

Contamination of birds with Fulmar oil

Roger A. Broad

Fisher (1952) summarised the known records of Fulmars *Fulmarus glacialis* using their stomach oil in defence against intruders at their nest sites. In this work he wrote: 'On the cliffs of the Fair Isle the fulmars (as would be expected) resent strange intruders, and threaten such migrant birds as visit their cliffs, including great spotted woodpeckers [*Dendrocopos major*]!' More recently Dennis (1970b) reported the oiling of a White-tailed Eagle* and a Honey Buzzard at Fair Isle and mentioned several other possible victims. The aim of this paper is to summarise recent reports of Fulmar oiling from Fair Isle and elsewhere and to discuss its consequences. It is hoped that this will stimulate other observers to look for similar cases of what must be a more widespread phenomenon than was previously realised.

THE NATURE OF THE CONTAMINATION

Fulmar oil is generally thought to be a secretion of the stomach (Mathews 1949) and can be produced by the chick even as it emerges from its shell. The oil is usually yellow in colour (although it may be tinted by ingested foods) and has a characteristic foul, musky odour. When threatened by an intruder, the Fulmar forcibly ejects oil in a series of hiccoughs via the open gape in the direction of the threat. This emission may be repeated several times in succession. A bird contaminated with this oil is unable to preen it from the feathers, to which it clings with tenacity. When fresh, this contamination may be recognised as such on a bird in the hand by the characteristic smell and by being sticky to the touch. Areas of contamination may often be located by the presence of small particles of peat, soil or grass adhering to the oil. With age it loses much of its stickiness and darkens in colour, but it may retain its smell for a considerable time. G. J. Barnes (verbally) has informed me that a contaminated wing in his possession still retains its smell after 13 years!

RECENT OBSERVATIONS

Table 1 lists recent cases of birds contaminated with Fulmar oil on Fair Isle and elsewhere. It also includes sight records of six birds of five species with contaminated plumage possibly resulting from such oiling. The records listed by Dennis (1970b) are included, except where possible Fulmar contamination of a particular species has since been proved. Represented in table 1 are 17 species de-

*Scientific names of birds affected by Fulmar oil are given in table 1

Table 1. Recent records of birds contaminated with oil ejected by Fulmars *Fulmarus glacialis*, and (in square brackets) sight records of birds reported with soiled plumage possibly from Fulmar oil

All localities are in Shetland, except Copinsay (Orkney) and Co. Durham. Data from Dennis (1970a, b), Macmillan (1970), Coulson and Horobin (1972), Tulloch (1973), G. J. Barnes (unpublished records), D. Coutis (verbally) and personal observations

Species	Place	Date	Extent of oiling	Remarks
Grey Heron <i>Ardea cinerea</i>	Fair Isle	{ 29.5.63 1.6.63	Light	Trapped
[Sparrowhawk <i>Accipiter nisus</i>	Fair Isle	Spring 73	Saturated	Found dead
Goshawk <i>Accipiter gentilis</i>	Fair Isle	3.12.71	Moderate	Sight record: flight impeded]
White-tailed Eagle <i>Haliaeetus albicilla</i>	Fair Isle	19.8.69	Light	Trapped
Honey Buzzard <i>Pernis ptilorvus</i>	Copinsay	8.6.69	Saturated	Caught by hand, flight much impeded
	Fair Isle	29.6.70	'Spattered'	Found dead, spattered with fishy oil
	Fair Isle	5.7.71	Heavy	Seen on 24.6 when spat at by Fulmars, later found dead
	[Fair Isle	15.6.73	Moderate	Seen alive from 30.6; caught by hand, emaciated, died later
[Osprey <i>Pandion haliaetus</i>	Fair Isle	Unknown	Unknown	Sight record: flight impeded]
Peregrine <i>Falco peregrinus</i>	[Fair Isle	Spring 71	Moderate	Sight record: soiled plumage]
	Mainland	July 73	Moderate	Sight record: flight impeded]
	Foula	May 72	'Contaminated'	Caught by hand, flight impeded
Kestrel <i>Falco tinnunculus</i>	Fair Isle	Spring 71	Light	Found dead
Coot <i>Fulica atra</i>	Fair Isle	July 71	Light	Caught by hand
Great Black-backed Gull <i>Larus marinus</i>	Fair Isle	Winter 71	Moderate	Chicks spattered when they passed Fulmar
Herring Gull <i>Larus argentatus</i> (2)	Fair Isle	Spring 66	'Covered'	Caught by hand, flight impeded
[Kittiwake <i>Rissa tridactyla</i> (2)	Co. Durham	Winter 70	Moderate	Sight record: covered in oily substance]
Razorbill <i>Alca torda</i>	Fair Isle	Winter 69	Saturated	Found dead
Guillemot <i>Uria aalge</i>	Fair Isle	13.6.71	Saturated	Found dead
Long-eared Owl <i>Asio otus</i>	Fair Isle	24.11.71	Light	Caught by hand; flight impossible, emaciated, died later
	Fair Isle	25.6.72	Light	Trapped
	Fetlar	June 72	'Contaminated'	Trapped
Short-eared Owl <i>Asio flammeus</i>	Fair Isle	Winter 71	Saturated	Found alive, died later
Raven <i>Corvus corax</i>	Yell	18.4.70	Light	Found dead
	Fair Isle	23.5.73	Moderate	Raven on ground spattered by flying Fulmar
Hooded Crow <i>Corvus corone cornix</i>	Fair Isle	27.10.73	Moderate	Three recently fledged chicks caught by hand, flight impeded
Grasshopper Warbler <i>Locustella naevia</i>	Fair Isle	May 71	Saturated	Caught by hand
Reed Bunting <i>Emberiza schoeniclus</i>	Fair Isle	Spring 72	Light	Caught by hand, flight impossible
				Trapped

finitely contaminated by this oil, of which four may be classified as 'residents' at the time of the oiling (Great Black-backed Gull, Raven, Hooded Crow and the introduced White-tailed Eagle); the Peregrine might also belong to this category. Although it is difficult to assign some species to a particular category, for example the winter records of Herring Gull, Razorbill and Guillemot, the remainder were mainly migrants. Only two species of small passerines (Grasshopper Warbler and Reed Bunting) are included in the table, and it is evident that the majority of the birds found Fulmar-oiled are of larger species. The definite, dated records come from eight months of the year between April and December, with three-quarters of these between May and September.

Where known, the extent of the contamination has been given; birds examined at Fair Isle have been found with contamination varying from light spattering to almost total saturation. A Long-eared Owl in the latter extreme state had the flight-feathers stuck together and the body-feathers matted, exposing the bare skin in many areas. A Grasshopper Warbler in a similar state was almost unable to move its wings which were virtually stuck to its flanks. Thus the effects are twofold; firstly, when the flight-feathers are contaminated there is impairment of flight; secondly, when the body-feathers are contaminated, disarrangement of the insulating feathers may well result in serious heat loss through the exposed skin.

DISCUSSION

Fulmars first bred at Fair Isle in 1903; they have since increased rapidly and at the last complete count in 1969 there were estimated to be 17,000 pairs. Initially the birds deserted the cliffs between September and December but now, although numbers are lower at the end of the breeding season, they may be seen ashore at any time of the year and vacation of the cliffs occurs only in severe weather. The incidence of Fulmar oil contamination may be viewed against this background of increasing numbers and increasing attendance throughout the year. There is a correlation between the Fulmar breeding season (May to September) and the concentration of reports of contaminated birds, three-quarters occurring in these months. This might be expected, as the Fulmar breeding season spans the main migration months at Fair Isle. The records falling outside this period (dated records in April, October, November and December and undated winter records) indicate that interaction between Fulmars and other species on the cliffs can occur at any time of the year, not only during the breeding season in defence of eggs and chicks.

The cliffs at Fair Isle provide shelter and food for many small migrants but, considering the large numbers of small passerines

sometimes present on the sea cliffs, the percentage recorded contaminated with Fulmar oil is negligible. Nevertheless, it is difficult to imagine the circumstances which would culminate in a Fulmar oiling a Grasshopper Warbler or a Reed Bunting unless the victim was unintentionally caught in some other conflict.

Birds of prey (including owls) figure prominently in the table. Since only small numbers pass through Fair Isle, Fulmar oiling must be a real problem for these migrants. Of the birds of prey affected, only the White-tailed Eagle has represented a direct threat to the Fulmar; this species was recorded by Fisher (1952) as one of only a very few avian predators of adult Fulmars. On Fair Isle the four young birds introduced in 1968 taught themselves to capture adults on the wing and one took chicks on the cliffs. It was probably this last bird that was oiled (Dennis 1970a). The other birds of prey, posing no direct threat to the Fulmars, were probably contaminated while seeking refuge on the cliffs, being unable to find any other place safe from the attentions of the skuas *Stercorarius spp* and gulls *Larus spp* and away from the populated part of the island.

Although both gulls and Ravens take unattended Fulmars' eggs, the contaminated young of these species were not opportunist feeders but were still dependent on their parents for food. The Great Black-backed Gull chicks were seen to be sprayed when they wandered too close to nesting Fulmars, and it is likely that the young Ravens similarly ran the gauntlet of the Fulmars on the cliffs before they were fully fledged.

To produce the state of saturation seen in some of the birds, it would be necessary for several conflicts to have taken place. Evidence for successive oilings comes from the Grey Heron trapped with light oiling and then subsequently found dead with its plumage saturated. This also emphasises the plight of some of the tired migrants arriving at Fair Isle where suitable food may not be readily available. Conflict with the Fulmars and the resulting incapacitating burden of oil might quickly lead to their death.

Actual observations of these conflicts are few but presumably they must usually happen on land. Dennis (1970b) reported a case of a Honey Buzzard sprayed by Fulmars when it landed too near them, and the contamination of the wandering, unfledged gull chicks was similar. This last observation is paralleled by a case mentioned by Fisher (1952). However, Tulloch (1971) recorded an incident in which a Fulmar displaced from a ledge by a Raven returned and sprayed the intruder as it flew by. Similarly, again in Fisher (1952) there are two records of Fulmars ejecting oil in flight, once at a man who had dislodged a sitting bird from its egg. At sea, where Fulmars follow fishing boats for the offal thrown overboard, their supremacy is respected even by the larger gulls and Great Skuas *S. skua*. Here

adoption of an aggressive posture, without the emission of oil, is apparently sufficient in itself.

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SUMMARY

Recent occurrences of birds contaminated with oil ejected by Fulmars *Fulmarus glacialis* at Fair Isle and elsewhere are summarised and the circumstances of the contamination discussed. Seventeen species were definitely contaminated, the majority being large birds, particularly raptors and owls. Three other species were possibly affected. Only two small passerines were reported. Three-quarters of the reports were during the Fulmar breeding season (May to September), but interaction is not confined to this period. The winter records are a result of increased Fulmar attendance on the cliffs at this season. Of the birds affected only the White-tailed Eagles *Haliaeetus albicilla* introduced on Fair Isle posed a direct threat to the Fulmars, taking adults and young for food; a minority were fledging young wandering too close to Fulmars, and the majority of the remainder were tired migrants, contaminated while seeking refuge on the cliffs.

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Roger A. Broad, Bird Observatory, Fair Isle, Shetland

