, n= 433) was reached (**Fig. 3**). The five-year running mean (10.9 ± 12.1%) is about what has to be achieved by 2030 according to OSPAR and well exceeded expectations for 2020.

For the other pelagic seabirds (**Fig. 4**) highly similar trends and patterns were found, although the data were slightly more erratic in species such as Northern Gannet, in which the sample size was often fairly small. Oil rates in recent years were often nihil (0%), something that never occurred prior to 2008. Oil rates (incl 5-year running means) tend on average to be lower in the aerial species than in the more sensitive auks, but the difference is small (**Table 2**).

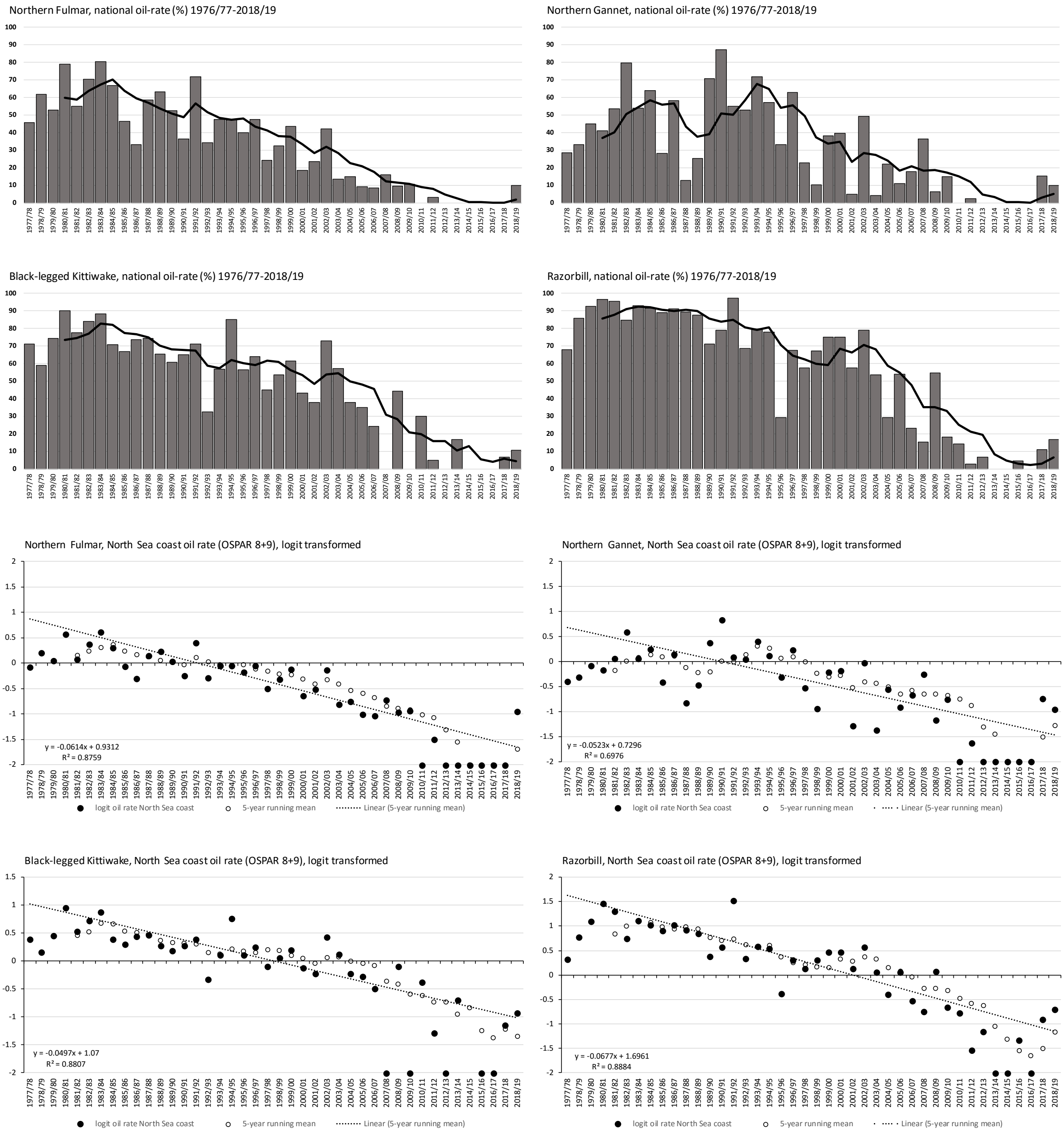

Fig. 4 Proportions oiled and 5-year running mean in oil rates (top panels) and a significant declines in logit-transformed oil rates in the four commoner pelagic species: Northern Fulmar, Northern Gannet, Black-legged Kittiwake, and Razorbill, 1977/78-2018/19.

Table 2 Proportions oiled and 5-year running means (±SD) in pelagic seabirds in 2018/19. () = small sample.

Species	Oiled (%)	n=	Mean		SD
Common Guillemot	5.3	433	10.8	±	12.1
Razorbill	16.7	30	6.5	±	7.2
Northern Fulmar	(10.0)	20	2.0	±	4.5
Northern Gannet	(10.0)	20	5.1	±	7.2
Black-legged Kittiwake	10.7	28	4.3	±	5.3

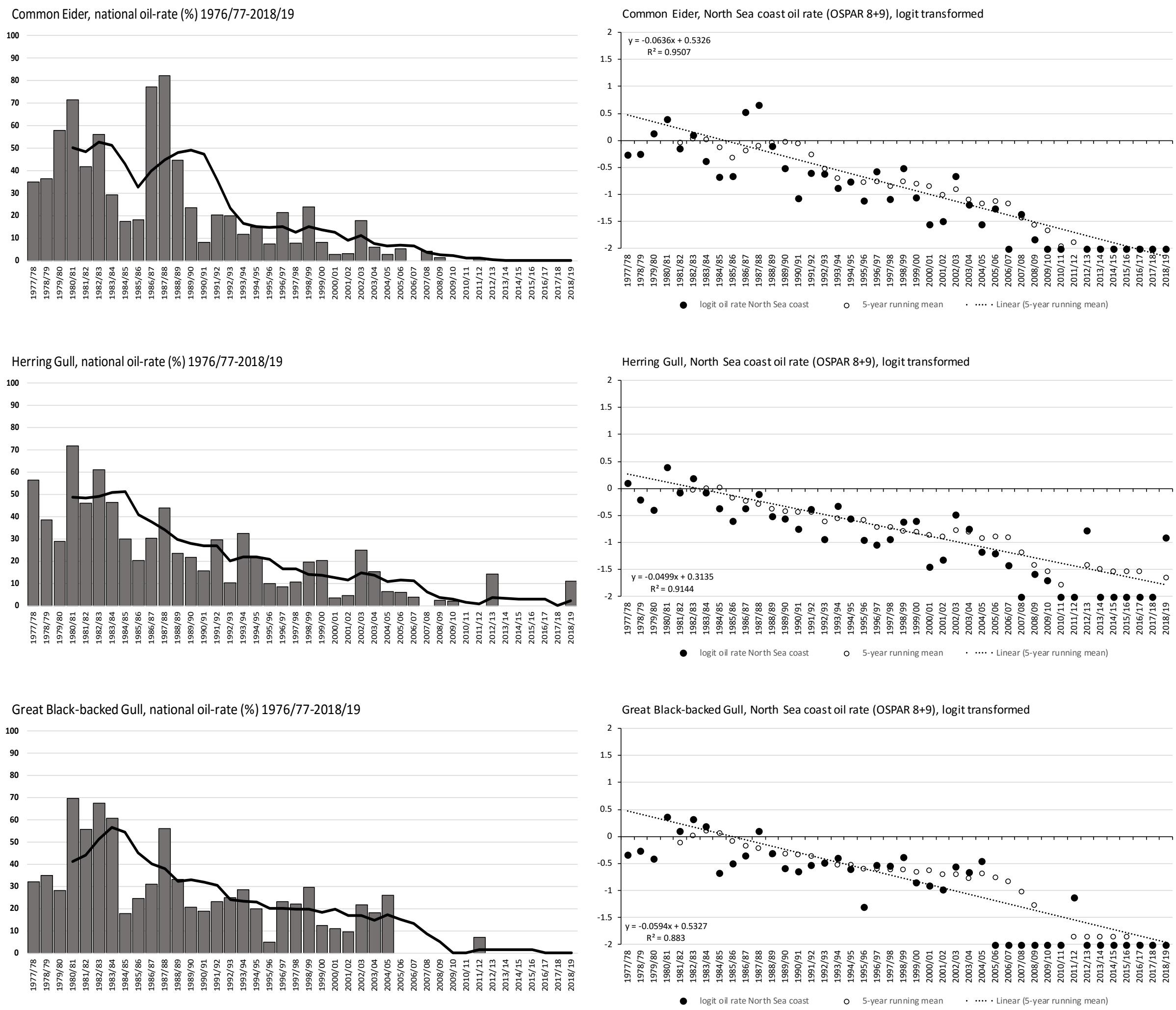

Fig. 5 Proportions oiled and 5-year running mean in oil rates (left panels) and declines in logit-transformed oil rates (right panels) in three coastal species: Common Eider, Herring Gull, and Great Black-backed Gull, 1977/78-2018/19.

For the more coastal species, a trend analysis is in fact pointless in recent years, for the oil rates are essential nihil with occasional casualties every now and then. For these species, in this part of the world, chronic oil pollution is no longer an issue of concern, even though an accidental spill could still kill thousands of birds on a single occasion. Oil rates equalling 0% (depicted as logit -2 on the right panels) predominate in recent years.

Discussion

In winter 2018/19, oil rates were again very low, signaling a further improvement in marine ecosystems for as far as chronic oil pollution is concerned. The 5-year running (arithmetic) mean oil rate in Common Guillemots for North Sea coasts in OSPAR areas 8 and 9 combined was until recently the only trend that was still linear, but the latest results indicate an acceleration of the decline in oil rates in the southern Bight. The decline is similar in all OSPAR regions covered by The Netherlands. With the current oil rates, the fairly conservative OSPAR target (20% oiled by 2020) has been exceeded and the better target (10% in 2010) has in fact almost been reached.

As said in the previous report, beached bird surveys are a vital part of both the Oiled-Guillemot EcoQO as well as for the plastic particle monitoring conducted by using Northern Fulmar carcasses around the North Sea (Van Franeker & SNS Fulmar Study Group). More and more people prefer to post their findings directly online on internet as a way of rapid communication and data storage. Therefore, to complete the overview over strandings in The Netherlands, more opportunistic reports from www.waarneming.nl, and especially those reports that include clear photographic material were screened for double counts and identification errors, even to the sample size of stranded Common Guillemots and several other seabirds didn't need to be enhanced. It is now foreseen that the waarneming.nl applications will be modified such that systematic beached bird surveys are better accommodated.

The Dutch data collected for OSPAR regions 8 and 9 must be seen as contributions to the data set. An international co-ordinator, or OSPAR itself, will have to combine Dutch, Belgian and German data for these areas in order to arrive at OSPAR area specific oil rates for Common Guillemots in the southeastern North Sea.

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Appendices

The tables below show raw data underlying the graphs in this report, except the long-term trends in densities. Shown are the oil rates (%), in parentheses when the sample size was <25 intact carcasses in a given winter and/or area, and the sample size (n), for each of the OSPAR regions (8-10) and for the North Sea coast as a whole (8+9).

(1) Common Guillemot

	Subregion 8		Subregion 9		subregion 10			National (8+9)		
	ratio	n=	ratio	n=	ratio	n=		ration	n=	mean
1977/78	96.3	82	(100.0)	23			1977/78	96.2	105	
1978/79	83.9	93	91.3	46			1978/79	86.3	139	
1979/80	94.1	118	85.9	64	(66.7)	3	1979/80	91.2	182	
1980/81	90.4	3061	96.0	448	91.8	233	1980/81	91.1	3509	91.2
1981/82	86.8	675	95.5	202	92.2	115	1981/82	88.8	877	90.7
1982/83	87.6	2494	95.6	1449	91.9	434	1982/83	90.5	3943	89.6
1983/84	87.4	1625	95.2	660	77.9	163	1983/84	89.6	2285	90.3
1984/85	77.1	855	89.5	474	87.2	47	1984/85	81.5	1329	88.3
1985/86	78.3	803	90.2	378	81.1	159	1985/86	82.1	1181	86.5
1986/87	89.7	107	96.1	51	(88.2)	17	1986/87	91.8	158	87.1
1987/88	96.1	1177	92.7	288	78.3	83	1987/88	95.4	1465	88.1
1988/89	73.0	1224	82.7	248	49.6	133	1988/89	74.6	1472	85.1
1989/90	79.5	1266	76.6	158	73.5	83	1989/90	79.1	1424	84.6
1990/91	83.9	1861	85.4	144	42.9	35	1990/91	84.0	2005	85.0
1991/92	88.9	522	92.2	268	(100.0)	6	1991/92	90.0	790	84.6
1992/93	41.4	794	28.7	150	40.7	123	1992/93	39.4	944	73.4
1993/94	60.8	559	56.4	179	52.8	106	1993/94	59.8	738	70.5
1994/95	69.1	246	75.8	124	71.1	83	1994/95	71.4	370	68.9
1995/96	58.6	111	62.3	61	(57.1)	7	1995/96	59.9	172	64.1
1996/97	84.2	146	77.5	71	(66.7)	6	1996/97	82.0	217	62.5
1997/98	69.5	285	64.6	144	(61.9)	21	1997/98	67.8	429	68.2
1998/99	43.3	1054	51.5	631	24.1	411	1998/99	46.4	1685	65.5
1999/00	78.7	675	76.8	310	60.4	149	1999/00	78.1	985	66.8
2000/01	48.1	108	63.5	197	42.9	49	2000/01	58.0	305	66.5
2001/02	62.6	340	55.0	320	50.7	138	2001/02	58.9	660	61.8
2002/03	95.9	1992	58.9	314	46.8	77	2002/03	90.9	2306	66.5
2003/04	83.7	141	69.3	215	45.9	61	2003/04	75.0	356	72.2
2004/05	61.5	265	39.7	312	42.7	103	2004/05	49.7	577	66.5
2005/06	53.7	82	56.8	132	47.9	71	2005/06	55.6	214	66.0
2006/07	28.4	356	23.5	153	13.2	76	2006/07	26.9	509	59.6
2007/08	(50.0)	18	48.8	43	(35.0)	20	2007/08	49.2	61	51.3
2008/09	(86.4)	22	76.5	68	(66.7)	9	2008/09	78.9	90	52.1
2009/10	(23.1)	13	34.8	23	(66.7)	9	2009/10	30.6	36	48.2
2010/11	(55.6)	9	37.5	24	( )	0	2010/11	42.4	33	45.6
2011/12	29.2	106	27.5	91	0.0	28	2011/12	28.4	197	45.9
2012/13	3.6	28	18.5	27	(33.3)	3	2012/13	10.9	55	38.2
2013/14	(0.0)	16	53.5	43	(12.5)	16	2013/14	39.0	59	30.3
2014/15	(55.6)	18	(10.5)	19	( )	0	2014/15	32.4	37	30.6
2015/16	(10.5)	19	2.5	122	4.0	25	2015/16	3.5	141	22.9
2016/17	2.7	37	10.0	30	(16.7)	6	2016/17	6.0	67	18.4
2017/18	0.0	26	13.3	30	(0.0)	20	2017/18	7.1	56	17.6
2018/19	9.8	51	4.7	382	(0.0)	15	2018/19	5.3	433	10.9
								10.9	5yr mean	
								12.1	SD	

(2) Razorbill

	Subregion 8		Subregion 9		subregion 10			National (8+9)		
	ratio	n=	ratio	n=	ratio	n=		ratio	n=	
1977/78	92.6	27	(100.0)	23			1977/78	68.0	50	
1978/79	84.0	25	(88.2)	17			1978/79	85.7	42	
1979/80	96.8	31	(80.0)	10	(0.0)	0	1979/80	92.7	41	
1980/81	96.2	496	100.0	77	88.5	26	1980/81	96.7	573	85.8
1981/82	94.8	77	96.7	30	(100.0)	19	1981/82	95.3	107	87.7
1982/83	84.7	1299	85.9	311	85.8	141	1982/83	84.9	1610	91.1
1983/84	92.9	547	91.9	37	96.8	31	1983/84	92.8	584	92.5
1984/85	90.1	71	93.3	45	(100.0)	2	1984/85	91.4	116	92.2
1985/86	87.4	127	93.5	46	(100.0)	4	1985/86	89.0	173	90.7
1986/87	(88.2)	17	(100.0)	6	(0.0)	0	1986/87	91.3	23	89.9
1987/88	94.3	175	75.4	61	(85.0)	20	1987/88	89.4	236	90.8
1988/89	87.5	152	88.9	36	(81.8)	11	1988/89	87.8	188	89.8
1989/90	72.0	690	60.6	66	48.0	25	1989/90	71.0	756	85.7
1990/91	79.3	174	76.5	34	(100.0)	2	1990/91	78.8	208	83.7
1991/92	97.6	42	96.3	27	(100.0)	6	1991/92	97.1	69	84.8
1992/93	72.9	59	(37.5)	8	(33.3)	6	1992/93	68.7	67	80.7
1993/94	83.7	49	(66.7)	15	(0.0)	2	1993/94	79.7	64	79.1
1994/95	77.4	53	79.3	29	(73.3)	15	1994/95	78.0	82	80.5
1995/96	28.9	121	30.4	46	(25.0)	4	1995/96	29.3	167	70.6
1996/97	62.5	24	75.0	16	(33.3)	3	1996/97	67.5	40	64.6
1997/98	58.4	77	55.2	29	(100.0)	2	1997/98	57.5	106	62.4
1998/99	71.4	77	61.4	57	(55.6)	18	1998/99	67.2	134	59.9
1999/00	75.7	259	73.3	86	(53.8)	13	1999/00	75.1	345	59.3
2000/01	(70.0)	10	77.8	18	(50.0)	2	2000/01	75.0	28	68.5
2001/02	58.4	77	55.3	38	(33.3)	18	2001/02	57.4	115	66.4
2002/03	87.8	841	38.2	178	(26.1)	23	2002/03	79.1	1019	70.7
2003/04	45.6	57	63.3	49	(66.7)	6	2003/04	53.8	106	68.1
2004/05	34.8	135	22.9	118	(13.0)	23	2004/05	29.2	253	58.9
2005/06	50.0	24	55.8	52	91.4	35	2005/06	53.9	76	54.7
2006/07	25.5	145	16.0	50	(22.2)	18	2006/07	23.1	195	47.8
2007/08	(16.7)	6	(14.3)	7	(0.0)	4	2007/08	15.4	13	35.1
2008/09	(60.0)	5	(50.0)	6	( )	0	2008/09	54.5	11	35.2
2009/10	(25.0)	8	(0.0)	3	(100.0)	1	2009/10	18.2	11	33.0
2010/11	(0.0)	4	(33.3)	3	( )	0	2010/11	14.3	7	25.1
2011/12	1.9	209	4.1	145	0.0	36	2011/12	2.8	354	21.0
2012/13	) 0.0)	10	(20.0)	5	(0.0)	1	2012/13	6.7	15	19.3
2013/14	) 0.0)	10	(0.0)	7	(0.0)	2	2013/14	0.0	17	8.4
2014/15	( )	0	(0.0)	7	( )	0	2014/15	0.0	7	4.8
2015/16	(0.0)	2	(5.0)	20	(0.0)	5	2015/16	4.5	22	2.8
2016/17	(0.0)	4	(0.0)	5	(0.0)	0	2016/17	0.0	9	2.2
2017/18	(11.1)	9	(11.1)	9	(0.0)	20	2017/18	11.1	18	3.1
2018/19	(0.0)	2	17.9	28	(0.0)	15	2018/19	16.7	30	6.5
								6.5	5yr average	
								7.3	SD	

(3) Black-legged Kittiwake

	Subregion 8		Subregion 9		subregion 10			National (8+9)		
	ratio	n=	ratio	n=	ratio	n=		ratio	n=	
1977/78	83.3	102	(50.0)	23			1977/78	71.2	125	
1978/79	53.7	54	(100.0)	7			1978/79	59.0	61	
1979/80	73.7	114	76.7	30	(0.0)	0	1979/80	74.3	144	
1980/81	89.6	1371	92.3	209	84.2	184	1980/81	89.9	1580	73.6
1981/82	76.9	147	79.2	53	90.6	64	1981/82	77.5	200	74.4
1982/83	84.5	969	82.2	202	82.1	262	1982/83	84.1	1171	77.0
1983/84	88.8	1750	80.7	119	82.4	142	1983/84	88.3	1869	82.8
1984/85	68.0	175	78.8	66	(84.6)	13	1984/85	71.0	241	82.2
1985/86	65.5	252	75.0	44	74.2	31	1985/86	66.9	296	77.5
1986/87	73.2	82	(77.8)	9	(20.0)	5	1986/87	73.6	91	76.8
1987/88	75.8	124	69.7	33	54.5	33	1987/88	74.5	157	74.9
1988/89	66.7	102	(57.9)	19	(41.2)	17	1988/89	65.3	121	70.3
1989/90	59.8	132	(68.8)	16	(37.5)	16	1989/90	60.8	148	68.2
1990/91	64.5	124	(71.4)	14	(75.0)	4	1990/91	65.2	138	67.9
1991/92	67.3	55	(85.7)	14	(50.0)	6	1991/92	71.0	69	67.4
1992/93	32.4	182	32.1	28	38.9	36	1992/93	32.4	210	58.9
1993/94	53.5	43	61.3	31	(46.7)	15	1993/94	56.8	74	57.2
1994/95	81.4	43	(100.0)	11	(66.7)	15	1994/95	85.2	54	62.1
1995/96	(50.0)	20	(100.0)	3	(0.0)	2	1995/96	56.5	23	60.4
1996/97	63.6	33	(66.7)	6	(0.0)	0	1996/97	64.1	39	59.0
1997/98	42.1	114	57.7	26	(33.3)	15	1997/98	45.0	140	61.5
1998/99	51.1	131	58.5	65	40.0	35	1998/99	53.6	196	60.9
1999/00	61.9	134	61.0	82	42.5	40	1999/00	61.6	216	56.2
2000/01	46.4	28	37.5	16	(25.0)	4	2000/01	43.2	44	53.5
2001/02	46.3	108	25.7	74	34.0	47	2001/02	37.9	182	48.2
2002/03	85.8	106	34.3	35	(68.8)	16	2002/03	73.0	141	53.9
2003/04	67.6	37	45.2	31	(20.0)	10	2003/04	57.4	68	54.6
2004/05	34.8	69	44.8	29	10.8	37	2004/05	37.8	98	49.9
2005/06	(38.5)	13	(28.6)	7	(0.0)	5	2005/06	35.0	20	48.2
2006/07	(13.6)	22	(36.8)	19	(9.1)	11	2006/07	24.4	41	45.5
2007/08	(0.0)	4	(0.0)	12	(11.8)	17	2007/08	0.0	16	30.9
2008/09	(50.0)	4	(42.9)	14	(0.0)	1	2008/09	44.4	18	28.3
2009/10	(0.0)	7	(0.0)	6	(0.0)	0	2009/10	0.0	13	20.8
2010/11	(20.0)	5	(40.0)	5	(0.0)	0	2010/11	30.0	10	19.8
2011/12	3.3	151	10.2	49	0.0	28	2011/12	5.0	200	15.9
2012/13	(0.0)	20	(0.0)	9	(0.0)	3	2012/13	0.0	29	15.9
2013/14	(0.0)	1	(20.0)	5	(0.0)	0	2013/14	16.7	6	10.3
2014/15	(0.0)	0	(0.0)	0	(0.0)	0	2014/15		0	12.9
2015/16	(0.0)	1	(0.0)	15	(0.0)	4	2015/16	0.0	16	5.4
2016/17	(0.0)	1	(0.0)	1	(0.0)	0	2016/17	0.0	2	4.2
2017/18	(0.0)	9	(16.7)	6	(0.0)	20	2017/18	6.7	15	5.8
2018/19	(0.0)	7	(14.3)	21	(0.0)	15	2018/19	10.7	28	4.3
								4.3	5yr average	
								5.3	SD	

(4) Northern Fulmar

	Subregion 8		Subregion 9		subregion 10			National (8+9)		
	ratio	n=	ratio	n=	ratio	n=		ratio	n=	
1977/78	76.0	25	(60.0)	23		0	1977/78	45.8	48	
1978/79	58.8	34	(75.0)	8		0	1978/79	61.9	42	
1979/80	59.3	27	(33.3)	9	( )	0	1979/80	52.8	36	
1980/81	81.6	256	67.2	58	84.2	38	1980/81	79.0	314	59.9
1981/82	61.5	52	(36.8)	19	(65.2)	23	1981/82	54.9	71	58.9
1982/83	72.4	58	(65.0)	20	(66.7)	12	1982/83	70.5	78	63.8
1983/84	81.1	169	(75.0)	16	(66.7)	15	1983/84	80.5	185	67.5
1984/85	(66.7)	24	(66.7)	18	(100.0)	1	1984/85	66.7	42	70.3
1985/86	43.8	80	53.3	30	(37.5)	8	1985/86	46.4	110	63.8
1986/87	(22.2)	9	(50.0)	6	(0.0)	1	1986/87	33.3	15	59.5
1987/88	63.9	166	46.8	77	35.7	28	1987/88	58.4	243	57.1
1988/89	61.0	82	68.4	38	(25.0)	16	1988/89	63.3	120	53.6
1989/90	50.0	34	(66.7)	6	(0.0)	1	1989/90	52.5	40	50.8
1990/91	(36.4)	11	( )	0	( )	0	1990/91	36.4	11	48.8
1991/92	63.6	44	78.8	52	(33.3)	6	1991/92	71.9	96	56.5
1992/93	40.7	27	(12.5)	8	(33.3)	12	1992/93	34.3	35	51.7
1993/94	(33.3)	12	(66.7)	9	(50.0)	2	1993/94	47.6	21	48.5
1994/95	(57.1)	21	(30.8)	13	(63.6)	11	1994/95	47.1	34	47.4
1995/96	(50.0)	12	(25.0)	8	(100.0)	1	1995/96	40.0	20	48.2
1996/97	(38.5)	13	(66.7)	6	( )	0	1996/97	47.4	19	43.3
1997/98	29.0	31	19.4	31	(0.0)	2	1997/98	24.2	62	41.2
1998/99	26.3	399	42.1	247	29.9	97	1998/99	32.4	646	38.2
1999/00	43.5	69	43.9	57	(53.8)	13	1999/00	43.7	126	37.5
2000/01	(12.5)	16	22.2	27	(0.0)	4	2000/01	18.6	43	33.2
2001/02	21.3	244	30.8	78	25.0	28	2001/02	23.6	322	28.5
2002/03	67.9	28	(12.5)	24	(0.0)	4	2002/03	42.3	52	32.1
2003/04	18.4	103	10.6	161	3.6	28	2003/04	13.6	264	28.4
2004/05	14.7	34	15.0	40	(16.7)	18	2004/05	14.9	74	22.6
2005/06	4.2	24	(15.0)	20	(0.0)	4	2005/06	9.1	44	20.7
2006/07	12.0	25	(0.0)	10	(0.0)	10	2006/07	8.6	35	17.7
2007/08	(0.0)	5	(20.0)	20	(7.7)	13	2007/08	16.0	25	12.4
2008/09	(7.4)	27	10.9	55	(0.0)	7	2008/09	9.8	82	11.7
2009/10	(33.3)	3	(6.3)	16	(33.3)	3	2009/10	10.5	19	10.8
2010/11	(0.0)	4	(0.0)	5	( )	0	2010/11	0.0	9	9.0
2011/12	3.8	78	1.9	52	(0.0)	13	2011/12	3.1	130	7.9
2012/13	(0.0)	2	(0.0)	3	( )	0	2012/13	0.0	5	4.7
2013/14	(0.0)	2	( )	0	(0.0)	1	2013/14	0.0	2	2.7
2014/15	(0.0)	0	(0.0)	2	( )	0	2014/15	0.0	2	0.6
2015/16	(0.0)	3	(0.0)	10	( )	0	2015/16	0.0	13	0.6
2016/17	(0.0)	11	(0.0)	13	(0.0)	3	2016/17	0.0	24	0.0
2017/18	(0.0)	9	(0.0)	2	(0.0)	20	2017/18	0.0	11	0.0
2018/19	(0.0)	4	(12.5)	16	(0.0)	15	2018/19	10.0	20	2.0
								2.0	5yr average	
								4.5	SD	

(5) Northern Gannet

	Subregion 8		Subregion 9		subregion 10			National (8+9)		
	ratio	n=	ratio	n=	ratio	n=		ratio	n=	
1977/78	(50.0)	12	(66.7)	23			1977/78	28.6	35	
1978/79	(30.0)	20	(50.0)	4			1978/79	33.3	24	
1979/80	(54.2)	24	(14.3)	7	( )	0	1979/80	45.2	31	
1980/81	45.3	86	26.9	26	(25.0)	8	1980/81	41.1	112	37.0
1981/82	57.4	47	(45.5)	22	(42.9)	14	1981/82	53.6	69	40.4
1982/83	82.2	90	(69.6)	23	(63.6)	11	1982/83	79.6	113	50.6
1983/84	51.5	66	(66.7)	12	(54.5)	11	1983/84	53.8	78	54.7
1984/85	69.2	26	(53.8)	13	(100.0)	2	1984/85	64.1	39	58.5
1985/86	27.4	62	(30.0)	20	(50.0)	10	1985/86	28.0	82	55.9
1986/87	(61.1)	18	(50.0)	6	(0.0)	1	1986/87	58.3	24	56.8
1987/88	17.8	73	4.7	43	(5.3)	19	1987/88	12.9	116	43.5
1988/89	22.0	41	(33.3)	18	(20.0)	15	1988/89	25.4	59	37.8
1989/90	69.1	55	(80.0)	10	(66.7)	3	1989/90	70.8	65	39.1
1990/91	85.7	49	(100.0)	6	(100.0)	1	1990/91	87.3	55	50.9
1991/92	56.8	37	(52.2)	23	(0.0)	6	1991/92	55.0	60	50.3
1992/93	60.0	40	(22.2)	9	(11.1)	9	1992/93	53.1	49	58.3
1993/94	72.4	29	(70.0)	10	(75.0)	4	1993/94	71.8	39	67.6
1994/95	66.7	27	(40.0)	15	(55.6)	9	1994/95	57.1	42	64.9
1995/96	(40.0)	10	(25.0)	8	( )	0	1995/96	33.3	18	54.1
1996/97	(60.0)	20	(71.4)	7	( )	0	1996/97	63.0	27	55.7
1997/98	31.3	32	13.8	29	(0.0)	2	1997/98	23.0	61	49.6
1998/99	9.3	324	12.8	164	10.5	76	1998/99	10.5	488	37.4
1999/00	38.1	63	38.5	52	(33.3)	9	1999/00	38.3	115	33.6
2000/01	(26.3)	19	46.2	39	(20.0)	5	2000/01	39.7	58	34.9
2001/02	4.0	200	8.5	59	(0.0)	21	2001/02	5.0	259	23.3
2002/03	74.3	35	(12.5)	24	(0.0)	4	2002/03	49.2	59	28.5
2003/04	3.4	87	4.6	151	0.0	27	2003/04	4.2	238	27.3
2004/05	19.4	36	24.4	45	(6.3)	16	2004/05	22.2	81	24.1
2005/06	(4.2)	24	(19.0)	21	(50.0)	8	2005/06	11.1	45	18.3
2006/07	21.4	28	(9.1)	11	(16.7)	12	2006/07	17.9	39	20.9
2007/08	(28.6)	7	38.5	26	(14.3)	14	2007/08	36.4	33	18.4
2008/09	3.8)	26	7.5	53	(0.0)	7	2008/09	6.3	79	18.8
2009/10	(33.3)	3	(11.8)	17	(0.0)	2	2009/10	15.0	20	17.4
2010/11	(0.0)	4	(0.0)	5	( )	0	2010/11	0.0	9	15.1
2011/12	2.6	77	1.9	52	(0.0)	13	2011/12	2.3	129	12.0
2012/13	(0.0)	2	(0.0)	3	( )	0	2012/13	0.0	5	4.7
2013/14	(0.0)	2	( )	0	(0.0)	1	2013/14	0.0	2	3.5
2014/15	( )	0	(0.0)	2	( )	0	2014/15	0.0	2	0.5
2015/16	(0.0)	3	(0.0)	10	( )	0	2015/16	0.0	13	0.5
2016/17	(0.0)	11	(0.0)	13	(0.0)	3	2016/17	0.0	24	0.0
2017/18	(10.0)	10	(33.3)	3	(50.0)	20	2017/18	15.4	13	3.1
2018/19	(0.0)	4	(12.5)	16	(0.0)	15	2018/19	10.0	20	5.1
								5.1	5yr average	
								7.2	SD	

(6) Common Eider

	Subregion 8		Subregion 9		subregion 10			National (8+9)		
	ratio	n=	ratio	n=	ratio	n=		ratio	n=	
1977/78	(71.4)	14	(75.0)	23			1977/78	35.1	37	
1978/79	(53.3)	15	27.6	29			1978/79	36.4	44	
1979/80	(71.4)	7	54.8	31	(25.0)	4	1979/80	57.9	38	
1980/81	(76.2)	21	69.6	56	39.3	61	1980/81	71.4	77	50.2
1981/82	(36.4)	22	44.0	50	37.0	119	1981/82	41.7	72	48.5
1982/83	47.1	34	58.0	169	41.3	392	1982/83	56.2	203	52.7
1983/84	57.7	52	17.2	122	17.7	379	1983/84	29.3	174	51.3
1984/85	22.9	96	15.7	287	14.3	509	1984/85	17.5	383	43.2
1985/86	(50.0)	8	15.9	107	5.7	211	1985/86	18.3	115	32.6
1986/87	62.9	35	78.6	355	75.3	174	1986/87	77.2	390	39.7
1987/88	99.5	555	52.8	322	17.3	237	1987/88	82.3	877	44.9
1988/89	40.0	50	45.8	216	10.9	523	1988/89	44.7	266	48.0
1989/90	(87.5)	8	16.2	68	17.7	209	1989/90	23.7	76	49.2
1990/91	11.0	429	2.0	204	2.0	200	1990/91	8.1	633	47.2
1991/92	36.8	261	7.6	340	(13.5)	6	1991/92	20.3	601	35.8
1992/93	34.1	123	8.5	153	2.3	343	1992/93	19.9	276	23.3
1993/94	28.6	28	3.4	58	12.0	108	1993/94	11.6	86	16.7
1994/95	29.3	41	6.1	66	8.1	533	1994/95	15.0	107	15.0
1995/96	4.6	108	9.0	178	(4.1)	121	1995/96	7.3	286	14.8
1996/97	9.7	31	25.9	81	(4.4)	206	1996/97	21.4	112	15.1
1997/98	18.5	27	3.8	78	(9.5)	105	1997/98	7.6	105	12.6
1998/99	(6.3)	16	29.1	55	11.1	171	1998/99	23.9	71	15.1
1999/00	20.2	455	4.7	1631	3.4	4982	1999/00	8.1	2086	13.7
2000/01	6.6	91	1.9	377	0.2	965	2000/01	2.8	468	12.8
2001/02	1.5	323	3.9	613	1.6	2723	2001/02	3.1	936	9.1
2002/03	73.7	57	4.3	232	1.1	474	2002/03	18.0	289	11.2
2003/04	(20.0)	10	4.2	71	1.4	209	2003/04	6.2	81	7.6
2004/05	(0.0)	14	2.9	170	1.7	480	2004/05	2.7	184	6.6
2005/06	(16.7)	12	4.0	101	1.5	267	2005/06	5.3	113	7.1
2006/07	(0.0)	4	0.0	38	1.5	130	2006/07	0.0	42	6.4
2007/08	( )	0	4.2	24	0.0	59	2007/08	4.2	24	3.7
2008/09	(0.0)	1	1.5	67	0.0	82	2008/09	1.5	68	2.7
2009/10	( )	0	0.0	51	2.8	71	2009/10	0.0	51	2.2
2010/11	(0.0)	3	(0.0)	16	( )	0	2010/11	0.0	19	1.1
2011/12	(0.0)	6	0.9	112	0.0	61	2011/12	0.8	118	1.3
2012/13	( )	0	(0.0)	5	(0.0)	5	2012/13	0.0	5	0.5
2013/14	( )	0	(0.0)	9	(0.0)	6	2013/14	0.0	9	0.2
2014/15	( )	0	(0.0)	5	( )	0	2014/15	0.0	5	0.2
2015/16	( )	0	(0.0)	7	(0.0)	14	2015/16	0.0	7	0.2
2016/17	( )	0	(0.0)	11	(0.0)	7	2016/17	0.0	11	0.0
2017/18	( )	0	(0.0)	3	(0.0)	20	2017/18	0.0	3	0.0
2018/19	(0.0)	2	(0.0)	0	(0.0)	15	2018/19	0.0	2	0.0
								0.0	5yr average	
								0.0	SD	

(7) Herring Gull

	Subregion 8		Subregion 9		subregion 10			National (8+9)		
	ratio	n=	ratio	n=	ratio	n=		ratio	n=	
1977/78	68.8	64	(71.4)	23	0.0	3	1977/78	56.3	87	
1978/79	38.9	211	(36.8)	19			1978/79	38.7	230	
1979/80	32.0	122	18.4	38	(0.0)	4	1979/80	28.8	160	
1980/81	73.7	350	63.6	88	25.0	40	1980/81	71.7	438	48.9
1981/82	52.1	257	27.4	84	13.2	121	1981/82	46.0	341	48.3
1982/83	61.2	237	61.7	60	20.1	134	1982/83	61.3	297	49.3
1983/84	46.4	412	47.4	38	12.3	162	1983/84	46.4	450	50.8
1984/85	31.3	224	26.8	82	17.4	144	1984/85	30.1	306	51.1
1985/86	23.2	181	14.7	95	10.9	119	1985/86	20.3	276	40.8
1986/87	37.2	113	21.0	81	(9.3)	75	1986/87	30.4	194	37.7
1987/88	47.2	106	37.0	46	5.2	116	1987/88	44.1	152	34.3
1988/89	24.7	174	19.6	56	5.1	137	1988/89	23.5	230	29.7
1989/90	21.4	215	(26.1)	23	8.2	49	1989/90	21.8	238	28.0
1990/91	14.2	169	(60.0)	5	0.0	9	1990/91	15.5	174	27.1
1991/92	25.7	105	(50.0)	20	(0.0)	6	1991/92	29.6	125	26.9
1992/93	10.5	105	10.0	30	9.7	72	1992/93	10.4	135	20.2
1993/94	30.4	92	(46.2)	13	0.0	24	1993/94	32.4	105	21.9
1994/95	31.4	70	8.0	50	6.8	73	1994/95	21.7	120	21.9
1995/96	9.6	83	11.1	36	(0.0)	54	1995/96	10.1	119	20.8
1996/97	6.3	64	12.9	31	(0.0)	29	1996/97	8.4	95	16.6
1997/98	8.6	81	(17.4)	23	(5.0)	20	1997/98	10.6	104	16.6
1998/99	17.6	102	28.0	25	12.5	40	1998/99	19.7	127	14.1
1999/00	17.9	84	25.7	35	9.1	44	1999/00	20.2	119	13.8
2000/01	5.0	40	2.2	46	0.0	99	2000/01	3.5	86	12.5
2001/02	2.7	74	9.4	32	3.6	166	2001/02	4.7	106	11.7
2002/03	41.2	51	6.7	45	0.7	135	2002/03	25.0	96	14.6
2003/04	(16.7)	24	14.3	28	0.0	74	2003/04	15.4	52	13.8
2004/05	10.8	37	0.0	25	2.2	91	2004/05	6.5	62	11.0
2005/06	(7.1)	14	(5.3)	19	3.4	116	2005/06	6.1	33	11.5
2006/07	(0.0)	10	(5.9)	17	0.0	63	2006/07	3.7	27	11.3
2007/08	(0.0)	6	(0.0)	8	(0.0)	47	2007/08	0.0	14	6.3
2008/09	(0.0)	13	3.8	26	(0.0)	61	2008/09	2.6	39	3.8
2009/10	(0.0)	7	2.3	44	(0.0)	40	2009/10	2.0	51	2.9
2010/11	(0.0)	11	0.0	18	( )	0	2010/11	0.0	29	1.6
2011/12	0.0	26	0.0	30	0.0	37	2011/12	0.0	56	0.9
2012/13	(28.6)	7	(0.0)	7	(0.0)	8	2012/13	14.3	14	3.8
2013/14	(0.0)	3	(0.0)	14	(12.5)	8	2013/14	0.0	17	3.2
2014/15	(0.0)	5	(0.0)	6	( )	0	2014/15	0.0	11	2.9
2015/16	(0.0)	2	(0.0)	21	0.0	25	2015/16	0.0	23	2.9
2016/17	( )	0	0.0	37	(0.0)	15	2016/17	0.0	37	2.9
2017/18	(0.0)	2	0.0	42	(0.0)	20	2017/18	0.0	44	0.0
2018/19	(0.0)	1	(11.8)	17	(0.0)	15	2018/19	11.1	18	2.2
								2.2	5yr average	
								5.0	SD	

(8) Great Black-backed Gull

	Subregion 8		Subregion 9		subregion 10			National (8+9)		
	ratio	n=	ratio	n=	ratio	n=		ratio	n=	
1977/78	59.3	27	(0.0)	23	(0.0)	2	1977/78	32.0	50	
1978/79	38.1	63	(18.2)	11			1978/79	35.1	74	
1979/80	31.6	38	(12.5)	8	(0.0)	1	1979/80	28.3	46	
1980/81	73.7	95	(54.2)	24	(50.0)	6	1980/81	69.7	119	41.3
1981/82	66.3	95	26.5	34	35.7	28	1981/82	55.8	129	44.2
1982/83	66.2	77	(73.7)	19	39.6	48	1982/83	67.7	96	51.3
1983/84	62.3	77	(53.3)	15	11.3	53	1983/84	60.9	92	56.5
1984/85	19.4	36	(13.3)	15	(12.5)	8	1984/85	17.6	51	54.4
1985/86	34.5	29	(6.3)	16	12.1	33	1985/86	24.4	45	45.3
1986/87	14.8	27	(60.0)	15	(0.0)	11	1986/87	31.0	42	40.3
1987/88	42.9	7	(61.1)	18	(15.0)	20	1987/88	56.0	25	38.0
1988/89	38.5	13	(25.0)	8	(4.8)	21	1988/89	33.3	21	32.5
1989/90	18.2	22	(28.6)	7	(25.0)	4	1989/90	20.7	29	33.1
1990/91	17.9	28	(25.0)	4	(0.0)	2	1990/91	18.8	32	31.9
1991/92	22.5	40	(33.3)	3	(0.0)	6	1991/92	23.3	43	30.4
1992/93	30.8	13	(0.0)	3	(0.0)	17	1992/93	25.0	16	24.2
1993/94	25.0	8	(33.3)	6	(0.0)	6	1993/94	28.6	14	23.3
1994/95	15.4	13	(25.0)	12	(12.5)	8	1994/95	20.0	25	23.1
1995/96	7.1	14	(0.0)	7	(0.0)	5	1995/96	4.8	21	20.3
1996/97	33.3	6	(14.3)	7	(0.0)	11	1996/97	23.1	13	20.3
1997/98	18.2	11	(28.6)	7	(0.0)	10	1997/98	22.2	18	19.7
1998/99	29.6	27	(29.4)	17	0.0	28	1998/99	29.5	44	19.9
1999/00	7.7	13	(18.2)	11	11.8	34	1999/00	12.5	24	18.4
2000/01		0	(11.1)	18	(0.0)	23	2000/01	11.1	18	19.7
2001/02	8.3	12	(11.1)	9	0.0	30	2001/02	9.5	21	17.0
2002/03	50.0	8	(6.7)	15	(9.5)	21	2002/03	21.7	23	16.9
2003/04	25.0	8	(14.3)	14	(0.0)	24	2003/04	18.2	22	14.6
2004/05	23.1	13	(30.0)	10	(0.0)	15	2004/05	26.1	23	17.3
2005/06	0.0	7	(0.0)	10	(0.0)	18	2005/06	0.0	17	15.1
2006/07	0.0	4	(0.0)	15	(0.0)	24	2006/07	0.0	19	13.2
2007/08	( )	0	(0.0)	3	(0.0)	15	2007/08	0.0	3	8.9
2008/09	(0.0)	6	(0.0)	11	(0.0)	9	2008/09	0.0	17	5.2
2009/10	(0.0)	5	(0.0)	14	(0.0)	7	2009/10	0.0	19	0.0
2010/11	(0.0)	2	(0.0)	5	( )	0	2010/11	0.0	7	0.0
2011/12	8.3	24	(5.3)	19	(0.0)	18	2011/12	7.0	43	1.4
2012/13	0.0	3	(0.0)	5	(0.0)	4	2012/13	0.0	8	1.4
2013/14	(0.0)	4	(0.0)	2	(0.0)	3	2013/14	0.0	6	1.4
2014/15	(0.0)	3	(0.0)	4	( )	0	2014/15	0.0	7	1.4
2015/16	(0.0)	2	(0.0)	12	(0.0)	2	2015/16	0.0	14	1.4
2016/17	0.0	2	0.0	36	(0.0)	13	2016/17	0.0	38	0.0
2017/18	0.0	2	(0.0)	3	(0.0)	20	2017/18	0.0	5	0.0
2018/19	0.0	7	(0.0)	8	(0.0)	15	2018/19	0.0	15	0.0
								0.0	5yr average	
								0.0	SD	