

## **‘SAVE THE NORTH SEA’ FULMAR PROJECT RESULTS FOR NORTH EAST ENGLAND 2003-2005**

Daniel M Turner

9 Haswell Gardens, North Shields, Tyne and Wear NE30 2DP

### INTRODUCTION

Fulmars *Fulmarus glacialis* have the unfortunate habit of ingesting all sorts of litter that they find on the surface of the sea. Ingested items that do not, or poorly, digest, accumulate in their stomachs. Already in the 1980s most beached Fulmars found in the Netherlands had plastics in their stomach (Van Franeker, 1985). The quantities of plastic in the stomachs of beached birds can be used to survey changes in the abundance of marine litter at sea.

In The Netherlands, beached Fulmar corpses have been collected since 1982 by volunteers of the Dutch Beached Bird Survey and by seabird rehabilitation centres. They have been studied by Dr Jan Andries van Franeker, a marine biologist specialising in seabirds and working for IMARES (Institute for Marine Resources & Ecosystem Studies), the new Dutch organisation for applied marine research and part of Wageningen University & Research. Dr Franeker is the organiser of the international ‘Save the North Sea’ (SNS) Fulmar surveys around the North Sea and is based on the Dutch island of Texel. Funding for the SNS project during 2002-2004 came from the European Union in the Interreg IIIB program for the North Sea. The ‘Save the North Sea’ project aimed at reducing marine litter by increasing awareness. The specific aim of the Fulmar project is to use this species as an ecological monitoring instrument for assessing levels and trends in marine litter in the North Sea. This will assist policy makers to take appropriate measures to reduce the amount of litter discarded, and to set realistic targets for a cleaner and healthier North Sea in the future (Van Franeker *et al.*, 2005; Van Franeker and Meijboom, 2007).

In 2003, North East England started to participate in the SNS Fulmar project with a number of volunteers who searched beaches for Fulmar corpses. The participation in the SNS Fulmar project triggered the start of a monthly regional Beached Bird Survey (BBS). This BBS, which covers counts of corpses of all species and items of interest, was set up with assistance of the BBS co-ordinators for Shetland (Martin Heubeck) and Orkney (Eric Meek and Keith Fairclough). Details on methods and results of the BBS in North East England will be published in a separate report (Turner, 2008).

### METHODS

During initial dedicated searches and later BBS surveys, Fulmar corpses which were sufficiently intact in order to have a complete abdomen and stomach were collected. Corpses were stored in a project freezer housed in the Dove Marine Laboratory of Newcastle University. Training in dissection of such birds had been received during various workshops at IMARES Texel. Standard methods of dissections in the SNS Fulmar study have been described in Van Franeker (2004b). The first set of North East England Fulmar dissections were conducted together with Mark Grantham and Stuart Newson of the British Trust for Ornithology in Thetford, Norfolk. Dissection information and stomachs were then transferred to the IMARES laboratory on Texel, the Netherlands, for full analysis of their contents. Methods of stomach analysis are

described in the various reports of the Fulmar project, all available on the website of the Dutch Seabird Group NZG ([www.zeevogelgroep.nl](http://www.zeevogelgroep.nl)) under ‘downloads’. In plastics, frequency of occurrence, number of items and mass of items of a number of different plastic categories are recorded. The main plastic categories distinguished are industrial granules (so called ‘pellets’), which is the raw material used to mould all plastic items of the second category, the user plastics. Further details are given with tables showing data.

## RESULTS

Some of the international and North East England Fulmar data from the SNS project are shown in the following three tables (Tables 1-3). In early 2004 there was a wreck of hundreds of Fulmars in the southern North Sea, with some found in NE England at this time. An initial report was given in Van Franeker (2004a), but an in depth paper on this large scale wreck of North Sea Fulmars is in progress.

Table 1 details specific biometrics of the North East England birds. The bill measurement is bill *depth* and the following list relates to the other measurements:

U	Unknown
Sub	Sub-adult
n/a	Not applicable
Colour-phase	LL double light, L light, D dark, DD double dark
Condition	0-9 Very poor-Healthy (very fat)
STA	Starvation
CEM	Cement cloaca
PLU	Plumage problems

These measurements and dissections were carried out by Mark Grantham (BTO), Dr Stuart Newson (BTO) and Daniel M Turner (volunteer co-ordinator for NE England).

Table 2 shows preliminary analysis of the stomach contents of a selected number of North East England Fulmar corpses. There was no oil present on any of these six birds.

Other NE England Fulmar corpses (unsuitable for analysis) were found on 29 Feb, 9 April, 2 June and 7 Aug in 2004 and also on 9 Mar, 19 May, 21 June, 31 July and 24 Aug in 2005.

Stomachs of the NE England birds collected during 2005 await analysis and this will be reported on at a later date.

Table 3 shows the occurrence of plastics (industrial and user plastics combined) from different study locations around the North Sea and Faeroes, in the period 2002-2004 (2004 as far as could be included in the SNS final data analysis).

In March 2004 many hundreds of dead Fulmars were washed up in the southern North Sea. Many were dissected during the group workshop on Texel in September 2004.

The majority of these birds were females that died from starvation (Van Franeker, 2004a).

For complete information please see the final Save the North Sea Fulmar report (Van Franeker *et al.*, 2005). This is available as a pdf file under ‘downloads’ at the website of the Dutch Seabird Group ([www.zeevogelgroep.nl](http://www.zeevogelgroep.nl)). Various other study reports are also available from this website.

**Table 1** Certain biometrics of North East England Fulmars.

Reference NEE:	Colour-phase	Sex	Age	Culmen (mm)	Bill (mm)	Head (mm)	Tarsus (mm)	Wing (mm)	Condition (0-9)	Possible death cause	Finding information
2003-001	LL	M	Imm	39.9	17.4	99	55.3	340	6	UNK	28.06.03 P Collins, Marsden, Tyne & Wear.
2004-001	LL	M	Imm	42.9	17.3	99	59.3	339	1	STA	30.05.04 D M Turner, Seaton Sluice, Northumberland.
2004-002	LL	F	Ad	38.7	15.6	90	50.5	313	1	STA	02.03.04 M A Blick, Saltburn Beach, Cleveland.
2004-003	LL	F	Juv	n/a	n/a	n/a	54.0	329	2	STA	03.03.04 M A Blick, Redcar, Cleveland. No head.
2004-004	D	F	Ad	35.1	15.1	89	53.0	332	3	CEM	14.03.04 D M Turner, Blyth Beach, Northumberland.
2004-005	L	U	Imm	36.5	15.4	87	52.2	310	1	STA	03.11.04 P. Collins, Marsden, Tyne and Wear. Wt: 440g.
2005-001	LL	F	Imm	37.1	16.0	92	53.5	320	2	STA	26.01.05 M A Blick, Redcar beach, Cleveland.
2005-002	LL	F	Ad	—	—	—	52.3	331	2	STA	23.02.05 P Collins, Marsden, Tyne and Wear. No head. Possible Peregrine victim.
2005-003	LL	F	Imm	40.6	17.6	96	53.3	310	1	STA	16.03.05 M A Blick, Hartlepool North Sands, Cleveland. Wt: 545g.
2005-004	LL	M	Ad	41.4	18.9	100	58.7	345	1	STA	16.03.05 M A Blick, Hartlepool North Sands, Cleveland.
2005-005	LL	F	Ad	37.1	16.6	92	53.5	326	1	CEM	16.03.05 M A Blick, Hartlepool North Sands, Cleveland.
2005-006	LL	M	Ad	40.4	15.5	96	57.4	335	2	STA	19.05.05 D M Turner, Seaton Sluice, Northumberland.
2005-007	LL	M	Ad/Sub?	40.1	17.8	100	54.5	323	1	PLU	31.07.05 D M Turner, Seaton Sluice, Northumberland.

**Table 2** Stomach contents overview, North East England Fulmar corpses 2003–2004.

Reference	Fulmar stomach analysis selected details						Other comments
	Plastic pieces	Other rubbish	Pollutants	Prey items	Non-food items		
NEE-2003-001	16 (incl. 6 pellets)	0	0	7	4		Suspected shot; but no hail was found; non-breeding male.
NEE-2004-001	4 (incl. 1 pellet)	0	0	6	6		Gut scavenged; bursa not noted; non-breeding male.
NEE-2004-002	7 (no pellets)	0	0	0	0		Arrested moult.
NEE-2004-003	25 (incl. 1 pellet)	0	0	0	10		Bird was juvenile or 2nd year; plumage + bursa suggest juv.; no head.
NEE-2004-004	13 (incl. 1 pellet)	0	0	3	0		Very large concrete cloaca i.e. the cause of death.
NEE-2004-005	30 (incl. 1 pellet)	0	0	3	14		Sex organs not found; probable Female (due to size), second winter (external moult was present).

Explanations: In the second column, ‘pellets’ refer to industrial plastic granules. Other plastics are the normal ‘rubbish’ or user type plastics.

Among the category ‘Other rubbish’ would be, e.g. paper, aluminium foil, chips of metal or paint, etc.

Pollutants are e.g. lumps of tar, paraffin-like substances, industrial slags etc.

Prey items are squid-beaks, fish eye lenses or otoliths, remains of crustaceans etc.

The ‘Natural non food’ category refers to, e.g. pieces of plants, seaweed, small stones etc.

**Table 3** Plastic content of NE England Fulmars compared to other North Sea locations.

Location	No. of stomachs in sample	Incidence of plastic	Avg no. pieces of plastic per bird	Max. no. of plastic items	Avg mass of plastic per bird (g)	Max. plastic mass (g)
Faeroes	38	92%	7	77	0.09	0.5
Shetland	41	88%	15	59	0.18	1.7
Orkney	23	96%	28	162	0.28	1.2
NE England	5	100%	13	25	0.18	0.3
SE England	40	93%	30	226	0.21	1.1
France (north)	36	100%	58	363	0.25	0.9
Belgium	85	98%	74	1603	0.37	4.3
Netherlands	95	97%	42	558	0.36	11.1
Germany	92	95%	39	1175	0.35	4.3
Denmark <i>Skagen</i>	105	94%	39	761	0.38	20.6
Norway <i>Lista</i>	32	97%	60	457	0.39	1.8
Sweden <i>Sotenäs</i>	6	83%	48	182	0.63	3.0
North Sea avg (except Faeroes)	n/a	<b>95%</b>	<b>41</b>	<b>1603</b>	<b>0.33</b>	<b>20.6</b>

## DISCUSSION

In comparison to other European countries involved in the SNS Fulmar project, NE England produced a smaller number of corpses (due to a fairly late start in the project and relatively low presence of beached Fulmars). NE England became involved halfway through the SNS project, but was able to supply some valuable data and to fill a gap in the North Sea shore coverage. For the time being, the NE English sample by itself is too small for firm conclusions. At this moment, it is best to look at combined results for the NE and SE English North Sea coasts. In this combined area, in the sample of forty-five birds, 93% had ingested some plastic, in an average number of twenty-eight particles and with a mass of 0.21 grams per bird (Van Franeker *et al.*, 2005 appendix 4b). Such a level of plastics found in the stomachs of Fulmars along the English coast is intermediate between the very high level found in the southern North Sea and the moderate level found in the Orkney and Shetland Islands. However, over 90% of Fulmars anywhere in the North Sea have been shown to have some plastic in the stomach, with average quantities two to four times as high as that observed in a cleaner reference area, *i.e.* the Faeroe Islands.

With seven Fulmar stomachs collected in 2005 waiting for analysis, and future continuation of our collection program, the NE England BBS will make a growing contribution to

the monitoring of marine litter in the North Sea area. The Fulmar study is an important tool in politics and a powerful instrument to create wide public awareness of marine litter problems and the need to change the situation.

I have attended three SNS Fulmar workshops on the island of Texel, The Netherlands, in October 2003, September 2004 and September/October 2005. It was great to be able to meet the co-ordinators from the other North Sea bordering countries and learn the analysis and dissection techniques from Dr Franeker and his team. During these well organised workshops we worked in the laboratory, attended presentations and gave feedback from our own areas concerning recent coastal findings.

#### ACKNOWLEDGEMENTS

Many thanks go to the volunteer NE England surveyors during 2003-2005: Ross Ahmed, Martin A Blick, Ray Chilton, Peter Collins, Phil R Davey, Hew Ellis, Phil (Keziah and Otis) Gilbert, Malcolm Hutcheson, George D Moody, Jenny Prince, Geoff Siggins, Mick Simpson, Laurie Small, Daniel M Turner and Michael Yianni. Dr Jane Delany of Newcastle University agreed that we could house a freezer in the Dove Marine Laboratory at Cullercoats for the storage of Fulmar corpses and technician John Knowles kept an eye on it. Dr Jan Andries van Franeker kindly checked, commented on and improved the draft of this report. Dr Franeker and his team in the Netherlands provided detailed information on the NE England Fulmar stomach contents, 2002-2004 North Sea Fulmar project data (included in this report) and training for working with Fulmar corpses. Mark Grantham and Dr Stuart Newson of the BTO gave their time to assist with the initial dissection of the NE England Fulmars in September 2004 at BTO headquarters in Thetford, Norfolk. Please accept apologies for any omissions.

#### REFERENCES

- TURNER, D M (2008) Beached bird survey results for North East England 2004-2005. *Trans. nat. Hist. Soc. Northumbria* **66**: 213-226.
- VAN FRANEKER, J A (1985). Plastic ingestion in the North Atlantic Fulmar. *Marine Pollution Bulletin* **16**: 367-369.
- VAN FRANEKER, J A (2004a). Fulmar wreck in the southern North Sea: preliminary findings. *British Birds* **97**: 247-250.
- VAN FRANEKER, J A (2004b). Save the North Sea Fulmar-Litter-EcoQO Manual Part 1: Collection and dissection procedures. Wageningen, Alterra, Alterra-rapport 672.
- VAN FRANEKER, J A, HEUBECK, M, FAIRCLOUGH, K, TURNER, D M, GRANTHAM, M, STIENEN, E W M, GUSE, N, PEDERSEN, J, OLSEN, K O, ANDERSSON, P J and OLSEN, B (2005). 'Save the North Sea' Fulmar Study 2002-2004: a regional pilot project for the Fulmar-Litter EcoQO in the OSPAR area. Wageningen, Alterra, Alterra-rapport 1162.
- VAN FRANEKER, J A and MEIJBOOM, A (2007). Fulmar Litter EcoQO Monitoring in the Netherlands 1982-2005 in relation to EU Directive 2000/59/EC on Port Reception Facilities. Wageningen IMARES Report Nr C019-07. IMARES Texel, 40pp.
- (All SNS Fulmar reports are available from [www.zeevogelgroep.nl](http://www.zeevogelgroep.nl) under 'downloads').

## APPENDIX

A selection of photographs taken during the study and analysis.



Figure 1 Fulmar NEE-2005-006, adult male. Found 19 May 2005, D M Turner, Seaton Sluice, Northumberland.



Figure 2 Fulmar NEE-2004-005, immature. Found 3 November 2004, Peter Collins, Marsden, Tyne and Wear.



Figure 3 Head length measurement being taken by Mark Grantham at the BTO, September 2004.



Figure 4 Martin de Jong analyses Fulmar stomach contents under the microscope. Texel, September 2004.



Figure 6 Preparing for Fulmar analysis in the laboratory, Texel, September 2004. From left: Dr Jan Andries van Franeker, Keith Fairclough, Wouter Courtens, André Meijboom, Eric Stienen and Marc van de Walle.

