



NATIONAL PARKS AND WILDLIFE SERVICE  
THE OFFICE OF PUBLIC WORKS  
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WORKING DOCUMENT:  
EXECUTIVE SUMMARY

# GREENLAND WHITE-FRONTED GOOSE

*Anser albifrons flavirostris*

## INTERNATIONAL CONSERVATION PLAN

Prepared for the

NATIONAL PARKS AND WILDLIFE SERVICE  
OF THE OFFICE OF PUBLIC WORKS, IRELAND

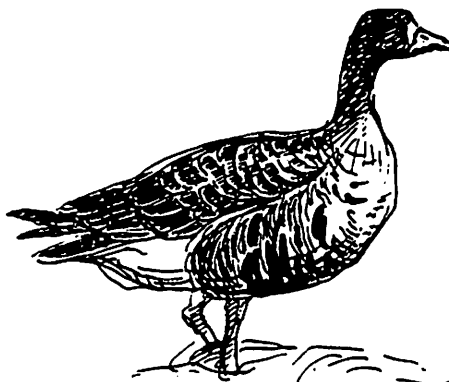
and the

INTERNATIONAL WATERFOWL AND WETLANDS RESEARCH BUREAU

by

David A. Stroud  
UK Joint Nature Conservation Committee

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# **Greenland White-fronted Goose International Conservation Plan Executive summary**

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## **1. Introduction**

- 1.1 For some years, those involved in Greenland White-fronted Goose conservation have promoted the need for a conservation plan for the whole population. This would address the various problems and opportunities facing the population at an international level and facilitate co-operation between the four Range States (Greenland/Denmark, Iceland, Ireland and the United Kingdom) responsible for the well-being of this small population.
- 1.2 The first steps in this direction were taken at the Meeting of the Contracting Parties to the Ramsar Convention at Montreux, Switzerland in 1990. A meeting of representatives of the four Range States was held to discuss co-operation, at which Ireland offered to be host to a further meeting of Range States to discuss further future co-operation. This is being held at Wexford, Ireland in March 1992. In preparation for this, Ireland contracted the International Waterfowl and Wetlands Research Bureau to develop an international conservation plan which has been prepared by the UK Joint Nature Conservation Committee.
- 1.3 The format for site management plans developed by the former Nature Conservancy Council was chosen as a basis to develop the draft conservation plan. Although it is a lengthy document, it presents the necessary technical background in a logical format which has been subject to much previous development. This executive summary describes the principal plan actions and explains their derivation.
- 1.4 The draft plan has been developed following extensive consultation with interested parties throughout the range of the Greenland White-fronted Goose.

## **2. The population**

- 2.1 The Greenland White-fronted Goose is the most morphologically distinct of all races of White-fronted Goose and has discrete breeding and wintering areas. It breeds in west Greenland, occurs on migration in Iceland and winters in Ireland, Scotland and Wales (Figure 1).
- 2.2 The successful conservation of Greenland White-fronted Geese is the joint and equal responsibility of the governments of Greenland (Denmark), Iceland, Ireland and the United Kingdom. As such there would be considerable benefits from greater international co-ordination and co-operation through the production and implementation of an international conservation plan to provide a framework for actions in each Range State.

- 2.3 The world population declined from 17,500 - 23,000 in the 1950s to 14,300 - 16,600 in the late 1970s. Following conservation measures on the wintering grounds and in Greenland during the early 1980s, and several recent successful breeding seasons, the population in April 1991 was estimated to number c.29,400. However, the small world population, its limited range and generally low productivity, coupled with habitat loss and disturbance on wintering and staging areas, and its high site-fidelity, give continued concern for the long-term well-being of this population.
- 2.4 Productivity is generally low with only a small proportion of pairs breeding successfully each year. Both in terms of population dynamics and social behaviour, Greenland White-fronted Geese differ from other races of Whitefront (and other geese). The extended family cohesion is unusual, with parent-offspring associations persisting.
- 2.5 The geese traditionally occur on natural and semi-natural habitats, especially peatlands throughout their range. Throughout much of the winter range these areas are still used as roosts. However, loss of these traditional habitats in Ireland, Scotland, Wales and Iceland means that the population now largely feeds on a range of both intensive and low-intensity farmland in these countries. The features of site-fidelity and social behaviour underlie a sensitivity to radical land-use change. This results in an ecological fragility which provides challenges for conservation.
- 2.6 The population is currently protected from shooting in much of its world range but subject to high, and probably increasing mortality from shooting during migration in autumn in Iceland. The limited information available suggests that shooting mortality is additive rather than compensatory to natural mortality.
- 2.7 The occurrence of this goose with a range of other species and habitats of high conservation priority allows its use as an indicator of wider conservation, and especially wetland, values.
- 2.8 The range of the geese in winter and summer includes many sparsely populated areas of the United Kingdom and Ireland and many inaccessible parts of west Greenland. Although basic information on numbers, distribution, ecology and behaviour was lacking for this race of goose in the late 1970s, more recent research has given an adequate understanding of distribution and abundance on the wintering grounds.

### **3. Why conserve Greenland White-fronted Geese?**

#### **Naturalness**

3.1 The Greenland Whitefront is unusual amongst geese in still frequenting traditional haunts throughout much of its winter range (e.g. peatland roost and feeding sites, and wet grasslands such as callows and turloughs). It occurs on natural wetlands in Greenland and on some natural and semi-natural wetlands in Iceland.

#### **Rarity (population size)**

3.2 The size of the world population (c. 30,000) is small in comparison with most other goose populations.

#### **Fragility**

3.3 Characteristics of Greenland Whitefront population dynamics and ecology indicate ecological fragility compared to other geese. The population is geographically restricted to a limited number of traditional sites within a small world range in which a very high proportion of the total population (c.60%) occur in just two areas during winter - Wexford (Ireland) and Islay (Scotland). Although occurring across a wide area of west Greenland, it is highly restricted in Iceland. On an international scale, these factors make the population vulnerable to adverse circumstances affecting their few sites.

#### **Typicalness**

3.4 The Greenland White-fronted Goose is a typical wintering bird of western 'Celtic' Britain and Ireland (i.e. generally those areas with an oceanic/hyperoceanic climate with Lusitanian flora and fauna). In Greenland and Iceland, Greenland Whitefronts are one of a group of migratory birds breeding either in west Greenland or further west in the Nearctic and using a similar, trans-icecap, migratory flyway.

#### **Potential value**

3.5 Greenland Whitefronts are one of an assemblage of species which can be associated with traditional forms of low-intensity agriculture. The geese are a good indicator of biotopes of high conservation importance.

#### **Intrinsic appeal**

3.6 Greenland White-fronted Geese have high potential appeal to some elements of society. In Britain and Ireland they are currently being used as 'flagships' in a

campaign relating to peatland conservation. There is the potential in Iceland and Greenland for their use in this way to highlight wider wetland or international conservation issues.

#### **4. Rationale**

- 4.1 The successful conservation of Greenland White-fronted Geese is the joint and equal responsibility of the governments of Greenland (Denmark), Iceland, Ireland and the United Kingdom. The effective conservation of the population also requires the involvement of a range of non-governmental organisations and public in all countries.
- 4.2 In Greenland, Namminersomerullitik Oqartussat (the Home Rule Government) has the responsibility for the conservation of the population on their breeding grounds.
- 4.3 On their spring and autumn migratory staging areas, the Government of Iceland has responsibility for the conservation of the population and their habitats.
- 4.4 On their wintering grounds, the Governments of Ireland and the United Kingdom have joint responsibility for the conservation of the population and its habitats.

#### **5. Ideal objectives**

- 5.1 The ideal objectives are presented which are necessary to conserve the special importance of the population in the absence of external constraints.
- 5.2 The ideal objectives for the conservation of Greenland White-fronted Geese are:
  - 5.2.1 to maintain and enhance population size, recognising that the current population size represents an absolute minimum;
  - 5.2.2 to maintain and enhance viable numbers throughout the present geographic range, and to encourage the re-occupation of formerly frequented areas where the geese are now extinct; and to further avoid the contraction of range to a few centres of population;

- 5.2.3 to ensure that any interactions with people are according to the principles of sustainability, and to give special emphasis to the avoidance of agricultural conflicts on the wintering and staging grounds;
- 5.2.4 to ensure that any consumptive 'use' of the population should be wisely undertaken on the basis of sustainability; and
- 5.2.5 to ensure full international cooperation between the Range States in joint programmes of monitoring, research, conservation and liaison to the benefit of Greenland White-fronted Geese, their habitats and the human populations with which the geese come into contact.
- 5.3 Current policies and other factors affecting the population are summarised in Table 1 for each Range State, and a summary of suggested actions which would effect objectives is given in Table 2. A more detailed list of 'operational objectives' (see main plan for explanation) is given in Table 3.

## **6. Conservation priorities**

- 6.1 This section considers the net result of all factors and influences detailed in the main plan upon the conservation of the population, and the conclusions reached as to their possible effects upon future management, together with indication of such steps as may be necessary to mitigate undesirable effects. Existing policies and other factors affecting the population are summarised in Table 1.
- 6.2 Conservation will primarily be guided by ecological principles which take cognisance of all values and the requirement to avoid the population from becoming threatened or endangered. Also by the need to maintain or enhance its abundance across its traditional geographic range, encouraging expansion of range when possible. It will secondarily be guided by the requirement that if, and when, the population is exploited by humans, this is done so wisely, recognising the full range of social and ecological values of the resource. Conservation of the population will take into account the desirability of ensuring that both non-consumptive as well as consumptive benefits accrue equitably across the international range.
- 6.2.1 The population is small in global terms and has low productivity. As is recognised internationally, there is no basis on which to set a 'target' or 'optimum' population level, since such a level interacts in a complex

fashion with other conservation objectives such as the importance of range (e.g. paras 5.2.2 and 5.2.3). There is scope for population expansion, and this should be encouraged, however the present population size should be considered the minimum in terms of international management.

The need to maintain the present geographic range, and where possible extend it to formerly used areas, derives from the risks of having the population distributed at only a few centres of population. Threats to these sites could have a disproportionate impact on the whole population. It also enhances regional avifaunal diversity. The maintenance of range conforms to legal requirements under the EC Birds Directive which applies to Ireland and the UK.

- 6.2.2 With ever expanding pressure from the human population, particularly on the wintering grounds and in Iceland, Greenland White-fronted Goose habitats will be subject to a greater degree of threat for the foreseeable future. In order to safeguard the population in the light of these threat, it is necessary to establish a network of protected areas to provide a minimum extent of necessary habitat. The selection of these areas should take into consideration needs at both different times and different places. These areas need not exclude other land-uses. Indeed, most areas (away from breeding grounds) will need active management (usually including farming) to maintain and optimise their suitability for geese.
- 6.2.3 Avoidance of agricultural conflict is possible by a range of measures and would diminish adverse local impacts on human populations and lessen political pressure for population control. It would also focus attention on the mechanisms of integrating goose conservation within agricultural policies and practises - of benefit to a wide range of other species.
- 6.2.4 Policies for the population need to be sustainable in the long-term. Given that the resource is shared between several Range States, a high degree of co-operation is required to avoid conflicts over resource allocation or conflicting policies both within and between states. This co-operation can best be effected by the coming together of Range States through a common conservation plan.
- 6.2.5 Since the successful conservation management of Greenland White-fronted Geese is the joint and equal responsibility of the governments of Greenland (Denmark), Iceland, the Republic of Ireland and the United Kingdom,



international co-operation is required for the effective implementation of all aspects of this plan.

### Hunting

- 6.3 Sport-hunting is a traditional and legitimate consumptive use of Greenland White-fronted Geese in some Range States. However, hunting is not a necessary tool for the conservation management of Greenland White-fronted Geese. The decision to allow hunting should be taken at a national level.
- 6.4 If a Range State does decide to allow sport-hunting, it is important that this decision is taken in accordance with the principles of this plan, including the following points:
- 6.4.1 - the population is shared by four Range States, and consumptive uses in one Range State should not jeopardise the potential for other uses, whether consumptive or non-consumptive, elsewhere;
  - 6.4.2 - there must be adequate provision of disturbance-free refuges wherever hunting takes place;
  - 6.4.3 - consumptive use must be biologically sustainable. Thus adequate information on bag size and mortality is required to monitor sport-hunting impact on the population. In the absence of good data on thresholds of sustainability, conservative limits should be set;
  - 6.4.4 - hunting and associated disturbance should not be permitted during the spring migration and pre-breeding period (after 31 January);
  - 6.4.5 - adequate provision should be made for the closure of shooting seasons in line with criteria relating to emergency situations (para. 7.5 et seq.), and including periods of severe cold weather;
  - 6.4.6 - sport-hunting should not influence local flock survival to the detriment of objectives on range conservation.

### Greenland

- 6.5 In Greenland, the geese occur in areas remote from human habitation, but which are occasionally frequented in summer mostly by hunters, Greenlanders and tourists. Substantial areas have been designated as Ramsar sites, although no active management plans have yet been written for these areas. In terms of management for the geese, the present 'wilderness' status of these areas is

optimal and few threats are currently foreseen that could affect substantial proportions of the population. The summer population remains vulnerable however, due to their flocking behaviour which localises significant proportions of the population on arrival in spring, and during the moult period in late summer. Inappropriate development (e.g. onshore oil or gas) or widescale human disturbance could be highly damaging in these specific areas at specific times.

- 6.6 The Greenland Home Rule Authority has limited resources for proactive management of conservation resources. This limits what is achievable within the scope of this plan. Given the conservation priorities indicated above, the most effective actions would be to sponsor completion of surveys of geese (and other biological resources), to input this and other collated information into site inventories, and thus be able to advise and guide potentially threatening developments away from areas of key importance. Clearly such survey needs include the requirement to monitor, at intervals, numbers using existing protected sites.
- 6.7 The education of hunters all 'users' of goose habitat (both protected and unprotected) is a high priority, as is dissemination of information on protected sites to all parts of government (i.e. to kommune level).

#### Iceland

- 6.8 The geese occur in Iceland during spring and autumn migration and are highly vulnerable at this time owing to their flocking in areas close to some of the densest centres of habitation. Significant, and probably increasing, numbers are shot during these periods. No areas are statutorily protected for the geese and the resources available to governmental and other conservation bodies in Iceland are very restricted.
- 6.9 There are two areas for priority action: site protection and management, and regulation of hunting in a biologically sustainable fashion. At present information does not exist to indicate the sustainability, or otherwise, of current hunting practices. As a minimum, there is a need for information on bags, hunter numbers, and the frequency and extent of, and the disturbance caused by hunting. Such information should be used to establish a network of refuge areas and hunter education programmes.
- 6.10 Although there have been no thorough surveys in Iceland, enough information on distribution and abundance exists to indicate areas of key importance. There is a particular need to complete surveys of geese, to establish and maintain detailed site inventories, and thus be able to advise and guide

potentially threatening developments away from areas of key importance. Clearly such survey needs include the requirement to monitor use of important areas over time so as to guide practical site management.

- 6.11 It is likely that all actions in Iceland will be highly constrained given the current limited resources for conservation. There are particular benefits from using the mechanisms of this plan to share expertise and resources for goose conservation with other Range States. This should be explored as a high priority, as actions in Iceland are probably of greatest priority when assessed at a flyway level.

### Ireland

- 6.12 Greenland White-fronted Geese winter in Ireland, although flocks are local with discrete ranges. An established network of counters assist in autumn and spring monitoring of numbers and productivity. This is undertaken on a collaborative international basis with the UK. A continuing programme of marking and resighting has given a database of the highest quality information. It is of the greatest importance to continue this programme at least at the present level so as to underpin the conservation of the population with high quality research and population monitoring.
- 6.13 An inventory of feeding and roosting sites has been undertaken on a flock by flock basis. This is the basis of the site protection programme as statutory nature reserves, no-shooting areas or through management agreements with private landowners, as well as the listing as Areas of Scientific Interest (ASIs). There are proposals to amend existing legislation, which if passed would give legal status to ASIs. Such enhancement of status would allow better defined site-management for the geese, resources permitting. The designation of those sites which are of international importance under the Ramsar Convention and as EC Special Protection Areas is particularly important.
- 6.14 Resources for conservation in Ireland are limited although high priority has been given to the geese in recent years especially to their peatland habitats. In particular, the recognition of the important role of the small, scattered flocks in maintaining range is valuable. Whilst active conservation of major sites such as Wexford is crucial to the overall conservation of the population, there will remain a need to give high priority to threatened, declining and small flocks. These often frequent natural or semi-natural habitats of high nature conservation value for other fauna or flora.

## United Kingdom

- 6.15 Greenland White-fronted Geese winter in Scotland, Wales and Northern Ireland. An established network of counters assist in autumn and spring monitoring of numbers and productivity. This is undertaken on a collaborative international basis with Ireland. It is of the greatest importance, at flyway level, that existing monitoring and research continues and is expanded.
- 6.16 A network of protected sites exists. These are protected under national statute and, increasingly, by international designation. These sites are subject to conservation management. The designation of those sites which are of international importance under the Ramsar Convention and as EC Special Protection Areas is particularly important.
- 6.17 There are particular agricultural conflicts in a few parts of the range. As in Ireland, it is important that these are resolved according to principles agreed at the IWRB/Dutch Government Workshop on Farmers and Waterfowl in autumn 1991.
- 6.18 The UK has greater resources for nature conservation than other flyway states. There is the potential to share experience and knowledge at a flyway level to the benefit of all parties to this plan (see Iceland above).

## **7. Plan Review**

- 7.1 It is essential to review, at predetermined intervals, this conservation plan. The effectiveness of the plan must be measured by comparing achievement against objectives.
- 7.2 The plan should be subject to a major review every three years by representatives of the Range States, as well as an annual review by a Plan Committee, and emergency reviews whenever necessary.

### Annual review

- 7.3 The annual review considers especially any serious unexpected events or trends which could affect conservation. It checks and reports changes of status and conservation developments and reports progress under the plan to Range States and other participating organisations.

### Three year review

7.4 The plan is prepared to cover a three year period. This does not mean that objectives are restated and the entire plan rewritten every three years. However, it does imply that a major review by the Plan Committee, measuring achievement against objective takes place at three year intervals. The prime function of this review is to ensure that the long term objectives and options are still pertinent, and that the prescriptions have been, and will continue to be, effective in achieving the desired objectives.

At each three year review, the Range States should take detailed note of changes in population parameters, particularly population size, distribution and range.

The population is subject to variable breeding success but this has generally occurred within a limited range of population levels. Medium term changes in breeding success, and more directly population size, can indicate changing conditions faced by the geese and alert Range States to the need for a review of conservation actions.

### Emergency review

7.5 It is important to establish mechanisms for emergency action under this plan, if sudden major environmental changes occur within the range of the Greenland White-fronted Goose, liable to affect the population.

In the event of such an occurrence, an immediate review meeting of the plan should be convened by the Range States. This meeting will be convened by a Plan Committee and will discuss conservation options in the light of all available information.



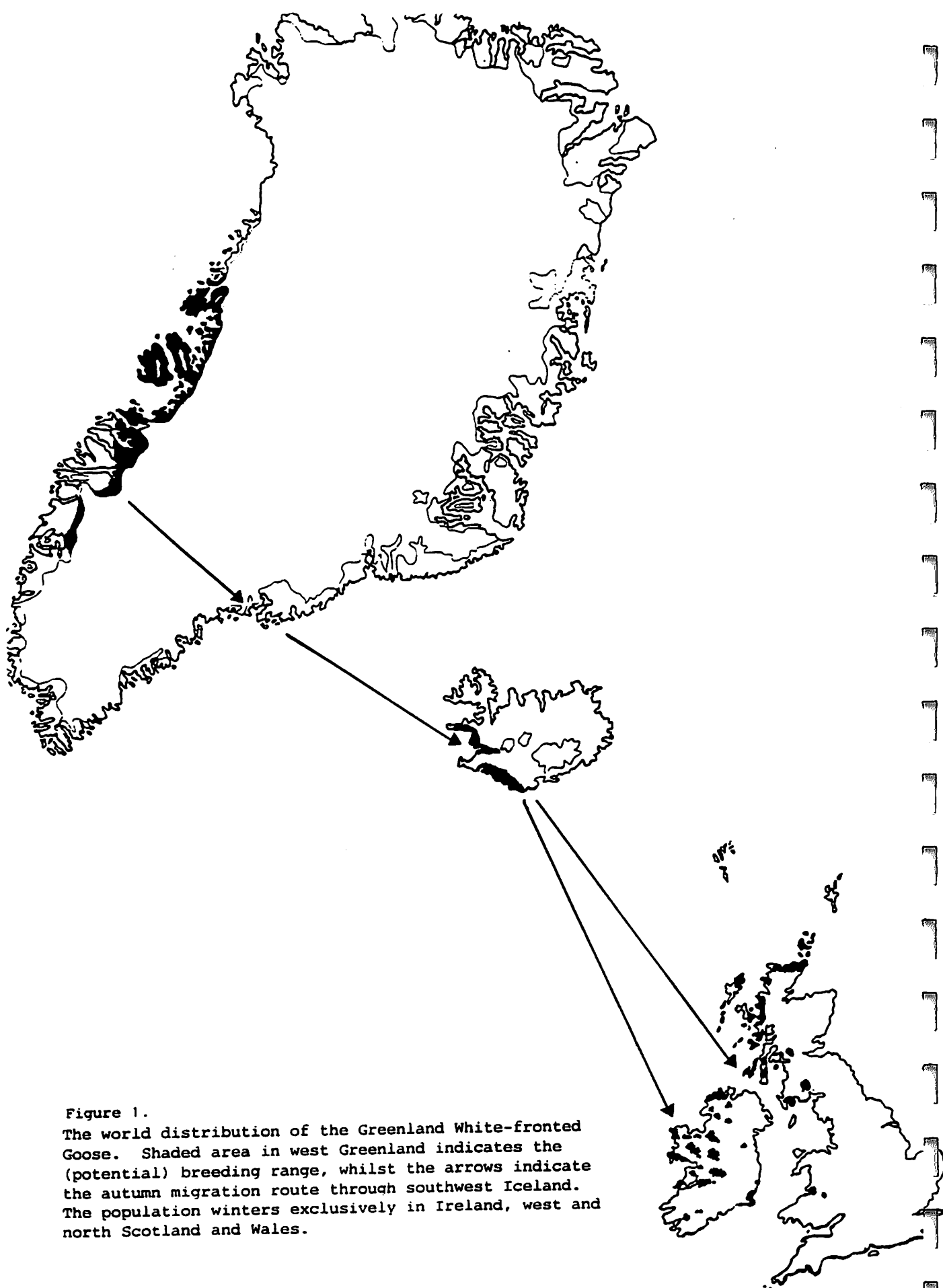


Figure 1.  
 The world distribution of the Greenland White-fronted Goose. Shaded area in west Greenland indicates the (potential) breeding range, whilst the arrows indicate the autumn migration route through southwest Iceland. The population winters exclusively in Ireland, west and north Scotland and Wales.

**Table 1.**  
**Summary of current major policies affecting Greenland White-fronted Geese.**

For further details see text for elaboration.

Extent/levels of current activity indicated as follows: n/a = activity not appropriate for country

None = no activity occurring

Limited = limited activity or activity in some years only

Y = activity occurring in most/all years

	Flyway	Greenland	Denmark	Iceland	Scotland	Wales	England	N. Ireland	Ireland
<b>HABITATS</b>									
Site protection	Limited	Y	n/a	None	Y	Y	None	Limited	Y
Site management	Limited	None	n/a	None	Y	Y	n/a	Limited	Y
Monitoring use of protected sites	Limited	None	n/a	None	Y	Y	n/a	Limited	Y
Promotion of appropriate agricultural policies	Limited	n/a	n/a	None	Limited	None	n/a	Limited	None
Policies to reduce potential agricultural conflicts	Limited	n/a	n/a	None	Limited/Y	None	n/a	None	Limited/Y
<b>POPULATION AND RESEARCH</b>									
Development and maintenance of population model using data from projects listed below:	Limited	None	n/a	None	Y	Y	Y	Y	Y
Regular population census and monitoring	Y	None	n/a	None	Y	Y	Y	Y	Y
Aerial census as appropriate	Limited	Limited	n/a	None	Limited	None	None	None	Limited
Continued capture and marking of geese	Y	Limited	n/a	None	Limited	None	n/a	None	Y
Co-operative ringing programme: resightings	Limited	None	n/a	Limited	Y	Y	Limited	Y	Y
Encourage research and conservation initiatives	Limited	Limited	Y	Limited	Y	Y	Limited	Y	Y
<b>INTERNATIONAL CO-OPERATION</b>									
Regular meetings to discuss international monitoring	Limited	None	n/a	None	Y	Y	Y	None	Y
Information exchange on site management etc.	None	None	n/a	None	None	None	None	None	None
International co-operation in personnel training	None	None	None	None	None	None	None	None	None
<b>LEGAL STATUS</b>									
Protection in spring pre-breeding period	Limited	Y	n/a	Limited	Limited	Y	Y	Y	Y
<b>EDUCATION</b>									
Hunter identification skills	Limited	Limited	n/a	Limited	Limited	Limited	n/a	Limited	Limited
Hunter education	Limited	Limited	n/a	Limited	Limited	Limited	Limited	Limited	Limited
International links between schools etc.	None	None	None	None	None	None	n/a	None	None
Opportunities for site twinning programme	None	None	n/a	None	None	None	n/a	None	None

**INTERNATIONAL OBLIGATIONS**

Compliance with relevant EEC Directives

Ramsar Convention: wise use of wetlands etc.

Bonn Convention: compliance

Limited	n/a	Y	n/a	Y	Y	Y	Y	Y
Limited								
Limited								



**Table 2.**  
**Summary of suggested major policies for Greenland White-fronted Geese**

Suggested priority rankings as follows: n/a = action currently not applicable for country  
 Y = action, further action or continuing action required  
 Low = low relative priority  
 High = high relative priority  
 Very high = very high relative priority

	Flyway	Greenland	Denmark	Iceland	Scotland	Wales	England	N. Ireland	Ireland
<b>HABITATS</b>									
Expand/maintain population's range	High	Y	n/a	Y	High	High	Y	High	High
Expand/sustain population size	High	Y	n/a	Y	High	High	Y	High	High
Site protection	High	High	n/a	Very high	Y	Y	n/a	Y	High
Site management	Y	Y	n/a	High	Y	Y	n/a	Y	Y
Monitoring use of protected sites	High	Low	n/a	Y	Y	Y	Y	Y	Y
Promotion of appropriate agricultural policies	Y	n/a	n/a	Y	Y	Low	n/a	Y	Y
Policies to reduce potential agricultural conflicts	High	n/a	n/a	High	High	Low	n/a	Y	High
<b>POPULATION AND RESEARCH</b>									
Development and maintenance of population model using data from projects listed below:	High	High	n/a	High	High	High	High	High	High
Regular population census and monitoring	High	Low	n/a	Y	Y	Y	Y	Y	Y
Aerial census as appropriate	Y	High	n/a	Y	Low	Low	Low	Low	Low
Continued capture and marking of geese	High	Y	n/a	Low	Y	Y	n/a	Y	Y
Co-operative ringing programme: resightings	High	Y	n/a	Y	Y	Y	Y	Y	Y
Encourage research and conservation initiatives	High	High	Y	High	Y	Y	Y	Y	Y
<b>INTERNATIONAL CO-OPERATION</b>									
Regular meetings to discuss international monitoring	High	Low	n/a	Low	High	High	Low	High	High
Information exchange on site management etc.	High	Y	n/a	Y	Y	Y	Low	Y	Y
International co-operation in personnel training	High	Y	Y	Y	Y	Y	Low	Y	Y
International plan review meetings	High	High	High	High	High	High	High	High	High
<b>LEGAL STATUS</b>									
Enhanced legal status as appropriate/necessary	Y	Y	n/a	High	Y	High	High	Y	Y
Protection in spring pre-breeding period	High	High	n/a	High	High	Y	Y	Y	Y
<b>EDUCATION</b>									
Hunter identification skills	High	Y	n/a	Very high	Y	Y	Y	Y	Y

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	Y	Y	n/a	Very high	Y	Y	Y	Y	Y	Y	Y
Hunter education	Y	Y	n/a	Very high	Y	Y	Y	Y	Y	Y	Y
International links between schools etc.	Y	Y	Y	Y	Y	Y	Y	n/a	Y	Y	Y
Opportunities for site twinning programme	Y	Y	n/a	Y	Y	Y	Y	n/a	Y	Y	Y
<b>INTERNATIONAL OBLIGATIONS</b>											
Compliance with relevant EEC Directives	Y	n/a	Y	n/a	Y	Y	Y	Y	Y	Y	Y
Ramsar Convention: wise use of wetlands etc.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Bonn Convention: compliance	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

**Table 3.****Summary of operational objectives to implement ideal conservation objectives.**

Ideal objective	Country	Management option	Operational objectives
1. To maintain and enhance the population recognising that the current population size represents the absolute minimum. the absolute minimum.	Flyway	Species	1.1 Establish population model with accurate estimation of mortality and productivity rates to allow management decisions to be undertaken on the basis of biological sustainability 1.2 Monitor mortality rates by encouraging continued ringing, ring reporting and studies of individually marked birds 1.3 Regulate hunting in a biologically sustainable manner 1.4 Develop systems for bag statistics adapted to the conditions in the different range states. 1.5 Natality: ensure and enhance protective status during crucial spring pre-breeding period
	UK & Ireland	Species	1.6 Undertake autumn and spring international census and report results to other range states 1.7 Monitor productivity and report results to other range states
	All Flyway states	Habitat	2.1 Establish a register of sites, especially those of national and international importance, and including networks of small wetlands. 2.2 Encourage the listing of all wetlands of international importance for Greenland White-fronted Geese under the Ramsar Convention, promoting especially the conservation of sites of importance to maintain range, and encouraging the restoration of sites which were previously of similar importance. 2.3 Designated sites of importance: Inform local and central government of the importance and location of protected sites. Enhance knowledge of sites amongst user-groups (e.g. hunters, farmers) Use sites wisely sensu Ramsar Convention.
		Species	2.4 Prepare and implement management plans for designated sites of importance
	Greenland	Habitat	2.5 Encourage the re-establishment of former range or expansion of range as opportunities permit.
	Greenland	Habitat	2.6 Undertake extensive survey to give context to sites already designated and identify other sites of nature conservation importance.
	2. To maintain and enhance viable numbers throughout the present range and to encourage the reoccupation of formerly frequented areas where the geese are now extinct; and to further avoid the contraction of range to a few centres of population.	All Flyway states	Habitat
		Species	2.4 Prepare and implement management plans for designated sites of importance

**Table 3.****Summary of operational objectives to implement ideal conservation objectives.**

Ideal objective	Country	Management option	Operational objectives
		Species	2.7 Ensure that policies for tourism development avoid areas of importance.
	Iceland	Habitat	2.8 Undertake extensive survey to identify sites of nature conservation importance. 2.9 Explore possibilities of positive management of state owned land for benefit of Greenland White-fronted Geese in Iceland. 2.10 Encourage consultation under article 29 of Nature Conservation Act.
	United Kingdom	Species	2.11 Statutory protection for Greenland White-fronted Geese in Wales
3. To ensure that any interactions with people are according to the principals of sustainability, and to give special emphasis to the avoidance of agricultural conflicts on the wintering and staging grounds.	All flyway states	Habitats	3.1 Establish adequate disturbance free refuge zones or time periods in areas international importance. 3.2 Establish dual strategy for creation of refuge areas with scaring at key sites on intensive agriculture, with other 'wider countryside' measures on semi-natural habitats and traditional farmland. 3.3 Produce advisory materials on the assessment and alleviation of crop damage for distribution to the people directly concerned. 3.4 Establish local strategies for alleviation of crop-damage problems in specific 'problem' areas.
4. To ensure that any consumptive 'use' of the population should be wisely undertaken on the basis of sustainability.	All flyway states	Education	4.1 Inform the general public, and the hunters in particular, of the objectives and provisions of this plan in order to ensure it of a broad support 4.2 Public: disseminate information on the importance of the conservation of internationally important wetlands as habitat for migratory waterfowl and use geese as a wider indicator of wetland values in education programmes and policy development 4.3 Ensure knowledge of hunting regulations and enforcement, and encourage and promote the training and responsible behaviour of hunters through relevant organisations 4.4 Encourage enforcement of legislation on hunting e.g. especially action against illegal spring shooting 4.5 Promote knowledge of nationally and internationally important sites and

Table 3.

## Summary of operational objectives to implement ideal conservation objectives.

Ideal objective	Country	Management option	Operational objectives
			<p>their wise use at all levels of government - both centrally and locally</p> <p>4.6 Encourage policies that are compatible with sustainable conservation of wildlife resources including geese (cf World Conservation Strategy)</p> <p>4.7 Take consideration of the needs of the geese when developing conservation and other land-use policies away from protected sites</p> <p>4.8 Use the mechanisms of this plan to feedback information on the status of the geese to relevant national authorities</p> <p>4.9 Promote awareness of this plan with all Departments of State and liaise in its implementation</p> <p>4.10 Encourage co-operation between state and non-governmental organisations in the development of this plan at the national level</p> <p>4.11 Co-operate on the further development and implementation of this plan by participating in the review process</p> <p>4.12 Participate in emergency review meetings should 'alert' thresholds be reached</p> <p>4.13 Regulate hunting in a biologically sustainable manner (also 2.3)</p>
5. To ensure full international cooperation between the Range States in joint programmes of monitoring, conservation and liaison to the benefit of Greenland White-fronted Geese, their habitats and the human populations with which the geese come into contact.	All flyway states		<p>5.1 Ensure the continued review, development and implementation of this plan by making provision for support from a secretariat to facilitate co-ordination.</p> <p>5.2 Range States to share knowledge relevant to plan with other Range States</p> <p>5.3 Investigate and develop twinning initiatives between internationally important sites</p> <p>5.4 Co-operate in collaborative international research</p> <p>5.5 Train staff and co-operate with international exchanges of staff and relevant training material</p> <p>5.6 Monitor mortality rates by encouraging continued ringing, ring reporting and studies of individually marked birds</p>
	UK & Ireland		<p>5.7 Undertake autumn and spring international census and report results</p> <p>5.8 Monitor productivity annually and report results</p>