4. Discussion

Population Size Estimates

To assess the international importance of breeding birds of the Wadden Sea, the 1996 populations are compared with the national population estimates of the Wadden Sea countries and those of northwestern Europe (namely: Belgium, Denmark, Estonia, Finland, France, Germany, Iceland, Ireland, Latvia, Lithuania, Luxembourg, Norway, Poland, Russia around the Gulf of Finland and Kaliningrad, Sweden, Switzerland and United Kingdom).

The sources of the population estimates used here are in The Netherlands: Koks & Hustings (1998), van Dijk et al. (1998); Germany: Witt et al. (1996); Denmark: Grell (1998); Northwestern Europe: Hagemeijer & Blair (1997); Rose & Scott (1997), van Dijk et al. (1998). Estimates in Rose & Scott (1997) are given as individuals and when comparing the populations in pairs, it is calculated that breeding populations hold three times as many individuals as breeding pairs.

The accuracy of the population estimates varies between the species, being best for colony breeding species such as the Great Cormorant, Eurasian Spoonbill and for terns. Estimates for northwestern Europe are average values in case of an estimation range.

The 1996 survey confirms the outstanding significance of the breeding bird fauna of the Wadden Sea. For 22 species, the Wadden Sea holds more than 1% of the northwestern European populations (Appendix C). For twelve of these species, the Wadden Sea holds more than 5% of the total northwestern European populations and these should be considered as species on the red list of the Wadden Sea, for which the area has special responsibility (Rasmussen et al. 1996).

Holding more than 50% of the northwestern European population, the Wadden Sea is of crucial importance for the Gull-billed Tern, Eurasian Spoonbill and the Avocet. The entire northwest European population of Gull-billed Tern now breeds in the Wadden Sea. Other nearest breeding grounds are in the Mediterranean (Hagemeijer & Blair 1997). The Eurasian Spoonbill has become increasingly important in recent years after the collapse of important mainland colonies in The Netherlands. The Avocet still has a very large population in the Wadden Sea despite a recent negative trend.

Assessment

This chapter assesses the significance of the Joint Monitoring Program for Breeding Birds in the Wadden Sea and the results of this, the second report of a total count of breeding birds, as well as the results of the first six years of annual counts of colony breeding species in the Wadden Sea.

The results of the 1996 total survey were considerably more comprehensive than the first total survey in 1991. Important here is the improved coverage and the formulation and standardization of survey methods, which have been agreed trilaterally and implemented since 1995 (Hälterlein et al. 1995). The new methods, at least for some species, have led to higher numbers of breeding birds, which are considered more reliable, based on comparison between these and the earlier methods (Hälterlein 1996). In this way we are more confident about basic data now available on breeding bird populations in the Wadden Sea. This has been one of the most important aims of the program since the beginning, a prerequisite for effective nature conservation monitoring and a vital basis for the development and implementation of conservation management measures.

Both complete surveys in 1991 and 1996 were influenced by unfavorable weather conditions. In 1991, very low temperatures in May and a high precipitation rate in June led to reduced numbers of birds being counted. Many potential breeders could not be counted because they did not breed at all. The breeding season in 1996 suffered from unfavorable weather conditions mainly because of the severe and dry winter before. This year was characterized by low numbers of meadow bird

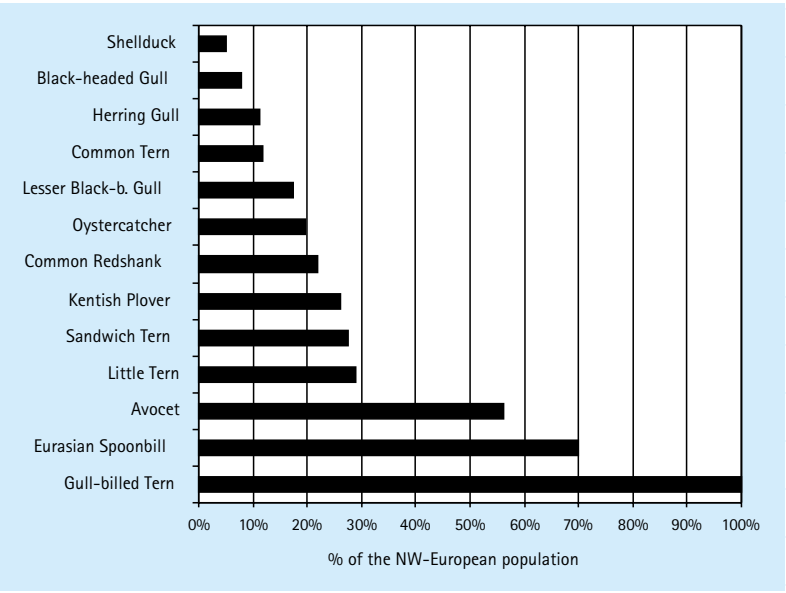

Figure 74: Species breeding in the Wadden Sea in 1996 holding more than 5% of the northwest European population (Common Redshank* population of Tringa totanus totanus).

species and an increased winter mortality for those species wintering in the Wadden Sea, such as the Oystercatcher and a bad food supply, especially benthos (Thyen et al. 1998). Despite the shortcomings of the earlier lack of common methods and the weather conditions in the two seasons of 1991 and 1996, it would appear that most Wadden Sea breeding species are showing rather increasing than decreasing trends.

For the colony breeders, it is possible to document regional changes in the distribution of breeding birds in the Wadden Sea in a way that is only feasible through international collaboration. Total overall counts can be influenced by international Wadden Sea and local/regional effects. The case of the Sandwich Tern clearly demonstrates that short and long-term changes in the overall breeding numbers can only be understood if all colonies in the Wadden Sea are annually monitored, using the same techniques. Despite annual fluctuations in different parts of the Wadden Sea the total population has been increasing. The Black-headed Gull and Common Tern showed opposite trends in Niedersachsen and The Netherlands but showed almost stable population trends in the Wadden Sea, despite large regional changes in the western part.

The data from this report demonstrates that exchange of breeding individuals can take place to a large extent across national borders and even with populations outside the Wadden Sea. It emphases that co-ordinated monitoring is necessary to provide explanations for local changes in bird numbers. The results of the census show that the breeding bird populations are a commonly shared resource that needs common protection.

Issues of Concern

The most important issues of concern raised by the results of the survey from the overall TMAP-program in this report can be summarized as follows:

Climate change

Due to the recent initiation of the program, changes in climatic conditions have yet to become evident in breeding bird numbers. Predicted first effects are likely to be a reduction factor of the breeding success, especially in low laying salt marshes, due to increased rates of tidal inundation. Hence, breeding success is not monitored within this program. Further steps would be changes of the distribution range for some species.

Fisheries

Fisheries for shrimps, mussels and fish produce huge amounts of discard, most of which is eaten by gulls (Garthe 1996). The population trends during the period 1991 to 1996 for gulls are almost all stable or increasing. The most significant increase in terms of numbers occurred in the population of Lesser Black-backed Gulls that increased by 115% from about 17,000 to 37,000 in a six-year period. In contrast the population of Herring Gulls was reduced considerably in the western Wadden Sea. Lesser Black-backed Gulls profit, to a large extent, from fishery activities far off the coast, which has supported a larger population in recent years (Garthe et al. 1999).

There are no regulations aimed at reducing the bycatch of shrimp fisheries, in which the quantity of the bycatch normally exceeds the target catch. Therefore, many scavenging birds have access to a large additional food supply because of the current shrimp fishery activities. Zones free of shrimp fishery are still very small and restricted especially in the western Wadden Sea, and this fishery will therefore continue to influence the breeding gull populations.

An important outcome from the results of the survey is the Oystercatcher decline in The Netherlands in contrast to the rest of the Wadden Sea. This points to the very serious local impact of the Dutch mussel fishery on the food supply of Oystercatchers which probably has also affected the Eider as well (Hulscher et al. in press., Smit et al. 1998).

Disturbance

The Wadden Sea is of considerable importance for recreational activities, most of which are concentrated on the beaches and in the dunes. It is to be expected that those species depending on these habitats show the greatest relationship with such activities. The level of disturbance is likely to be the single most important factor determining the population size and distribution of the Kentish Plover, Little Tern and Great Ringed Plover. Other colony breeding birds suffer from intensive tourism as well. The main factor seems to be direct loss of suitable breeding habitats, but increasing predation rates as a consequence of disturbance due to human activity can be a problem as well. The serious declines in numbers of the Kentish and the Great Ringed Plover demonstrate the potential effects of threats. In the western parts of the Wadden Sea, the Kentish Plover and Little Tern have especially small populations, which gives cause for concern.

Species breeding in dynamic habitats nowadays have only limited access to newly created natural habitats. Artificial coastal management restricts the geomorphological processes on the

islands that inhibit the creation of primary dunes and sand spits, which are their normal breeding sites. Therefore, to protect these species, human activities, which may disturb birds on breeding sites, may be banned by denying access to potential sites, and thus not restrict the creation of new breeding habitat.

To simply protect the geomorphological dynamics of the islands is an appropriate measure to safeguard a number of the most sensitive breeding bird species. The population of Little Tern increased for the first time in decades possibly as a response to improved protection of the habitat. Specific colonies can be protected by various measures such as fencing, wardening and public information, but despite such measures, the numbers especially in the western Wadden Sea, still seem to be very low. For the Kentish Plover, the situation has become acute in the last few years, as the relatively large populations established in the embanked areas (especially in Schleswig-Holstein) have declined as a result of natural vegetation succession processes. However, these birds are unable to find suitable alternative breeding habitats on beaches due to human activities on potential breeding sites as a result of tourism. The more dispersed breeding Great Ringed Plover needs more space on the beaches and the primary dunes, to be protected effectively. Therefore, it is important to create disturbance free breeding areas in suitable and potential primary habitats to allow for the species to retain natural breeding populations.

Agriculture

Large parts of the Wadden Sea ecosystem are subject to agricultural use, including salt marshes, polders and wetlands behind the dikes. Therefore, the nature and intensity of agriculture is an important factor affecting locally the breeding bird numbers. This is of increasing importance within the Wadden Sea, because the ecological function of inland agricultural areas is degrading. So the salt marsh habitat of the Wadden Sea is of increasing importance for typical meadow birds, such as the Northern Lapwing, Black-tailed Godwit and the Redshank. However, species depending on terrestrial feeding in habitats with traditional farming practices such as the Ruff and Dunlin are declining internationally and are also declining in the Wadden Sea.

Within the Co-operation Area the Dunlin and Ruff are seriously threatened with extinction. Appropriate agricultural management of salt marshes and the grassland behind the dikes belonging to the Co-operation Area could improve the protection status of these two species. The developments in the newly reclaimed areas show that nature restoration behind the dikes can be achieved successfully and conditions can be improved for the meadow birds. So far, protection of the Wadden Sea has mainly focussed on the marine habitats. However, there is a growing responsibility for the protection of meadow birds, and it is becoming clear that the protection of terrestrial habitats needs a higher priority.

In general, the conditions for breeding birds on the mainland are less suitable than on the islands. Most of the populations have decreased along the mainland coast. The colony breeding species suffer from increasing predation, especially from foxes. Non-colony breeding waders are under pressure from intensified agriculture in many areas. The cessation of grazing on salt marshes has contributed to a considerable increase in Redshank numbers, a species, which has lost large areas of inland habitat due to intensification of agriculture. The Common Redshank has shown a remarkable increase in areas in Niedersachsen and Schleswig-Holstein where grazing has been reduced or ceased.

Evaluation of existing protection measurements

In the last five-year period, some conservation measures have been successful in terms of increasing population sizes. Among these, the protection of colonies (Little Tern, Arctic Tern, Eurasian Spoonbill), the appropriate management of the protection of salt marshes in the German Wadden Sea (Redshank), and the reduction of pollutants (Common Tern, Sandwich Tern) have been discussed in the species accounts.

Conclusions and recommendations

It is concluded that:

- the report confirms the outstanding significance of the breeding bird fauna of the Wadden Sea. The Wadden Sea is of great importance for a number of coastal species supporting large proportions of the northwestern European breeding populations;
- for some colony breeding species, the data presented in this report show that exchange of breeding individuals takes place, to a large extent, across borders and even with populations outside the Wadden Sea;
- species that use mudflats as feeding habitat, such as the Common Redshank and Oystercatcher, are generally stable or increasing (except Oystercatcher in the westernmost Wadden Sea). The fact that the Dutch Oystercatchers show different trends to those in the rest of the Wadden Sea acts as warning signal for the state of the Wadden Sea ecosystem in that region;
- most species dependent on terrestrial feeding in habitats with traditional farming practices are declining;
- for the populations of Ruffs and Dunlins, the declines are alarming, and protection measures are necessary to prevent the Dunlin and Ruff, from becoming extinct as breeding birds in the Wadden Sea;
- for wader species, breeding in agricultural areas, like the Northern Lapwing and Black-tailed Godwit, the Wadden Sea is of increasing importance;
- this report proves a sound basis of ecological data relating to breeding birds in the Wadden Sea upon which conservation priorities and actions in the area can be based;
- the data emphasize that the breeding bird populations represent a commonly shared resource that needs common protection;
- for several species, protection measures could improve breeding conditions.

It is recommended that:

- the financial and organizational support to continue the survey and processing of data as a long-term monitoring program should be ensured in all the countries. The required effort to support the data handling and analysis will increase with increasing amounts of data as well as the increasing demands of the overall TMAP (Trilateral Monitoring and Assessment Program);
- a breeding success program under the TMAP should be implemented to obtain knowledge about breeding success and mortality which is essential in order to understand the dynamics of individual species in the ecosystem and to be able to explain the observed trends;
- to better understand the distribution patterns and trends of breeding birds in the Wadden Sea, this information should be combined with the results of the future monitoring of a number of parameters such as fishery, farming practice, tourism, habitat distributions, pollutants in birds eggs etc.;
- additional information should be provided on the mortality of different age groups of the breeding birds and on numbers and distributions in wintering grounds in the Wadden Sea and along the migration routes. For most species, these data are only fragmentary at the moment. Studies of these parameters would provide additional information for the interpretation of the bird monitoring in the Wadden Sea;
- co-ordinated protection measures, especially directed towards the Dunlin and Ruff, should be taken immediately to prevent these two species from becoming extinct as breeding birds in the Wadden Sea in the near future;
- disturbance-free breeding areas should be created in suitable and potential primary habitats to allow for the Little Tern, Kentish and Great Ringed Plover to retain natural breeding populations;
- more research should be carried out to understand the effects which the fisheries for shrimps, mussels and fishes have on the relative abundance of gulls, terns and Oystercatchers especially in the western Wadden Sea.

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Appendix A

Breeding Bird Numbers in the Wadden Sea 1996

Number of breeding pairs in 56 regions (see Figure 1) of the entire Wadden Sea.

Oversigt over antallet af ynglefugle i 56 regioner (se Fig. 1) i hele Vadehavet i 1996.

Anzahl der Brutpaare in 56 Regionen (s. Fig. 1) des gesamten Wattenmeeres.

Het aantal vastgestelde paren van de projectsoorten in 56 regio's (Figuur 1) in de internationale Waddenzee in 1996.

	Region	Great Cormorant	Eurasian Spoonbill	Shelduck	Common Eider	Red-breasted Merganser	Hen Harrier	Oystercatcher	Avocet	Great Ringed Plover	Kentish Plover
1	Texel	0	169	194	175	0	23	2,195	174	29	1
2	Vlieland	126	160	100	2,135	0	8	525	24	2	4
3	Griend	0	0	17	36	3	0	300	0	12	13
4	Terschelling	0	116	264	3,517	0	39	2,688	86	20	16
5	Ameland	0	11	495	377	0	15	2,128	125	12	8
6	Engelsmansplaat-Rif	0	0	0	0	0	0	9	0	0	0
7	Schiermonnikoog	0	121	166	541	0	6	336	7	2	6
8	Rottumeroog R. Plaat	0	0	55	1,742	0	1	256	12	6	6
9	Noord Hollandse Kust	0	4	8	0	0	0	363	560	21	9
10	Friese Kust	0	0	57	8	0	0	1,285	1,719	24	1
11	Groningse Kust	140	0	53	43	0	0	1,376	1,252	25	7
12	Dollard-Aussenems	0	0	24	0	0	0	96	496	6	0
	Dutch Wadden Sea total	**266**	**581**	**1,409**	**8,574**	**3**	**92**	**11,461**	**3,959**	**153**	**71**
12	Dollard-Aussenems	0	0	12	0	0	0	62	20	4	0
13	Leybucht	0	0	16	0	0	0	490	871	38	6
14	Borkum-Lütje Hörn	128	0	149	120	0	7	1,634	110	16	10
15	Juist-Memmert	15	8	79	109	0	5	1,087	56	10	12
16	Norderney-Baltrum-Langeoog	0	0	517	1	0	20	3,865	146	31	6
17	Norderland-Harlingerland	0	0	84	0	0	0	330	3	3	7
18	Elisabeth-Aussengroden	0	0	36	0	0	0	182	36	21	1
19	Spieker./Wanger./Minsener Oog	0	0	349	72	0	6	2,383	79	46	9
20	Mellum	60	3	79	150	6	2	560	0	11	0
21	Aussjade	0	0	12	0	0	0	36	0	7	1
22	Jadebusen	0	0	75	0	0	0	262	199	40	0
23	Butjadingen	0	0	24	0	0	0	65	13	8	0
24	Wurster Küste	308	0	1	0	0	0	254	28	35	0
25	Neuwerk-Scharhörn	61	0	62	1	0	0	574	2	21	3
26	Elbe Estuary Niedersachsen	0	0	60	0	0	0	245	82	16	0
55	Ems	0	0	27	0	0	0	77	544	0	0
56	Weser	0	0	19	0	0	0	25	2	1	0
	Niedersachsen total	**572**	**11**	**1,601**	**453**	**6**	**40**	**12,131**	**2,191**	**308**	**55**
26	Elbe Estuary Schleswig-Holstein	0	0	9	0	0	0	166	110	2	0
27	Wetlands in Dithmarschen	0	0	231	0	0	1	1,338	94	21	5
28	Salt Marshes Dithmarshen	0	0	47	0	0	0	1,540	910	4	16
29	Trischen	0	0	60	3	0	0	439	0	27	2
30	Eider Estuary	0	0	36	0	0	0	590	82	14	0
31	Nordstrand polders	0	0	30	0	0	0	385	10	1	0
32	Outer sands in Nordfriesland	0	0	0	0	0	0	39	0	2	0
33	Wetlands in Eiderstedt	0	0	2	0	0	0	21	15	0	0
34	Wetlands in Nordfriesland	0	0	131	21	6	0	1,061	515	182	104
35	Salt Marshes in Eiderstedt	0	0	91	0	0	0	1,700	312	68	191
36	Salt Marshes in Nordfriesland	0	0	90	2	1	0	1,171	483	25	1
37	Halligen	0	0	110	83	9	0	4,997	295	98	3
38	Pellworm	0	0	308	0	0	0	2,871	30	16	0
39	Amrum	0	0	100	570	10	0	600	68	12	0
40	Föhr	0	0	127	0	2	0	2,163	44	21	0
41	Sylt	0	0	160	2	1	4	671	226	75	16
	Schleswig-Holstein total	**0**	**0**	**1,532**	**681**	**29**	**5**	**19,752**	**3,194**	**568**	**338**
42	Margrethe Kog wetland-Koldby	0	0	24	4	2	0	304	196	21	1
43	Rejsby-Ballum Salt Marshes	0	0	16	12	0	0	248	3	33	0
44	Ribe-Darum Salt Marshes	0	0	37	15	0	0	106	153	40	0
45	Ho Bugt coast Skallingen	0	0	0	0	0	2	87	0	54	0
46	Langli	0	0	12	59	0	0	141	24	5	0
47	Fanø	0	0	0	3	0	1	241	36	63	16
48	Mandø	0	0	0	301	0	0	1,086	21	12	0
49	Rømø-Jordsand	0	0	33	5	1	2	342	67	51	40
50	Tøndermarsken	0	0	9	0	0	0	143	72	1	0
51	Ballummarsken	0	0	0	0	0	0	50	15	10	0
52	Rejsby- og Brønsmarsken	0	0	0	0	0	0	48	0	20	0
53	Ribe- og Tjæreborgmarsken	0	0	21	1	0	0	122	190	22	0
54	Varde Ådal	0	0	4	0	0	0	2	0	0	0
	Denmark total	**0**	**0**	**156**	**400**	**3**	**5**	**19,752**	**777**	**332**	**57**
	Wadden Sea Total	**838**	**592**	**4,698**	**10,108**	**41**	**142**	**63,096**	**10,121**	**1,361**	**521**

	Region	Northern Lapwing	Dunlin	Ruff	Snipe	Black-tailed Godwit	Eurasian Curlew	Common Redshank	Turnstone	Mediterranean Gull	Little Gull	Black-headed Gull
1	Texel	1,220	0	0	6	410	99	353	0	0	0	1,220
2	Vlieland	23	0	0	1	0	64	23	0	0	0	5
3	Griend	0	0	0	0	0	0	15	0	0	0	22,500
4	Terschelling	588	0	0	3	369	190	571	0	0	0	1,370
5	Ameland	533	0	0	3	209	140	268	0	0	0	2,526
6	Engelsmansplaat-Rif	0	0	0	0	0	0	0	0	0	0	0
7	Schiermonnikoog	37	0	1	2	81	0	102	0	0	0	884
8	Rottumeroog R. Plaat	0	0	0	0	0	0	3	0	0	0	86
9	Noord Hollandse Kust	12	0	0	0	0	0	15	0	1	0	4,464
10	Friese Kust	199	0	0	0	115	0	280	0	1	1	7,532
11	Groningse Kust	17	0	0	0	1	0	682	0	1	1	16,240
12	Dollard-Aussenems	43	2	0	0	11	0	511	0	0	0	126
	Dutch Wadden Sea total	**2,629**	**0**	**1**	**15**	**1,185**	**493**	**2,312**	**0**	**3**	**2**	**56,827**
12	Dollard-Aussenems	34	0	0	1	12	0	113	0	0	0	0
13	Leybucht	93	0	0	0	94	0	385	0	0	0	666
14	Borkum-Lütje Hörn	202	0	0	12	57	33	84	0	0	0	1,749
15	Juist-Memmert	32	0	0	2	2	8	54	0	0	0	5,167
16	Norderney-Baltrum-Langeoog	305	0	0	8	118	42	266	0	0	0	9,373
17	Norderland-Harlingerland	43	0	0	0	17	0	94	0	0	0	0
18	Elisabeth-Aussengroden	40	0	0	0	4	0	810	0	0	0	0
19	Spieker./Wanger./Minsener Oog	136	0	0	1	52	4	236	0	0	0	13,815
20	Mellum	0	0	0	0	0	0	50	0	0	0	18
21	Aussjade	31	0	0	0	4	0	32	0	0	0	0
22	Jadebusen	143	0	0	8	28	2	813	0	0	0	210
23	Butjadingen	42	0	0	0	8	0	94	0	0	0	30
24	Wurster Küste	240	0	0	1	3	0	283	0	0	0	0
25	Neuwerk-Scharhörn	25	0	0	0	0	0	28	0	0	0	3,329
26	Elbe Estuary Niedersachsen	543	0	5	6	221	0	295	0	0	0	337
55	Ems	267	0	0	8	187	0	202	0	0	0	1,969
56	Weser	116	0	0	4	61	0	90	0	0	0	0
	Niedersachsen total	**2,292**	**0**	**5**	**51**	**868**	**89**	**3,929**	**0**	**0**	**0**	**36,663**
26	Elbe Estuary Schleswig-Holstein	46	0	0	3	8	0	94	0	0	0	730
27	Wetlands in Dithmarschen	882	0	15	0	181	0	374	0	0	0	29
28	Salt Marshes Dithmarshen	146	0	0	0	1	0	430	0	0	0	2,186
29	Trischen	0	1	0	0	0	0	171	0	1	0	7,450
30	Eider Estuary	217	0	20	6	53	0	193	0	0	0	346
31	Nordstrand polders	220	0	0	0	0	0	50	0	0	0	0
32	Outer sands in Nordfriesland	0	0	0	0	0	0	0	0	0	0	0
33	Wetlands in Eiderstedt	11	0	0	0	4	0	11	0	0	0	171
34	Wetlands in Nordfriesland	730	3	26	8	142	0	425	0	0	0	1,938
35	Salt Marshes in Eiderstedt	58	5	0	3	11	0	794	0	0	0	3,626
36	Salt Marshes in Nordfriesland	141	0	3	0	17	0	866	0	0	0	3,527
37	Halligen	65	0	4	0	1	0	533	2	0	0	7,368
38	Pellworm	260	0	0	0	24	0	225	0	0	0	30
39	Amrum	40	0	0	1	0	1	40	0	0	0	171
40	Föhr	696	0	0	24	48	0	131	0	0	0	1,696
41	Sylt	429	0	0	34	150	0	291	0	0	0	1,555
	Schleswig-Holstein total	**3,941**	**9**	**68**	**79**	**640**	**1**	**4,628**	**2**	**1**	**0**	**30,823**
42	Margrethe Kog wetland-Koldby	24	0	0	0	1	0	14	0	0	0	100
43	Rejsby-Ballum Salt Marshes	73	1	0	0	1	0	315	0	0	0	2
44	Ribe-Darum Salt Marshes	84	2	0	0	1	0	209	0	0	0	11
45	Ho Bugt coast Skallingen	78	0	0	30	0	0	153	0	0	0	12
46	Langli	6	0	0	0	0	0	6	0	0	0	2,926
47	Fanø	291	7	0	211	0	21	215	0	0	0	0
48	Mandø	166	0	0	0	22	0	92	0	0	0	277
49	Rømø-Jordsand	275	18	0	150	62	28	187	0	0	0	756
50	Tøndermarsken	417	0	5	13	97	0	117	0	0	0	81
51	Ballummarsken	555	0	0	15	42	0	59	0	0	0	0
52	Rejsby- og Brønsmarsken	106	0	0	4	2	0	24	0	0	0	0
53	Ribe- og Tjæreborgmarsken	373	0	3	36	24	0	57	0	1	0	4,578
54	Varde Ådal	26	0	0	41	0	0	6	0	0	0	0
	Denmark total	**2,474**	**28**	**8**	**500**	**252**	**49**	**1,455**	**0**	**1**	**0**	**8,743**
	Wadden Sea Total	**11,336**	**37**	**82**	**645**	**2,945**	**632**	**12,324**	**2**	**5**	**2**	**133,056**

	Region	Common Gull	Lesser Black-b. Gull	Herring Gull	Gr. Black-b. Gull	Gull-billed Tern	Sandwich Tern	Common Tern	Arctic Tern	Little Tern	Short-eared Owl
1	Texel	1,437	7,013	6,503	0	0	0	102	32	71	12
2	Vlieland	815	1,180	4,942	1	0	2	135	46	2	0
3	Griend	19	5	38	0	0	5,600	1,700	1,150	1	1
4	Terschelling	264	9,568	7,684	0	0	0	58	5	0	7
5	Ameland	238	168	2,523	0	0	0	152	132	0	15
6	Engelsmansplaat-Rif	0	0	0	0	0	0	0	1	0	0
7	Schiermonnikoog	496	3,340	7,092	0	0	276	255	32	0	2
8	Rottumeroog R. Plaat	82	427	4,358	0	0	226	405	121	42	0
9	Noord Hollandse Kust	529	2	2	0	0	0	3,449	0	0	0
10	Friese Kust	0	0	218	0	0	1	557	258	0	1
11	Groningse Kust	1	9	150	0	0	0	529	157	8	0
12	Dollard-Aussenems	4	0	0	0	0	0	13	4	0	0
	Dutch Wadden Sea total	**3,881**	**21,712**	**33,510**	**1**	**0**	**6,105**	**7,342**	**1,934**	**124**	**0**
12	Dollard-Aussenems	0	0	0	0	0	0	0	3	0	0
13	Leybucht	3	0	0	0	0	0	6	259	13	0
14	Borkum-Lütje Hörn	251	157	3,216	0	0	0	37	25	35	6
15	Juist-Memmert	158	2,648	3,873	0	0	2,370	121	65	77	4
16	Norderney-Baltrum-Langeoog	742	1,216	4,779	0	0	0	95	66	68	28
17	Norderland-Harlingerland	0	0	0	0	0	0	0	0	0	2
18	Elisabeth-Aussengroden	0	0	0	0	0	0	0	0	0	2
19	Spieker./Wanger./Minsener Oog	921	3,729	3,828	0	0	266	2,324	484	73	10
20	Mellum	166	2,000	13,500	0	0	0	2	0	0	0
21	Aussjade	0	0	0	0	0	0	0	0	0	0
22	Jadebusen	0	0	0	0	0	0	186	0	0	0
23	Butjadingen	0	0	12	0	0	0	0	0	0	4
24	Wurster Küste	0	0	0	0	2	0	0	0	0	0
25	Neuwerk-Scharhörn	11	58	985	0	0	519	1,382	545	67	1
26	Elbe Estuary Niedersachsen	102	0	16	0	0	0	0	0	0	0
55	Ems	0	1	1	0	0	0	0	0	0	0
56	Weser	0	0	0	0	0	0	0	0	0	1
	Niedersachsen total	**2,354**	**9,809**	**30,210**	**0**	**2**	**3,155**	**4,153**	**1,447**	**333**	**58**
26	Elbe Estuary Schleswig-Holstein	0		0	0	41	0	490	35	0	0
27	Wetlands in Dithmarschen	25	0	0	0	0	0	3	2	0	0
28	Salt Marshes Dithmarshen	13	0	0	0	18	0	172	380	0	0
29	Trischen	85	982	4,783	3	0	4,382	380	95	6	0
30	Eider Estuary	5	0	13	0	2	0	7	23	0	0
31	Nordstrand polders	0	0	0	0	0	0	0	0	0	0
32	Outer sands in Nordfriesland	0	0	26	0	0	0	0	86	10	0
33	Wetlands in Eiderstedt	0	0	0	0	0	0	1	0	0	0
34	Wetlands in Nordfriesland	54	5	302	2	2	0	155	127	4	0
35	Salt Marshes in Eiderstedt	31	4	440	0	1	0	44	176	69	0
36	Salt Marshes in Nordfriesland	91	7	348	1	2	0	6	157	0	3
37	Halligen	1,031	31	2,337	5	0	2,601	401	2,924	51	0
38	Pellworm	0	0	3	0	0	0	5	24	0	0
39	Amrum	1,225	4,700	2,200	0	0	3	25	50	75	2
40	Föhr	81	2	70	0	0	0	64	215	53	0
41	Sylt	196	10	326	1	6	0	0	216	39	0
	Schleswig-Holstein total	**2,837**	**5,741**	**10,848**	**12**	**72**	**6,986**	**1,753**	**4,510**	**307**	**5**
42	Margrethe Kog wetland-Koldby	14	0	51	0	0	0	57	54	0	0
43	Rejsby-Ballum Salt Marshes	0	0	0	0	0	0	0	0	0	3
44	Ribe-Darum Salt Marshes	0	0	0	0	0	0	0	0	1	1
45	Ho Bugt coast Skallingen	0	0	0	0	0	0	0	3	0	0
46	Langli	1,168	27	1,742	0	2	1,039	0	224	0	0
47	Fanø	12	0	1	0	0	0	0	55	58	0
48	Mandø	138	5	437	2	0	0	143	87	0	3
49	Rømø-Jordsand	34	0	449	0	10	0	0	637	160	5
50	Tøndermarsken	0	0	0	0	0	0	14	0	0	0
51	Ballummarsken	0	0	0	0	0	0	0	0	0	0
52	Rejsby- og Brønsmarsken	0	0	0	0	0	0	0	0	0	0
53	Ribe- og Tjæreborgmarsken	0	0	2	0	0	0	1	0	0	1
54	Varde Ådal	0	0	0	0	0	0	0	0	0	0
	Denmark total	**1,366**	**32**	**2,682**	**2**	**12**	**1,039**	**215**	**1,060**	**219**	**13**
	Wadden Sea total	**10,438**	**37,294**	**77,250**	**15**	**86**	**17,285**	**13,463**	**8,951**	**983**	**76**

Appendix B

Colony Breeders in the Wadden Sea 1991–1996

The annual number of pairs of colony breeding species in the regions of the entire Wadden Sea in the period of 1991 to 1996.

Det årlige antal par af koloniynglende fugle i perioden 1991 til 1996 i regionerne i hele Vadehavet.

Jährliche Bestandsgröße von koloniebrütenden Vogelarten 1991 bis 1996 in den einzelnen Regionen des gesamten Wattenmeeres.

Het aantal broedparen van kolonie broedvogels in de periode 1991-96 in de afzonderlijke regio's in de internationale Waddenzee.

	Cormorant						Spoonbill					
Region	1991	1992	1993	1994	1995	1996	1991	1992	1993	1994	1995	1996
1							114	111	116	116	127	169
2				7	77	126	53	74	75	92	103	160
3												
4							47	56	75	78	65	116
5										2	2	11
6												
7							3	13	21	22	47	121
8										1		
9										1	1	4
10												
11	12	32	94	142	135	140						
12	12	31	30	54								
13												
14			30	46	167	128						
15					13	15					5	8
16												
17												
18												
19												
20	5	44	53	66	57	60						3
21												
22												
23												
24	245	263	220	292	313	308						
25				37	103	61						
26												
27												
28												
29												
30												
31												
32												
33												
34												
35												
36												
37												
38												
39												
40												
41												
42												
43												
44												
45												
46												
47												
48												
49				11	3							
50												
51												
52												
53												
54												
55												
56												
Total	**274**	**370**	**427**	**655**	**868**	**838**	**217**	**254**	**287**	**312**	**350**	**592**

	Avocet						Kentish Plover					
Region	1991	1992	1993	1994	1995	1996	1991	1992	1993	1994	1995	1996
1	113	*	42	157	161	174	1			2		1
2	3	*	32	37	9	24	2				1	4
3		*							4		7	13
4	55	*	479	38	69	86	12		1	19	15	16
5	77	*	75	64	95	125	2			2	10	8
6		*										
7	22	*	25	29	1	7	13		8	14		6
8		*		1	6	12	6		10	8	5	6
9	406	*	556	614	246	560	17		13	14	9	9
10	3,012	*	1,759	1,545	1,539	1,719			1	1		1
11	1,897	*	1,364	1,834	1,795	1,252	3		2	1	3	7
12	57	40	47	14	69	516	2	2	8	1	2	
13	1,115	1,030	958	973	812	871	1	8	8	6	7	6
14	155	43	119	141	70	110	3	2	11	13	14	10
15	27	15	21	63	80	56	13	7	17	18	15	12
16	149	175	226	215	204	146	2	2	4	6	10	6
17	54	25	17	15	13	3			2	3	5	7
18	45	165	134	228	173	36	6	8	7	1	2	1
19	36	82	78	91	49	79	20	9	16	16	16	9
20		13					2		4	1	2	
21							2	2	1	1	1	1
22	247	245	177	144	200	199	1	1				
23	24	17	20	18	24	13						
24		14	5	17	20	28	2	1		1	1	
25						2	13	8	8	5	3	3
26	309	404	470	363	319	192	4	4	7	2		
27	250	155	50	22	253	94	55	7	5	2	5	5
28	357	787	470	998	902	910	8	15	28	26	27	16
29							2			1		2
30	148	290	206	153	71	82	1	2	1			
31						10						
32												
33	10	7	7	12	15	15		2	1		1	
34	785	1,151	781	1,112	1,325	515	122	260	291	310	275	104
35	351	386	316	381	535	312	207	213	243	175	235	191
36	757	755	727	700	860	483	4	3	9	3	2	1
37	201	158	94	135	121	295	3	3	3	2		3
38	27	16	35	14	22	30						
39	18	9	28	48	72	68	2	2		1	2	
40	43	40	29	37	60	44						
41	107	71	73	87	108	226	14	2	2			16
42	302	197	482	248	226	196	2				3	1
43	248	100	18	2		3						
44	336	32	23	38	191	153						
45	2		1		3					1	1	
46	13	31	18	20	52	24						
47	205	165	37	99	11	36	10			19	21	16
48	14	14	12		6	21						
49	13	19		34	7	67	10	18	22	15	19	40
50						72						
51					13	15						
52												
53			15			190						
54												
55	27	37	327	466	551	544		2	1	1		
56					1	2	1					
Total	**12,017**	**6,688**	**10,353**	**11,207**	**11,359**	**10,617**	**568**	**583**	**738**	**691**	**719**	**521**

	Mediterranean Gull						Little Gull					
Region	1991	1992	1993	1994	1995	1996	1991	1992	1993	1994	1995	1996
1	1	1		2								
2					1							
3												
4	1	3	1									
5												
6												
7												
8												
9						1					1	
10						1			1	2		1
11						1	1			3	3	1
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
26				5	3							
27												
28												
29						1						
30												
31												
32												
33												
34												
35												
36												
37												
38												
39												
40												
41												
42								1				
43												
44												
45												
46												
47												
48												
49												
50												
51												
52												
53						1						
54												
55												
56												
Total	**2**	**4**	**1**	**7**	**4**	**5**	**1**	**1**	**1**	**5**	**4**	**2**

	Black-headed Gull						Common Gull					
Region	1991	1992	1993	1994	1995	1996	1991	1992	1993	1994	1995	1996
1	8,200	8,428	6,109	6,474	3,109	1,220	1,126	1,485	1,215	854	896	1,437
2	50	35	50	22	2	5	473	650	600	413	399	815
3	22,000	21,000	16,000	25,500	24,500	22,500	5	23	15	19	26	19
4	2,857	2,836	2,557	2,558	1,875	1,370	313	342	130	226	201	264
5	159	130	172	702	1,291	2,526	130	163	165	193	283	238
6												
7	148	197	95	45	385	884	256	582	478	358	337	496
8	9	5	8	36	48	86	88	91	102	114	112	82
9	7,133	8,161	5,347	5,156	4,867	4,464	104	87	150	266	456	529
10	22,590	16,450	13,424	12,242	7,853	7,532						
11	14,946	13,437	7,286	12,357	13,341	16,240	1	3	4	4	10	5
12	19	16	22	20		126						
13	2,695	1,913	1,997	1,249	469	666			4	4	1	3
14	2,929	2,040	4,917	1,673	1,204	1,749	32	93	178	117	150	251
15	1,938	3,028	4,293	3,991	3,837	5,167	93	184	204	184	180	158
16	7,175	9,886	8,887	9,616	8,023	9,373	386	429	489	802	581	742
17	2				2							
18	2				2							
19	5,496	6,360	9,523	10,788	10,422	13,815	216	273	905	366	613	921
20	100	25	40	30	8	18	180	122	224	220	270	166
21												
22	376	387	397	246	362	210	1	1	1			
23	27	40	35	49	47	30						
24												
25	2,140	2,380	2,968	2,912	3,072	3,329	2	2	1	5	6	11
26	4,333	1,938	4,768	4,350	4,658	1,067	60	77	75	172	95	102
27	1,450	3			5	29	66	20	14	7	4	25
28	3,883	3,771	3,258	2,202	2,571	2,186	10	10	11	13	15	13
29	4,200	5,000	7,080	7,350	7,640	7,450	90	91	87	97	87	85
30	418	565	59	124	284	346	2	5	3	2	2	5
31												
32							1	1	3			
33	627	521	265	315	124	171						
34	2,036	2,425	1,630	1,627	1,420	1,938	8	15	22	41	92	54
35	2,485	3,015	2,113	2,631	2,311	3,626	13	15	27	39	7	31
36	2,512	1,834	2,044	5,315	3,288	3,527	92	95	103	96	178	91
37	7,893	7,025	6,821	5,585	6,569	7,368	525	560	679	709	855	1,031
38	50	47	113	275	73	30	2			1	1	
39	78	298	520	512	43	171	964	422	620	1,302	1,120	1,225
40	2,465	2,210	2,102	1,268	1,422	1,696	52	56		303	107	81
41	1,323	923	1,164	1,003	1,354	1,555	72	97	112	154	120	196
42	446	1,196	547	94	60	100	4	8	9	9	12	14
43	138		2			2						
44	2,254	700	860	1,280	3,219	11						
45	700				92	12	7				2	
46	56	609	1,697	2,261	2,170	2,926	614	632	918	1,020	1,051	1,168
47	536	605	500	111			56	45	33	30	17	12
48	141	769		150	153	277	35	65	50	30	181	138
49	579	848	30	122	212	756	39	174	5	12	14	34
50		24				81						
51												
52												
53						4,578						
54												
55						1,969						
56												
Total	139,594	131,080	119,700	132,241	122,387	133,182	6,118	6,918	7,636	8,182	8,481	10,442

	Lesser Black-backed Gull						Herring Gull					
Region	1991	1992	1993	1994	1995	1996	1991	1992	1993	1994	1995	1996
1	678	187	1,877	422	3,529	7,013	8,878	11,135	10,162	3,541	6,385	6,503
2	1,007	1,050	1,000	248	745	1,180	9,907	8,000	8,500	257	2,466	4,942
3				2	3	5	7	30	30	136	102	38
4	10,200	11,469	13,350	12,312	12,761	9,568	12,585	13,791	14,880	14,032	11,614	7,684
5	50	106	109	141	180	168	3,440	3,550	2,558	2,620	2,413	2,523
6												
7	1,428	1,941	2,271	4,001	825	3,340	5,175	5,496	5,415	6,230	2,867	7,092
8	219	212	260	290	392	427	6,705	6,627	5,781	5,682	5,227	4,358
9		1		1	3	2	5		2	8	2	2
10							82	253	296	310	290	218
11	3	1	8	13	9	9	184	150	165	145	91	150
12												
13										1		
14	30	22	144	93	123	157	1,085	1,475	2,061	2,088	2,804	3,216
15	1,013	1,104	1,220	3,000	4,222	2,648	12,607	11,632	11,281	7,221	5,429	3,873
16	315	606	1,326	1,646	2,293	1,216	5,851	6,951	7,120	7,913	6,006	4,779
17							4					
18												
19	846	407	2,434	2,097	5,409	3,729	2,341	3,800	4,108	4,617	5,225	3,828
20	120	215	114	170	1,831	2,000	10,000	10,000	12,100	12,100	13,464	13,500
21												
22							15	19	19	19		
23							14	13	14	2	22	12
24												
25	5	13	23	24	26	58	392	356	615	599	891	985
26							8	17	17	6	6	16
27	1						655	11			2	1
28							4	21	1	1	39	
29	260	420	783	783	966	982	2,500	3,110	5,065	4,360	4,490	4,783
30							122	43	5	15	15	13
31												
32					5		3	40	1		32	26
33								1	1	7		
34					2	5	41	91	136	233	251	302
35			1	4	7	4	44	39	20	408	301	440
36		1	2	2	5	7	353	311	321	263	296	348
37	13	16	21	25	23	31	2,091	2,474	2,241	2,522	3,148	2,337
38							1			8	1	3
39	1,181	1,400	3,300	3,987	5,996	4,700	2,247	1,444	1,520	2,660	3,092	2,200
40				10	13	2	11	17	12	105	79	70
41	6	8	6	12	8	10	321	305	395	312	381	326
42							19	16	5	36	42	51
43												
44								1			1	
45							3				1	
46	3	7	8	10	25	27	911	1,049	1,098	1,594	1,748	1,742
47	2	3					400	475	350	20		1
48				4	3	5	31	130	235	300	398	437
49							535	636	607	510	417	449
50												
51												
52												
53												2
54												
55												
56												
Total	**17,380**	**19,189**	**28,257**	**29,297**	**39,404**	**37,293**	**89,577**	**93,509**	**97,137**	**80,881**	**80,038**	**77,250**

	Great Black-backed Gull						Gull-billed Tern					
Region	1991	1992	1993	1994	1995	1996	1991	1992	1993	1994	1995	1996
1												
2						1						
3												
4												
5												
6												
7												
8												
9												
10												
11				1	1							
12												
13							1					
14												
15					1							
16												
17												
18												
19												
20					1							
21												
22												
23												
24										1	1	2
25												
26							15	43	50	42	48	41
27	1						7					
28											2	18
29	1		1	1	4	3						
30												2
31												
32					2							
33												
34			1	1	1	2		1		5	5	2
35					2							1
36						1						2
37		1				5	1					
38												
39												
40		1										
41					1	1	2			1		6
42							1				2	
43			1									
44												
45												
46	1	1	2	1	1						2	2
47		1										
48	2	2	2	5	2	2	1	10	12		5	
49	1	2						9	1	3	4	10
50												
51												
52												
53												
54												
55												
56												
Total	**6**	**8**	**7**	**9**	**16**	**15**	**28**	**63**	**63**	**52**	**69**	**86**

	Sandwich Tern						Common Tern					
Region	1991	1992	1993	1994	1995	1996	1991	1992	1993	1994	1995	1996
1	750						142	149	82	202	155	102
2						2	84	90	130	55	82	135
3	7,000	6,600	7,600	8,300	8,100	5,600	1,900	2,200	2,500	3,300	2,600	1,700
4			140				36	130	42	44	158	58
5							30	43	41	45	81	152
6												
7					119	276	120	73	67	78	24	255
8						226	231	181	233	369	288	405
9							1,018	1,701	1,378	2,154	1,853	3,449
10						1	1,195	570	634	944	634	557
11							694	730	497	580	596	529
12							21			15	11	13
13							63	30	55	32	13	6
14		1		1			8	23	77	54	38	37
15	320	250	200	700	1,071	2,370	489	410	216	113	151	121
16							80	85	121	212	88	95
17												
18												
19	1,458	620	878	1,777	1,038	266	2,284	2,646	2,129	2,270	1,878	2,324
20							25	40				2
21								1	1	1		
22							235	264	188	226	193	186
23							2					
24												
25	1,200	1,100	974	474	991	519	1,800	2,903	2,868	2,510	1,493	1,382
26							339	503	558	1,028	1,341	490
27										1		3
28							12	62	15	34	50	172
29	1,540	3,773	3,682	4,261	3,200	4,382	2,125	2,900	2,050	1,930	340	380
30							48	83	41	15	10	7
31												
32										1		
33							8	15	6	6		1
34							48	149	141	174	172	155
35							127	24	35	1	36	44
36							9	21	12	23	48	6
37	4,705	3,900	3,264	2,600	2,500	2,601	357	237	265	122	244	401
38										1	5	5
39	8	8	2	3		3	27	32			18	25
40		1					136	89	98	123	131	64
41							7	5	3	1	9	
42							62	40	124	56	44	57
43												
44											2	
45							7				1	
46		71	78	568	350	1,039		1	1	1	3	
47							3					
48							37	100	81	120	24	143
49							50	11		14	3	
50												14
51												
52												
53												1
54												
55												
56												
Total	**16,981**	**16,324**	**16,818**	**18,684**	**17,369**	**17,285**	**13,859**	**16,541**	**14,689**	**16,855**	**12,817**	**13,476**

	Arctic Tern						Little Tern					
Region	1991	1992	1993	1994	1995	1996	1991	1992	1993	1994	1995	1996
1	109	66	16	63	35	32	32	66	75	142	103	71
2	11	25	40	21	35	46	2		6		2	2
3	410	800	1,100	1,200	1,000	1,150	23					1
4	2		27	2	2	5			1	1	3	
5	26	68	4	47	212	132		2				
6				5	6	1						
7	6	28	8		18	32		1				
8	129	263	214	235	125	121	19	28	64	48	71	42
9							3		8	2		
10	218	394	394	388	244	258						
11	54	68	73	96	94	157			3	4	3	8
12	5	10				7		2		2	2	
13	32	65	92	98	91	259			1		1	13
14	5	2	27	48	49	25	39	30	49	57	45	35
15	84	126	200	295	246	65	58	59	72	76	100	77
16	70	182	57	83	71	66	54	54	29	64	48	68
17		1	1									
18												
19	156	234	325	418	581	484	52	56	69	79	88	73
20								2				
21												
22	2	1	1	1								
23												
24												
25	210	459	370	416	493	545	15	17	38	26	47	67
26	21	18	13	10	10	35						
27						2						
28	7	83	138	176	436	380			1			
29	250	400	450	280	75	95	10	23	5	5	9	6
30	96	75	59	42	45	23						
31												
32		5	2	1	6	86		1	1		16	10
33				8				1				
34	140	151	119	217	262	127	21	28	25	43	39	4
35	549	227	37	136	283	176	69	66	62	67	99	69
36	290	403	297	172	370	157						
37	1,336	1,764	1,765	1,265	2,791	2,924	26	34	41	46	55	51
38		11	26	26	34	24						
39	30	54			55	50	49	66	62	81	90	75
40	260	144	141	251	222	215	45	25	23	27	36	53
41	207	379	361	222	268	216	62	102	104	99	92	39
42	8	17	34	41	17	54						
43	3											
44	3											1
45						3	41	11		14	25	
46	77	233	213	283	273	224						
47	136	350	40	123	10	55	38	18	6	45	31	58
48	235	267	203	300	164	87						
49	109	250	201	6	99	637	3	15	29	40	80	160
50												
51												
52												
53												
54												
55												
56												
Total	**5,286**	**7,623**	**7,048**	**6,975**	**8,722**	**8,955**	**661**	**707**	**774**	**968**	**1,085**	**983**

Appendix C

The Importance of the Wadden Sea for Breeding Birds

The actual Number of 31 bird species in the Wadden Sea in 1996 compared with the estimated numbers of breeding pairs in the three Wadden Sea countries and Northwest Europe and their international importance.

Antallet af 31 arter af ynglefugle i Vadehavet sammenlignet med bestandsvurderinger i de tre lande i Vadehavet og i Nordvesteuropa samt Vadehavets internationale betydning.

Bestandsgröße von 31 Vogelarten des Wattenmeeres im Vergleich zu Bestandsschätzungen in den drei Wattenmeerstaaten sowie Nordwest-Europas mit Angabe der internationalen Bedeutung.

Het aantal broedparen van de projectsoorten in de drie Waddenzee-landen in 1996 vergeleken met het geschatte aantal broedparen elders in NW-Europa.

Species	Netherlands	Germany	Denmark	NW-Europe	Wadden Sea(b)	Importance	%
Great Cormorant	16,567	14,473	36,000-41,000	85,000	838	+	1
Spoonbill	1,126	11	2	845	592	+++	70
Shelduck	6,000-9,000	3,840-4,270	2,500	100,000	4,982	++	5
Common Eider	10,000	1,305	20,000-24,000	1,000,000	11,534	+	1
Red-breasted Merganser	27	590	2,000-3,000	330,000	41	-	0
Hen Harrier	115-120	63	2-5	8,900	142	+	2
Oystercatcher	88,500-111,000	40,000	7,000-8,000	235,000	46,360	++	20
Avocet	7,100-7,200	6,000	5,000	18,900	10,617	+++	56
Great Ringed Plover	380-390	1,200	2,000	93,000	1,367	+	1
Kentish Plover	330-340	400	50-61	2,000	521	+++	26
European Lapwing	226,000-278,000	80,000-100,000	30,000-50,000	830,000	11,336	+	1
Dunlin*	0-2	30	450	1,000	39	+	4
Ruff	300-400	120-150	300-500	79,000	82	-	0
Common Snipe	2,400-3,100	?	2,500-3,000	72,000	645	-	1
Black-tailed Godwit	78,000-102,000	7,000-8,000	600-800	123,000	2,956	+	2
Curlew	6,900-8,800	4,000-5,000	300	133,000	632	-	0
Common Redshank*	25,700-34,000	10,000-12,000	10,000-15,000	59,000	12,835	++	22
Turnstone	0-3	3	40	18,000	2	-	0
Mediteranean Gull	247	20	0-1	327	5	+	2
Little Gull	6	0-2	0	12,000	2	-	0
Black-headed Gull	162,000	200,000-250,000	150,000	1,700,000	133,182	++	8
Common Gull	6,000	15,000	25,000-30,000	475,000	10,442	+	2
Lesser Black-backed Gull	40,700	16,000	4,400	215,000	37,294	++	17
Herring Gull	34,000	45,000	55,000-58,000	685,000	77,250	++	11
Great Black-backed Gull	6	11	1,500-1,600	107,000	15	-	0
Gull-billed Tern	0	70	15-16	86	86	+++	100
Sandwich Tern	13,171	11,000	4,500	63,000	17,285	+++	27
Common Tern	16,500	12,000	1,000	113,000	13,476	++	12
Arctic Tern	1,850	6,300	8,000-9,000	449,000	8,955	+	2
Little Tern	385	800	400-600	3,400	983	+++	29
Short-eared Owl	35-40	200-500	0-5	?	114	-	

Dunlin*: *Baltic schinzii* population
Common Redshank*: *Tringa totanus totanus*

NW-Europe: Belgium, Denmark, Estonia, Finland, France, Germany, Iceland, Ireland, Latvia, Lithuania, Luxembourg, The Netherlands, Norway, Poland, Russia around Gulf of Finland and Kaliningrad, Sweden, Switzerland and UK.

International importance:
+++ = at least 25% of NW-European population is breeding in the Wadden Sea
++ = 5-25% of NW-European population is breeding in the Wadden Sea
+ = 1-5% of NW-European population is breeding in the Wadden Sea
- = less than 1% of NW-European population is breeding in the Wadden Sea

The sources of the population estimates are: The Netherlands: Koks & Hustings 1998; van Dijk et al. 1998. Germany: Witt et al. 1996. Denmark: Grell 1998. Northwestern Europe: Hagemeijer & Blair 1997; Rose & Scott 1997; van Dijk et al 1998.

Appendix D

List of Field workers, Organizations and Institutions

Liste over deltagere i optællingerne, organisationer og institutioner.

Liste der Mitarbeiterinnen und Mitarbeiter, Organisationen und Institutionen.

Lijst van veldmedewerkers en organisaties.

The Netherlands

Fieldworkers

Theo Bakker, Harry Blijleven, Martin Birkenhäger, Freek Blom, Peter de Boer, C. Boersma, M.T. Boom, Leo Bot, André Boven, Eelco Brandenburg, Allix Brenninkmeier, IJme Brijker, Cees Bruin, Piet de Bruin, Cees Boot, Gerrit Boot, Jan Bunnink, Kees Camphuysen, Hillebrand van Dijk, Jan van Dijk, Klaas van Dijk, Koen van Dijken, Adriaan Dijksen, Lieuwe Dijksen, mevr. Drijver, Eddie Douwma, Piet Duiven, Edwin van Egmond, Hans Eikhoudt, Ricus Engelmoer, Fokko Erhart, Jaap Feddema, Marten Geertsema, Fred Geldermans, Rob Halff, Jan Harthoorn, Dik Heg, W. van der Heide, Trinus Hek, L. Hemrica, H. Hiemstra, H. Horstman, Harry Horn, Hans Hut, Justin Jansen, Jan de Jong, Joop de Jong, Oene de Jong, D. Imhoff, Giny Kasemir, Leon Kelder, Richard Kiewiet, Henk Koffijberg, Kees Koffijberg, Pim. de Kock, Ben Koks, Laurens van Kooten, Eduard Koopman, Mark Koopmans, Anton Kraus, Johan Krol, Gerrit Krottje, Dirk Kuiper, Robert Kuipers, D. Lautenbach, Gradus Lemmen, Date Lutterop, Dirk Maas, Frank Majoor, Jan Mey, Harry Miedema, Hannes Milder, W. Mud, E. Mulder, Bake Mulder, Theo Mulder, Martin Olthoff, A. Oosterdijk, Orangewoud BV, Meindert Otter, Frits Oud, Arie Ouwerkerk, Otto Overdijk, Bert Oving, Wim Penning, Leon Peters, Arnoud van Petersen, Bart Jan Prak, L. de Ree, Richard de Ree, S. Rienks, wijlen Rein Rollingswier, Jan Piet Rijf, Karel Sars, Kees van Scharenburg, Erik Schothorst, Dick Schut, Cor Smit, Harry Smit, Cees Soepboer, Bernard Spaans, E. van der Spek, Aart van der Spoel, W. Spoelstra, J. Sijtsma, Eric Stienen, Maarten Stoepker, Menno van Straaten, Hester Straatsma, Wim Swart, Johan Taal, Auke Talsma, Teun Talsma, Pieter Tepper, Piet van Tienen, Wim Tijsen, Lex Varkevisser, Jan Veen, Dick Veenendaal, Ronnie Veldkamp, Jaap Vink, Jan Vis, Erik Visser, Piet Visser, Kees de Vries, C.A. van der Wal, Tj. Walda, Gerrit Visch, Rob Vogel, Jan Jaap Werkman, Jacob Westerhuis, George Wintermans, Teun de Wit, Giel Witte, Marco Witte, Willem Witte, Jan Zorgdrager, Carl Zuhorn, J. Zuidewind, Christhof Zijm, Mart Zijm, Freek Zwart.

Organisations/Institutions

Wadvogelwerkgroep van de FFF, VWG Texel, Vogelwachten Nes-Buren en Hollum-Ballum, VWG Wierhaven, VWG Den Helder, Staatsbosbeheer, SOVON, Stichting het Noord-Hollands Landschap, It Fryske Gea, Natuurmonumenten, IBN-DLO, Nederlandse Aardolie Maatschappij (NAM), Prof. H.C. van Hall-Instituut te Leeuwarden. Vereniging Avifauna Groningen, Provincie Noord-Holland.

Germany: Niedersachsen

Fieldworkers

P. Adam, L. Adorf, S. Ahlers, J. Albrecht, W. Andresen, U. Appel, L. Bach, P. H. Becker, R. Beckmann, N. Behrmann, B. Berg, G. Berg, H. Besemann, H. Blindow, W. Böckelmann, J. Bocher, F. Bock, I. Bormann, E. Brahms, N. Bruns, G. Busch, G. Cihlars, T. Clemens, H. Culmsee, B. Daehne, G. Dahms, J. Dannemann, J. Djuren, M. v.d. Driesch, M. Eggert, G. Eilers, F. Esser, I. Feldmann, J. Feldmann, M. Fetz, M. Fichtler, W. Fischer, B.-O. Flore, P. Folkens, M. Folkerts, D. Frank, E. Fredrich, K.-R. Freitag, T. Frenzel, L. Frers, D. Friedrichs, J. Fröhling, C. Froitzhuber, E. Fuhrken, J. Furken, H. Garrelts, J. Gebauer, J. Geipel, E. Gentsch, K. Gerdes, S. Gödderz, K. Goslar, K. Grebe, J. Grünig, D. Gueffroy, T. Haase, R. Hadjitarkhani, D. Haese, P. Halve, N. Hampel, G. Hardekopf, E. Hartje, T. Hasse, P. Heimlich, U. Hemmerling, H. R. Henneberg, B. Herhaus, E. Herrmann-Brunke, C. Heuermann, B. Heyen, E. Hicken, M. Hintze, B. Hochfeld, M. Holzweg, F. Hopf, S. Hotes, M. Jacob, K. Jankowski, A. Janssen, C. Jauch, C. Jones, B. Jürgens, K. Jürgens, V. Kahlert, R. Kasten, U. Kasten, P.Kerber, C. Ketzenberg, D. Kirsch, G. Klauberg, H.-W. Klose, J. Knödel, L. Knödl, D. Köllmann, F. Kösters, I. Kolaschnik, M. Kolbe, M. Korsch, J.-C. Kranefeld, G. Kraus, R. Kreja, H. Krethe, M. Kriewen, T. Krüger, L. Krzywanski, R. Kubica, K. Kukatz, I. Latendorf, R. Lau, D. Legler, T. Lehmberg, J. Lempert, M.A. Lessing, J. Leyrer, T. Lissner, T. Lobinger, J. Ludwig,

J.-D. Ludwigs, T. Maren, L. Mayer, T. Meenken, S. Meier, T. Meinrenken, D. Meisel, W. Menger, W. Menke, T. Mennebäck, A. Mensching, U. Meyer, F.-O. Müller, M. Müller, U. Müller, D. Nannen, F. Nannen, N. Neumann, N. Niedernostheide, G. Nikolaus, L. Nilsson, M. Nuss, H. Obendorf, D. Oldenburg, S. Olearius, F. Oltmanns, K. Osburg, W. Pappel, M. Pattmann, K. Pawliczek, M. Petermann, R. Petri, C. Pott, F. Rabenstein, B. Rackoll, E. Raddatz, V. Rahn, F. Rasche, B. Rau, G. Reinders, H. Reiner, D. Renken, M. Reuter, K. Richter, H.-J. Ropers, R. Roth, D.-H. Rückamp, U. Satorius, G. Scheiffarth, W. Schießberg, P. Schmal, E. Schmidt, S. Schmidt, M. Scholze, H.-A. Schoof, R. Schopf, A. Schramm, U. Schramm, W. Schütz, A. Schulz, C. Schwennesen, J. Seehausen, U. Siebolts, G. Stauch, P.J. Stegmann, B. Steinborn, S. Stoepper, J. Teerling, M. Temme, O. Tschetsch, M. Timmermann, B. Trede, T. Trinkl, S. Uhlmann, N. Unger, K. Veentjer, E. Voß, T. Voßhage, U. de Vries, M. Wagner, R. Wahlhäuser, B. Waschkowski, F.-W. Wegener, R. Wehking, J. Weinbecker, G. Wietfeld, G. Wilken, H. Wilkens, S. Wilkens, A. Wilms, S. Wolff, J. Zellerhoff.

Organisations/Institutions

Nds. Landesbetrieb für Wasserwirtschaft und Küstenschutz (NLWK), Betriebsstelle Norden, ehemals: Staatliches Amt für Insel- und Küstenschutz (StAIK), Norden; Verein Jordsand zum Schutz der Seevögel und der Natur e.V.; Der Mellumrat e.V., Oldenburg; Wissenschaftliche Arbeitsgemeinschaft für Natur- und Umweltschutz e.V. (WAU), Jever; Ornithologische Arbeitsgemeinschaft Oldenburg (OAO); Arbeitsgemeinschaft Biologische Station Osterholz, Osterholz-Scharmbeck; Landkreis Stade / Naturschutzstation Unterelbe der Bezirksregiering Lüneburg; Kreisgruppe Unterweser; Naturschutzbund Deutschland Landesverband Niedersachsen.

Germany: Schleswig-Holstein

Fieldworkers

A. Altmaier, B. Andresen, W. Andresen, Wiebke Andresen, R.K. Berndt, L. Biemann, Jan Blew, W. Block, Ingolf Bode, Gerd Böhm, Wanda Born, R. Brauer, Till Brehm, H.A. Bruns, T. Bungardt, Daniels, Dannenburg F., H. J. Deppe, Sebastian Dirks, Till Dörges, M. Ehrhardt, P.Fehrs, Klaus Fleeth, Manfred Friedebold, Ralf Gliedstein, Peter Gloe, G. Görrissen, Bodo Grajetzky, P. Grell, C. Grüneberg, K. Günther, B. Hälterlein, Peter Hammer, Conrad Hansen, C. Herden, Nicole Heuer, F. Hofeditz, Steven Hoflen, Hermann Hötker, A. Hübner, H.-M. Ingwers, Ralf Joest, D. Kalisch, E. Kappes, W. Kappes, K. Karkow, N. Kempen, N. Kempf, A.Klinge, H.Knabe, R. Kohlscheen, Ingo Kolaschnik, Silke Kühl-Kellermann, M. Lehnert, S. Lenz, Sönke, Lorenzen, B. Ludz, Karsten Lutz, G. Mackensen-Neitzke, H. Matthiesen, K. Mock, H. Müller, R. Müller, S. Oppel, Walther Petersen-Andresen, Wolfram Petzl, C. Plehn, G. Quedens, M. Radloff, Nils Reupke, Thomas Sacher, G. Sanders, R. Schiederkötter, Julian Schmidt, Rainer Schulz, M. Schümann, Sokolowski, B. Strauß, W. Streberny, Manfred Sturm, O. Thassler, J. Thormählen, Peter Todt, Sebastian Unger, Ute Vette, P. Walter, J. Werner, S. Wolfram.

Organisations/Institutions

Amt für Land und Wasserwirtschaft, Husum; Bund für Umwelt und Naturschutz Deutschland e.V.; Naturschutzbund Deutschland Landesverband Schleswig-Holstein e.V.; Naturschutzbund Deutschland Landesverband, Hamburg; Landesamt für den Nationalpark Schleswig-Holsteinisches Wattenmeer, Tönning; Naturschutzgesellschaft Sylt e.V; Öömerang Ferian e.V.; Söl´ring Foriining e.V; Naturschutzgesellschaft Schutzstation Wattenmeer e.V.; Universität Bremen; Institut für Haustierkunde der Universität Kiel; Verein Jordsand zum Schutz der Seevögel und der Natur e.V..

Denmark

Fieldworkers

Per B. Baden, Keld Bakken, René Christensen, Michael Clausen, David F. Drost, Jeppe Ebdrup, Kim Fischer, John Frikke, Iver Gram, Volker Heesch, Morten J. Hansen, Bjarne Hoff, Bent Jakobsen, Peter Emil Jensen, Michael S. Johansen, Niels Knudsen, Jakob Kryger, Jesper Leegaard, Klaus Melbye, Peter Mæhl, Kristian Dammann Nielsen, Peter Emil Nielsen, Lars Maltha Rasmussen, Nete Kyhl Revsbech, Jan Ryttergaard, Svend Rønnest, Carl Schneider, Keld Stougaard, Ole Thorup.

Organisations/Institutions

Danmarks Miljøundersøgelser, Dansk Ornitologisk Forening, Ribe Amt, Lindet Skovdistrikt/Skov- og Naturstyrelsen.

Appendix E

Survey Areas and Coverage in the Wadden Sea 1996

Information about size and coverage of counting sites for breeding birds in the Wadden Sea.

Oplysning om areal og dækning af tælleområderne for ynglefugle i hele Vadehavet.

Übersicht über die Größe und Erfassungsgrad von Brutvogelzählgebieten im Wattenmeer.

Informatie over omvang en dekking van telgebieden voor broedvogels in de Waddenzee.

Region: No. 1 – 56 (see Figure 1)

Coverage:

C = Counted / optalt / gezählt / geteld
P/C = Partly counted / delvist optalt / teilweise gezählt / gedeeltelijk geteld
E = Estimated / estimeret / geschätzt / geschat
0 = Not covered / ikke optalt / nicht gezählt-keine Daten / niet geteld

The Netherlands

Region	Site code	Site name	Size in ha	Coverage
1	11010190	Texe, island	3,191	
1	11010280	Texel, polders	7,500	
1	11010390	Noorderhaaks	350	
2	12020490	Vlieland	801	
2	12020590	Richel	330	
3	12030621	Griend	75	
4	12040790	Terschelling, island	5,538	
4	12040880	Terschelling, polder	1,800	
5	12050990	Ameland	2,677	
5	12051080	Ameland, polders	1,000	
6	12061191	Engelsmanplaat	200	
6	12061290	Rif	50	
7	12071390	Schiermonnikoog	3,279	
8	13081490	Rottumeroog	200	
8	13081591	Rottumerplaat	600	
9	11091650	Afsluitdijk	100	
10	11101710	Friesland	2,572	
10	12101850	Lauwersmeer	4,972	
11	13111910	Groningen	903	
11	13112010	Punt van Reide	150	
12	13112130	Dollard	8,500	
Total The Netherlands			**44,788**	

Niedersachsen

Region	Site code	Site name	Size in ha	Coverage
12	2608	Rysumer Nacken	35	C
12	2609	Dollart	380	C
13	2408	Leybucht	1,325	C
13	2508	Pilsum-Manslagter	330	C/E
14	2306	Borkum	3,000	C
14	2407	Lütje Hörn	50	E
15	2307	Juist West	660	C
15	2307	Memmert	620	C
15	2308	Juist Ost	680	C
16	2208	Norderney Ort	80	C
16	2209	Norderney West	1,000	C
16	2209	Norderney Ost	1,210	C
16	2210	Baltrum	650	C
16	2210	Langeoog West	980	C
16	2211	Langeoog Nord	420	C
16	2211	Langeoog Ost	600	C
16	2211	Langeoog Süd	250	C
17	2309	Altendeich bis Hilgenriedersiel	190	C
17	2309	Hilgenriedersiel bis Neßmersiel	520	C
17	2310	Neßmersiel bis Dreihausen	160	C
17	2310	Dreihausen bis Dornumersiel	105	C
17	2311	Dornumersiel bis Bensersiel	135	C
17	2311	Bensersiel bis Neuharlingersiel	15	C
18	2212	Neuharlingersiel	60	C
18	2212	Harlesiel	160	C
18	2213	Elisabeth-Außengroden West	390	C
18	2213	Elisabeth-Außengroden Ost	460	C
19	2212	Spiekeroog West	720	C
19	2212	Spiekeroog Ost	980	C
19	2213	Wangerooge West	280	C
19	2213	Wangerooge Ost	410	C
19	2214	Minsener Oog	195	C
20	2214	Mellum	700	C
21	2314	Horumersiel (Wangersiel)	555	C
22	2414	Wilhelmshaven Süd	1	C
22	2415	Jadebusen Nord	180	E
22	2514	Jadebusen West	440	C
22	2514	Jadebusen Südwest	330	C
22	2515	Jadebusen Ost	330	E
22	2515	Jadebusen Süd	210	C
22	2515	Jadebusen Südost	530	C
23	2315	Langwarder Deich	290	C
23	2416	Burhave	120	C
23	2416	Waddenserdeich	50	C
23	2417	Langlütjen	300	E
24	2116	Knechtsand	10	C
24	2117	Cuxhaven-West	130	C
24	2117	Spieka Nord	970	C
24	2217	Spieka Süd	320	PC
24	2217	Dorumer Neufeld Süd	90	C
24	2316	Wremen Nord	110	C
24	2216	Süd Eversand	1	C
24	2317	Wremen Süd	90	C
25	2016	Scharhörn	15	C
25	2017	Neuwerk	205	C
26	2118	Cuxhaven Ost	80	C
26	2119	Otterndorf West	80	C
26	2119	Otterndorf bis Oste	910	C
26	2120	Nordkehdingen West	1,120	PC
26	2120	Hullen	550	PC
26	2121	Nordkehdingen Mitte	650	PC
26	2121	Nordkehdingen Ost	640	PC
26	2121	Allwördener Außendeich	670	PC
55		Ems	1,050	
56		Weser	2,105	
Total Niedersachsen			**26,111**	

Schleswig Holstein

Region	Site code	Site name	Size in ha	Coverage
26	ES12	Vorl.St.Margarethen	286	
26	VD52	Vorl. Neufelder Koog	369	
27	FD	Feuchtgebiete Dithmarschen	4,280	
28	VD1	Vorland Eider-Büsum	244	
28	VD2	Speicherkoog Außen	55	
28	VD3	Vorl. Friedrichsk.-N	476	
28	VD4	Vorl. Dieksanderkoog	966	
28	VD51	Vorland Kai.Wil.Koog	237	
29	IT	Trischen	215	
30	EE1	Katinger Watt	609	0
30	EE2	Eider südl. Tönning	323	
31	MN6	Nordstrander Marsch	3,872	A
32	SN	Außensände NF	2,427	
33	FE	Feuchtgeb.Eiderstedt	76	
34	FN1	Rickelsbüller Koog	460	
34	FN2	Vordeich. Fahretoft	7	
34	FN3	Hauke-Haien-Koog	336	
34	FN4	Vordeichung Ockholm	20	
34	FN6	Beltringharder Koog	2,072	
35	VE1	Husum-Everschopsiel	263	
35	VE2	Vorl.Norderheverkoog	423	
35	VE3	Westerhever	468	
35	VE4	Tümlauer Bucht	404	
35	VE5	St.Peter Vorl.& Sand	1,545	
35	VE6	St.Peter bis Eider	125	
36	VN1	Vorland Rickelsb.Koog	74	
36	VN2	Hind.Damm-Dagebüll	590	
36	VN3	Dagebüll-Schlüttsiel	183	
36	VN4	Schlüttsiel-Ham.Hallig	339	
36	VN5	Hamburger Hallig	519	
36	VN6	Hamburger Hallig-Nordstrand	171	
36	VN7	Nordstrand West	19	
36	VN8	Nordstrand Süd	415	
36	VN9	Schobüller Bucht	237	
37	IH1	Langeneß	1,006	
37	IH2	Oland	204	
37	IH3	Gröde	230	
37	IH4	Habel	6	
37	IH5	Nordstrandischmoor	180	0
37	IH6	Hooge	580	C
37	IH7	Norderoog	11	
37	IH8	Süderoog	54	
37	IH9	Südfall	51	
38	IP1	Pellworm-Salzw.	145	C
38	IP3+4	Pellworm Marsch & wetlands	3,200	A/C
39	IA	Amrum	2,530	C
40	IF1	Föhr Vorländer Nord	231	
40	IF3	Föhr Godel & Bruk	200	
40	IF5	Föhr Marsch	4,110	A/C
40	IF6	Föhr Geest	1,000	A
41	IS1	Sylt Seeseite	143	
41	IS2	Sylt Königshafen	112	
41	IS3	Sylt Watt Nordost	543	
41	IS4	Sylt Watt Südost	487	
41	IS5	Sylter Dünen	2,386	
41	IS6	Sylter Marschen	1,282	
Total Schleswig Holstein			**41,796**	

Denmark

Region	Site code	Site name	Size in ha	Coverage
42	FV	Det Fremskudte Dige	140	C
42	KV	Dagligreservoiret	125	C
42	KV	Saltvandssøen	265	C
42	FV	Emmerlev Koldby S+C168kræntkyst	48	E
43	FB	Astrup Forland	198	C
43	FB	Ballum Forland	265	C
43	FB	Bådsbøl-Ballum Kyst	81	E
43	FB	Rømødæmningen	848	PC
43	FX	Brøns Rejsby Forland	627	PC
44	FR	Ribe Digets Forland	551	PC
44	FS	Måde Enge	280	C
44	FS	Sneum Forland	69	C
44	FX	Brøns Rejsby Forland	40	E
45	EV	Tarphage Enge	160	PC
45	FH	Ho Enge	160	PC
45	FH	Nyeng	67.33	C
45	FH	Skallingen	1,734	C
45	EV	Skødstrup Enge	480	PC
45	FH	Marbæksøerne	28	C
45	FH	Skallingen Strand	507	C
45	FE	Esbjerg Havn	352	0
45	FH	Sædding til Marbæk Strand	55	0
46	IL	Langli	80	C
47	IF	Fanø Strandeng	592	C
47	IF	Fanø Strand	283	C
47	IF	Langejord	47	0
47	IF	Peter Meyers Sand	267	0
47	IF	Fanø indland	4,034	PC
47	IF	Fanø Klitter	634	PC
47	IF	Søren Jessens Sand	381	C
48	IM	Mandø Forland	270	C
48	IM	Koresand	966	o
48	IM	Mandø Koge	610	C
49	IR	Rømø strandeng	1,259	PC
49	IR	Lakolk Sø	92	C
49	IR	Rømø strand	308	C
49	IJ	Jordsand	3	C
49	IR	Rømø Indland	3,910	PC
49	IR	Havneby Kog	116	C
49	IR	Juvre Enge	538	C
49	IR	Havsand	793	C
49	IR	Juvre Sand	1,154	C
49	IR	Rømø strand	1,359	C
49	IR	Bolilmark	202	o
49	IR	Juvre	201	C
50	KV	Hasberg Sø	23	C
50	KV	Klæggrave i Margrethe Kog	26	C
50	KV	Gammel Frederikskog	629	C
50	KV	Indre Koge	2,961	PC
50	KV	Magisterkog	884	C
50	KV	Margrethe Kog	731	C
50	KV	Ny Frederikskog	933	C
51	KB	Ballum Enge	3,366	C
52	KX	Brøns Enge	571	E
52	KX	Rejsby Enge	1,391	C
53	KR	Ribe Marsken Klæggrave	152	C
53	KS	Sneum Klæggrav	59	C
53	KR	Rejsby Enge	175	PC/E
53	KR	Ribe Marsken	4,442	PC
53	KS	Sneum Enge	673	PC
54	EV	Varde Ådal	1,489	PC
Total Denmark		**43,684**		

Appendix F

Species List

List of the species in the Joint Monitoring Program for Breeding Birds in the Wadden Sea and their native language names.

Euring	English name	Scientific name	Nederlandse naam	Deutscher Name	Dansk navn
720	Great Cormorant	Phalacrocorax carbo	Aalscholver	Kormoran	Skarv
1440	Eurasian Spoonbill	Platalea leucorodia	Lepelaar	Löffler	Skestork
1730	Shelduck	Tadorna tadorna	Bergeend	Brandente	Gravand
2010	Common Eide	Somateria mollissima	Eidereend	Eiderente	Ederfugl
2210	Red-breasted Merganser	Mergus serrator	Middelste Zaagbek	Mittelsäger	Toppet Skallesluger
2610	Hen Harrier	Circus cyaneus	Blauwe Kiekendief	Kornweihe	Blå Kærhøg
4500	Oystercatcher	Haematopus ostralegus	Scholekster	Austernfischer	Strandskade
4560	Avocet	Recurvirostra avosetta	Kluut	Säbelschnäbler	Klyde
4700	Great Ringed Plover	Charadrius hiaticula	Bontbekplevier	Sandregenpfeifer	Stor Præstekrave
4770	Kentish Plover	Charadrius alexandrinus	Strandplevier	Seeregenpfeifer	Hvidbrystet Præstekrave
4930	Northern Lapwing	Vanellus vanellus	Kievit	Kiebitz	Vibe
5120	Dunlin	Calidris alpina	Bonte Strandloper	Alpenstrandläufer	Almindelig Ryle
5170	Ruff	Philomachus pugnax	Kemphaan	Kampfläufer	Brushane
5190	Common Snipe	Gallinago gallinago	Watersnip	Bekassine	Dobbeltbekkasin
5320	Black-tailed Godwit	Limosa limosa	Grutto	Uferschnepfe	Stor Kobbersneppe
5410	Eurasian Curlew	Numenius arquata	Wulp	Grosser Brachvogel	Stor Regnspove
5460	Common Redshank	Tringa totanus	Tureluur	Rotschenkel	Rødben
5610	Turnstone	Arenaria interpres	Steenloper	Steinwälzer	Stenvender
5750	Mediterranean Gull	Larus melanocephalus	Zwartkopmeeuw	Schwarzkopfmöwe	Sorthovedet Måge
5780	Little Gull	Larus minutus	Dwergmeeuw	Zwergmöwe	Dværgmåge
5820	Black-headed Gull	Larus ridibundus	Kokmeeuw	Lachmöwe	Hættemåge
5900	Common Gull	Larus canus	Stormmeeuw	Sturmmöwe	Stormmåge
5910	Lesser Black-backed Gull	Larus fuscus	Kleine Mantelmeeuw	Heringsmöwe	Sildemåge
5920	Herring Gull	Larus argentatus	Zilvermeeuw	Silbermöwe	Sølvmåge
6000	Great Black-backed Gull	Larus marinus	Grote Mantelmeeuw	Mantelmöwe	Svartbag
6050	Gull-billed Tern	Gelochelidon nilotica	Lachstern	Lachseeschwalbe	Sandterne
6110	Sandwich Tern	Sterna sandwichensis	Grote Stern	Brandseeschwalbe	Splitterne
6150	Common Tern	Sterna hirundo	Visdief	Flussseeschwalbe	Fjordterne
6160	Arctic Tern	Sterna paradisaea	Noordse Stern	Küstenseeschwalbe	Havterne
6240	Little Tern	Sterna albifrons	Dwergstern	Zwergseeschwalbe	Dværgterne
7680	Short-eared Owl	Asio flammeus	Velduil	Sumpfohreule	Mosehornugl