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Setting Up Monitoring and the Ringing of Rehabilitated Birds Following the Sea Empress Oil Spill

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1. EXECUTIVE SUMMARY

1. A successful monitoring scheme, based on the Wetland Bird Survey (WeBS), was set-up to record the size of local wildfowl populations immediately after the spill and the frequency of oiling. This provides a good model for any future incidents.

2. Most rehabilitated sea-birds were ringed prior to release, enabling survival rates to be calculated in the future. Since the spill, all RSPCA rehabilitation centres have a qualified bird ringer on site.

3. Common Scoter *Melanitta nigra* was the only bird species which was oiled in significant numbers, at times all the birds counted were oiled and over 750 were brought into care.

4. Recovery of ringed Common Scoter show that at least 10% of rehabilitated birds died shortly after release.

2. INTRODUCTION

In the days immediately following the grounding of the Sea Empress it became apparent that it was possible that the oil would end up coming ashore in large quantities in the Three Rivers Estuary and the Burry Inlet. On 22 February there was a forecast for strong south westerly winds which would force the oil ashore in these important environmental areas. The BTO, after consultation with Steve Parr (CCW), arranged for the work described in this report to be carried out. There were three main objectives:

1. To record the effect of the oil on the area's wildfowl. Volunteer Wetland Bird Survey (WeBS) counters on the Three Rivers Estuary and the Burry Inlet were asked to make additional WeBS counts on a weekly basis and to check birds for oil contamination.

2. To monitor the health of the Oystercatcher population immediately prior to any oil entering the Burry Inlet. This was necessary because it was predicted that the body condition of Oystercatchers would be below normal as a result of the earlier severe winter weather.

3. To ensure that seabirds taken to oil cleaning centres were ringed upon release, so that their subsequent survival could be estimated.

This report summarises the work that was done to achieve these three objectives and highlights the problems that should be borne in mind for any similar emergency environmental situations which might occur in the future.

3. WATERFOWL MONITORING IN THE THREE RIVERS ESTUARY AND BURRY INLET

3.1 Requirement for the Work

The Wetland Bird Survey (BTO/WWT/RSPB/JNCC) routinely monitors waterfowl populations on all British estuaries on a monthly basis. Historically it has been very difficult to regularly cover the Three Rivers Estuary although recently the situation has improved. Monitoring on the Burry Inlet and Swansea Bay has been much more detailed, with excellent coverage for over twenty years. This gave a suitable background to compare counts during early 1996 with those obtained in previous years. This allows an assessment to be made on whether birds moved into the area having been displaced from Milford Haven, or moved out of the area as a result of the oil contamination.

3.2 The Monitoring Scheme that was Set Up

The WeBS local organisers for the Three Rivers Estuary, Burry Inlet and Swansea Bay (Figure 2.1) were contacted by telephone between 20th and 22nd of February asking for their support. They were asked to speak individually to their volunteer counting teams and this was followed up by a telephone call from a BTO staff member (NAC). As expected, there was an exceptionally good response. However, there were several areas where there were gaps that could not be filled as the counters who normally counted those areas were already busy in a professional capacity dealing with the spill. All counters were sent an additional supply of WeBS forms and asked to count once a week if possible, ideally on a Sunday for consistency.

In addition they were supplied with a set of Oiled Bird Recording Forms (example given in Table 3.2) which were used to document the numbers of oiled and non-oiled birds, when conditions allowed. The aim of this information was to see how long oiled birds remained in the population. Counters were also supplied with reply-paid envelopes to encourage them to return forms promptly. This enabled the BTO to be rapidly updated on the number of oiled birds present in the population.

3.3 Results

3.3.1 Species Affected

The proportion of oiled to non-oiled birds found during February to May was assessed for the 54 species for which data were available. Thirteen of these species were recorded as being oiled. Different taxonomic groups varied in the proportion of species that were oiled, as shown in Table 3.3.1. Taxonomic groups, and their constituent species, also varied in the proportion of individuals that were oiled. This is shown in Table 3.3.2.

These tables show that the oil spill only directly affected a small proportion of the bird species that occur in the area. Taxonomic groups whose component species occupy the open sea suffered a higher frequency of oiling than those of intertidal mud or grazing marshes, this matches the distribution of the oil. Common Scoter appears to be the only species to have suffered significant oiling in terms of the percentage of the population that was oiled, the total number of oiled individuals and differences in WeBS counts obtained during and before the spill.

Figures 3.3.1 - 3.3.3 illustrate changes in the counts of clean and oiled Common Scoter following the spill. Oiled Scoter were reported as birds whose plumage appeared ragged rather than smooth. It is probable these birds were relatively heavily oiled, many lightly oiled birds may have been considered as "unoiled". Analysis of these count data raises two key points:

1. Parts of the survey area recorded Common Scoter for the first time, whilst other areas recorded higher numbers than usual, compared to previous WeBS counts. The highest total counts and the highest number of oiled birds were recorded in early March, a long time after the spill. In combination these facts suggest that the Common Scoter flocks were displaced by the oil spill.

2. Following the peak count the number of clean and oiled birds declined rapidly, due to either emigration and/or mortality. The importance of emigration cannot be investigated by analysing population fluctuations elsewhere, as regular counts are not available. The faster rate of decline in the number of oiled birds, compared to clean ones, suggests that these birds died. Migration away from the area is less likely as oiled birds tend to be very weak, however migration of some oiled birds cannot be ruled out. Another possibility is that oiled birds were removed from the population by rescue workers. Data for other species show similar trends but they are of reduced magnitude, see Table 3.3.3.

3.3.2 The Geographic Distribution of Oiled Birds

Data were analysed with respect to the number of visits which found oiled birds and the total number of oiled birds found. The Taf Estuary, especially the Pendine section, was the worst affected section of the coast, see Table 3.3.4.

3.4 Lessons for the Future

1. Volunteers can only make counts at weekends, but a higher quality count may be obtained during the week, due to tidal conditions. Volunteer WeBS counters are often professionally involved in environmentally related work and during major incidents may not be able to make counts due to work commitments. Total reliance on volunteers in the future may significantly reduce the quality and quantity of the data collected.

2. A few counters lumped data from different sectors of an estuary. Counters should be made fully aware of the need to provide data at the same resolution as normal WeBS counts.

3. Ideally, Oiled Bird Recording Forms should include data on the species and numbers of birds that were present but not checked for oiling.

4. MONITORING THE CONDITION OF OYSTERCATCHERS IN RELATION TO THE ARRIVAL OF OIL

4.1 Requirement for the Work

Ringing studies have been monitoring Oystercatchers on the Burry Inlet for many years, giving a valuable baseline against which the effects of the Sea Empress oil spill could be monitored. January and early February 1996 coincided with a period of severe winter weather which was likely to result in some sections of the Oystercatcher population losing condition compared to their normal winter fat levels. As a result, it was necessary to catch samples of Oystercatchers before oil affected the Burry Inlet. This would enable the effects the oil spill to be separated from any effects caused by the severe winter weather.

4.2 Methods

Two samples of Oystercatchers were caught using cannon nets. One at Whitford on 24 February and one at Llanelli on 25 February. This provided a baseline with which future impacts on the Oystercatcher population could be compared.

4.3 Results

Table 4.3 shows that the average weight of adult Oystercatchers was similar to previous years but that the average weight of juveniles was substantially below that expected. No further samples were caught as no large quantities of oil entered the Burry Inlet and it was judged that the condition of Oystercatchers in the Burry Inlet would not have been affected by the oil spill.

4.4 Lessons for the Future

1. Catching samples of estuarine waders is always difficult. At Whitford on 24 February work was hindered by the disturbance created by the MPCU plane, which circled the shore of the Burry Inlet at a comparatively low altitude. This caused considerable disturbance to the bird populations and resulted in wildfowl leaving the saltmarsh, in which they were feeding, to land on the open sea. Foraging waders also left the saltmarsh and landed at the tidal edge, where they remained for several minutes.

2. Extreme care had to be exercised while making cannon net catches to ensure that there was no evidence of oil on the water surface which could contaminate birds caught under a net. No oil was seen on 24 February, but on 25 February there was evidence of sheen on the surface. Birds were caught substantially before high tide to avoid the risk of contamination but this reduced the sample size.

5. RINGING OF REHABILITATED SEA BIRDS

5.1 Requirement for the Work

As soon as large numbers of live oiled birds started coming ashore, it became apparent that it would be important to monitor the subsequent survival of birds that were rehabilitated. Before the Sea Empress oil spill, some sick bird rehabilitation centres routinely ringed sea birds before release. However, many others did not. This incident involved large numbers of Common Scoter and it was important to gather as much information on them as possible because:

1. Little is known about the rehabilitation of scoter in Europe.

2. Only very small numbers of scoter have ever been ringed and hence the origins and movements of scoter are very poorly understood.

5.2 Methods

For legal, and other reasons, ringing of birds prior to release must be done by personnel with a ringing license and appropriate experience. For some centres this was straight forward; however, for others, local volunteer ringers had to be enrolled. For instance, at RSPCA Stapley Grange Centre, ringers had to go on a sixty mile round trip to ring birds ready for release. This meant that not all birds that were released were ringed. Table 5.2.1 shows the numbers of birds ringed at each of the main centres.

It is too early to make any detailed assessment of the survival rates of birds that were ringed, but recent work at the BTO would suggest that on average between 4 and 5 Guillemot recoveries would have been expected from 220 ringed and rehabilitated Guillemots. No similar data are available for Common Scoter, although 79 recoveries of dead birds from 756 ringed birds suggests that substantial numbers survived only for a short period. Table 5.2.2 gives the recoveries of oiled birds that were found dead in the oil spill. It is unlikely that this is an exhaustive list as some birds are likely to have been reported without making it clear that they were victims of the Sea Empress oil spill.

5.3 Lessons for the future

1. Arranging for birds to be ringed at short notice from rehabilitation centres proved extremely difficult. It is important that all rehabilitation centres have trained ringers to enable rehabilitated birds to be ringed when appropriate. Since the spill, RSPCA have made considerable efforts to ensure that trained ringers are based at each of their stations.

2. Special forms were produced for ringers at rehabilitation centres to send information rapidly back to the BTO about released birds. This proved only partially successful and a number of members of the public were unhappy at the length of time it took to find out where the birds they had found came from. Trained ringers based at rehabilitation centres, who are used to filling in the paperwork required, are likely to understand fully the need for urgency in the return of paperwork.

ACKNOWLEDGEMENTS

Many BTO members and other volunteers spent a substantial amount of their own time to undertake counts to ensure that we learnt as much as possible from the Sea Empress oil spill.

The WeBS counters who helped were:

H Coats, D Cornish, Rhian Evans, Ian Hainsworth, Bob Howells, P James, June Jordan, Stuart Lewis, K Nicholas, Jill O'Brien, Melanie Picton, Graham Rutt, Nigel Williams and the late Dilwin Roberts

The following Ringing Groups went to considerable effort to ensure that we learnt as much as possible from the rehabilitated birds:

South Pembrokeshire Ringing Group, Merseyside Ringing Group and Basildon Ringing Group

The ringing team involved in long term monitoring of Oystercatchers on the Burry Inlet is co-ordinated by Graham Coachman, Steve Dodd and Steve Ormerod and involved many ringers from South Wales.

This study was funded with the assistance of CCW, whose staff (especially Steve Parr and Bob Haycock) were of considerable assistance.

TABLES

Table 3.2 The Oiled Bird Recording Form

SEA EMPRESS OIL SPILL
OILED BIRD RECORDING FORM

Name of counter: _____
Estuary: _____ Date: _____

This form is to record the proportion of oiled birds in a sample of as many species as possible with each count sector. It is not essential to check every bird you see on your count.

Site/Sector	Species	Number NOT oiled	Number Oiled

PLEASE RETURN this form to the BTO as soon as completed, together with the WeBS form.

Table 3.3.1 The number of oiled and non-oiled species by taxonomic group.

Group	No. of species with some oiled individuals reported	No. of species with no oiled individuals reported
Wildfowl	6	13
Waders	1	18
Gulls	4	2
Other	2	8
Total	13	38

Table 3.3.2 Maximum number and percentage of oiled individuals for all species reported as oiled.

Group	Species	Maximum % of oiled birds	Maximum count of oiled birds
Wildfowl	Common Scoter	100	76
	Scaup	100	1
	Red-breasted Merganser	14	1
	Mallard	7	7
	Shelduck	5	6
	Wigeon	2	1
Waders	Oystercatcher	7	3
Gulls	Herring	6	17
	Common	5	5
	Greater Black-backed	4	1
	Black-headed	3	12
Other	Red-throated Diver	100	1
	Cormorant	7	1

Table 3.3.3 The number of clean and oiled Black-headed Gulls and Herring Gulls recorded in the Three Rivers Estuary and at Pendine after the Sea Empress oil spill.

No. of days after the spill	Black-headed Gull		Herring Gull	
	Clean	Oiled	Clean	Oiled
11	350	0	270	0
13	70	0	-	-
18	212	0	152	0
19	18	0	-	-
25	148	0	148	0
31	100	0	12	0
32	181	0	28	0
33	14	0	250	0
36	4	0	-	-
60	-	-	10	0
74	2	0	-	-
75	-	-	7	0
89	-	-	39	0
94	10	0	-	-
95	-	-	12	0

Table 3.3.4 The geographic distribution of oiled birds after the Sea Empress oil spill

Estuary	Total No. Visits	No. visits that recorded oiled birds	No. oiled birds
Taf (excluding Pendine)	19	4	46
Pendine	4	3	122
Bury Inlet North	32	2	29
Bury Inlet South	1	1	4
Gwendraeth	9	2	3
Tywi West Bank	24	1	3
Mumbles Head	5	0	0
Port Eynon Point	6	0	0
Aberavon Beach	5	0	0
Swansea Bay	13	8	10

N.B. Pendine is counted as part of the Taf estuary in WeBS counts.

Table 4.3 Weights of Oystercatchers at two roosts on the Burry Inlet

Roost	Age	Date	Weather	Mean±S.E	Number
Whiteford	Adult	24/2/96	Severe	548.1±8.9	32
Whiteford	Juvenile	24/2/96	Severe	462.5±6.9	8
Llanelli	Adult	25/2/96	Severe	589.3±5.4	53
Llanelli	Juvenile	25/2/96	Severe	487.6±6.3	45
Whiteford	Adult	Winter mean	Normal	549±2.4	260
Whiteford	Juvenile	Winter mean	Normal	560±8.5	11
Llanelli	Adult	Winter mean	Normal	589±4.2	181
Llanelli	Juvenile	Winter mean	Normal	526±4.5	94

NB Data obtained during normal weather conditions are from:

Durell, S.E.A., Le Dit, V., Ormerod. S.J. & Dare, P.J. In press. Differences in population structure between two Oystercatcher roosts on the Burry Inlet, South Wales. *Ardea*

Table 5.2.1 The Total Number of Oiled Birds Rehabilitated and Ringed after the Sea Empress Oil Spill

	RSPCA Stapley Grange	RSPCA West Hatch	RSPCA West Winch	South Devon Seabird Trust	South Pembs Ringing Group	South West Seabird Group	Guernsey	Total	No. recovered to May 1997
Red- throated Diver		15			1			16	0
Red-necked Grebe		2						2	1
Great-crested Grebe		1						1	0
Shag		3			4			7	0
Grey Heron		1			1			2	0
Mute Swan					11			11	0
Mallard					1			1	0
Scaup					1			1	0
Eider	1	1						2	0
Common Scoter	34	457	85		112	5	63	756	79
Velvet Scoter					2			2	0
Red-breasted Merganser		1						1	0
Peregrine Falcon					1			1	0
Coot					1			1	0
Oystercatcher					13			13	1
Herring Gull		3			2			5	0
Kittiwake				1				1	0
Guillemot	6	40	9	54	73	38		220	5
Razorbill				3	6	12		21	0
Total	41	524	94	58	229	55	63	1064	86

Table 5.2.2 Recoveries known to have been of birds oiled in Sea Empress oil spill

Species	Ring Number	Date Ringed	Age	Ringing Place	Date Recovered	Recovery Place
Guillemot	GP57311	23/6/73	4	St Margaret's Island, Dyfed	27/2/96	Tenby, South Beach
Guillemot	X29869	20/6/95	P	Isle of May, Fife	18/3/96	Carnsore Point, Wexford
Guillemot	GK46??3	1979	?	Great Saltee	7/3/96	Frainslake, Castle Montin
Guillemot	T31111	03/07/85	P	Skomer Island, Pembs	28/0296	Freshwater East, Pembs
Guillemot	X12346	27/07/94	P	Sanda Island, Strathclyde	06/03/96	Manorbier, Pembs
Guillemot	X24868	1995	P	Isle of May, Fife	24/03/96	nr Carne Pier, Wexford
Razorbill	M74904	8/6/93	P	Great Saltee	3/3/96	Pembrokeshire
Razorbill	M47012	1/7/82	6	Great Saltee	6/3/96	Newgale Beach
Razorbill	M49296	12/6/85	P	Great Saltee	29/2/96	Tenby, South Beach
Shag	1311735	26/6/95	P	Midland Island, Dyfed	27/2/96	Freshwater East
Shag	1234148	11/6/86	P	Great Saltee	9/3/86	Musselwick

Note: This is unlikely to be exhaustive as some recoveries will have been reported not explaining that they were oil victims.

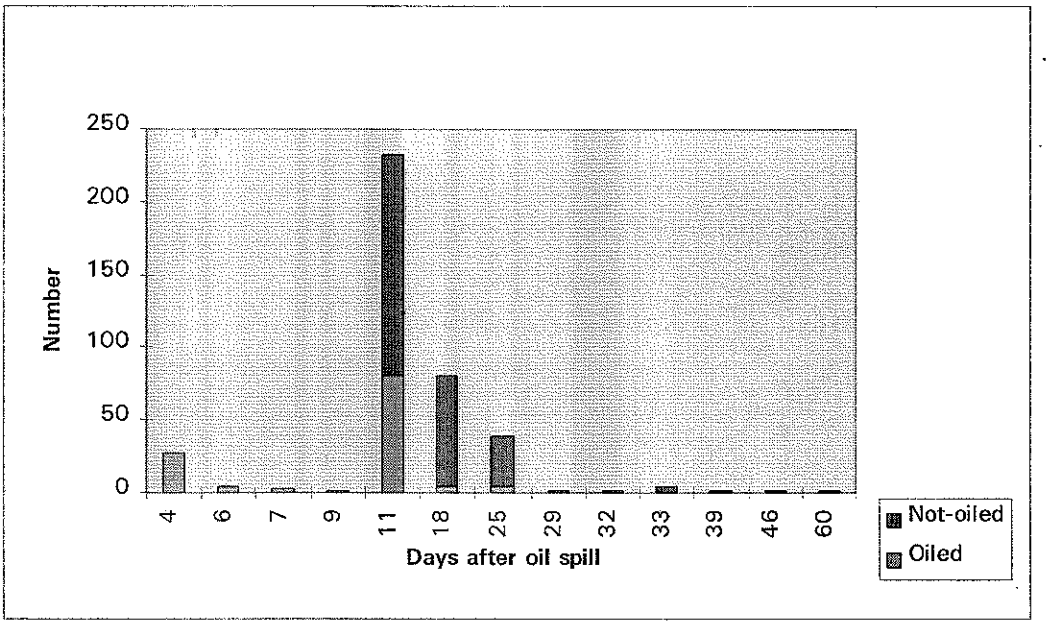

Figure 3.3.1 The numbers of oiled and non-oiled Common Scoter recorded in all estuaries after the Sea Empress oil spill.

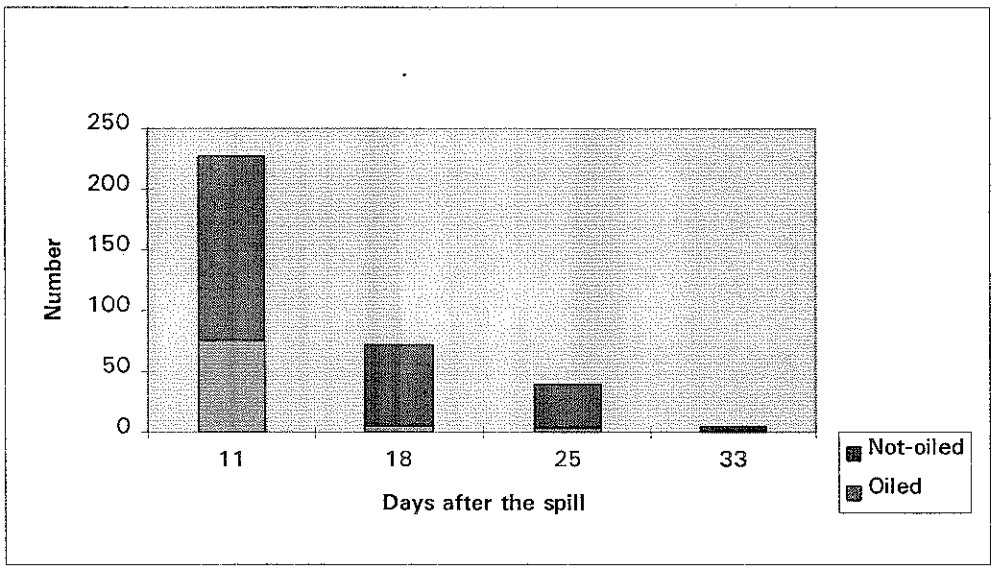

Figure 3.3.2 The number of oiled and non-oiled Common Scoter recorded at Pendine after the Sea Empress oil spill.

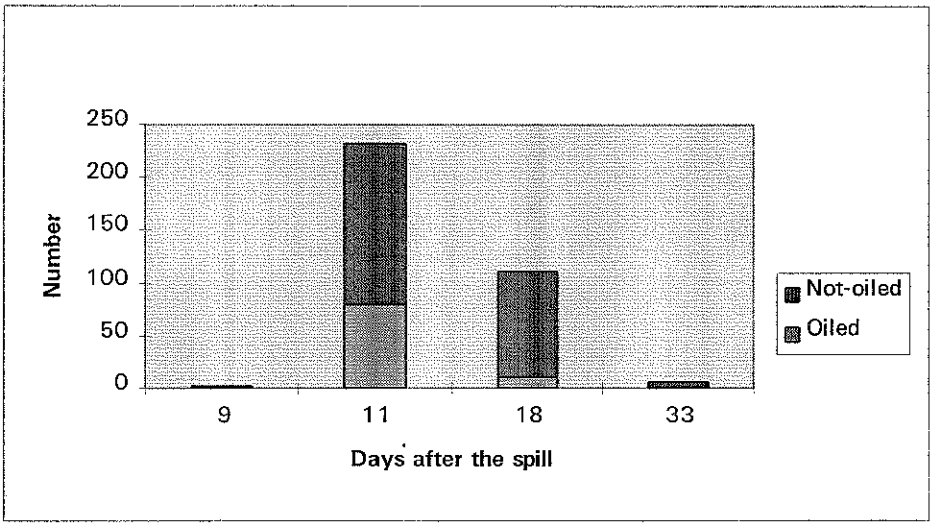

Figure 3.3.3 The number of oiled and non-oiled Common Scoter recorded in the Three Rivers Estuary and at Pendine after the Sea Empress oil spill.