

PART 5: THE ORNITHOLOGICAL IMPORTANCE OF DUICH MOSS

1. In view of the exceptional importance of this site to the Greenland White-fronted Goose (Anser albifrons flavirostris), most of this Part is devoted to a summary of this aspect of the ornithological importance of the Duich Moss site. Consideration is, however, given to use of the site by other bird species. A more detailed account of the conservation status of the Greenland White-fronted Goose in the British Isles is presented in Annex 1 to this Part.

2. **Greenland White-fronted Geese**
 - 2.1 The world population of Greenland White-fronted Goose winters entirely in northern and western Scotland, in Ireland and at two sites in Wales. Within this limited winter range, the distribution of traditional feeding and roost areas is strongly linked to peatlands. The world population was estimated at some 17,500 -23,000 in the late 1950s, but by the late 1970s had fallen to an estimated 14,300 - 16,000 (Rutledge & Ogilvie, 1979). Since that time the population has risen slightly and seems to have stabilised at about 18,000 - 19,000 geese (Table 5.1). (Stroud, 1985).

 - 2.2 Annual Greenland White-front productivity is normally low. The average percentage of young birds in the population on Islay each autumn is only 14.5% (Ogilvie, 1983). Mean brood size is high compared with other goose species. This implies that an exceptionally small number of pairs breed successfully each year (Stroud, 1984). In 1982 only 724 pairs out of a population of 16,600 bred successfully (Wilson & Norris, 1985). Such low productivity is a serious constraint on the ability of the population to increase should deleterious changes on the wintering areas, notably Islay, affect the spring reproductive condition of these small numbers of breeding geese (Fox et al., 1983).

 - 2.3 Greenland White-fronted Geese are listed on Annex 1 of the European Communities Directive on the Conservation of Wild Birds (EC/79/409). This Directive obliges the UK Government to take steps to protect the habitat of the goose and to declare the most important areas as Special Protection Areas under the Directive.

Table 5.1 Summarised totals of wintering Greenland White-fronted Geese 1982/83-1984/85

	Autumn 1982	Spring 1983	Autumn 1983	Spring 1984	Autumn 1984	Spring 1985
Wexford, Ireland ¹	4,913	6,363	4,758	6,267	6,331	7,590
Rest of Ireland ¹	-	2,994	2,768	3,231	2,989	3,355
England ²	33	0	1	4	10	13
Wales ²	73	73	93	78	76	88
Scotland ²	7,083	7,209	8,094	7,844	9,404	8,851
World total population	-	16,639	15,714	17,424	18,810	19,897

1. Totals from Wilson & Norriss 1985

2. Totals from Stroud 1985

- 2.4 Traditional habitat of the Greenland White-fronted Goose is ombrotrophic mire where they feed predominantly on Eriophorum angustifolium and Rhynchospora alba. Loss of this habitat, particularly in Ireland (Van Eck et al., 1984), has been identified as the single most important reason for the decline in numbers (Ruttledge & Ogilvie, 1979). Areas such as Cumbria and Lancashire in north-west England used to hold wintering flocks on a regular basis but are now deserted following the almost complete destruction of peatland habitat there (Table 5.2).
- 2.5 Duich Moss is the single most important Greenland Whitefront site known in Britain. In the world range, only at Wexford Slobs in SE Ireland do numbers exceed those at Duich Moss. As a night-time roost, the bog is used by several flocks which otherwise feed separately during the day. Thus numbers using Duich Moss exceed those at any known daytime feeding site. In excess of 600 geese regularly use the bog as a roost. The most recent counts in November 1985 found 831 and 611 on two separate nights.
- 2.6 This level of use considerably exceeds the criteria for international importance accepted by parties to the Ramsar Convention on the Conservation of Wetlands of International Importance especially as Waterfowl Habitat, to which the UK is a Contracting Party. These criteria state that any site holding more than 1% of a biogeographical population of wildfowl is of international importance and thus qualifies for designation under the Convention. For Greenland Whitefronts, this 1% criterion is set at 150 geese. In terms of the world population some 3-4% thus use Duich Moss as a roost.
- 2.7 Thus, in terms of ornithological importance, Duich Moss qualifies for protection under national legislation (the Wildlife & Countryside Act 1981); European legislation (EC/79/409) and an international convention (Ramsar Convention).

3. Other species

- 3.1 Duich Moss is used as a breeding or wintering area by at least seven other species listed under Annex 1 of the Directive on the Conservation of Wild Birds (EC/79/409). In summer Red-throated Divers (Gavia arctica) breed on

TABLE 5.2

Loss of wet open bog in North-West England Since 1840

<u>Region</u>	<u>Original area</u>	<u>Remaining Area</u>	<u>% loss of peatland</u>
Lancashire	4229 ha	0	100%
South Cumbria	1771 ha	60 ha	97%
Solway (Cumbria)	2698 ha	210 ha	92%
Solway (Dumfries & Galloway)	2973 ha	20 ha	99.3%

the pool systems, whilst Merlins (Falco columbarius) feed over the site. Golden Plover (Pluvialis apricaria) summer and possibly breed on the bog.

- 3.2 In the non-breeding season, Whooper Swans (Cygnus cygnus) roost on the pools, especially in autumn. Peregrine (Falco peregrinus), Short-eared Owl (Asio flammeus) all use the bog as a feeding area. Hen Harriers (Circus cyaneus) both feed and roost on the site in winter. The roost, on the western edge of the bog, is traditional and holds nationally important numbers.
- 3.3 Additionally, the site holds a representative community of breeding birds typical of this type of unmodified raised/blanket bog. This includes Tufted Duck (Aythya fuligula), Common Scoter (Melanitta nigra), Dunlin (Calidris alpina), Meadow Pipit (Anthus pratensis), Curlew (Numenius arguata), Common Gull (Larus canus), Sedge Warbler (Acrocephalus schoenobaenus), Reed Bunting (Emberiza schoeniclus), Skylark (Alauda arvensis), Red Grouse (Lagopus lagopus) and others. Table 5.3 lists birds recorded from the site.

4. References

- FOX, A.D, MADSEN, J. & STROUD, D.A. (1983). A review of the summer ecology of the Greenland White-fronted Goose Anser albifrons flavinestrus. Danask. Orn. Foren. Tidsskr. 77 43-55.
- OGILVIE, M.A. (1983). Wildfowl of Islay. Proc. Roy. Soc. Edinburgh B 83 473-490.
- RUTTLEDGE, R.F. & OGILVIE, M.A. (1979). The past and current status of the Greenland White-fronted Goose in Ireland and Britain. Irish Birds, 1(3): 293-363.
- STROUD, D.A. (1984). Greenland White-fronted Geese in Great Britain: 1983/84, GWGS, Aberystwyth, 12pp.
- STROUD, D.A. (1985). Greenland White-fronted Geese in Great Britain 1984/85, GWGS, Aberystwyth, 20pp.

VAN ECK, H., GOVERS, A., LEMAIRE, A. & SCHAMINEE, J. (1984). Irish Bogs: The Case for Planning. Catholic University, Nymegan.

WILSON, H. J. & NORRISS, D. W. (1985). The Greenland White-fronted Goose in Ireland 1982/83 to 1984/85. Rep. Forest and Wildlife Service.

Table 5.3 Birds recorded using Eilean na Muice Dubh SSSI, Islay.

<u>Species</u>	<u>Annex 1</u>	<u>Summer</u>	<u>Winter</u>	
Red-throated Diver	*	*		
Whooper Swan	*		/	roosts
Teal		*	/	
Mallard		*	/	
Goldeneye			/	
Tufted Duck		*		
Common Scoter		*		
Hen Harrier	*	+	/	Possibly breeds
Sparrowhawk		+		
Buzzard			/	
Kestrel		+	/	
Merlin	*	+	/	
Peregrine	*		/	
Red Grouse		*	/	
Black Grouse		+/*	/	
Pheasant		*	/	
Golden Plover	*	*?		
Dunlin		*		
Snipe		*	/	
Curlew		*		
Redshank		*		
Common Gull		*		
Herring Gull		*		
Black-headed Gull		*		
Wood Pigeon		*		
Short-eared Owl	*		/	
Meadow Pipit		*	/	
Skylark		*		
Wren		*	/	
Whinchat		*		
Wheatear		+		
Sedge Warbler		*		
Hooded Crow			/	
Reed Bunting		*		
Blackbird		*		

In some respects, the ornithological interest of Eilean na Muice Dubh is poorly known. Thus this should not be taken to be a comprehensive list of all birds using the site.

Caption

Winter / = present

Summer * = breeding

+ = present, feeds no regular breeding

Annex 1

Conservation of the Greenland White-fronted Goose in
the British Isles

CONTENTS

SUMMARY

DISTRIBUTION AND ABUNDANCE

British totals

CHANGES IN COUNT QUALITY AND COVERAGE

CURRENT PROTECTION

Legal Status in Britain
Legal Status in Ireland
Legal Status in Northern Ireland
Legal Status in Iceland
Legal Status in Greenland

BENEFITS OF PAST PROTECTION

TRENDS IN RECRUITMENT AND MORTALITY

EFFECTS OF WINTER SHOOTING/DISTURBANCE ON BREEDING SUCCESS

CONSERVATION OF TRADITIONAL PEATLAND HABITATS

REFERENCES

1. SUMMARY

- 1.1 Numbers of Greenland White-fronted Geese in Britain have increased under protection from c. 7,200 in autumn 1982 to c. 8,200 in autumn 1983, to c. 9,490 in autumn 1984.
- 1.2 The proportion of British Greenland Whitefronts wintering on Islay has increased from 45% in 1982/83 to 55% in 1984/85.
- 1.3 There is no evidence of a long-term decline or increase on Islay. During two winters since protection, there has been a real increase in numbers there, although this increase is confused by more thorough counting techniques.
- 1.4 Greenland Whitefronts typically produce large clutches without nutrient supplement at spring migration staging areas, placing a higher reliance on spring condition on departure from wintering grounds and on arrival in Greenland.
- 1.5 Although brood size is relatively high, productivity is less than half that of most races of the White-fronted Goose. Consequently, the race is highly dependent on small numbers of successfully breeding pairs for continued recruitment into the population.
- 1.6 Survivorship is low compared to most European grey geese, with a large proportion of the annual mortality resulting in the past from shooting. Recruitment may fall short of mortality in most years away from Islay, but further information is required on these features of the population.
- 1.7 Small overall population size, poor productivity and low survivorship all make the Greenland White-fronted Goose an unsuitable quarry species. As a result it is presently protected throughout most of its world range: in Scotland (since September 1982), in Northern Ireland (since March 1985), in Greenland (since March 1985) and on the Dyfi Estuary in mid-Wales by voluntary ban since 1972. In Iceland, they are not currently protected but legislation is being considered at present.
- 1.8 In addition to the other pressures on the population, habitat loss as feeding and roosting sites are drained, cut for peat or improved continues unabated in Ireland, whilst important areas in Scotland have either been lost or damaged recently.

2. DISTRIBUTION AND ABUNDANCE

- 2.1 The Greenland race of the circumpolar White-fronted Goose (Anser albifrons flavirostris) breeds solely in west Greenland between 64°N and 73°N and winters exclusively in western and northern Scotland, Ireland and two sites in Wales.
- 2.2 Occasional vagrants are seen on the eastern seaboard of North America (Palmer 1976, and references in Fox and Stroud 1981) and in north-western England, although these do not constitute regular wintering flocks.

- 2.3 The geese traditionally associate with peatland areas which represent their natural feeding grounds. As a result, wintering sites are scattered and discrete and flocks in Britain rarely exceed 300 birds at any one site.
- 2.4 The highly dispersed breeding distribution and remote nesting areas makes summer population size assessment impossible. Estimates of the world population thus derive from winter counts alone. Past counts are few, and for much of the range non-existent, yet by the 1970s, Ruttledge (1973) had noted a major decline at many traditional Irish sites.
- 2.5 Ruttledge and Ogilvie (1979) estimated the world population in the 1950s at 17,500-23,000 birds, falling to 14,300-16,600 by the late 1970s. Numbers in Ireland were reported to have declined by 50% whilst numbers in Britain had increased slightly in the same period.
- 2.6 In the late 1970s it also became apparent that not only was the population small and declining, but that recovery from further decline would be inhibited by low productivity (Ogilvie 1978). Massive continuing loss of traditional peatland habitat, especially in Ireland, was having a severe detrimental effect on Greenland White-fronted Geese (Owen 1978, Ruttledge and Ogilvie 1979, Ryan and Cross 1984, Reynolds 1984, Stroud 1984).
- 2.7 Since autumn 1982, a series of co-ordinated counts at all known sites in Scotland and Wales has been undertaken, with two complete censuses each winter, timed to coincide with those in Ireland organised by the Forest and Wildlife Service. The autumn count is normally undertaken during the second or third week of November, the spring survey during the last week of March/first week in April. The results have been published in a series of reports (Stroud 1983, 1984, 1985a) and are summarised in Table 1.
- 2.8 Intensive surveys of groups of wintering sites over the three years have been carried out to locate previously unknown wintering areas and assess census accuracy by repeated counts of certain sites. Thorough surveys of this nature have been undertaken on Coll and Tiree and in Galloway, Kintyre and Caithness.
- 2.9 Since February 1983, monthly counts on Islay by four teams of two counters have checked over 700 known feeding areas in a single day. Counts are repeated on two successive days to check the accuracy of the method and to look in detail at day-to-day distribution changes (Stroud, Easterbee and Bignal in prep). Peak counts on Islay for the last four winters are given in detail in Table 2, and all counts summarised in Table 3.
- 2.10 Between-day count accuracy varied, but rarely exceeded 10% on the two counts each month. Greater error was usually attributable to severe weather or degree of disturbance on one of the two days. During 1983/4, numbers declined in mid-winter from an autumn 'peak', then increased slightly in spring. Such changes were highly correlated to change in mean flock size, implying the fragmenting flocks in mid-winter were becoming

increasingly difficult to find and count accurately. It is thus considered the mid-winter fall in numbers is a 'coverage error' and does not reflect emigration from the island.

2.11 Past counts in November on Islay, at least in recent years, are thus likely to have detected most birds present when flock sizes are large and geese tend to feed on stubble (but see 3.3). Further discussion is restricted to autumn counts.

2.12 British Totals

2.12.1 The November 1982 British total was found to be c. 7,200 and the spring total that winter was not significantly different (Table 1). Since the previously reported British total of Ruttledge and Ogilvie (1979), several small, but apparently long-established wintering flocks have come to light, notably Barvas (Isle of Lewis), two flocks on Mull, Isle of Danna (Argyll), Loch a' Chnuic Bhric (Jura) and Sguod Valley (Wester Ross).

2.12.2 In calculating the British wintering population in the 1970s, Ruttledge and Ogilvie (1979) took the lowest and highest annual counts for the period 1974/75 to 1978/79. Using this method for the new sites (2.12.1) an additional 130-290 geese would have been involved, making the adjusted mid-1970's population 6,630-7,590. The results of the two 1982/3 censuses fall within the mid-range of that estimate and indicate no significant increase or decrease within Britain since the 1970s.

2.12.3 By November 1983, the population had increased to c. 8,200: a 14% increase. The increase was entirely accounted for by a very high Islay count (4,592) and numbers elsewhere had generally fallen. The proportion of the British population on Islay during 1983/4 (56%) was significantly higher than in 1982/3 (45%). This inflated British total is hard to reconcile with the very low numbers of young in the flocks: 1983 had been a below average breeding season. It is felt that the apparent increase was compounded by the more thorough counting techniques on Islay that season (3.2), since there was an 8.6% decrease in numbers at sites away from Islay. This decline (from 3,939 to 3,596) is what would be expected from the smaller proportion of young produced in 1983.

2.12.4 By November 1984, the population in Britain had increased to 9,490, a 13.7% increase from the previous autumn. This increase is considered genuine, since most British wintering flocks increased by a similar proportion and is in line with observed productivity (13.5% young overall in British flocks).

3. CHANGES IN COUNT QUALITY AND COVERAGE

3.1 This observed increase in numbers is compounded by known changes in coverage and count methodology, particularly on Islay where the largest proportion of the British wintering population is found.

- 3.2 Prior to February 1983, Islay was counted by one observer over the course of two to three days. Observations of Darvic-ringed birds (Fox and Stroud in prep) shows little short-term movement between different areas of the island, but sample size is small and such counting is inevitably less accurate than a complete count on a single day. From February 1983 until 22 November 1983, counts were made by three teams of counters covering different areas of the island in one day. From 23 November 1983 to the present, counts have been made by four co-ordinated teams.
- 3.3 Despite the numbers of counters and their routes remaining constant 'new' feeding areas are constantly being found. With well over 700 separate sites to check in the course of a day, it is inevitable that coverage errors will still play an important role in the final total. Islay counts are currently thought comparable and detect a very high proportion of the total number present. However, with a survey route totalling 264 km, it is clearly impractical to locate every last bird on the island.
- 3.4 Elsewhere, coverage error is less important, sites tending to be discrete and usually well-known. Flocks are generally small, minimising count error (Stroud, Easterbee and Bignal in prep). November flocks are easily found and counted, although spring flocks away from Islay tend to be less predictable. 'New' sites continue to be located (see 1.12.1), although less frequently to the present, and most hold very small groups suggesting that all major wintering areas in Britain are now well known and regularly counted.
- 3.5 Analysis of historical records is fraught with difficulties. Early estimates for Islay considerably underestimate numbers present due to incomplete counts and lack of intimate knowledge of feeding areas. We agree with Ogilvie (1983) that "..... there seems to have been no long term change in numbers, either up or down", excepting the last two years' counts which do seem to represent a real increase. Coffey's assertion (1983a, 1983b) of an 80% increase on Islay ".... from 2,000-3,600" seems to be a misunderstanding of the published counts for Islay and we would refute evidence for any such long-term increase.
- 3.6 Given the strong site fidelity of this race (Fox and Stroud in prep), the recent Scottish increase is better explained in terms of lower winter mortality of this population segment rather than any implication of immigration from elsewhere.
- 3.7 Elsewhere in Britain, there is evidence of both site desertion and the establishment of new flocks. A major wintering site at Cors Caron, Dyfed, Wales, which held a peak of 600 birds in the early 1960s was deserted by the end of the decade (Fox and Stroud in press). Several minor Scottish sites have been deserted each decade from the 1950s to the present and many sites have shown significant declines over the same period. In many cases, these desertions can be explained in habitat change, yet others appear spontaneous. It does appear, however, that to date, site loss in Scotland has been considerably less than in Ireland.

- 3.8 Increases have been reported at a few, genuinely new sites, although these do not balance larger desertions. A now regular flock on Jura was first noted in 1980/81, whilst at Rhunahaorine, Kintyre a flock first recorded in 1934/35 has now increased to over 850 birds.
- 3.9 Overall, evidence shows British Greenland Whitefronts are tending to become increasingly concentrated at a small number of heavily-used sites, a trend which can only make these flocks more vulnerable to land-use changes and increase the potential risk of conflict with local agriculture. However, to date there has been no agricultural conflict regarding Greenland Whitefronts in Britain, not even on the island of Islay.
- 3.10 In conclusion, we strongly feel the historical record is too patchy and liable to varying types of bias to permit heavy reliance on it when compared with results of recent surveys and counts where bias is controlled to a minimum. In formulating decisions affecting a major proportion of a scarce race, stress must be given to recent censuses which have at least established a base-line for the population. Past recollections and vague counts can be useful in identifying trends but are unreliable in formulating conservation policy.

4. CURRENT PROTECTION

4.1 Legal Status in Britain

4.1.1 The Greenland White-fronted Goose was placed on Annex 1 of the 1979 EEC Directive on the Conservation of Wild Birds. The British Government is thus required to take the following measures:

- i) To take special conservation measures concerning their habitat (Article 4).
- ii) Classify the most suitable territories as Special Protection Areas (Article 4).
- iii) Take steps to avoid pollution, deterioration of habitat or any other disturbance affecting the birds within designated areas (Article 4).
- iv) Provide protection from shooting.

British legislation was introduced to comply with obligations under the Directive in 1981. To date, no Special Protection Areas have been designated in Great Britain for Greenland White-fronted Geese, although the designation of Eilean na Muice Dubh (Duich Moss), Islay is being processed. Several other Greenland Whitefront SPAs are likely in the long-term.

4.1.2 Under the terms of the Wildlife and Countryside Act (1981), White-fronted Geese (Anser albifrons) were protected in Scotland. This effectively gave protection to the vast majority of British wintering Greenland Whitefronts. Although enjoying no legal protection

in Wales, a voluntary shooting ban has been in operation on the main Welsh site (Dyfi Estuary) since 1972; this ban has undoubtedly been the major factor in the survival of this small flock (Fox and Stroud in press).

4.1.3 Although enacted in 1981, the provisions affecting the Whitefront did not commence until September 1982, the winter of 1982/83 being the first when the race was fully protected in Scotland. Although there have been, and no doubt will continue to be, infringements of this protection, the change in legal status in Britain has been generally accepted and no great enforcement problems have arisen.

4.1.4 Of importance in context is the continued shooting, under licence, of Barnacle Geese on Islay. These geese can now be shot throughout the spring until their departure in late April. On many areas of Islay, flocks of Whitefronts, feeding in association with Barnacle Geese, have been severely disturbed throughout the crucial late spring feeding period (7.5). Refuge management on Islay, while primarily aimed at Barnacle Geese, will benefit some Greenland Whitefronts also. However, the intended or established Barnacle Goose refuges lie outwith the main Greenland Whitefront feeding areas (Stroud, Easterbee and Bignal in prep, Stroud 1985a). The same authors conclude that Greenland Whitefronts require a broader management policy than Barnacle Geese, including habitat protection over a wider area of Islay.

4.2 Legal Status in Ireland

4.2.1 Protection for a three year period (winters 1982/3-1984/5 inclusive) was given to Greenland Whitefronts by the Irish Government.

4.2.2 In summer 1985 the Irish Wildlife Advisory Council fully reviewed the situation of the Greenland Whitefront. Consequent to this, a limited shooting season has been declared at Wexford running from 16 November to 4 January. Elsewhere, the geese remain completely protected. The situation will be reviewed on a year to year basis by the WAC in the light of annual census information.

4.2.3 The Greenland Whitefront is listed on Annex II/2 of the EEC Directive in Ireland. This means that sport shooting can be allowed without breach of the Directive despite their status as Annex 1 species.

4.3 Legal Status in Northern Ireland

4.3.1 Protection has recently been given to Greenland Whitefronted Geese in Northern Ireland under a Wildlife and Conservation (Northern Ireland) Order issued by the Department of the Environment for Northern Ireland in February 1985.

4.4 Legal Status in Iceland

- 4.4.1 Shooting commences in late August and geese can be shot in Iceland throughout the autumn migration. With only 600 waterfowl hunters in 1974 and little tradition of goose-shooting (Lampio 1974, Ruttledge and Ogilvie 1979), there appears little threat from this source of mortality. However, there have been 31 recoveries of ringed Greenland White-fronted Geese to the present, 8.6% of all recoveries, an alarming proportion of these in their first year of life. The Icelanders are now considering legislation to move in line with Great Britain, and since there are no agricultural conflicts nor a large and active shooting lobby given the abundance of other goose quarry, this seems likely to be implemented in the near future.

4.5 Legal Status in Greenland

- 4.5.1 In February 1985, the Greenland Landstinget (Home Rule Parliament) gave full protection to Greenland Whitefronts from spring 1985 for a provisional three year period. This decision is regarded as important, since it is the first change in bird protection legislation since declaration of Home Rule in May 1979.
- 4.5.2 An important factor in the decision was the increased shooting pressure on geese first arriving on the breeding grounds in May. Greenland Whitefronts are unusual amongst geese of the world in not staging en route to the breeding grounds on migration. Instead, they derive supplementary nutrition in Greenland during a period of pre-nesting feeding close to their ultimate nesting areas (Fox and Madsen 1981, Fox and Ridgill 1985). Since it appears the earliest arriving geese are breeding adults, this increasing shooting was disproportionately affecting the already small number of nesting pairs.
- 4.5.3 Although present in midden remains, Whitefronts never seem to have been important prey for historical Inuit and Greenlandic cultures (Stroud in prep). With the notable exception of a very few specialised settlements, these geese have not been a part of the traditional Greenlandic diet. The hunting in spring has been undertaken for sport (rather than subsistence) and generally by Danes and visiting US Service personnel. It is thus considered this legislation change will not significantly affect the Greenlandic way of life.

5. BENEFITS OF PAST PROTECTION

- 5.1 Analysis of past census and productivity data from Islay suggests numbers have risen in winters following good breeding seasons. However, increases are never sustained, with numbers soon falling back to the long-term average of 3,500-4,000 geese. This implies mortality, from whatever source, has always been sufficient to damp any tendency for real and sustained increase in population size.

- 5.2 In considering this information, we feel that count and coverage error (2.5) would not affect productivity scores, nor would have been sufficiently great to mask real and sustained increase in numbers on Islay.
- 5.3 Since protection, Greenland Whitefronts on Islay have apparently risen for two years in succession. Whilst some of the increase following the poor 1983 season may have been due to better counting methods (1.9), the increase following the average breeding season in 1984 is no doubt real.
- 5.4 Although too early to determine if the Islay increase will be sustained, we feel there can be no doubt that protection over the last three winters has been beneficial to the population there.
- 5.5 In bearing this in mind, it should be remembered that Islay is by far the largest and most important of the British wintering sites and may not be typical of the rest of the range where numbers are smaller and more vulnerable.
- 5.6 Few sites elsewhere have sufficient base-line counts to judge increases against, and whilst some sites have shown a recent increase, others have remained stable and yet others have continued to decline. Declines are most commonly manifest amongst the smaller and most isolated flocks. Although a longer period of monitoring is required, protection has undoubtedly helped in most areas, particularly at sites which were subject to heavy shooting disturbance and mortality.

6. TRENDS IN RECRUITMENT AND MORTALITY

- 6.1 Breeding success has been monitored on Islay by age ratio and brood size determination since 1962/63 (Ogilvie 1983, Stroud 1983, 1984, 1985a) and are summarised for Islay in Table 4.
- 6.2 The success varies greatly from year to year; this may be due to extrinsic factors such as the weather on arrival and throughout the summer in Greenland, but probably also reflects aspects of goose condition on the winter grounds during the previous spring.
- 6.3 Confidence in these sample estimates increases with sample size, and some of the earlier samples are based on small numbers of geese aged which may be misleading.
- 6.4 Mean productivity on Islay was 14.51%, alarmingly low for a goose population and particularly so for a quarry species. In contrast, the European race of Whitefront (Anser albifrons albifrons) has on average 34% young in autumn, and the two North American sub-species (Anser albifrons gambeli and Anser albifrons frontalis) produce 37 and 37.5% (Owen 1978).
- 6.5 Brood size, however, is high, the mean of 2.6 equals that of the European race, but is far higher than the 2.2 and 2.5 of the American races. This means that an exceptionally low proportion of mature Greenland Whitefronts breed successfully. This feature is confirmed by studies of Darvic-ringed birds caught in Greenland during 1979 (Fox et al 1983).

- 6.6 With such a small proportion of the population contributing to new recruitment through successful breeding, it is vital that no additional factors contribute to the failure of this small number of breeding pairs.
- 6.7 There is no direct information about mortality rate, although analysis of ringing recoveries of geese ringed in Greenland during 1946-1978 gives a mean of 30.1% (+ 1.4% standard error, after the method of Haldane 1955; Fox and Stroud in prep). This is far higher than that of other western European grey geese (eg Boyd 1956, 1957).
- 6.8 Ogilvie (1983), balancing loss against productivity from incomplete Islay counts, suggested the mean rate of loss to be 10.5% annually. Clearly to balance population gains in what has been assumed to be a stable population, the total rate of loss must have been considerably higher than this.
- 6.9 Whilst it is impossible to interpret the distribution and cause of death amongst recovered birds as reflecting the loss amongst ringed geese and is even less likely to represent the unmarked population, it is of interest to examine these records. Of 230 recoveries of ringed geese in the British Isles, 88.7% were shot, and of those recovered in Ireland, 93.3% were shot, the remainder being recovered by other means.

7. EFFECTS OF WINTER SHOOTING/DISTURBANCE ON BREEDING SUCCESS

- 7.1 Winter shooting, at least on Islay, is age specific. Bag analysis from 1979-1982 (prior to protection) shows that although the number of adults exceeds that of juveniles in all years (2.32 : 1.00 ratio), juveniles are represented in a higher proportion than in the population as a whole in all years (Wilson, Norriss, Stroud and Fox in prep).
- 7.2 This high juvenile mortality from shooting pressure is a feature of all quarry goose populations (Wright and Boyd 1983) and is considered to be related to the experience of an individual and its ability to avoid the hunter which improves with age. Such off-take, particularly in years of poor young production, will severely affect recruitment into breeding age classes in future years.
- 7.3 All geese show an increase in feeding rate prior to migration, usually associated with an improvement in condition. Most geese in Europe and North America then migrate northwards to their arctic breeding grounds via several staging areas where nutrient reserves can be topped up during the energetically demanding flight north.
- 7.4 Greenland White-fronted Geese do stage briefly in Iceland (Fox et al 1983), but are generally far more dependent on accumulated winter fat reserves than other geese.
- 7.5 Disturbance of feeding in late spring prior to departure by shooting of Barnacle Geese (as on Islay under licence) or Greylags (as in Caithness under licence) is likely to have a severe detrimental effect on the efficacy of this feeding period.

- 7.6 In extreme cases, that of breeding females, insufficient accumulated food reserves may result in the inability to breed, or where incubating females need to leave the nest more frequently to avoid starvation, to failure of the breeding attempt.
- 7.7 Fox et al (1983) drew attention to the observed dispersion of marked geese from one area of the breeding grounds to many areas throughout the wintering range. This implies birds from any one wintering flock may derive from many areas in Greenland.
- 7.8 Hence, while the general theory of leapfrog migration appears to relate to Greenland Whitefronts (whereby northern breeding birds resort to the southern parts of the wintering range and southern breeders winter in the north of Britain), high levels of shooting or disturbance at a few wintering areas will affect the birds throughout the summer range (Fox and Stroud in prep). In this way, high levels of mortality at single wintering sites could potentially depress breeding success throughout the population (Abraham 1981).
- 7.9 Given this latter situation and whilst studies relating population structure and dispersal continue, it would appear premature to permit high levels of shooting mortality or other site-related disturbance.
- 7.10 In conclusion, further investigation is required to evaluate rates of mortality in order to comprehend the population dynamics of this goose. It appears that until very recently, mortality balanced production in years of mild winters at least on Islay.
- 7.11 Declines at many other sites suggest that mortality here exceeds recruitment although emigration may be involved at some sites. Since shooting constitutes a major proportion of the winter mortality, this, in conjunction with small population size, vulnerability to poor breeding years and high mortality in severe winters and its overall low production rate all make the Greenland White-fronted Goose an unsuitable quarry species.

8. CONSERVATION OF TRADITIONAL PEATLAND HABITATS

- 8.1 Ruttledge and Ogilvie (1979) considered loss of traditional habitat was a major cause of the population decline between the 1950s and the late 1970s. Reynolds (1984) and Ryan and Cross (1984) have discussed and described the current rate of destruction of Irish peatlands and both concluded that the current rate of site conservation is inadequate to conserve the range of variation present in Irish peatlands. The Forest and Wildlife Service has been documenting those peatlands important for Greenland Whitefronts and the protection of these should be a high priority for any management plan concerning these geese in Ireland.
- 8.2 Appendices 1 and 2 give details of Irish sites where drainage or peat-cutting on traditional peatland wintering areas has resulted in reductions in use or desertion of the site by the geese. Ruttledge and Ogilvie (1979) describe in detail numerous cases where Irish sites have been lost to peat-cutting, drainage or afforestation.

- 8.3 The process leading geese to desert these areas seems twofold. Initially, the change in topography of the area can scare birds away. Ruttledge and Ogilvie describe this happening at Cumber bog, Co. Mayo in the mid-1960s.

"A reason for destruction is given as being the excessive opening up of the bog in the mid-1960s for turf-cutting. Moreover it is felt locally that the birds became scared by the large turf ricks scattered over their habitat and also at the newly cut turf banks. Be that as it may, the first winter of this state of affairs geese came but desertion, not was lack of food, for a knowledgeable local man volunteered that the white cotton grass, on the roots of which he rightly stated the geese feed, had not decreased".

- 8.4. In the long-term, vegetational changes associated with the lowering of the water-table by drainage is also important. Other Irish sites (listed in the Appendices) were probably also affected in this way. A long-term decline in numbers over as much as a decade, probably reflects the response of geese to degraded feeding potential of these peatland roost and feeding sites.

- 8.5 Although the rate of site loss is not as high in Britain as in Ireland, important Greenland Whitefront sites are under threat. In July 1984, the Secretary of State for Scotland gave permission for commercial peat-cutting over Eilean na Muich Dubh SSSI on Islay (Stroud 1985b). This is the most important British site for the race holding a roost of over 600 birds. Despite a request in September 1984 from the European Commission that the site be added to the United Kingdom list of Special Protection Areas under the Wild Birds Directive (4.1), the British Government has refused to withdraw planning permission and site work commenced in June 1985.

- 8.6 In the light of the damage of Eilean na Muich Dubh SSSI by development, a review of all roost sites in Britain is being undertaken in order to provide statutory protection to the most important. An expanding hill forestry industry currently threatens many sites on Islay and in north and west Scotland.

9. REFERENCES

- Abraham, K F (1981) Winter distribution and site fidelity of eastern Brant (Branta bernicla hrota). Unpubl mss; 18 pp. University of Western Ontario.
- Boyd, H (1956) Statistics of the British Population of the Pink-footed Goose. *J Anim Ecol*, 25: 253-273.
- Boyd, H (1957) Recoveries of British-ringed Greylag Geese. *Wildfowl Trust Ann Rep* 8: 51-54.
- Coffey, T (1983a) The Greenland White-front ban - "The Goose that laid the statistical fiddle". *Field and Countryside Monthly*, 1(1): 8-10.

- Coffey, T (1983b) The Greenland White-fronted Goose - "A suitable case shooting". *Field and Countryside Monthly*, 1(3): 6-8.
- Fox, A D, Madsen, J and Stroud, D A (1983) A review of the summer ecology of the Greenland White-fronted Goose Anser albifrons flavirostris. *Dansk Orn Foren Tidsskr*, 77: 43-55.
- Fox, A D and Madsen, J (1981) The pre-nesting behaviour of the Greenland White-fronted Goose. *Wildfowl*, 32: 48-54.
- Fox, A D and Ridgill, S C (1985) Spring activity patterns of migrating Greenland White-fronted Geese in west Greenland. *Wildfowl* 36: 21-28.
- Fox, A D and Stroud, D A (1981) The life history and ecology of the Greenland White-fronted Goose (Anser albifrons flavirostris), pp 148-155 In: Fox, A D and Stroud, D A (eds). Report of the 1979 Greenland White-fronted Goose Study Expedition to Eqaungmiut Nunat, west Greenland. GWGS, Aberystwyth, 319 pp.
- Fox, A D and Stroud, D A (1985) The Greenland White-fronted Goose (Anser albifrons flavirostris) in Wales. *Nature in Wales* in press.
- Fox, A D and Stroud, D A (in prep) Mortality and survivorship of the Greenland White-fronted Goose.
- Haldane, J B S (1955) The calculation of mortality rates from ringing data. *Acta XI Congr Int Orn*, 454-458.
- Ogilvie, M A (1978) Wild Geese. T and A D Poyser, Berkhamstead.
- Ogilvie, M A (1983) Wildfowl of Islay. *Proc Roy Soc Edinburgh* B83: 473-490.
- Owen, M (1978) The Greenland White-fronted Goose - the case for protection. Unpubl mss, Wildfowl Trust, 3 pp.
- Palmer, R S (1976) (ed) Handbook of North American Birds. Volume 2: Waterfowl Part 1: 89-110. Yale University Press, New Haven.
- Reynolds, J (1984) Vanishing Irish Boglands. *World Wildlife News*, Spring 1984: 10-16.
- Ruttledge, R F (1973) Decrease of Greenland White-fronted Geese wintering in Ireland. *Irish Bird Rep*, 21: 65.
- Ruttledge, R F and Ogilvie, M A (1979) The past and current status of the Greenland White-fronted Goose in Ireland and Britain. *Irish Birds*, 1(3): 293-363.
- Ryan, J B and Cross, J R (1984) The conservation of peatlands in Ireland. Proceedings of the International Peat Congress, Dublin: 388-406.
- Stroud, D A (1983) Greenland White-fronted Geese in Great Britain: 1982/83. GWGS, Aberystwyth, 14 pp.

- Stroud, D A (1984) Greenland White-fronted Geese in Great Britain: 1983/84, Aberystwyth, 12 pp.
- Stroud, D A (1985a) Greenland White-fronted Geese in Great Britain: 1984/85. GWGS, Aberystwyth, 20 pp.
- Stroud, D A (1985b) The case of Duich Moss. *Ecos* 6(1): 46-48.
- Stroud, D A (in prep) Historical records of Greenland White-fronted Geese in Greenlandic midden remains.
- Stroud, D A, Easterbee, N and Bignal, E (in prep) Numbers and distribution of geese on Islay, Argyll in 1983/84.
- Wilson, H J, Norriss, D W (1985) The Greenland White-fronted Goose in Ireland 1982/83 to 1984/85. Rep. Forest and Wildlife Service, 37pp.
- Wilson, H J, Norriss, D, Stroud, D A and Fox, A D (in prep) Weights and biometrics of Greenland White-fronted Geese in winter. Submitted to Bird Study.
- Wright, G and Boyd, H (1983) Numbers, age and sex of Greylag and Pink-footed Geese shot at Loch Leven National Nature Reserve, 1966-1981. *Wildfowl*, 34: 163-167.

Table 1. Summary of Greenland White-fronted Goose counts from Britain 1982/83 to 1984/85.

	Nov 1982	Mar/Apr 1983	Nov 1983	Mar/Apr 1984	Nov 1984	Mar/Apr 1985
NE Scotland	457	576	315	410	376	518
NW Scotland	185	80	177	136	176	79
N Argyll	873	1068	985	896	1304	1110
S Argyll - Islay	3250	3441	4592	4198	5256	4715
Other sites	1723	1413	1342	1484	1659	1761
Galloway	595	631	683	720	633	668
England	33	0	1	4	10	13
Wales	73	73	93	78	76	88
British Total	7189	7282	8188	7926	9490	8952

Table 2. Distribution by area (Stroud 1984) of peak counts of Greenland Whitefronts on the Island of Islay, Argyll.

	1981/82	1982/83	1983/84	1984/85
Oa	540	758	865	1232
Ardtalla	0	0	0	95
Gruinart	322	114	415	884
Gorm ...	232	197	454	390
Rhinns .	396	657	504	217
Laggan .	527	444	646	777
Glen ...	475	174	350	340
Kilmeny	1096	1535	1358	1321
Total ..	3588	3879	4592	5256

Table 3. Co-ordinated Greenland White-fronted Goose counts on Islay, 1982/83-1984/85.

1982/83		1983/84		1984/85	
16-19 November	3250	2 November	4030	25 October	2448
		15-18 November	4312	26 October	3362
		22 November	3925	21 November	3690
		23 November	4592	22 November	5256
		20 December	3936	19 December	4462
2- 3 February	2826	21 December	3641	20 December	4012
		19 January	3468	30 January	4473
14 February	3879	20 January	3331	1 February	3698
15 February	3500	16 February	3478	28 February	5358
1- 2 April	3441	17 February	3730	1 March	4941
		16 March	3435	28 March	4715
21 April	2646	27 March	4198	29 March	3789
22 April	1829	17 April	3164		
		18 April	2560		

Table 4. Long-term productivity data for Greenland Whitefronts wintering on Islay, Argyll. (Ogilvie 1983 and in litt, and Stroud unpubl).

Breeding Season	% Young	Mean Brood Size	Sample Size (where known)
1962	14.1	-	
1963	17.0	-	
1964	15.1	-	
1965	15.4	-	
1966	26.1	2.7	582*
1967	16.0	1.7	
1968	16.2	1.5	
1969	9.3	2.0	
1970	12.5	2.8	
1971	7.4	2.0	
1972	4.6	2.2	1347
1973	15.1	2.8	1600
1974	18.4	2.9	
1975	21.4	3.2	
1976	20.8	3.4	
1977	10.2	3.1	
1978	9.7	2.8	
1979	11.9	2.8	1440
1980	23.3	3.1	1787
1981	14.3	3.1	
1982	12.9	2.7	1309
1983	9.9	2.7	2121
1984	12.1	2.8	1920
Mean Values	14.51	2.60	

* Some doubt must be thrown on this apparent high productivity given the very small sample of geese aged.

Appendix A. Details of Irish Greenland Whitefront wintering sites where numbers have declined due to drainage or peat-cutting. Adapted from Ruttledge and Ogilvie (1979).

<u>Site</u>	<u>1950s</u>	<u>1970s</u>	<u>Reasons for decrease</u>
Downpatrick Marshes, Co. Down	150	50-60	Drainage of marshland used as feeding area in 1964
Lough Kinale, River Inny flats and Lough Bane, Co. Longford	100	15-20	Drainage of rough low-lying pasture
Lough Iron and Complex, Co. Westmeath	500	200	Major drainage and peat-cutting by Bord na Mona on main bog roost areas
River Inny mouth, Co. Longford	400-150	20	Extensive drainage of marshland feeding areas and heavy shooting pressure
Inchenagh, Lough Ree, Co. Longford	100+	25	Peat-cutting by Bord na Mona on two well-used bogs in area; shooting
The Curragh, Co. Laois	50-150	25-40	Drainage of callow feeding areas
River Shannon, Athlone to Portumna	600	200-250	Peat-cutting on bog roost/feeding sites by Bord na Mona; shooting
Little Brosna River, Cos. Offaly Tipperary	400	150-170	Peat-cutting on bog roost/feeding sites by Bord na Mona; shooting
Lough Funshinagh, Co. Roscommon	300	125	Peat-cutting on bog roost/feeding sites (Muckanagh bog) by Bord na Mona
Rahasane turlough, Co. Galway	125-300	80-115	Drainage and flooding of turlough and marshes
Lough Corrib, Cos Galway Mayo	100-200	50-100	Drainage of callows and marsh feeding areas

<u>Site</u>	<u>1950s</u>	<u>1970s</u>	<u>Reasons for decrease</u>
Altmore Lake, Co. Galway	100+	30-40	Extensive drainage of feeding area
Bog of Erris, Co. Mayo	200-400	200	Extensive peat-cutting, drainage and afforestation on bog feeding/roost areas
Lough Gara, Co. Sligo	c500	175-200	Peat-cutting of bog roost sites
SE of Ardara, Co. Donegal	50-200	50-60	Afforestation of boggy feeding areas in valley of River Corker

Appendix B. Details of Irish Greenland White-fronted Goose wintering sites due to drainage or peat-cutting practices.
Adapted from Ruttledge and Ogilvie (1979).

<u>Site</u>	<u>1950s</u>	<u>Reasons for decrease</u>
Coolamber, Cromium, Castlewilder, River Deel, Co. Westmeath	200-300	Drainage and peat-development
Marshes and bogland bordering Lough Ree, Co. Roscommon	150+	Heavy shooting pressure and drainage
River Suir Valley, Co. Tipperary	up to 200	Arterial drainage of callows in 1960's
Inish-Cull, Co. Wexford	up to 200	Drainage of callows in 1958
Marshes NW of Killorglin, Co. Kerry	50	Drainage
Moors N of Spiddal, Co. Galway	up to 200	Peat-cutting and road construction to peat-banks on previously undisturbed bog feeding area; also widespread afforestation of peat-bogs
Carrowbourne Callows, Co. Galway	50-100	Drainage of callows
Cloonken turlough, Co. Galway	c150	Drainage of callows and feeding marshes in 1957-58
Killower turlough, Co. Galway	?	Drainage of callows
Birmingham turlough, Co. Galway	150+	Drainage of feeding marshes
Carnagoon & Brackloon turlough, Co. Galway	100	Drainage of turlough in 1959
Moors SE of Louisburgh, Co. Mayo	50	Drainage and afforestation of bog feeding areas
Lough Deen, Bloomfield bog & Lough Carra, Co. Mayo	50	Drainage and peat-cutting of bog roost area
Bogs near Brickeens, Co. Mayo	50	Drainage, reclamation, peat-cutting and afforestation on bogs in 1950s

<u>Site</u>	<u>1950s</u>	<u>Reasons for decrease</u>
Bogs south of Lough Glinn, Co. Mayo	<50	Peat-cutting and afforestation on bogs
Cummer Bog, Co. Mayo	8-120	Extensive peat-cutting and associated disturbance on main bog feeding site
River Mey Valley, Co. Mayo	400	Initially heavy shooting, finally when numbers already depleted, drainage of main callow feeding area
North of Lough Feagh, Co. Mayo	30	Afforestation of bog feeding area

PART 6: HISTORY OF THE PLANNING APPLICATION

1. Early in February 1983, Scottish Malt Distillers (SMD), who, although not owning the site had purchased the peat extraction rights, made a formal application to extract peat from approximately 151 acres (61 ha) in the south west sector of the site. Commercial peat extraction, partly for the purpose of supplying whisky distilleries on Islay, has been undertaken for some years in the north eastern sector of the site known as Laggan Moss but, as explained in Part 4, this sector is hydrologically separate from the area proposed for extraction in SMD's application.
2. The SMD application involved the construction of an access road and intensive drainage over a period of two years prior to cutting. The work was proposed in three consecutive phases moving progressively towards the centre of the site.
3. NCC lodged a strong objection to the local planning authority on the basis that a nature conservation site of international importance would be very seriously damaged by the development. At the same time, NCC was able to show that not only was there no immediate requirement for the peat, but there were several alternative sources of suitable quality peat, including Laggan Moss (see Part 8). The Greenland White-fronted Goose Study also made a formal objection to the local planning authority. Subsequently these two formal objections were endorsed by: International Council for Bird Preservation - UK, International Council for Bird Preservation - Denmark, World Wildlife Fund - UK, World Wildlife Fund - Denmark, International Waterfowl Research Bureau, Scottish Ornithologist's Club, Royal Society for the Protection of Birds, and the Islay Natural History Trust.
4. Under the National Planning Guidelines, this case was referred to the Secretary of State for Scotland who indicated in July 1984 that planning permission should be granted, subject to certain planning conditions to safeguard nature conservation interests. The Secretary of State's decision letter indicated that he was not convinced (despite NCC's assessment) that the site would be adversely affected by the development, and he requested that the various parties concerned make recommendations on necessary planning conditions.
5. NCC prefaced its submission (attached as Annex 1) on the latter by making it clear that in its opinion, the attachment of such conditions would not prevent

serious damage to the site, and recommended that a comprehensive hydrological survey be carried out prior to any development (including drainage) in order, given planning approval, to determine planning conditions.

6. In December 1984, the Secretary of State confirmed his decision to allow peat development and the conditions to be attached to this including (see Annex 2) timing of operations, drainage and site restoration.
7. Following the Secretary of State's decision, NCC has continued to receive strong representations from voluntary conservation bodies expressing their concern at the threat to this site; the RSPB in particular has publicly criticised the Secretary of State's decision and lodged a formal complaint with the European Commission on his alleged failure to take account of the international importance of the site under the terms of the EEC directive. In late July 1985 Friends of the Earth (FoE) invited NCC to attend a public meeting on Islay to discuss the issue, but it became clear subsequently that this was to be preceded by a demonstration on the site involving FoE and the TV personality, Dr David Bellamy, effectively preventing the commencement of access road construction. Despite misgivings it was felt that NCC, with their direct interest in this SSSI, should be represented at the public meeting to present factual information, especially in view of SMD's attendance. NCC was represented by Mr Kerr, Regional Officer and Mr Lindsay, Chief Scientist's Directorate. This was preceded by an NCC Press Notice on 2 August 1985 (Annex 3). The public meeting was notable for very hostile reactions on the part of some Islay residents and councillors towards the supporters of conservation.
8. At the meeting FoE obtained SMD's agreement to attend a meeting with NCC under the chairmanship of Mr Archy Kirkwood MP, a Vice-Chairman of the NGO (Non-Governmental Organisations) liaison group 'Wildlife Link' (although the local MP is Mr John J MacKay). Before this meeting could be arranged SMD sought a private meeting directly with NCC, which the latter accepted. At this meeting SMD insisted that their activities would not damage the core area of the site. However, they offered to co-fund with NCC a hydrological survey of the site by an independent hydrologist for a five year period. SMD stated that their initial cutting within the first phase of the operations covered by the planning consent would be restricted to half of this first phase. The outline of this agreement (which, given the planning permission, NCC had little option but to accept) is reflected in the joint SMD/NCC Press statement attached as Annex 4 to this Part.



NATURE CONSERVANCY COUNCIL

James McCarthy B.Sc.(For.)

Deputy Director, Scotland

Scottish Headquarters, 12 Hope Terrace, Edinburgh EH9 2AS. Telephone 031-447 4784

D J Esseray Esq
Scottish Development Department
New St Andrew's House
EDINBURGH
EH1 3SZ

Your ref: P/PP/75/SA/6

Our ref: 1273

30 August 1984

Dear Mr Esseray

DUICH PEAT MOSS, ISLAY: PLANNING APPLICATION BY SCOTTISH MALT DISTILLERS

Your letter of 18 July 1984 setting out the Secretary of State's decision on the above application and requesting further action by Argyll and Bute District Council, Scottish Malt Distillers and the Nature Conservancy Council refers.

Before dealing in detail with the question of conditions that might be attached to a planning permission, my Council wish to make clear their view that commercial peat extraction anywhere within the area to which the application refers will damage the special scientific interest of the site, and that no conditions attached to the planning permission can prevent that damage or ameliorate its long term effect to a satisfactory degree

The application is for 3 phases of extraction and Scottish Malt Distillers have indicated in their letter to you of 14 August 1984 that these would cover their requirements for 15, 19 and 14 years respectively, and that on the basis of a 1 m cut only. In discussion with their staff on site we have established that these figures are based on maximum production rates for the distillery. At the current level of production, however, Phase 1 is likely to last for the order of 30 years. It is moreover probable that research on the more efficient use of peat in the production process will mean that the Phase 1 area will support the distillery for an even longer period.

We have also noted that the detailed plans now submitted by Scottish Malt Distillers have altered, by extending, the area which was the subject of the planning application. As a general point, therefore, we would submit that, as Scottish Malt Distillers have made clear that development of the areas within Phases 1-3 will meet their longer term needs, the planning permission should not extend to either (a) the area contained in the application which is outside the Phase 1-3 locations or (b) the land which lies outside the original application area.

We are in no doubt that Phases 2 and 3 in particular will affect the hydrology of the core area of the bog. Precisely what the effects will be could only be gauged, however, after a full impact assessment involving a detailed hydrological survey. Such a survey, by an independent expert, is an essential prerequisite for framing conditions aimed at minimising damage to the site.

A detailed survey of this kind might be expected to take 2-3 years. It would appear that this delay in itself need not be damaging to SMD's interests, as (a) we understand that they have existing stocks of peat for some years ahead and/or (b) NCC is prepared, if need be, to consider entering into an agreement with SMD to ensure that they can obtain suitable peat supplies, in the interim and on an acceptable basis, from MacIntyre and Brown's existing operation - which was originally opened to supply SMD, and of which SMD currently take only a proportion.

Even if SMD run at maximum production, the MacIntyre and Brown peat resource is assessed as adequate to maintain SMD's operation for some 7 years, i.e. more than enough time for a detailed hydrological study and for the new ground at Duich Moss then to be prepared for working, taking account of the impact assessment.

In the light of these facts, we wish to propose, as the first condition of the planning permission, that no work be started until a detailed hydrological survey has been carried out by independent experts, and its results made available to the NCC, so that detailed conditions relating to the operations can be formulated for the Secretary of State's subsequent consideration.

We submit that responsibility for commissioning the hydrological survey should lie with SMD, as the developer whose activities the Secretary of State rightly wishes to ensure should cause minimal damage to this nationally important site. NCC is ready to advise on the specification and terms of reference which would form the basis of a suitable contract: the person or body contracted to carry out the survey should be agreed by SMD and NCC.

During Phase 1, and following the hydrological survey, monitoring the effects of the operations on the scientific interest of the site would enable an assessment to be made of the relative merits of (a) subsequently extracting peat from a second area or (b) cutting the first area to a greater depth.

As Phase 1 is estimated by SMD to last for 15 years (and it could be much longer) we would ask whether it might be considered appropriate, in the circumstances, to limit the planning permission to the Phase 1 operations only? Alternatively, we would suggest a condition that no aspect of subsequent Phases (eg preparatory work such as drainage) should proceed until an assessment has been made of the effects of Phase 1, to enable NCC to advise on the manner in which subsequent Phases might proceed with least damage to the site. In this connection, a review and assessment after the first five years' operations in Phase 1 should also be required.

In this way, the overall impact of the proposal may be reduced and ultimately phased restoration may be possible. Drainage of the entire area within the first year or so would result in a profound lowering of the water-table, both within the working area and in the immediate surrounds, resulting in an immediate loss of wildlife interest. A phased loss of wildlife interest is obviously preferable to a sudden, catastrophic loss, particularly if restoration is part of the programme.

The proposed conditions set out above, and summarised for ease of reference below, we believe to be essential in this case, in view of the importance of the site for nature conservation. Precise hydrological data, in particular, are necessary as a basis for formulating satisfactory conditions for the development. We attach as an Appendix, more detailed points which indicate the kind of considerations which might apply: these have been drawn up on the basis of existing knowledge and in some cases could be subject to amendment in the light of the outcome of the hydrological studies.

Summary of main conditions proposed by NCC

1. A hydrological survey by independent experts (agreed between SMD and NCC) to be commissioned by SMD:NCC to advise on specification and terms of reference for the study.
2. Results of the survey to be made available to NCC who will then provide the Secretary of State with their proposals for detailed conditions to be attached to the planning permission in order to minimise damage to the site.
3. No work to take place on site pending the Secretary of State's decision on these proposed conditions.
4. Planning permission not to extend to land within the area of the application which lies outside the locations of Phases 1-3; or to any land outside the area of the application.
5. Planning permission to be restricted to the Phase 1 location only; or to Phase 1 initially; the conditions to be attached to Phase 2 and 3 to be contingent upon and framed in the light of assessments of the effects of Phase 1 (a) after the first 5 years' operations and (b) at the end of Phase 1.

Time has not permitted discussion of these proposals with Scottish Malt Distillers or the District Council, to whom I am copying this letter. The proposed conditions have the full support of the Greenland White-fronted Goose Study.

Yours sincerely

J McCARTHY
Deputy Director (Scotland)

METHODS

- a. Access Road. The alignment should be roughly parallel to the river. In order to prevent permanent damage, the road should be constructed in such a way as to facilitate its removal at the end of the period. NCC recommends the use of drive-on mats of the type supplied by Domnick (brochure enclosed).
- b. Drainage. It is essential that the cutting hollows be cut parallel to the contour. The arterial drains can be cut at any angle thereto but preferably not at right angles. This will reduce erosion and facilitate reinstatement.
- c. Cutting. The peat should be worked by sod cutting. Milling should be prohibited as this would make reinstatement extremely difficult. Although in their submission SMD refer to other methods of cutting, it is essential that the work should be restricted to sod-cutting. All other currently used methods are unacceptable as they render restoration extremely difficult or impossible. The only form of peat extraction which provides conditions which are known to be suitable for restoration is sod-peat cutting.

RESTORATION OF THE SITE

At the end of the extraction of the 1 m cut, all arterial drains must be blocked at intervals along their length. The interval will be dependent on slope but should be such that the crest of one dam is approximately the same level as half way up the face of the next dam upslope. Construction of the dam would consist of a corrugated plastic sheet driven into the peat such that its edges are 30 cm into the peat on either side and into the bottom of the drain. Peat is packed on either side of this and stakes driven in at an angle to form a dam of roughly triangular sections. Sluices should be installed at the top of each arterial drain in order to retain as much water as possible in the core area of the bog. After the final cut the baulks should be left standing 40-50 cm above the hollows. All of this work is aimed at reducing the rate of water loss and encouraging Sphagnum growth. All tracks and buildings should be removed if so required by NCC.

TIMING

No work should be carried out on the site between 31 September and 1 May while the white-fronted geese are present.

OTHER REQUIREMENTS

- a. Damage to the site would be considerably lessened if, for all work, vehicles with special low pressure tyres were used.
- b. It would be helpful for NCC to be kept informed of progress with the work through an annual liaison meeting at which there was a report on the work done and discussion of the programme for the coming year.
- c. NCC employees should have permission to visit the area at any time, by arrangement, in order to carry out monitoring.
- d. Tracked vehicles should not be used within the application area outside the Phase 1-3 locations.



SCOTTISH DEVELOPMENT DEPARTMENT

New St Andrew's House Edinburgh EH1 3SZ

Telephone 031-556 8400 ext or

Our Ref: P/PP/75/SA/6

Scottish Malt Distillers Limited
1 Trinity Road
Elgin
Morayshire
IV30 1UF

18 December 1984

Dear Sirs

**TOWN AND COUNTRY PLANNING (SCOTLAND) ACT 1972
THE TOWN AND COUNTRY PLANNING (REFERENCE OF APPLICATION)
(ARGYLL AND BUTE DISTRICT COUNCIL) (PLANNING PERMISSION FOR THE
WINNING AND WORKING OF MINERALS AT THE DUICH PEAT MOSS, PORT
ELLEN, ISLAY) DIRECTION 1983**

In my letter of 18 July 1984 I conveyed the Secretary of State's conclusion, for the reasons given therein, that planning permission should be granted for the extraction of peat at Duich Moss, Port Ellen, Islay, subject to conditions which he proposed to attach to ensure that the risk of damage to the nature conservation interest of the then proposed Eilean Na Muice Dubh Site of Special Scientific Interest is minimised. I also conveyed the Secretary of State's invitation to the parties concerned to suggest conditions which might be attached to the grant of planning permission. Responses to the Secretary of State's invitation were received from Argyll and Bute District Council, the Nature Conservancy Council, the Greenland White-Fronted Goose Study and your company and these have all been carefully considered. The Secretary of State has noted in particular from your letter of 16 August 1984 that the first cut from Phase 1 should cover your company's requirements of peat for the Port Ellen Maltings for 15 years.

Having completed his consideration of the whole matter, the Secretary of State hereby grants planning permission for the extraction of peat at Duich Moss in terms of your application dated 4 February 1983, subject to the following conditions:-

Location and Timing of Operations

1. No operations, except the construction of the access road, shall be carried out by your company or by agents acting on their behalf outwith the areas described in Phases 1, 2 and 3 in drawing PTE3/84 dated 7 August 1984 submitted with your letter of 16 August 1984 and copied to Argyll and Bute District Council and the Nature Conservancy Council.

2. Tracked vehicles shall not be used by your company, or by agents acting on their behalf, outside the Phase 1-3 locations as so described, except where this may be necessary for the construction of the access road.

3. To minimise disturbance to geese, no operations, including the construction of the access road, shall be carried out between 30 September and 1 April during the period of currency of the planning permission hereby granted.

Access Road

4. The access road shall be constructed along the route shown, and in the manner described, in drawing PTE3/84 dated 7 August 1984. Culverts must be adequate to carry the flow from the area drained and must be at least 600mm in diameter.

5. The junction of the access road with the A846 shall be formed with bellmouth radii of at least 7.5 metres and a gradient not exceeding 1 in 20 for the first 5 metres and 1 in 10 thereafter. The culvert required at the junction shall be installed in consultation with Strathclyde Regional Council's Area Engineer.

Method of Cutting

6. The peat shall be worked by the machine sod-cutting method, initially to a depth of 1 metre or thereby. If as a result of technological improvements in peat cutting methods an alternative means of cutting should in due course be envisaged, the Nature Conservancy Council shall be consulted by your company before any such alternative method is adopted.

Drainage

7. The arrangements for the drainage of the Phase 1 cutting area shall be as described in drawing PTE3/84 dated 7 August 1984 except that the angle of the new outfall ditches running between the southern boundary of the Phase 1 area and the Duich River shall, where necessary, be altered to ensure that the ditches do not cross the contours at a right angle.

8. No drainage of Phases 2 or 3 shall be carried out until at least 12 years after cutting operations in Phase 1 have begun and drainage of Phase 2 is required in anticipation of the commencement of cutting therein. Similarly, no operations shall be carried out in Phase 3 until drainage is required in anticipation of the commencement of cutting therein following the completion of operations in Phase 2.

Livestock

9. For the protection of livestock, before operations connected with the peat extraction commence, stockproof fences shall be erected around the site, or part of the site concerned, and a gate left (or provided if necessary) in the southern boundary to allow stock to escape from the grazings to the south in times of river flooding. The fences and gates shall be maintained in stockproof condition until the restoration of the site, or part of the site concerned, is complete.

10. After the extraction of the peat, the turf shall be laid in such a way as to provide safe grazing for livestock.

Restoration of the Site

11. Once the new outfall ditches are no longer required for the drainage of any of the peat cutting areas covered by this grant of planning permission, they shall be blocked by dams at intervals along their length, the intervals to be dependent on the slope, although they should be such that the crest of one dam is approximately the same level as half way up the face of the next dam up-slope.
12. Construction of each dam shall consist of a corrugated plastic sheet driven into the peat in such a way that its edges are 30cm into the peat on either side and into the bottom of the outfall ditch. Peat shall be packed on either side of the corrugated plastic sheet and stakes shall be driven in at an angle to form a dam of roughly triangular sections.
13. Dams shall be installed at the top of each outfall ditch to retain as much water as possible in the core of the bog. After the final cut the baulks shall be left standing above the hollows.
14. All ground affected by the creation of tracks shall be restored so far as possible to the condition it was in before the commencement of the operations.
15. The restoration work to be carried out in respect of each phase shall be begun immediately on completion of cutting operations in that phase.

General

16. The development to which this planning permission relates must be begun not later than 5 years after the date on which the permission is granted.
17. Before any drainage work for Phase 2 is begun, all of the conditions numbered 6 to 15 above shall be reviewed by the planning authority in consultation with your company and the Nature Conservancy Council in order to determine whether a second cut from Phase 1 and the development of Phases 2 and 3 shall proceed on the basis of these conditions or whether any revised and/or additional conditions in relation to the matters referred to may be appropriate. If your company or the Nature Conservancy Council consider the proposals put forward by the planning authority in the light of their review of conditions 6 to 15 to be unacceptable in any respect, the disagreement shall be referred to the Secretary of State for determination after consultation with the planning authority, your company and the Nature Conservancy Council.
18. In the event of your company deciding to proceed, in advance of the development of Phase 2, with a second cut from Phase 1 or with the development of Phase 3, the foregoing conditions shall apply mutatis mutandis.
19. This permission shall enure only for the benefit of Scottish Malt Distillers Ltd and only for the purpose of extracting peat for use in the production of whisky in their distilleries on Islay and not for the benefit of the land or any person for the time being interested therein.

The Secretary of State has noted that your company would have no objections to a hydrological survey of the Moss being undertaken simultaneously with the extraction of peat from Phase I, with the costs being shared equally between your company and the Nature Conservancy Council. He has also noted that your company would be prepared to keep the Nature Conservancy Council informed of the progress of work by means of annual liaison meetings, and to allow representatives of the Nature Conservancy Council to visit the area, by arrangement, and to undertake whatever monitoring they consider relevant, so long as this does not interfere with operations.

The foregoing decision of the Secretary of State is final subject to the right, conferred by sections 231 and 233 of the Town and Country Planning (Scotland) Act 1972, of any person aggrieved by his decision to apply to the Court of Session within 6 weeks of the date hereof. On any such application the Court may quash the decision if satisfied that it is not within the powers of the 1972 Act or that the applicants' interests have been substantially prejudiced by a failure to comply with any requirement of that Act or of the Tribunals and Inquiries Act 1971 or of any orders, regulations or rules made under these Acts.

A copy of this letter has been sent to Argyll and Bute District Council, the Nature Conservancy Council and the Greenland White-Fronted Goose Study.

Yours faithfully



(D J ESSERY)

*** * * press notice * * ***

Nature Conservancy Council

FOR IMMEDIATE RELEASE
2.8.85

**DUICH MOSS, ISLAY : STATEMENT BY
THE NATURE CONSERVANCY COUNCIL**

In view of recent on site developments and confusion about the state of negotiations to safeguard Duich Moss from the damaging effects of peat extraction, the NCC wishes to put on public record its part in events since the Secretary of State for Scotland granted conditional planning permission on 18 July 1984.

The NCC accepted that the statutory processes were effectively completed with that decision and therefore directed its efforts towards a voluntary arrangement which protected the Moss but did not disadvantage Scottish Malt Distillers Ltd or threaten future employment prospects on the island. On its own initiative the NCC found an alternative peat supply within the SSSI of the required quality (from a source already used by the Distillery) which would last well into the next century. Proposals were submitted to SMD on 15 March and 24 April 1985 but were rejected by them on the grounds that the proposed suppliers would be unable to meet their full requirements. Discussions with the suppliers have shown this to be incorrect.

SMD themselves proposed a jointly funded (SMD/NCC) hydrological survey during phase 1 of the extraction process, but this was conditional upon commencement of work. NCC could not agree to participate on these terms.

NCC is prepared to meet with SMD to consider any further options resulting in the long term protection of this internationally important site for nature conservation.

For Further Information please contact:

Mr A J Kerr
Regional Officer
Nature Conservancy Council
The Castle
Loch Lomond Park
Balloch
Dunbartonshire
G83 8LX

Telephone: 0389 58511 (Before 1700 hours 2.8.85)
0436 5421 (After 1700 hours 2.8.85)

PRESS RELEASE: DUICH MOSS, ISLAYFROM SCOTTISH MALT DISTILLERS LIMITED &
THE NATURE CONSERVANCY COUNCIL

A meeting has been held between Scottish Malt Distillers Limited (SMD) and the Nature Conservancy Council (NCC) to discuss the proposed development of part of Duich Moss, Islay, a Site of Special Scientific Interest (SSSI) for which planning permission has already been granted to extract peat. SMD have declared their intention to avoid operations which could in any way adversely affect the flora and fauna of the main area of the Moss lying outside the ground scheduled for future development and specifically the habitat for Greenland White-fronted Geese which use the northern part of Duich Moss in winter. SMD and NCC have agreed to the appointment of an independent expert consultant to undertake a jointly-funded scientific survey of the site for 5 years in order to investigate the hydrology and ecology of the Moss in relation to drainage and peat extraction. Such a survey, to include monitoring of proposed drainage, is required to determine its effects on the ecology of the site and would be used as a basis for reviewing future peat extraction.

SMD have agreed that within the first phase of peat extraction for which planning permission has been granted, internal cross-drainage will initially be limited to approximately half of that area and that commercial peat cutting over the same area will commence as planned in 1988. Internal drainage would not commence until Spring 1986 which would allow for the detailed determination of terms of reference of the studies referred to above. During the initial drainage period, SMD will continue as at present to draw on peat supplies from the Laggan Moss.

30th August 1985

Contacts:

Alan Tait (for SMD)

01-930 1040

(NCC Scotland) Mr J McCarthy

031-447 4784

An impasse at Duich Moss

Sir,—As the Nature Conservancy Council's "chief negotiator" whose resignation is called for by Friends of the Earth over the issue of Duich Moss (Guardian, August 31) perhaps I may be permitted to amplify the remarks attributed to me.

The Council has been throughout this case quite unequivocal in its scientific advice, but must now respect the legal decision of the Secretary of State (whether it likes that decision or not) if it expects others to do likewise. Council staff have spent considerable time and effort to establish the feasibility of supplying peat from an alternative site, including the offer of compensation for any additional costs, but have been unsuccessful in persuading Scottish Malt Distillers to consider this. It must be emphasized that in these circumstances it can

Guardian 5.9.85.
only be a matter of persuasion.

Far from being "hoodwinked by the whisky barons" we have been only too aware of the reality of the situation following the granting of planning consent. Friends of the Earth have not indicated what they expect the council to do in this situation, but we would welcome proposals which are not merely empty gestures of disapproval.

Having made the strongest possible case for conservation through all the channels available to us, we are now in the business of doing whatever is in our power to reduce the impact of the development on this important wildlife site.—Yours

faithfully,
J. McCarthy,
Nature Conservancy Council,
12 Hope Terrace,
Edinburgh.



NATURE
CONSERVANCY
COUNCIL

2 August 1985

Press notice

DUICH MOSS, ISLAY : STATEMENT BY
THE NATURE CONSERVANCY COUNCIL

In view of recent on site developments and confusion about the state of negotiations to safeguard Duich Moss from the damaging effects of peat extraction, the NCC wishes to put on public record its part in events since the Secretary of State for Scotland granted conditional planning permission on 18 July 1984.

The NCC accepted that the statutory processes were effectively completed with that decision and therefore directed its efforts towards a voluntary arrangement which protected the Moss but did not disadvantage Scottish Malt Distillers Ltd or threaten future employment prospects on the island. On its own initiative the NCC found an alternative peat supply within the SSSI of the required quality (from a source already used by the Distillery) which would last well into the next century. Proposals were submitted to SMD on 15 March and 24 April 1985 but were rejected by them on the grounds that the proposed suppliers would be unable to meet their full requirements. Discussions with the suppliers have shown this to be incorrect.

SMD themselves proposed a jointly funded(SMD/NCC) hydrological survey during phase 1 of the extraction process, but this was conditional upon commencement of work. NCC could not agree to participate on these terms.

NCC is prepared to meet with SMD to consider any further options resulting in the long term protection of this internationally important site for nature conservation.

For further information

Contact: Sandy Kerr 0389 58511

Helensburgh 5421 after 5 pm

PRESS RELEASE: DUICH MOSS, ISLAYFROM SCOTTISH MALT DISTILLERS LIMITED &
THE NATURE CONSERVANCY COUNCIL

A meeting has been held between Scottish Malt Distillers Limited (SMD) and the Nature Conservancy Council (NCC) to discuss the proposed development of part of Duich Moss, Islay, a Site of Special Scientific Interest (SSSI) for which planning permission has already been granted to extract peat. SMD have declared their intention to avoid operations which could in any way adversely affect the flora and fauna of the main area of the Moss lying outside the ground scheduled for future development and specifically the habitat for Greenland White-fronted Geese which use the northern part of Duich Moss in winter. SMD and NCC have agreed to the appointment of an independent expert consultant to undertake a jointly-funded scientific survey of the site for 5 years in order to investigate the hydrology and ecology of the Moss in relation to drainage and peat extraction. Such a survey, to include monitoring of proposed drainage, is required to determine its effects on the ecology of the site and would be used as a basis for reviewing future peat extraction.

SMD have agreed that within the first phase of peat extraction for which planning permission has been granted, internal cross-drainage will initially be limited to approximately half of that area and that commercial peat cutting over the same area will commence as planned in 1988. Internal drainage would not commence until Spring 1986 which would allow for the detailed determination of terms of reference of the studies referred to above. During the initial drainage period, SMD will continue as at present to draw on peat supplies from the Laggan Moss.

30th August 1985

Contacts:

Alan Tait (for SMD)

(NCC Scotland) Mr J McCarthy

01-930 1040

031-447 4784