

# INJURIES TO OYSTERCATCHERS WINTERING AND BREEDING INLAND IN NORTH-WEST ENGLAND

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## INTRODUCTION

Dare and Mercer (1968) found that 3.3% of the Oystercatchers *Haematopus ostralegus* wintering on the west coast of Britain in 1962-67 had some foot deformity or leg injury that had originated from the ensnaring of the foot by cast sheep's wool. Oystercatchers wintering in Morecambe Bay (Lancashire/Cumbria, north-west England - Figure 1) are making increasing use of coastal fields for foraging, and the inland breeding population in this area has increased by 50% in the last decade (Briggs 1982). This paper details foot, and other, injuries recorded from wintering and inland breeding Oystercatchers in relation to these two increases.

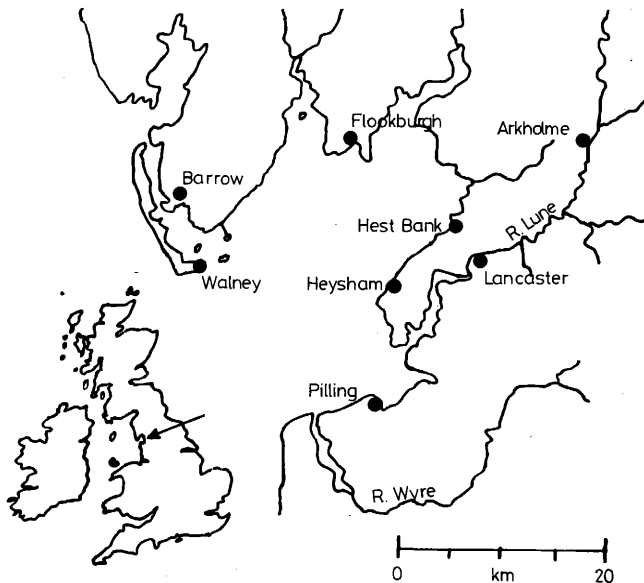


Figure 1. The study areas on and around Morecambe Bay, showing sites mentioned in the text.

## METHODS

Between 1968 and 1980 the Morecambe Bay Wader Ringing Group captured 8099 Oystercatchers at their winter roosts using mist and cannon netting. Detailed biometric processing, when leg injuries and other deformities were recorded, was carried out on 6058 individuals. In the Lune Valley (15 km from the coast) 75 breeding Oystercatchers were trapped on their nests in 1978-80 and examined for foot injuries.

## RESULTS

In the wintering population, 282 (4.7%) birds were found to have some type of foot or leg injury, probably caused by cast sheep's wool (Table 1). In addition, 11 birds had leg tumours, 2 had fishing line entangled around the legs and 7 had a heel callus. In total, 304 (5.0%) had some type of leg injury and a further 31 (0.5%) had loose wool "anklets" that had caused no damage.

Only 15 birds (0.2%) were recorded with damage to the bill or eye (Table 2). The majority of these birds were from the roosts on Walney Island at the north-western corner of Morecambe Bay. Altogether 319 birds (5.2%) had injuries.

The number of birds with leg injuries has increased by only 1.4% from the previous sample (Dare and Mercer 1968). This was due mainly to an increase in the number of adults losing one toe, the number second/third year birds losing a foot, and the number of first year birds injured. Birds with only one toe missing invariably lost the inner toe (82%) and those with two toes missing had lost both inner toes (88%). Weights of birds with leg injuries were lower, in most cases, than the mean of the sample captured, but not extremely low (Table 3), suggesting the birds could cope adequately with the disability when foraging.

Oystercatchers wintering in Morecambe Bay feed on mussel *Mytilus edulis* beds, sand-banks or

Table 1. Type and frequencies of leg and foot injuries in Oystercatchers examined whilst wintering in Morecambe Bay between 1968 and 1980. Values in brackets are percentages.

	1st Year	Second/Third Year	Adults	Total
Total no. examined	872	560	4626	6058
a) No. with minor injuries caused by wool				
One toe lost	1	4	176	181(3.0)
Two toes lost	0	2	43	47(0.8)
Three toes lost	0	0	6	6(0.9)
Total injured	1(0.1)	6(1.0)	225(4.7)	232(3.8)
b) No. with major injuries caused by wool				
Foot loss	0	3	4	7(0.1)
Foot swollen	1	2	15	18(0.3)
Tarsus swollen	0	0	11	11(0.2)
Tarsus amputated	0	0	6	6(0.09)
Total injured	1(0.1)	5(0.9)	36(0.8)	42(0.7)
c) No. with major injuries from other causes				
Tarsus deformed	0	1(0.01)	7(0.1)	8(0.1)
Overall total injured	2(0.2)	12(2.1)	268(5.8)	282(4.7)

Table 2. Types and frequencies of bill and eye injuries in Oystercatchers examined whilst wintering in Morecambe Bay between 1968 and 1980. Values in brackets are percentages.

	1st Year	Second/Third Year	Adults	Total
Total No. Examined	872	560	4262	6058
a) No. with damage to bill				
Mandible tips crossed	0	2(0.4)	8(0.2)	8(0.1)
Broken lower mandible	0	0	2(0.04)	2(0.03)
Total No. injured	0	2(0.4)	10(0.2)	12(0.2)
b) No. with damage to eye				
One blind eye	0	0	3(0.06)	3(0.04)

Table 3. Mean body weights ( $\pm$ S.D.) of Oystercatchers with leg and foot injuries, compared with weights of uninjured birds in the same catches at Morecambe Bay between 1970 and 1972.

Site	Date	Injured birds	n	Uninjured birds	n
Heysham	Jan 1970	554.4 $\pm$ 37.9	8	575.5 $\pm$ 45.9	57
Walney	Aug 1971	534.3 $\pm$ 39.2	7	537.4 $\pm$ 26.4	51
Hest Bank,	Nov. 1972	561.3 $\pm$ 29.1	11	592.9 $\pm$ 43.5	98

Table 4. Feeding habitats, roost sites and the proportion of Oystercatchers with leg and foot injuries caused by wool at Morecambe Bay between 1968 and 1980.

Roost site	Feeding habitat	No. examined	% injured
Walney	Mussel beds	2965	3.1
Hest Bank	Mussel beds, sand	562	4.0
Heysham	Mussel beds, sand, fields	1026	6.9
Flookburgh	Sand, fields	587	13.2

Table 5. Types and frequencies of leg and foot injuries in Oystercatchers examined on breeding grounds inland in north west England between 1978 and 1980. Values in brackets are percentages.

	Male	Female	Total
Total No. examined	42	33	75
a) No. with minor injuries caused by wool			
One toe lost	1(3.0)	0	1(1.3)
b) No. with major injuries caused by wool			
Foot swollen	14(33.3)	5(15.2)	19(25.3)
Tarsus swollen	4(9.5)	0	4(5.3)
Total	18(42.9)	5(15.2)	23(30.7)
Overall total with injuries	19(45.2)	5(15.2)	24(32.0)

fields, or may use two of these habitats. Each roost is associated with a particular mode of feeding and there is little interchange of birds between roosts, despite their close proximity (Dare 1969). Samples of birds have been examined at each of these roosts and the proportion of birds with leg injuries increases with the incidence of field feeding (Table 4). Oystercatchers feeding in sheep-grazed coastal fields would be expected to incur more foot injuries than those feeding on mussels in the littoral zone. The Flookburgh birds, which are becoming exclusively field-feeders, have four times the number of leg injuries compared to Walney birds, which are nearly exclusively mussel feeders.

Leg injuries occurred in 24(32%) of the inland breeding birds (Table 5). A further 4 birds had elongated toe nails and 2 had large heel calluses, so 30(40%) of the birds examined had foot deformities.

## DISCUSSION

Following the population crash in the 1962/63 winter, the numbers of Oystercatchers wintering in Morecambe Bay has increased annually (Prater 1981) with the majority of the birds originating from breeding pairs in northern England, Scotland, the Scottish Isles, and the Faeroes. The sheep in the Faeroes and Scottish Isles have a primitive fleece and the wool tends towards an annual moult in spring or early summer (wool gathering was originally by plucking the sheep prior to shearing) (Ryder 1973). Selective breeding has caused domestic sheep to lose this seasonal tendency to moult but in some breeds of Scottish and hill sheep there remains a definite tendency to a spring moult. If these, or any other breeds of sheep, suffer a nutritional check during the winter due to hard weather, then more wool will be shed in spring prior to shearing (Fraser and

Stamp 1961). Oystercatchers breeding in these areas and using sheep grazings for foraging are quite likely to suffer from injuries originating from cast wool. Many of these birds are inland breeders predisposed to feeding on coastal fields in winter, and probably account for the increase in the number of birds recorded feeding in this habitat in winter.

In summer the fields around Morecambe Bay are grazed by dairy cattle or used to grow grass for silage; in winter they are grazed only by sheep. Although the amount of wool cast during winter is minimal it will cause damage if entangled around the feet and could account for the injuries to the birds feeding in fields. The Walney birds that are exclusively mussel feeders must obtain their injuries from wool on their breeding grounds. More of these birds may now be breeding inland, since 2.5% of the birds at the Walney roost were injured in 1968-70 compared to 5.1% in 1972-80 (approximately the same number of birds were examined in each time period). The Oystercatchers wintering on the Wash, on the east coast of England have, by comparison, only 1% incidence of foot injuries (Anderson & Minton 1978). This population breeds mainly in Norway, where the majority of the birds are coastal breeders on rocky shores covered with boulders or, less frequently, small areas of sand (G.Toft pers. comm.). Islands and coastal areas grazed by sheep are not extensive, and are only found near settlements, so cast wool affects only a small proportion of breeding Norwegian Oystercatchers.

Foot and leg injuries are 6 times more frequent in the inland breeding Lune Valley population than in the winter population in Morecambe Bay. The Lune Valley birds are individually marked and are known to use Morecambe Bay in winter and in particular the Heysham and Hest Bank roosts (Briggs in prep.). Sheep are grazed all the year round on the pastures used by these inland breeders in spring and summer. Wool loss here is mainly during May and early June just prior to shearing. For no apparent behavioural reason, males are three times more likely than females to have foot injuries. Males do have a slightly shorter tarsus than females (males  $n=42$ ,  $55.2 \pm S.E. 4.4$  mm; females  $n=33$ ,  $56.2 \pm S.E. 2.4$  mm), and a slightly longer middle toe (males  $n=42$ ,  $38.7 \pm S.E. 4.4$  mm; females  $n=33$ ,  $37.5 \pm S.E. 2.2$  mm). This might mean that males have greater difficulty in removing wool, once it becomes entangled around the foot. Indeed, two males trapped at the nest and relieved of ensnaring wool were in the same state when recaptured 10 days later. This did not occur with females. The gait of Oystercatchers when feeding - shuffling forwards in the grass with head and bill constantly pointing down - might also be a reason for its susceptibility to these injuries.

Of the 12 birds with damaged bills, 10 (83%) were mussel feeders, suggesting that hammering and prising open these molluscs is not without problems. A mean body weight of  $470 \pm S.E. 4g$  was recorded in December for three Walney birds with damaged bills, significantly less than the mean weight of the uninjured sample,  $575 \pm S.E. 45g$  ( $n=72$ ) ( $P=0.05$  Student's *t*-test), suggesting that these injured birds might have been unable to forage effectively.

Melville (1982) reviews records of injuries to the feet of waders, and describes injuries found in 2198 individuals of 31 species of wader examined in Hong Kong and Thailand between 1976 and 1981. 1.8% of the birds had

some type of injury. The majority of damage was to the legs and feet (0.3% had minor injuries, 0.5% major injuries and 0.5% tarsal deformities). Most injuries resulted probably from unattended monofilament nylon nets used in commercial wader catching. In the four species where more than 100 birds had been examined, foot and leg damage was: Red-necked Stint *Calidris ruficollis* 0.9%, Lesser Sand-plover *Charadrius mongolus* 1.1%, Redshank *Tringa totanus* 1.4% and Curlew Sandpiper *Calidris ferruginea* 1.6%. These were all much lower than the 5% recorded for Oystercatchers wintering in Morecambe Bay.

The results indicate that the number of wintering Oystercatchers with foot and leg injuries has increased. 0.8% of adults now have some major damage, and within the whole population 5% have some type of foot damage. Increases in foot injuries could be as a result of: a) increased feeding in fields in winter, b) increased sheep density in winter field feeding areas, c) increased sheep densities in coastal breeding regions, especially salt marshes, d) increased inland breeding on sheep-grazed pastures, and/or e) sheep casting more wool. In the Lune Valley, where the sheep stocking rate is 4/ha, 33% of the inland breeding Oystercatcher population has some foot injury caused by cast sheep's wool. As this population is still increasing, whilst coastal breeders have decreased in numbers, it is likely that, if this trend has occurred throughout the breeding range of the Morecambe Bay wintering population, then reason d) is the most tenable, at least until further information becomes available. The effect of these leg injuries on the survival of Oystercatchers is not known.

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