

Dead Seabirds along European coasts, 1987 and 1988.

RESULTS OF THE INTERNATIONAL BEACHED BIRD SURVEY

DODE ZEEVOGELS OP DE EUROPESE KUST, 1987-1988; RESULTATEN VAN DE INTERNATIONALE OLIESLACHTOFFERTELLINGEN.

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Introduction

Coordinated nationwide surveys of beached dead seabirds have been carried out late February along the coasts of northwestern Europe in 1987 and 1988. These surveys are a continuation of an effort started in 1972, and have been performed in many countries. The Royal Society for the Protection of Birds (RSPB) in Great Britain coordinated the International Beached Bird Survey until 1986, when the Society also decided to stop surveying British coasts. As surveys continued on the continental coasts in 1987, the Danish Ornithological Society took over the role of summing up and linking together the data from different national surveys. The main aim of the International Survey is to study the mortality of wintering seabirds in the North Sea, the English Channel, the Atlantic coast and the Bay of Biscay. Areas of the Baltic are now included for the part bordering the North Sea (Kattegat and the Belts), but the coast of the rest of the Baltic will hopefully be included in future surveys. In the long term we wish to explore the possibilities within this large scale census to monitor impacts of marine pollution on seabirds as well. A coordinated survey of beached seabirds along the coasts of the Baltic Sea, the North Sea and the Bay of Biscay is the only way of comparing causes and extent of seabird mortality.

The aim of this paper is to give a short review of the results of the two counts in 1987 and 1988, focussing on differences and similarities in species composition and densities of dead seabirds.

Material

The surveys were undertaken during the last weekends of February 1987 and 1988. Approximately 2,000 kilometres of beach were covered during the two surveys (table 1). The national coordinators were:

Sweden: westcoast (only 1987); Rory P. Wilson, Deutsche Hydrographische Institut, Kiel, West Germany.

Norway: southcoast; Eirik Jacobsen, Hafsfjord, Norway.

Denmark: Henrik Skov, Danish Ornithological Society, Copenhagen, Denmark.

West Germany: Schleswig Holstein; Eike Hartwig, Verein Jordsand, Ahrensburg, West Germany; Nieder Sachsen; Eckart Schrey, Metjendorf, West Germany.

Netherlands: Kees Camphuysen, Nederlands Stookolieslactof-fer Onderzoek, Zaandam, Netherlands.

Belgium: (only 1987); Jan Verboven, Gent, Belgium.

France: Normandy; Francois Leclerc, GON, CAEN-CEDEX; Bretagne (not yet received); Jean-Claude Linard, SEPNE, Brest, France.

Spain: Francisco Arcos, Grupo Erva, Vigo, Spain.

table 1. Coverage (kilometres of beach surveyed) in the International Surveys in February 1987 and 1988.

tabel 1. Onderzochte hoeveelheid kilometers gedurende de internationale tellingen in februari 1987 en 1988.

| sector | | 1987 | 1988 |
|--------------|----------------|--------------|-------|
| Sweden | | 30 | 0 |
| Norway | | 6 | 21 |
| Denmark | | 531 | 514 |
| West Germany | Schl.Holstein | 365 | 350 |
| | Nieder Sachsen | 60 | 221 |
| Netherlands | | 371 | 271 |
| Belgium | | 30 | 0 |
| France | Normandy | 326 | 376 |
| | Bretagne | not received | |
| Spain | | 180 | 61 |
| Total number | | 1,899 | 2,053 |

Weather

The weather situation in western Europe in both winters was quite different. In 1987 the winter was characterized by very low temperatures, particularly in January. Most of the Baltic and coastal areas in the northern part of the North Sea were seriously ice-covered. In 1988 the winter was very mild, and rainy weather predominated throughout the season.

Oil incidents

No large scale oil pollution incidents were experienced during one of the two winters. A small oil spill from a fishing vessel killed at least 6,000 birds in the Dutch Wadden Sea in January/February 1987. The majority of the casualties were Common Eiders *Somateria mollissima*. Wildfowl and waders were found oil, indicating that the mudflats had been oil contaminated (Engelen 1987). In January 1988 an ore-carrier leaked 350 tonnes of oil off the Dutch coast, nearby important concen-

trations of seaducks. About 4,000 birds were found beached, and a total number of 5,000-5,500 birds are estimated to have been killed (Camphuysen *et al.* 1988). Only the first incident has affected the number of oiled birds recorded in the Dutch surveys. In western Danish waters in 1987, and off Normandy in 1988, oil pollutions without known sources were experienced shortly before the surveys.

Results and discussion

The densities of corpses recorded in 1987's and 1988's International Surveys are shown in figures 1 to 4. Only areas with large samples are shown here. The total number of birds found dead are listed in appendix 1.

Coastal species (divers, grebes (figure 1) and Eider *Somateria mollissima* and scoters *Melanitta* spp. (figure 2)) were generally found beached in considerably higher densities in 1987 than in 1988 along the southern coasts of the North Sea. This may reflect a combination of many factors: changes in the distribution of the wintering populations in western Europe in 1987's severe winter compared with 1988's mild winter, increased energy requirements in 1987 (in areas with low capacity), and the apparently higher rate of oil pollution in 1987. Increased densities of beached seaducks along northern North Sea coasts and the Baltic region in 1988 support the idea, that these waterfowl were more common in the southern North Sea during the severe winter of 1987, when most of the Baltic and Danish west coast were ice-covered. Surveys of waterfowl in the Danish sectors further support this for the scoters. In 1988 the wintering populations of Common Scoter *Melanitta nigra* and Velvet Scoter *M. fusca* moved from areas of the Wadden Sea to the ice-free Kattegat, changing the population here from 50,000 in 1987 to at least 500,000 in 1988 (Laurson *et al.* 1987, Laurson *et al.* 1988, Skov *et al.* 1988). With respect to the grebes, the distinct decrease in numbers on the coast of the Wadden Sea in 1988 compared with 1987, may have been the result of a change in main wintering haunts for both Great Crested Grebe *Podiceps cristatus* and Red-necked Grebe *P. grise-gena*, from fresh water to marine habitats. In Normandy, no difference in the number of beached grebes was recorded between the years.

Mass-mortality was also recorded for many species of wildfowl in 1987 (figure 2). In the Baltic, Mute Swan *Cygnus olor* had severe problems, and in the Wadden Sea area geese, dabbling ducks and Shelduck *Tadorna tadorna* died in high numbers in 1987.

One of the most striking results was the mass mortality of waders in 1987 (figure 3). This mortality was especially recorded in the Wadden Sea area, but apparently also occurred further south in the English Channel. Records of many waders beached in Spain may be linked to this mortality. An extreme weather situation in January 1987 made strong and cold winds, originating in the Arctic, penetrating deep south, hitting most of western Europe. The Oystercatcher *Haematopus ostralegus* was the main victim; tens of thousands were recorded on a coldrush along the Dutch coast (Keijl & Mostert 1988). An investigation of dead Oystercatchers sampled on the island Norderney (West German Wadden Sea) showed that the birds had lost between 36 and 39 percent of their normal weight (Temme & Garß 1988).

The pelagic seabirds, which main wintering habitats are in deeper waters, in general showed a different trend. Kittiwake *Rissa tridactyla*, Razorbill *Alca torda* (figure 3), and Guillemot *Uria aalge* (figure 4) were recorded in higher numbers all over the coast of northwestern Europe in 1988 compared with 1987. This difference is very difficult to

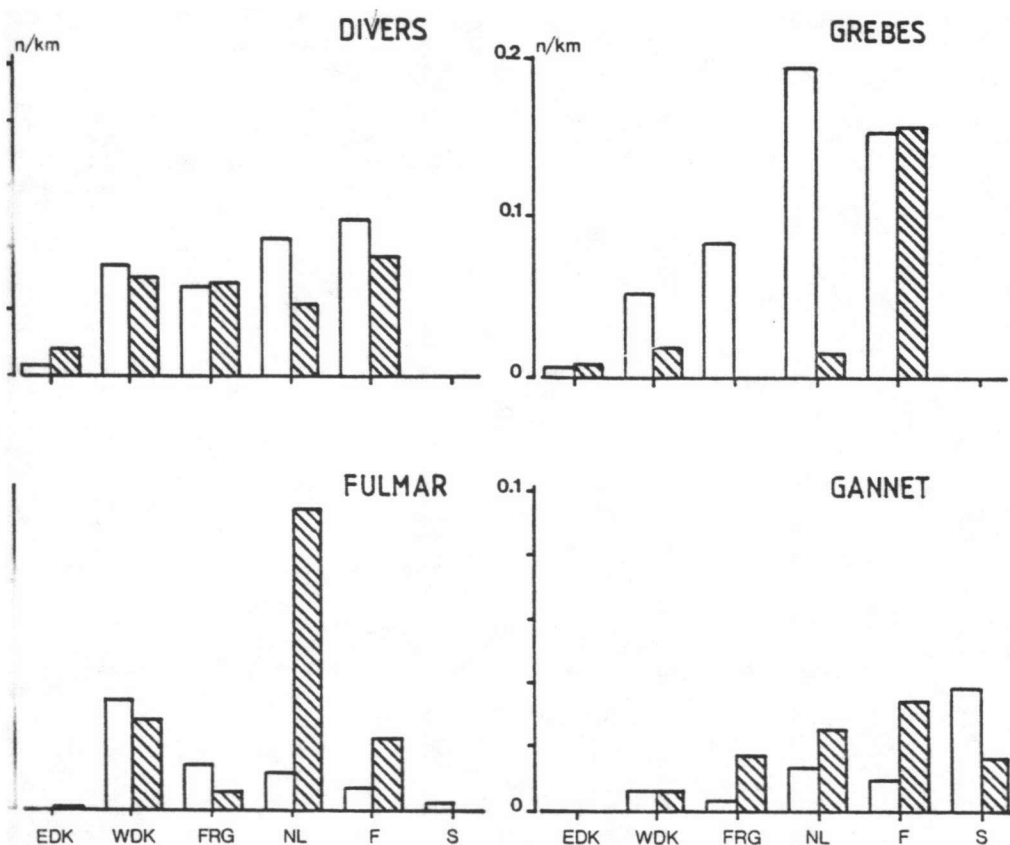


figure 1. Densities (n/km) of divers Gaviidae, grebes Podicipedidae, Fulmar *Fulmarus glacialis*, and Gannet *Sula bassana* found beached along selected coasts of northwestern Europe, February 1987 (white) and 1988 (hatched). BDK Baltic Denmark, WDK west coast Denmark, FRG West-Germany (Schleswig-Holstein), NL Netherlands, F Normandy, France, S Spain.

figuur 1. Dichtheden (kilometergemiddelde) duikers, futen, Noordse Stormvogels and Jan van Genten gevonden op geselecteerde kustgebieden in Noordwest Europa in februari 1987 (wit) en 1988 (gestreept). BDK Denemarken, Oostzeekust, WDK Denemarken westkust, FRG West-Duitsland (Schleswig-Holstein), NL Nederland, F Normandië, Frankrijk, S Spanje.

table 2. Proportions oiled (if $n \geq 10$) of selected species in four regions as a result of the International beached bird surveys, 1987-88. Baltic: E Denmark and Sweden; NE North Sea: S Norway, W Denmark and Schleswig Holstein; SE North Sea: Nieder Sachsen, Netherlands, Belgium; Bay of Biscay: Spain.

tabel 2. Aandeel met olie besmeurde individuen ($n \geq 10$) bij enkele belangrijke soorten/groepen in vier deelgebieden als resultaat van de Internationale stookolieslachtoffertellingen van 1987 en 88.

| GROUP | SECTOR | Baltic | NE North Sea | SE North Sea | Bay of Biscay |
|-----------|--------|--------|-----------------|-----------------|------------------|
| divers | 1987 | - | 90 % | 85 % | - |
| | 1988 | - | 70 % | - | - |
| grebes | 1987 | - | 97 % | 67 % | - |
| | 1988 | - | - | - | - |
| Fulmar | 1987 | - | 61 % | 20 % | - |
| | 1988 | - | 55 % | 57 % | - |
| Eider | 1987 | 62 % | 66 % | 70 % | - |
| | 1988 | 34 % | 41 % | 33 % | - |
| scoters | 1987 | - | 84 % | 84 % | - |
| | 1988 | 84 % | 66 % | 85 % | - |
| wildfowl | 1987 | 26 % | 36 % | 39 % | - |
| | 1988 | - | 8 % | 3 % | 0 % |
| waders | 1987 | - | 30 % | 1 % | 1 % |
| | 1988 | - | 13 % | 9 % | - |
| Larus spp | 1987 | 26 % | 67 % | 26 % | 14 % |
| | 1988 | 10 % | 47 % | 13 % | 19 % |
| Kittiwake | 1987 | - | 84 % | 77 % | - |
| | 1988 | - | 75 % | 82 % | - |
| Razorbill | 1987 | - | - | 100 % | - |
| | 1988 | - | 66 % | 88 % | 54 % |
| Guillemot | 1987 | - | 96 % | 95 % | 29 % |
| | 1988 | - | 68 % | 79 % | 82 % |
| L. Auk | 1987 | - | 98 % | - | - |
| | 1988 | - | 62 % | - | - |
| Puffin | 1987 | - | - | - | 46 % |
| | 1988 | - | - | - | 100 % |

interpret, since apparently there was a decrease in oil-contamination of these species. Changes may have taken place in the main direction of currents from offshore parts of the North Sea, as a result of a change from winds from mainland Europe in 1987 to westerly winds in 1988. Surveys of the offshore populations of seabirds in the North Sea unfortunately were not comparable between the two years, due to large differences in areas covered. The distinct increase in the density of Razorbills in the English Channel and Bay of Biscay is quite remarkable.

The Fulmar *Fulmarus glacialis* and Gannet *Sula bassana* (figure 1), Little Auk *Alle alle* and Puffin *Fratercula arctica* (figure 4) differ from the above group of species. The Fulmar was abnormally common in the southern North Sea in winter 1988, and was found beached in high densities (cf. Camphuysen & Keijl 1988). Most of the birds were recorded oiled (57% in the Netherlands, $n = 72$). The Gannet was recorded in the highest densities along the southern coasts in both years, though

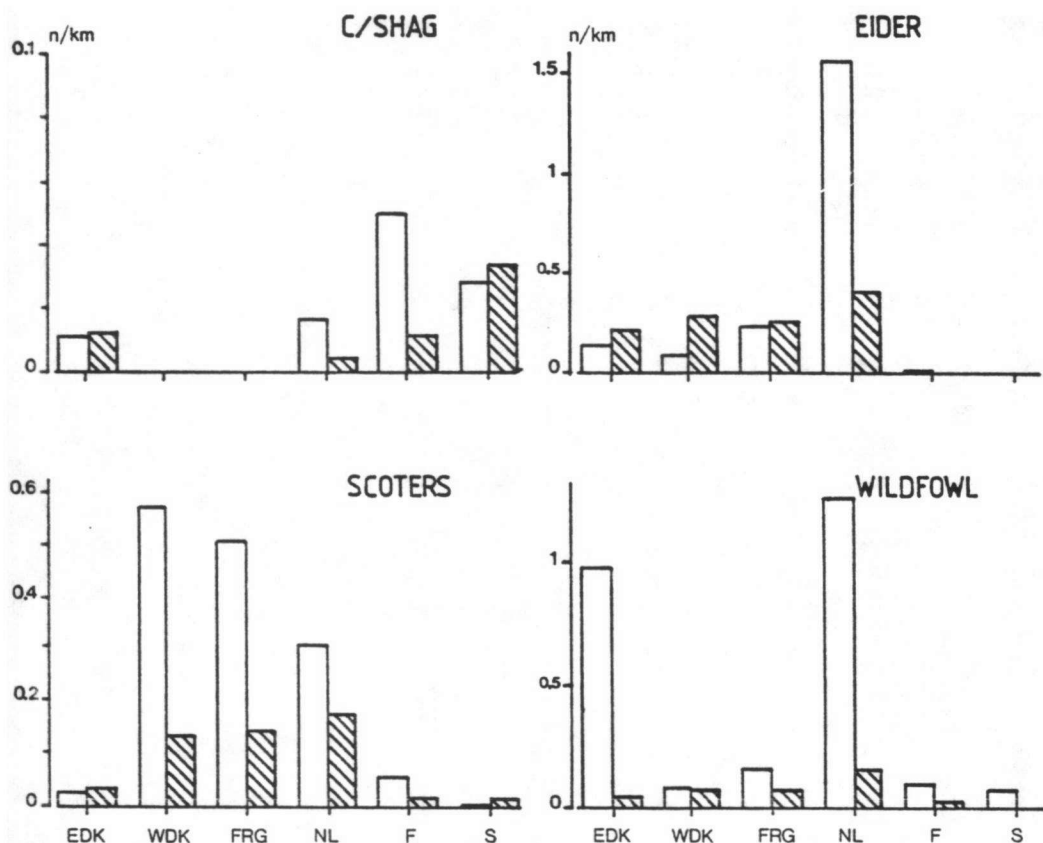


figure 2. Densities (n/km) of Cormorant/Shag *Phalacrocoracidae*, Eider *Somateria mollissima*, scoters *Melanitta* spp. and other wildfowl *Anatidae* found beached along selected coasts of north-western Europe, February 1987 (white) and 1988 (hatched). See figure 1. for conventions.

figuur 2. Dichtheden aalscholvers, Eidereenden, zeeëenden en ander waterwild gevonden op geselecteerde kustgebieden in Noordwest Europa in februari 1987 (wit) en 1988 (gestreept). Zie verder figuur 1.

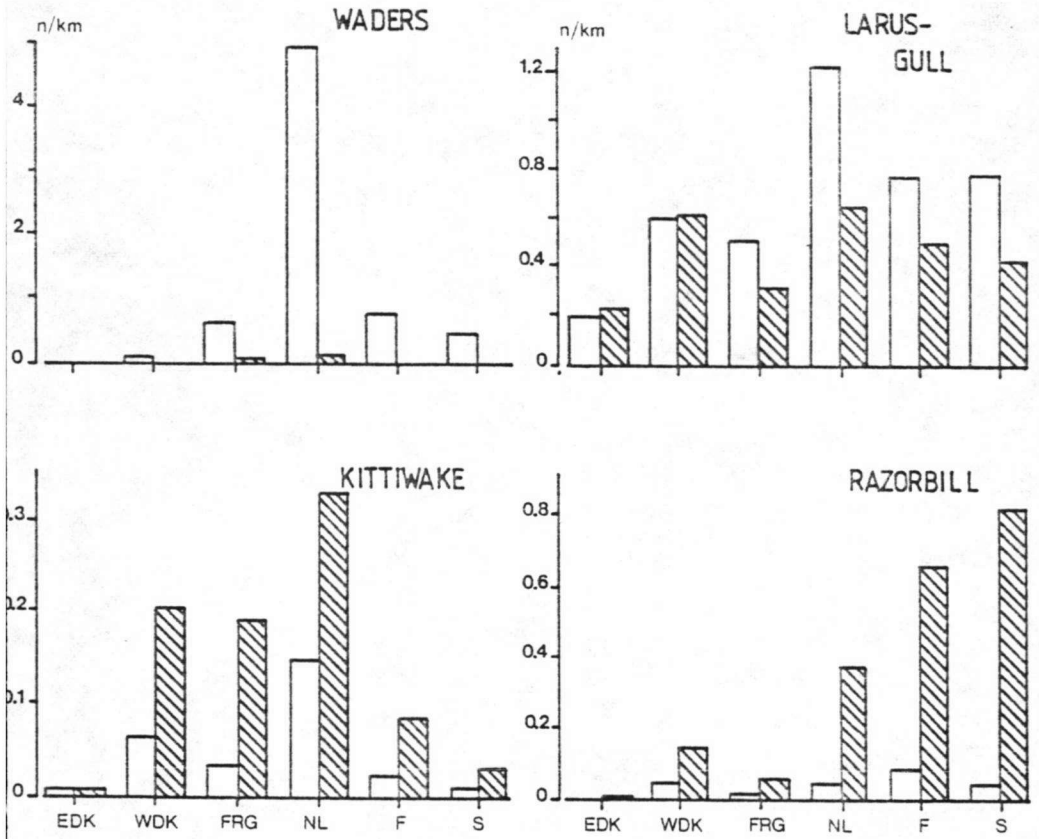


figure 3. Densities (n/km) of waders, Larus-gulls *Larus* spp., Kittiwakes *Rissa tridactyla*, and Razorbills *Alca torda* found beached along selected coasts of northwestern Europe, February 1987 (white) and 1988 (hatched). See figure 1. for conventions.

figuur 3. Dichtheden steltlopers, Larus-meeuwen, Drieteenmeeuwen en Alken gevonden op geselecteerde kustgebieden in Noordwest Europa in februari 1987 (wit) en 1988 (gestreept). Zie verder figuur 1.

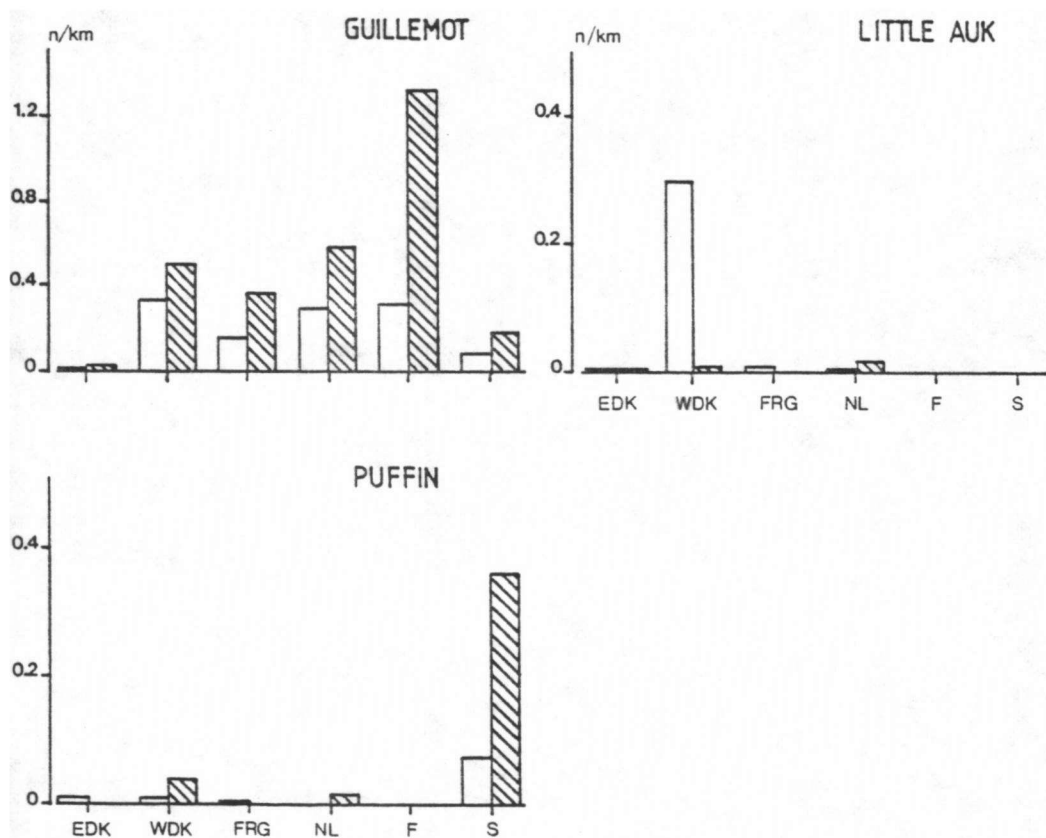


figure 4. Densities (n/km) of Guillemot *Uria aalge*, Little Auk *Alle alle*, and Puffin *Fratercula arctica* found beached along selected coasts of northwestern Europe, February 1987 (white) and 1988 (hatched). See figure 1. for conventions.

figuur 4. Dichtheden Zeekoeten, Kleine Alken en Papegaaiduikers gevonden op geselecteerde kustgebieden in Noordwest Europa in februari 1987 (wit) en 1988 (gestreept). Zie verder figuur 1.

relatively higher on North Sea coasts during 1988. Within the study area, the Little Auk only winters in high numbers in the northernmost part (Skagerrak and the Norwegian coast; Tasker *et al.* 1987, Follestad *in litt.*, Skov, Durinck and Danielsen *in litt.*). The numbers recorded on the south Norwegian (0.17 and 0.62/km in 1987 and 1988 respectively; appendix 1) and northwest Danish coast (figure 4) reflect this pattern of distribution. The Puffin winters only in low numbers in the eastern sector of the North Sea (Tasker *et al.* 1987), so few carcasses of this species are normally found beached along mainland coasts of this area. In Spain more birds beached in 1988 than in 1987, perhaps as a result of increased oil pollution (46% oiled in 1987, 100% oiled in 1988).

Proportions oiled

A general account of the impact of offshore oil pollution in Europe from the winter 1987 to 1988 is given in table 2. From Normandy, unfortunately, data on oil fouling have not yet been received. During the 1987 survey, extremely high proportions were recorded oiled for most seabirds in the North Sea and in the Kattegat. The proportion of oiled corpses was so high, that oil pollution must have had a severe impact on the mortality of divers, grebes, seaduck, and auks wintering in the continental part of the North Sea. Wildfowl, with normal foraging habitats close to or at the shoreline, and waders had surprising high oil-rates in the Wadden Sea in 1987. These species may well have been forced by the heavy ice-cover to feed in areas of relatively high water level.

In 1988, the proportion of oiled corpses was considerably lower in most species. Lower proportions were not found in the Fulmar and Kittiwake, though. In the Netherlands the scoters had a similar high rate of oiling compared with 1987, perhaps as a result of the leakage of oil from the carrier mentioned above. Compared with the results of the International beached bird surveys from 1971-81 (Stowe 1982), it seems that the level of impact on wintering seabirds in the southeastern North Sea (Normandy, Belgium, the Netherlands and Nieder Sachsen) from oil pollution has not changed much, while the level in the northeastern part (Denmark) has increased considerably. On the Spanish coast, the proportion of oiled Guillemots and Puffins in 1988 was twice the mean proportion found in auks on the Spanish coast in 1984-87 (Bermejo 1987).

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Samenvatting In dit verslag worden de resultaten van de Internationale stookolieslachtoffertellingen in februari 1987 en 1988 gepresenteerd. In deze tellingen werd respectievelijk 1.899 en 2.053 km kust onderzocht, en de deelnemende landen waren Zweden (1987), Noorwegen, Denemarken, West-Duitsland, Nederland, België (1987), Frankrijk en Spanje. De weersomstandigheden waren bij beide tellingen sterk verschillend. In 1987 was sprake van een strenge winter en in 1988 was het juist een mild seizoen en regenachtig en minder weer. De vondsten zijn gepresenteerd in 4 figuren (aantallen per km in Denemarken (Oost-

zeekust en Noordzeekust apart), Duitsland (Sleeswijk-Holstein), Nederland, Frankrijk (Normandië) en Spanje), een tabel met percentages olieslachtoffers (tabel 2) en een appendix waarin de gevonden aantallen voor beide jaren zijn samengevat. In de discussie wordt kort ingegaan op de voor de gevonden patronen verantwoordelijke factoren. Het is duidelijk dat de weersomstandigheden een groot stempel op de resultaten gedrukt hebben. Olieincidenten met bekende oorzaak deden zich voor in 1987 (Nederlandse Waddenzee) en 1988 (Nederlandse Voordelta), en olievervuiling van betekenis zonder dat de oorzaak duidelijk werd is geregistreerd voor de Deense westkust in 1987 en bij Normandië in 1988.

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APPENDIX 1. NUMBER OF BIRDS FOUND DEAD / AANTAL GEVONDEN VOGELS

| 1987 GROUP | NW | SW | E DM | W DM | SL-H FRG | N-S FRG | NL | B | F | SP |
|---------------|-----|-----|---------|---------|-------------|------------|------|-----|-----|-----|
| Divers | 0 | 0 | 1 | 6 | 10 | 2 | 16 | 0 | 16 | 0 |
| Grebes | 0 | 0 | 2 | 9 | 30 | 0 | 72 | 2 | 50 | 0 |
| Fulmar | 0 | 0 | 0 | 17 | 14 | 1 | 12 | 1 | 6 | 1 |
| Gannet | 0 | 0 | 0 | 1 | 1 | 0 | 5 | 0 | 3 | 7 |
| C\Shag | 0 | 0 | 4 | 0 | 0 | 0 | 6 | 2 | 16 | 5 |
| Eider | 0 | 0 | 48 | 15 | 83 | 4 | 580 | 0 | 3 | 0 |
| Scoters | 0 | 0 | 9 | 101 | 185 | 4 | 113 | 0 | 18 | 1 |
| Wildfowl | 0 | 0 | 345 | 14 | 57 | 14 | 468 | 0 | 29 | 12 |
| Waders | 0 | 0 | 0 | 10 | 226 | 92 | 1843 | 10 | 251 | 83 |
| Larus-gulls | 0 | 0 | 68 | 106 | 185 | 37 | 452 | 6 | 250 | 140 |
| Kittiwake | 0 | 0 | 2 | 11 | 12 | 3 | 54 | 1 | 8 | 2 |
| Razorbill | 0 | 0 | 0 | 8 | 3 | 0 | 13 | 1 | 26 | 7 |
| Guillemot | 2 | 0 | 2 | 59 | 55 | 2 | 109 | 2 | 103 | 14 |
| Little Auk | 1 | 0 | 1 | 53 | 2 | 0 | 1 | 0 | 0 | 0 |
| Purfin | 0 | 0 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 13 |
| Total | 3 | 0 | 485 | 411 | 864 | 159 | 3744 | 24 | 779 | 285 |
| km surveyed | 6 | 30 | 354 | 177 | 365 | 60 | 371 | 30 | 326 | 180 |
| n/km | 0.5 | 0.0 | 1.4 | 2.3 | 2.4 | 2.7 | 10.1 | 0.8 | 2.4 | 1.6 |

| 1988 GROUP | NW | SW | E DM | W DM | SL-H FRG | N-S FRG | NL | B | F | SP |
|---------------|-----|----|---------|---------|-------------|------------|-----|---|------|-----|
| Divers | 0 | | 5 | 5 | 10 | 3 | 6 | | 14 | 0 |
| Grebes | 0 | | 4 | 3 | 0 | 0 | 4 | | 59 | 0 |
| Fulmar | 2 | | 1 | 13 | 5 | 5 | 72 | | 23 | 0 |
| Gannet | 0 | | 0 | 1 | 6 | 0 | 7 | | 13 | 1 |
| C\Shag | 0 | | 7 | 0 | 0 | 0 | 1 | | 4 | 2 |
| Eider | 1 | | 123 | 45 | 88 | 5 | 109 | | 0 | 0 |
| Scoters | 0 | | 19 | 22 | 50 | 4 | 48 | | 6 | 1 |
| Wildfowl | 0 | | 20 | 11 | 24 | 14 | 43 | | 9 | 0 |
| Waders | 0 | | 0 | 1 | 24 | 16 | 31 | | 3 | 0 |
| Larus-gulls | 10 | | 134 | 100 | 108 | 37 | 177 | | 188 | 26 |
| Kittiwake | 3 | | 3 | 33 | 66 | 9 | 90 | | 32 | 2 |
| Razorbill | 0 | | 2 | 23 | 18 | 3 | 101 | | 247 | 50 |
| Guillemot | 15 | | 9 | 82 | 130 | 18 | 159 | | 497 | 11 |
| Little Auk | 13 | | 1 | 1 | 0 | 1 | 4 | | 0 | 0 |
| Puffin | 0 | | 0 | 6 | 0 | 0 | 3 | | 0 | 22 |
| Total | 44 | | 328 | 346 | 529 | 115 | 854 | | 1095 | 115 |
| km surveyed | 21 | | 587 | 164 | 350 | 221 | 271 | | 376 | 61 |
| n/km | 2.1 | | 0.6 | 2.1 | 1.5 | 0.5 | 3.2 | | 2.9 | 1.9 |