

First session

Oil sampling on corpses, on the beach and at sea and chemical analysis of these samples as an effective tool against illegal discharges at sea: present day examples and recommendations for future action, cooperation and policy.

Chairman: **J.A. van Franeker** (Research Institute for Nature Management, Texel). Minutes: J.E. den Ouden, T. Postma

Oil Pollution around Orkney and Shetland, 1976 - 1983

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Monthly Beached Bird Surveys began in Orkney and Shetland in response to the North Sea oil developments and the construction of major oil terminals at Flotta in Orkney and Sullom Voe in Shetland. Orkney surveys began in March 1976, and the first tanker loaded at the Flotta Terminal in January 1977. Surveys started in Shetland in August 1978 and the Sullom Voe Terminal exported its first oil in November that year. In this short presentation, I use the numbers of oiled auks found on surveys as an index of chronic oil pollution around the islands.

Both terminals experienced significant oil spills soon after opening. Crude oil leaked from the tanker *Nacella* at Flotta in March 1977, resulting in at least 110 seabird deaths. In December 1978 1,174 tonnes of heavy fuel oil spilled from the tanker *Esso Bernicia* at Sullom Voe, causing at least 3,700 seabird deaths. Standard Beached Bird Surveys were suspended in Shetland from September 1978 to February 1979, while the impact of this oil spill was assessed.

Apart from the aftermath of the *Nacella* oil spill, relatively few oiled auks were found on Orkney surveys during 1976 and 1977. Samples of oil taken from seabird corpses between October and December 1977 were mainly of fuel oils. Both the proportion of corpses oiled and the rate of oiled corpses per km were rather high during January to April 1978. Samples of oil from corpses and beaches during March to November 1978 comprised approximately one-third fuel

oils, one-third crudes (of which 27% were crude oil sludges, i.e. tank washings) and one-third a variety of other oils or oils which were typed. Beached Bird Surveys in Shetland during August to November 1978 recorded insignificant numbers of oiled auks.

The Sullom Voe Terminal loaded its first tanker on 28 November 1978, despite the fact that deballasting facilities were still under construction and would not be fully operational for another year. Within 10 days of the first shipment of oil leaving the Sullom Voe, unusual numbers of oiled birds were reported in Orkney and later along the coast of north-east Scotland. In early 1979, oiled birds not connected with the *Esso Bernicia* oil spill began to be found all around the coast of Shetland, culminating in early March when 1,700 were collected in an 18-day period. Further incidents continued around Orkney and Caithness and by late April 1979, oil spills from unknown sources had killed at least 4,000 birds (mainly auks) in the area. Undoubtedly, large numbers of victims were never found.

Analyses of samples of oil from beaches and birds in early 1979 showed a high proportion were crude oil sludges, confirming suspicions that tankers were deballasting or flushing tanks out at sea around Shetland and Orkney. The timing of the pollution suggested that ships bound for Sullom Voe were involved and public indignation included calls for the closure of the terminal. Instead, a number of measures to reduce chronic pollution from tankers, as well as improve navigational safety, were introduced in March 1979. These included:

- (1) Daily aerial surveillance of tankers around Shetland by the Shetland Islands Council;
- (2) The threat to refuse loading facilities at the terminal for polluting tankers;
- (3) All tankers entering Sullom Voe must carry at least 35% ballast water;
- (4) Oil company shipping contracts to include clauses discouraging illegal dumping at sea of contaminated ballast.

Tankers were observed breaking these rules and navigational guidelines around Shetland on a number of occasions in 1979 and 1980. Legal action was taken, where possible, and several vessels and their masters were banned from entering Sullom Voe. In November 1979, full deballasting facilities became available at the terminal.

In Orkney, the rate of oiled auks per kilometer fell considerably by the 1979/80 winter although the proportion of corpses oiled remained high. Both measures of chronic oil pollution remained low after the summer of 1980 and routine analyses of oil on dead birds showed that by 1982, crude oil sludges had fallen to 7% of samples taken.

The Shetland survey recorded a high proportion of oiled auks throughout the

1979/80 winter although large numbers only occurred in December. Aerial surveillance continued to detect tankers discharging oil around Shetland and crude oil sludges remained prominent among samples taken from corpses. Few oiled auks were found in the 1980/81 winter and since then, although high proportions of oiled auks have been recorded, they were mostly on surveys when few birds were found. Of 52 oil samples taken from corpses during 1982, only 4% were of crude oil sludges.

Acknowledgement

Orkney Beached Bird Survey data were collected by the Royal Society for the Protection of Birds, those in Shetland by the Shetland Oil Terminal Environmental Advisory Group.

Samenvatting 'Olievervuiling rond Orkney en Shetland, 1976 - 1983'

In reactie op nieuwe ontwikkelingen in de olieindustrie werd door de Royal Society for the Protection of Birds (RSPB) op Orkney en door de Shetland Oil Terminal Environmental Advisory Group (SOTEAG) op Shetland met maandelijkse olieslachtoffertellingen begonnen. Op Orkney vonden de tellingen voor het eerst plaats in maart 1976; de Flotta terminal aldaar kwam in januari 1977 in bedrijf. Op Shetland begonnen de tellingen in augustus 1978. De Sullom Voe terminal kwam in november 1978 in bedrijf, minstens een jaar voordat afgifte van ballastwater mogelijk was. Bij beide terminals trad aanzienlijke olievervuiling op kort na de opening. Op Orkney werden aanvankelijk weinig met olie besmeurde alkachtigen gevonden, en de olie bestond meestal uit resten brandstof. De dichtheid olieslachtoffers en het aandeel met olie besmeurde kadavers waren hoog van januari tot april 1978 en bevatten voor ongeveer een derde brandstofolie, een derde ruwe olie (waarvan 27% tankspoelingen) en voor de rest tal van andere soorten olie of onbestemde typen. Op de Shetlands ontstond een soortgelijke situatie en analyse van monsters wees uit dat een groot deel bestond uit ruwe olie uit gespoelde tanks. Hiermee werd het vermoeden bevestigd, dat tankers hun tanks op zee spoelden of vervuild ballastwater loosden rond Shetland en Orkney. In maart 1979 werden de volgende maatregelen genomen om de vervuiling door tankers tegen te gaan: (1) dagelijkse luchtpatrouilles, (2) dreigementen om de toegang tot de terminal te weigeren voor schepen die zich aan lozingen hadden schuldig gemaakt, (3) tankers moeten bij aankomst minstens 35% ballast water aan boord hebben en (4) in contracten met oliemaatschappijen worden clausules opgenomen ter ontmoediging van de illegale lozingen op zee. Het succes van dergelijke doelgerichte maatregelen werd al snel duidelijk. Hoewel het percentage met olie besmette dieren vaak vrij hoog bleef, trad er een aanzienlijke daling op in de totaal aantallen slachtoffers. Het percentage oliemonsters dat afkomstig bleek van tankspoelingen was in 1982 gereduceerd tot 7% op de Orkney Eilanden en 4% op de Shetlands. ■

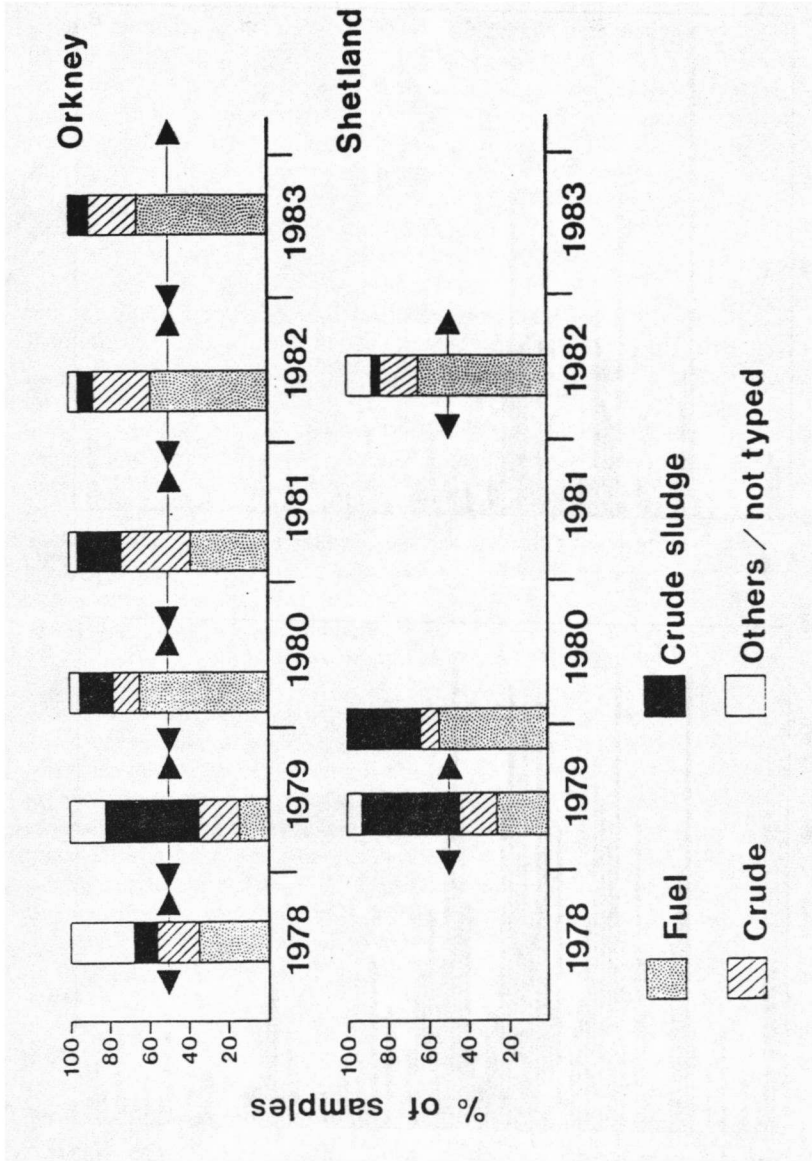


figure 1. Composition of oil samples taken from beached birds on Orkney and Shetland, 1978-1983.

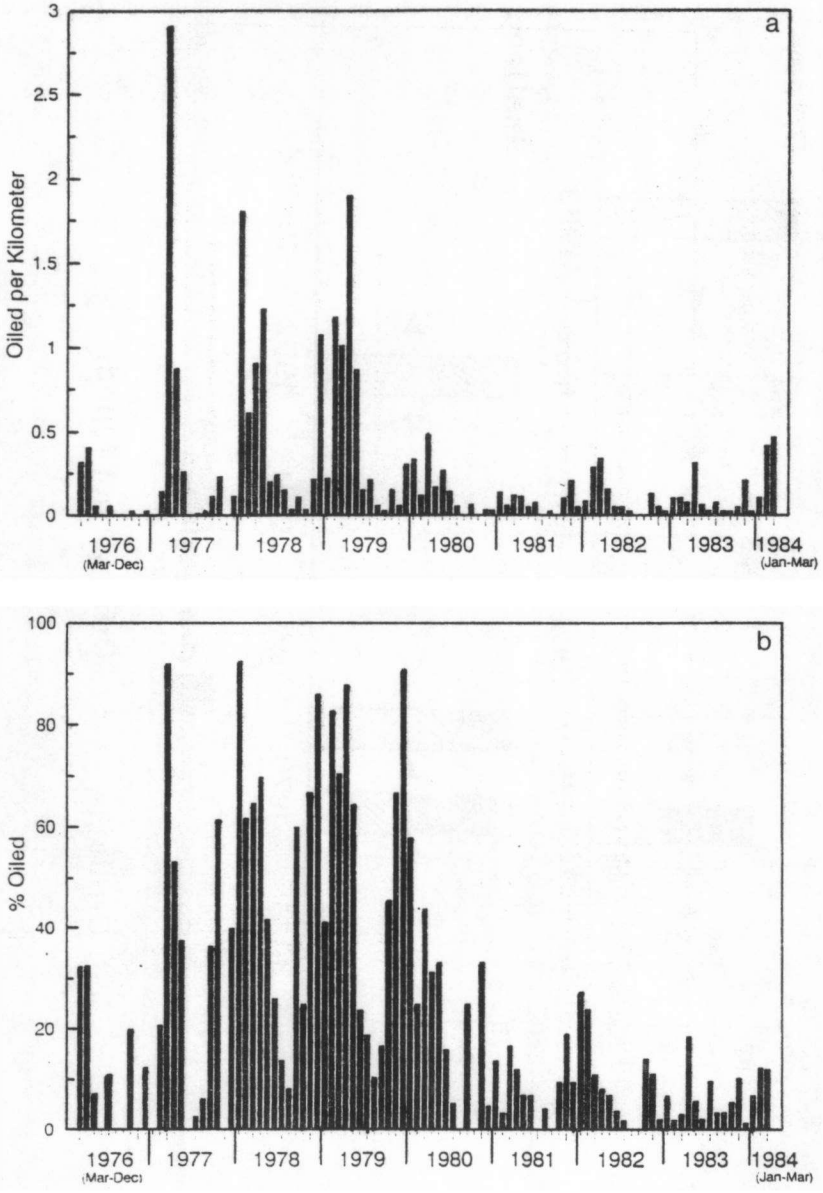


figure 2. (a) Oiled auks per kilometer and (b) percentage oiled of auks found in Orkney, 1976-1984.

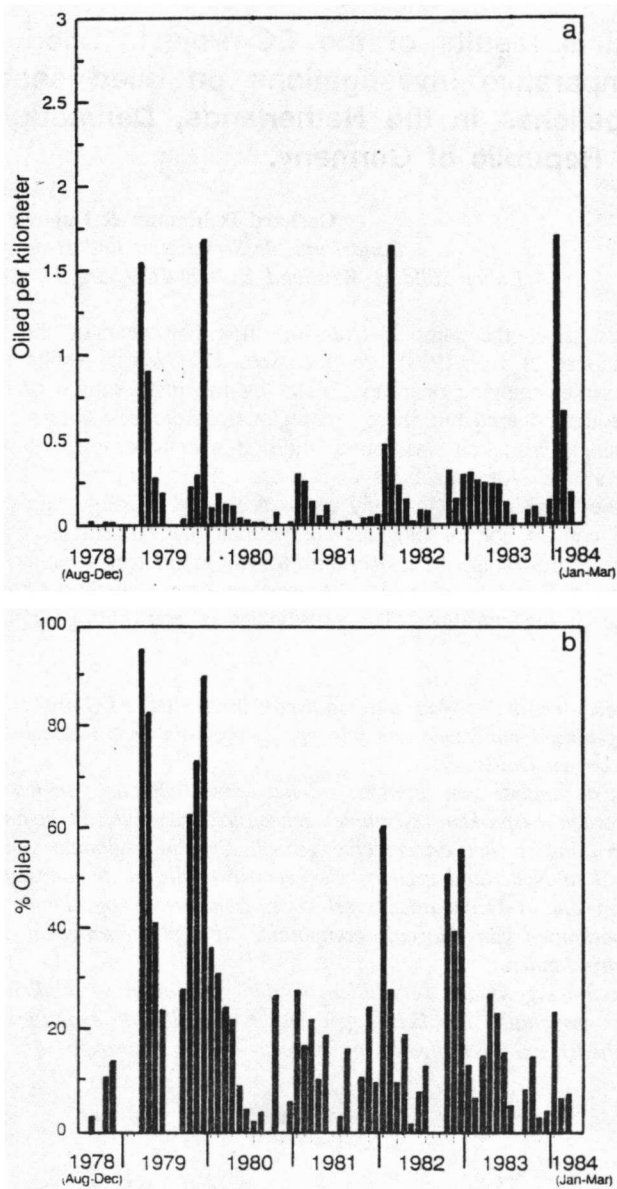


figure 3. (a) Oiled auks per kilometer and (b) percentage oiled of auks found in Shetland, 1978-1984.