

Section 2.2.5 Ideal objectives

The ideal objectives are presented which are necessary to protect the special importance of the population in the absence of external constraints. In Chapter 2.4 under 'rationale' these ideal objectives are reconsidered in the light of the constraints discussed in the next section.

The ideal objectives for the conservation of Greenland White-fronted Geese are:

1. to maintain and enhance the population, recognising that the current population size represents an absolute minimum;
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;
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;
4. to ensure that any consumptive 'use' of the population should be wisely undertaken on the basis of sustainability; and
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.

Chapter 2.3 Factors influencing management

The conservation of the population is constrained by obligations, trends and outside influences which have to be identified, and their effects recognised, before operational objectives can be formulated. These factors may also be considered when preparing work programmes in Part 3 of a plan.

Section 2.3.1 Natural trends

Note is made of natural process, both ecological and other, that will affect conservation of the population.

In the absence of anthropogenic influences, the population will show a natural tendency to increase in numbers until limited by the carrying capacity of its environment (whether limitation occurs on the breeding or wintering areas).

Aside from this, there are currently few truly natural processes which have the potential to effect the population in significant, long-term sense. Most potential impacts are anthropogenic (Section 2.3.2 below). The effects of potential climatic change are currently unclear, and in any case, should be considered as an anthropogenic rather than a natural process.

Some sites used by geese may be subject to natural ecological or geomorphological change. The effects of these are better considered in more local or site-related plans.

Section 2.3.2 Anthropogenic trends

This section considers the effects on conservation of any likely changes in human activity under a number of standard headings.

Section 2.3.2.1 Greenland

The present breeding population is largely remote from centres of human settlement and there is no current evidence to suggest that present interactions between geese and humans is at a level to give cause for concern. There are a number of actual, or potential, man-induced impacts which may give future concern. Most can be avoided with sensitive planning:

Disturbance (tourists) -

During the arrival period, when concentrations form in the lowlands (late April/May), geese are particularly susceptible to disturbance. Although the development of 'natural history tourism' has particular benefits to nature conservation by encouraging a greater awareness of Greenland's unique environment, there remains the possibility of disturbance. Should disturbance from human activity be high, this may lead to desertion of areas used by geese. However, given the timing of tourism in late summer (July/August), moulting areas are at greater risk than spring staging sites. As these moult sites are more widely scattered, significant disturbance is less likely.

Disturbance (aerial) -

There is the potential risk of severe disturbance from low flying aircraft or helicopters consequent upon developments on the breeding grounds (e.g. related to mineral exploitation - below).

Disturbance (ground based) -

Greenland has rich mineral resources, and there is an urgent economic need to develop these. Should important mineral deposits be located close to areas of major importance for the geese (as has occurred - Gronlands Miljoundersogelser 1988), there is the risk that insensitive development may adversely affect the geese. Such disturbance could relate not only to construction activities, consequence increase in air traffic (above), but also as a secondary consequence of the opening up of these areas through construction

of roads etc. These construction trails could make currently inaccessible areas more attractive to people and thus lead to other impacts.

Changing hunting practises -

At present direct hunting of the geese seems to be a very specialised practice undertaken by rather few hunters. There is a potential risk of consequential disturbance by Musk-ox and Caribou hunters in areas of recent or proposed introductions depending on the timing of such hunting.

Spring shooting -

Present regulations forbid the shooting of geese during the period of their arrival, when they are concentrated on a few lowland areas. Change in legislation or illegal shooting at these spring gathering areas could have an adverse effect on the wider population.

Section 2.3.2.2 Iceland

The areas used by the population on spring and autumn migration are agricultural lowlands in south and west Iceland. These areas not only bring the geese into close proximity with farmers, but also expose the geese to a large, and increasing, population of hunters (based largely in urban or suburban centres). This leads to a wide range of potential anthropogenic impacts.

Agricultural change -

In spring, geese feed largely in agricultural fields although a greater use of semi-natural and natural wetlands is apparent in autumn. There has been widespread wetland loss and degradation in Iceland until recently grant-aided by the State. The precise implications for the geese of the trend towards intensification and wetland loss and degradation is poorly understood but the precautionary principle would suggest that it should be urgently investigated.

Wetland loss and degradation -

See above. Drainage can occur in situations other than that directly related to agricultural intensification e.g. river engineering associated with hydroelectric and other schemes. This may pose a threat of loss or degradation to certain semi-natural wetland roost/feeding sites.

Conversely, the partial drainage of some lakes has resulted in a rich growth of mire vegetation and hence have become important as feeding areas for geese.

Agricultural conflict -

Although much smaller in number than the large Pink-footed and Greylag Goose populations, future problems may arise due to changes in the tolerance of farmers for geese feeding on their land, especially in spring.

Hunting (mortality) -

Hunting Regulations. Hunting in Iceland is subject to very little regulation, and the type of fine control on hunting techniques present in western Europe is absent in Iceland. The only regulations concern closed seasons (which are currently under review). There is no statutory bag limit in Iceland, nor collection of any systematic bag data.

Hunters. There are an estimated 10-12,000 people with gun licenses out of a total

Icelandic population of 260,000. The true number is unknown. The number of shooters is rapidly increasing and there are an estimated 800 new license applications each year. There is an element of specialism in Icelandic shooting, Ptarmigan shooting and goose shooting attracting particular followings. Goose shooting especially, seems to be gaining in popularity.

In Iceland, shooting is derived from ancient rights and is pursued regardless of status in society. This gives shooting a very wide potential and actual following.

Hunting locations

Refuges. There are few refuges for waterfowl in Iceland. There are several de facto refuges, one of which is Hvanneri near Borganes, a government owned agricultural station on which there is no goose shooting. Some farmers also forbid shooting on their land.

Roost sites. Most goose shooting occurs at dawn and dusk flights into roosts. Identification of geese in mixed species roosts is a potential problem which any change of protective status for Whitefronts. On the morning flight this would not be too much of a problem since geese call distinctively and have a clear flight identification. It would be much more of a problem on dusk flights where geese are arriving at a roost mixed with other species and in the gathering dark. However, many roosts are used by Whitefronts alone such that protection of these sites might be affected with little problem in restricting shooting of other grey geese.

Feeding sites. The other main form of goose shooting is undertaken over decoys in agricultural fields during the day. This appears to be quite common.

Hunting techniques -

Traditionally rifles have been used for goose shooting, although these are now seldom used because in open landscapes they can be lethal over very great distances. There is now an increasing tendency to use shotguns for goose shooting (mostly 12 bores using heavy (2 ounce) shot). Semiautomatics are widespread and their use legal, although agreement has

been reached in principle to restrict the use of these guns to having two shots in the magazine and one in the barrel. Decoys are legal to use in virtually any situation. Use of both dead bodies of geese and goose models is legitimate. The calling down of geese using whistles and lures is widespread. A recent innovation is an import from Italy which consists of a tape deck and loudspeakers placed in a field. A selector switch gives a range of amplified goose calls. These tapes appear to be dramatically effective and bring geese from many miles.

Hunting (disturbance) -

Current hunting practises include dawn and dusk shooting at most sites. This may have a major modifying effect on the use of existing roosts, and/or the potential use of other sites. Likewise hunting disturbance may result in a restriction in use of potential feeding areas with, by analogy with similar situations elsewhere, concentrations of geese leading to agricultural damage.

Spring shooting -

Although illegal, spring shooting is thought to occur, and may be a widespread practise in some areas. Its impact on the population is not clear, although potentially highly damaging since this is the period is likely to be of great energetic importance to breeding birds.

Section 2.3.2.3 Great Britain

The geese generally occur in close proximity to farming communities, feeding by day on agricultural grasslands, although at night roosting on peatbogs or hill lochs. As such they are greatly affected by agricultural practice and policy.

Agricultural practices -

The geese occur on a range of grasslands of differing intensity of management. The suitability of these areas seems to relate especially to the level of disturbance which generally increases with increasingly intensive agricultural management. Thus, agricultural policies which result in more intensive management of farmland without directly making provision for the geese (e.g. through refuge-type arrangements) will have adverse consequences on the population. Systems of low-intensity pastoralism result in least conflict with the farming community in terms of either real or perceived damage to crops).

There are both potential and real threats due to wetland loss and degradation, as well as the drainage and intensification of agriculture on important semi-natural feeding areas.

Peatland impacts -

The geese are dependent on secure roosts and these are often in peatland of upland areas. Policies which encourage expansion of afforestation or peatland exploitation in these areas will have an adverse effect on the population.

Spring shooting -

Although the goose statutorily protected in Scotland, licenses have been issued by government to shoot unlimited numbers of geese on Islay. These licences are valid substantially to the date of departure of the geese. In view of the importance of spring migratory fattening as a determinant of productivity of arctic-nesting geese, this additional mortality and disturbance at this time may adversely affect these birds.

Section 2.3.2.4 Northern Ireland

Generally potential impacts are similar to those in Scotland and Ireland except as noted below:

Peatland impacts -

The geese are dependent on secure roosts and these are often in peatland of hill areas. Policies which encourage expansion of afforestation or peatland exploitation in these areas will have an adverse effect on the population.

Agricultural practices -

As Great Britain above. It is notable that some of the small traditional flocks in Northern Ireland frequent areas with low levels of human disturbance (e.g. Lough Macnean, Caledon). This Caledon flock frequents a border area adjacent to a road blocked for security purposes. It is thus little currently disturbed.

There are both potential and real threats due to wetland loss and degradation, as well as the drainage and intensification of agriculture on important semi-natural feeding areas.

Shooting and disturbance -

See above. The small size and limited ranges of Northern Irish flocks render them particularly susceptible to the adverse consequences of disturbance, either as a result of illegal shooting or following hunting of other species.

Section 2.3.2.5 Republic of Ireland

Potential impacts are generally similar to those in Scotland and Ireland except as indicated below:

Peatland impacts -

The geese are dependent on secure roosts and these are often in peatland of hill areas. Policies which encourage expansion of afforestation or peatland exploitation in these areas will have an adverse effect on the population.

Agricultural practices -

Patterns of habitat use are modified in many flocks by disturbance pressures. Restrictions to normal patterns of site use are most marked in the smallest (most threatened) flocks. Greenland White-fronted Geese show a particularly varied pattern of feeding on traditional habitats in Ireland. This variety is only likely to be maintained in the absence of within-site intensification and when disturbance compares favourably with than on alternative farmland feeding areas.

There are both potential and real threats due to wetland loss and degradation, as well as the drainage and intensification of agriculture on important semi-natural feeding areas.

Oil spill -

The roost of a major part of the world population, off Raven Point in Wexford is potentially at risk from oil spillage. Contingency plans for oil spillage in this area do yet adequately take account of this internationally important conservation interest.

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Section 2.3.3 External factors

In considering site management for geese, changes in conditions outside the site may affect its management. For instance, on wetland sites, alterations in water-table level will have profound implications for management. This needs to be considered in the planning of effective habitat conservation measures (Stroud et al. 1990).

Of possible future importance may be competition with an expanding breeding population of Canada Geese *Branta canadensis* in west Greenland. These are now expanding and established near Sondre Stromfjord and have been reported also on Disko Island and in the Thule area (Best & Higgs 1990). The likelihood of competition for nest sites or feeding areas is not clear, but being a much larger bird, the Canada Goose is likely to be more successful should interactions with Whitefronts occur.

REFERENCES

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Section 2.3.4 Obligations

Section 2.3.4.1 Relevant international legislation

The Range States are all signatories of one or more international wildlife Conventions, and hence have taken upon themselves international obligations for the conservation and wise-use of their fauna and flora.

In some instances, these obligations may be moral rather than legal. These international Conventions and the main obligations as relating to these geese and their habitats are listed below. These Conventions provide the building blocks of international co-operation.

Background interpretation to the international conventions listed below are given by Lyster (1985), Koester (1989), Biber-Klemm (1991), Boere (1991), Moser (1991) and Stroud et al. (1990).

Convention on wetlands of International Importance Especially as Waterfowl Habitat: 'Ramsar' Convention (Greenland/Denmark, Iceland, Ireland, United Kingdom)

The preamble to the Convention refers to the contracting parties' desire "to stem the progressive encroachment on and loss of wetlands now and in the future". The Ramsar Convention has proved extremely successful in focusing attention on the need for wetland conservation, especially as habitat for waterfowl.

Article 1 of the Convention defines wetlands as "areas of marsh, fen, peatlands or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth which at low tide does not exceed six metres". Waterfowl are defined as "birds ecologically dependent on wetlands".

Article 2 requires each Contracting Party to designate suitable wetlands within its territory for inclusion in a list of wetlands of international importance. The boundaries of each wetland need to be described precisely and marked on a map, and may incorporate riparian and coastal zones adjacent to the wetlands and islands, or bodies of marine water deeper than 6 m at low tide lying within the wetlands, especially where these have importance as waterfowl habitat.

Article 3 requires Contracting Parties to formulate and implement their planning so as to promote the conservation of wetlands included in the list and also, as far as possible, the 'wise use' of all wetlands in their territory. This article also requires the Contracting Parties to inform the Bureau of the Convention, at the earliest possible time, if the ecological character of any wetland in the list has changed or is changing, or is likely to change as the result of technological developments, pollution, or other human interference.

Article 4 requires Contracting Parties to promote the conservation of wetlands and waterfowl. It also requires that where a Contracting Party, in its own urgent national interest, deletes or restricts the boundaries of wetlands included in the list, it should compensate for any loss of wetland resources. This is to be undertaken in particular by the protection, in the same area or elsewhere, of at least an equal area of the original habitat.

Article 5 requires Contracting Parties to consult with each other about implementation of the Convention. Such consultations should refer to trans-border wetlands, but also to other matters, including North-South consultations on developments and projects affecting wetlands.

Among the other provisions of the Ramsar Convention, Article 6 requires Contracting Parties to convene conferences to consider matters relating to the Convention. The meeting held in 1987 at Regina in Canada in 1987 defined the 'wise use' specified in Article 3 thus: *"The wise use of wetlands is their sustainable utilisation for the benefit of humankind in a way compatible with the maintenance of the natural properties of the ecosystem"*. Sustainable utilisation was defined as *"human use of a wetland so that it may yield the greatest continuous benefit to present generations while maintaining its potential to meet the needs and aspirations of future generations"*. Natural properties of the ecosystem were defined as its *"physical, biological or chemical components, such as soil, water, plants, animals and nutrients, and the interactions between them"*.

Convention on the Conservation of Migratory Species of Wild Animals: 'Bonn Convention' (Denmark, Ireland, United Kingdom)

This Convention is specifically concerned with migratory species. It provides for their conservation by giving strict protection to a number of endangered animals listed in its Appendix 1, whilst also providing the framework for a series of 'AGREEMENTS' between Range States for the conservation and management of Appendix II species. Currently, a Western Palearctic Waterfowl Agreement is being drawn up under the terms of the Convention and gives very great potential for the establishment of wide-ranging international co-operation in the conservation of migratory waterfowl.

Convention on the Conservation of European Wildlife and Natural Habitats: 'Berne Convention' (Denmark, Ireland, United Kingdom)

This Convention encourages in particular the promotion of co-operation between countries in their conservation efforts, especially with respect to migratory species. Article 4(3) of the Convention states that Parties should:
"undertake to give special attention to the protection of areas

that are of importance for the migratory species specified in Appendices II and III [including most birds] and which are appropriately situated in relation to migration routes as wintering, staging, feeding, breeding or moulting areas."

In addition contracting parties are generally obliged to:
"...coordinate their efforts for the protection of the migratory species specified in Appendices II and III whose range extends into their territories" (Article 10.1).

In order to fulfil these provisions, the contracting parties are obliged to:
"... take appropriate and necessary legislative and administrative measures to ensure the conservation of [these] habitats" (Article 4.1). "They shall have regard in their planning and development policies to the conservation requirements of the areas protected" (Article 4.2).

EEC Council Directive on the Conservation of Wild Birds: 'EEC Birds Directive' (Denmark, Ireland, United Kingdom)

The Directive concerns the urgent need for European co-operation in bird conservation policies. This is because bird populations may move rapidly between different Member States of the Community. Birds which widely range and which require to use habitats and areas in different Member States will clearly benefit from a uniform positive approach to conservation.

Like all such Directives under the Treaty of Rome (which established the EEC), the Birds Directive indicates what needs to be achieved, but the manner in which these objectives are attained is left to individual Member States.

These conservation measures include a wide range of measures for bird protection, including standardisation of seasons in which gamebirds are protected, and restrictions on certain methods of killing. Monitoring of bird populations is also stipulated, so that conservation policies can be revised as and when needed.

Emphasis is laid in the Birds Directive on the need to conserve bird habitats as a means of maintaining populations. In part, such habitat protection is to be achieved by the establishment of a network of protected areas for birds throughout the Community: Special Protection Areas (SPAs). However, as well as stating the need for SPAs, the Birds Directive also indicates that other means of protecting populations are necessary, especially where these populations are vulnerable and dispersed. These 'wider countryside' conservation measures are a necessary complement to site-based conservation.

The relevant part of the preamble to the Directive states that **"whereas the preservation, maintenance or restoration of a sufficient diversity and area of habitats is essential to the conservation of all species of birds; whereas certain species of**

birds should be the subject of special conservation measures concerning their habitats in order to ensure their survival and reproduction in their area of distribution; whereas such measures must also take account of migratory species and be co-ordinated with a view to setting up a coherent whole....."

Article 3 requires Member States to take requisite measures to preserve, maintain or re-establish a sufficient diversity and area of habitats for all the species of birds referred to in Article 1. This Article refers to all species of birds naturally occurring in the wild state in the European territory of the Member States to which the Treaty applies.

Article 4 is concerned with applying additional special conservation measures, including the designation of Special Protection Areas, to two groups of birds. These groups are, firstly, certain listed vulnerable species to which reference is made in Article 4.1 and which are listed in Annex 1 (amended with some additions by Directives 81/854/EEC, 85/411/EEC and 86/122/EEC); and secondly, all other migratory bird species (to which reference is made in Article 4.2).

Summary

	Ramsar Convention	Birds Directive	Berne Convention	Bonn Convention
Greenland	X			
Denmark	X	X	X	X
Iceland	X			
Ireland	X	X	X	X
United Kingdom	X	X	X	X

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Section 2.3.4.2 Relevant national legislation

A variety of legislation gives national obligations relating to the geese and their habitats as listed below:

Greenland

Nature Conservation Act 1980

Parliamentary regulations on environmental protection (1988)

"In 1980 the Home Rule Government adopted the Nature Conservation Act, which was followed up and developed in 1988 by parliamentary regulations on the protection of the environment. These laws were based on old traditions for local management of fish and game stocks - a practice that was prevalent in earlier times. These local traditions are now built into legislation, which consists of a mosaic of central Home Rule Government regulations and decentralized local authority rules.

The legislation is based on:

- local experience of the indigenous people;
- the advice of Greenlandic researchers;
- the advice of Danish researchers (biologists and experts in other fields);
- international advice from:
 - i) international fora such as CITES, Ramsar, International Whaling Commission and IUCN, and
 - ii) bilateral agreements, e.g. between Canada and Greenland on the Beluga and Narwhal in Baffin Bay and the Avanersuaq area.

In accordance with the Greenland Home Rule Act of 1978, international collaborative arrangements are established on a regular basis, and in close consultation with the Danish authorities." (Helms 1991)

Iceland

Nature Conservation Act No. 47/1971

Bird Protection Act (1966)

[currently under review]

Great Britain

Wildlife and Countryside Act (1981)

Environmental Protection Act (1990)

Natural Heritage (Scotland) Act (1991)

Northern Ireland

The Wildlife (Northern Ireland) Order 1985; Statutory Instrument 1985/171

Republic of Ireland

Wildlife Act (1976)

[currently under review]

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Summary of protection on a flyway basis

Table 2.3.4.2.1. Past and present protective legislation relating to shooting of Greenland White-fronted Geese throughout their range.

Country	Period	Season	Comments
Ireland	before 1977	1 September-31 January	An extended season until the end of February on the South Slobbs, Co. Wexford ceased with the implementation of the Wildlife Act, 1976.
	1977-1980	1 October-31 January	Open season without bag limit.
	1980-1982	15 November-31 January	A cold weather shooting ban 13-31 January closed the season early.
	1982-1985	Protected	Statutory suspension of all shooting throughout Republic for three seasons.
	1985/1986	Wexford only 15 November-4 January	Reintroduction of shooting at Wexford only using quota limit (quota: 480; 448 shot).
	1986-1988	Protected	Moratorium reinstated for two seasons, reviewed annually.
	1988/1989	Wexford only 1 November-31 December	Reintroduction of shooting at Wexford only using quota limit (quota: XXX; 432 shot).
Northern Ireland	1989-present	Protected	Moratorium reinstated for two seasons, reviewed annually.
	before 1985	1 September-31 January	Voluntary ban operated by wild-fowling clubs for the last 4-5 seasons.
England and Wales	1985-present	protected	Statutory protection under the Wildlife (Northern Ireland) Order, SI 1985/171 (N12).
	1954-present	1 September-20 February (foreshore 1-20 Febry)	The Wildlife and Countryside Act recognises an open season for White-fronted Geese; in practise this applies to Russian White-fronts <i>Anser albifrons albifrons</i> . The only regularly used Greenland Whitefront site (Dyfi Estuary, Wales) is subject to voluntary ban

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by local wildfowlers since 1972.

Scotland	1954-1982	1 September- 20 February (foreshore 1-20 Febry)	Quarry species under Appendix 2(2) of 1954 Protection of Birds Act
	1982- present	Protected	Protected by the Wildlife and Countryside Act 1981.
	1988	January- 16 April	13 licenses issued by Scottish Office to shoot unlimited numbers on Islay (76 shot).
	1988-1989	XXXXXXX- XXXXXXX-	4 licenses issued by Scottish Office to shoot unlimited numbers on Islay (6 shot).
	1989-1990	January- XXXXXXX-	2 licenses issued by Scottish Office to shoot unlimited numbers on Islay (49 shot).
	1990-91	XXXXXXX- XXXXXXX1	XX licenses issued by Scottish Office to shoot unlimited numbers on Islay (XX shot).
Iceland	1966- present	20 August-	Not protected under the 1966 Bird Protection Act. Traditionally hunters concentrate on more accessible Greylags and Pinkfeet. Spring passage occurs after 15 March, but ring recoveries show spring shooting takes place. Icelandic Shooting Society has encourages a voluntary ban on shooting.
Greenland	before 1985	"Arrival" to 15 June and 15 August to "departure"	Traditionally hunted throughout summer period; since c.1970 prot- ected during nesting and moult but still permitted shooting on arrival and in autumn.
	1985	15 August- 30 April	Protection extended in spring 1985 conditional on decisions reached elsewhere in the flyway, to be reviewed every year. Very few are thought to be shot after 15 August.

Section 2.3.4.3. Other obligations

United Kingdom

In response to a Parliamentary Question concerning the shooting of Greenland White-fronted Geese under license on Islay, the Minister of State at the Scottish Office (Lord Sanderson of Bowden) reaffirmed the obligation of the UK under the EEC Birds Directive: *"In considering any request to issue licenses to shoot Greenland White-fronted Geese in any area, the Government will have full regard to our obligations under EC Directive 79/409 on the conservation of wildbirds. Where an area has been (a) classified as a Special Protection Area on account of its importance as a habitat for Greenland White-fronted Geese or (b) identified as an area which in the opinion of the Nature Conservancy Council appears to meet the criteria to be so classified, there is a particular obligation upon the Government to avoid any potential damage or disturbance to the birds or their habitats which would be significant (in the terms of the directive) for the survival and reproduction of the species."*

Hansard 28 July 1988,
Column 480

Section 2.3.5 Legal constraints

At an international level the most significant legal constraint concerns designated SPAs. Under Article 4.1 of the EEC Birds Directive (EC/79/409) the United Kingdom and Republic of Ireland are specifically required to establish SPAs for Greenland White-fronted Geese since it is both migratory and listed on Annex 1 of the Directive.

Each Member State has a degree of discretion in the selection of SPA necessary to meet its obligations to species listed in the Annex 1 of the Directive. However, it is now clear, following a recent European Court of Justice ruling, that once such an area has been selected and designated, the obligation to take all appropriate steps to avoid significant deterioration of habitat or disturbances to birds is an extremely rigorous obligation indeed (Freestone 1991).

A variety of differing national legal constraints also potentially restrict some conservation options.

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Section 2.3.6 Conservation constraints

In formulating an international plan, there is a need to be aware of implications of resource constraints, such as finance, legislative and organisational limitations, both at the level of state nature conservation bodies and non-governmental organisations. Each level of resource input has clear implications for the conservation of both the population and its habitat. There must also be an awareness of what is potentially realisable should there be any change in these current constraints.

Section 2.3.6.1. Greenland

Scientific research and monitoring -

The Greenland Home Rule Authorities (Nammínorsornerullutik Oqartussat) are greatly resource limited. Specific research concerning the geese is likely to be limited, for the foreseeable future, to financial support for externally organised expeditions (e.g. the aerial surveys of 1988). Even this is limited.

In 1988 the Home Rule Government initiated a project to collate information on the distribution of renewable resources. This has been undertaken with use of a Geographic Information System which allows the computerised mapping and interrogation of information (Siegstad 1991). As far as the geese are concerned, information used has been a secondary collation of available data and has not involved any new surveys.

State nature conservation/wildlife management -

"In 1979 Greenland was granted home rule under which responsibility for the management of living resources was transferred to the Greenland Home Rule Government (Nammínorsornerullutik Oqartussat). In 1980 the Home Rule Government adopted the Nature Conservation Act, which was followed up and developed in 1988 by parliamentary regulations on the protection of the environment. These laws were based on old traditions for local management of fish and game stocks - a

practice that was prevalent in earlier times. These local traditions are now built into legislation, which consists of a mosaic of central Home Rule Government regulations and decentralized local authority rules." (Helms 1991)

Responsibilities within the Greenland Home Rule Authority are split between two Directorates: the Directorate of Industries and Fisheries (Section for Renewable Resources - also known as the Natural Resources Office), and the Department of Health and Environment (also known as the Office of the Environment). The Office of the Environment deals with the national park system, protection of mineral deposits, pollution problems, CITES regulations and international environmental work. The Office of the Environment collaborates closely with the Danish Ministry of the Environment.

Resources for pro-active management for sites or populations are very limited and, for example, none of the designated Ramsar sites currently have management plans. With a staff of only 2.5 people the Section for Renewable Resources is greatly limited in its capacity for biological work.

Non-governmental nature conservation/wildlife management -

None in Greenland. Verdensnaturfonden (Danish WWF) and other Danish based organisations have a nominal role, although their effective involvement will be limited to funding initiatives and lobbying. Most research on the geese in Greenland has been initiated by the British based Greenland White-fronted Goose Study, with support from the Wildfowl and Wetlands Trust in recent years.

Effective enforcement of legislation -

There is no intensive enforcement of wildlife regulations in any systematic fashion. This is again resource related. An experimental game warden scheme started in 1990 in the kommunes of Ilulissat, Maniitsoq and Sisimiut. In each areas, two wardens (well respected local hunters) were funded jointly by the Home Rule Government and the Municipality. They were provided with boats and they checked on hunting and fishing within their areas. The scheme has worked well and was continued in

1991. In future, an element of the hunting licence fee (a 'hunting stamp') will be used to fund wardens elsewhere. It is planned to extend this system to all kommunes in Greenland in a current revision of the hunting regulations which will require purchase of an annually renewable game license. This license will require reporting of the annual bag.

Notwithstanding this initiative, there is an urgent need for hunter education as the potential for direct enforcement will always remain limited in such a vast country.

Although Ramsar sites are not protected under national law, there is an awareness of their importance. As an example, construction of small summer cabins within these areas is not allowed.

Section 2.3.6.2. Iceland

Scientific research and monitoring -

Two organisations potentially have a role in research and monitoring relevant to this plan. The Nature Conservation Council (NCC) is responsible for the implementation of the 1971 Nature Conservation Act (NCA). As such it is largely concerned with various site protection issues and has a limited research remit. NCC currently undertakes no research or monitoring of Greenland White-fronted Geese. The Natural History Museum in Reykjavik (also funded by the Ministry of the Environment) has a remit to undertake basic ornithological research. No work is currently undertaken on White-fronted Geese, although the Museum co-ordinates Icelandic recoveries of ringed geese and has assisted foreign goose workers in Iceland. The remit of the Museum may be changed to encourage research into areas of a more applied nature but unless greater resources for such work are also provided, this will be unlikely to materially affect the present situation.

State nature conservation/wildlife management -

The NCC is concerned largely with designation of protected areas (Nature reserves under

Article 24 of NCA). It has a limited budget and limited remit beyond these functions. There is no mechanism for the management of protected areas, most of which to date, have been of a 'wilderness' nature. There is no organisation with executive powers concerned with wildlife management in Iceland. The scope of the Natural History Museum is limited to basic (although potentially also to applied) research (see above). The lack of any means of implementation of this plan in Iceland, in terms of wildlife management, is a major constraint on its future international development. However, private and government institutions are now having input into local plans. This may enable the recognition of areas of nature conservation interest within local planning frameworks.

Non-governmental nature conservation/wildlife management -

The Icelandic Bird Protection Society has historically been concerned largely with protection of birds of prey. Some members are particularly involved in goose survey and monitoring on an individual basis.

The Icelandic Shooting Society (Skotveidifelag Islands: SI) has a small membership (c. 400) out of a potential population of c. 8,000 shooters. It has done much in recent years to promote responsible shooting behaviour and a code of hunting ethics. It has also urged voluntary restraint on the shooting of Greenland White-fronted Geese on its members. It has worked closely with the Ministry of Justice in recent years to develop and run a training course for gun licence applicants. This course includes input on natural history/conservation matters from the Natural History Museum in Reykjavik. Attendance at the two day (evenings only) course for gun licence applicants, but only for those in the Greater Reykjavik area. The SI is also urging the routine collection of bag data as a means of moving towards more rational population management. It is likely to have an important role in the development of the plan, albeit that it is not representative of the whole Icelandic shooting community.

Research and survey have been undertaken on a limited basis in recent years by Greenland White-fronted Goose Study/Wildfowl and

Wetlands Trust expeditions from Britain.

Effective enforcement of legislation -

Enforcement of legislation appears to be lax, even on practices that are strictly illegal such as spring goose shooting. There appears to be little self-motivation for police enforcement of hunting legislation.

Section 2.3.6.3. Great Britain

Scientific research and monitoring -

Most recent research and monitoring has been initiated by the British based Greenland White-fronted Goose Study (GWGS) and more recently, by the Wildfowl and Wetlands Trust (WWT). GWGS co-ordinate the British input into the autumn and spring international census (now undertaken under contract to the UK Joint Nature Conservation Committee (JNCC)). Most census is undertaken by volunteer counters familiar with local flocks. GWGS also co-ordinate the collection of data on annual productivity measures. Results of this monitoring are published as an annual report. WWT hold, for GWGS and the Irish National Parks and Wildlife Service, the main databases of colour-marked birds. Research has also been instigated on Islay by the Nature Conservancy Council (now JNCC and the NCC for Scotland) (Bignal et al. 1988; Easterbee et al. in prep.). The Royal Society for the Protection of Birds (RSPB) monitor goose numbers on their reserves.

State nature conservation/wildlife management -

Prior to April 1991, The Nature Conservancy Council had a GB-remit and had executive powers concerning conservation and wildlife management issues. Since that time, authority has transferred to four bodies: the Nature Conservancy Council for England (English Nature), the Countryside Council for Wales (CCW), The Nature Conservancy Council for Scotland (NCCS) and the UK Joint Nature Conservation Committee (JNCC). From April 1992, NCCS will broaden its remit to include recreational and amenity issues and will become Scottish Natural Heritage (SNH). These

bodies have broad authority in management terms.

In international issues, such as this plan, JNCC speaks for the three Country Councils, although they are responsible for the plans' implementation. JNCC also funds relevant research and monitoring via contracts with WWT and GWGS. The Scottish Office Agriculture and Fisheries Department, part of central government, through its issuing of licenses to shoot geese allegedly causing severe agricultural damage, has also to be considered.

Non-governmental nature conservation/wildlife management -

See above. The main bodies concerned with research monitoring and conservation are GWGS and WWT. Additionally RSPB manages several reserves, in whole or in part, for their Greenland White-fronted Geese. They have also had an important role in lobbying on issues concerning Greenland Whitefront conservation including site protection and shooting policy. With JNCC, RSPB are developing joint Species Action Plans. It is through this mechanism that this international plan will be implemented in Great Britain.

Effective enforcement of legislation -

Generally enforcement of species protection legislation is good with recent prosecutions or attempted prosecutions for illegal shooting of Whitefronts at some sites. Notable problems persist on Islay with abuse of some licenses issued for the prevention of alleged serious agricultural damage by sport shooting interests (Bignal *et al.* 1991). The statutory mechanisms of the SSSI system generally gives an effective form of conservation management for key sites. It is consultative in nature but does not confer absolute protection - as shown by the case of Eilean na Muice Dubh (Duich Moss) in the mid-1980s (Stroud 1985; GWGS 1986; Smith 1985, 1986a,b).

Section 2.3.6.4. Northern Ireland

Scientific research and monitoring -

Little is undertaken. Counts of geese in Northern Ireland are usually undertaken by DoE(NI) and RSPB staff co-ordinating with the Irish National Parks and Wildlife Service. However, coverage has rarely been complete (Table 1.2.3.6). No specific studies have been undertaken.

State nature conservation/wildlife management -

The Conservation Service of the DoE(NI) has responsibility for goose conservation, including the opportunity to designate areas for protection as appropriate. It also, through the wildlife legislation, prohibits the shooting of Greenland White-fronted Geese. Otherwise it has not hitherto been greatly involved in Whitefront conservation issues in the Province.

There is close co-operation with the National Parks and Wildlife Service on relevant, all-Ireland, aspects of Greenland Whitefront conservation.

Non-governmental nature conservation/wildlife management -

The main relevant bodies are RSPB (who have a Belfast office) and, to a lesser extent, the Ulster Wildlife Trust.

Effective enforcement of legislation -

No known cases of deliberate (illegal) shooting are known to DoE(NI) since Greenland Whitefronts were protected in 1985. Enforcement is thought to be adequate, resources permitting.

Section 2.3.6.5. Republic of Ireland

Scientific research and monitoring -

Nearly all scientific research and monitoring has been co-ordinated or conducted by the State National Parks and Wildlife Service (NPWS). This has included operating a marking scheme since 1983/84, co-ordinating re-sightings, and co-ordinating the autumn and spring international census throughout Ireland. Use is made of the NPWS's extensive network of Rangers throughout the Republic.

The National Association of Regional Game Councils (NARGC) has independently counted some larger flocks on an occasional basis.

State nature conservation/wildlife management -

The NPWS has statutory remit for implementation of the 1976 Wildlife Act and associated research functions. The service is constrained by limited resources resulting in their working to strict priorities. The non-statutory nature of the Areas of Scientific Interest (ASI) network means that positive management of these areas for nature conservation is limited (in contrast to the British system). There is responsive control over protective status of birds and shooting seasons which are determined on an annual basis. The season may be defined either geographically or temporally. As a protected species under the Wildlife Act, the NPWS must issue a license to permit geese to be disturbed (in contrast to other Range States)

Non-governmental nature conservation/wildlife management -

The Irish Wildbird Conservancy either own or manage several reserves for Greenland White-fronted Geese. They are also much involved in lobbying for effective conservation measures both in Ireland and internationally. They are limited by their financial base from becoming very much more involved.

The NARGC has been involved in active lobbying for the shooting of geese on a regular basis in Ireland. Through the network of game councils it has an extensive membership.

The Irish Peatland Conservation Council has used the Greenland Whitefront as a 'flagship species' for peatland conservation issues in Ireland (see Section 2.2.1.8). It is unlikely to have a direct role in the management of sites, although it is acquiring peatland resources and developing a peatland conservation strategy.

Effective enforcement of legislation -

Generally adequate, although the geographic remoteness of many sites makes enforcement of the hunting ban difficult or impossible. The network of NPWS Rangers provides a visible

conservation presence on much of the country and act as a deterrent. Some illegal poaching probably occurs nonetheless.

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Section 2.3.7 Impact assessment

In this section the net result of all those factors and influences upon the conservation of the population are considered and conclusions reached as to their possible effect upon future management, together with such steps as may be necessary to mitigate undesirable effects.

Existing policies and actions for Greenland White-fronted Geese are summarised for each Range State in Table 2.3.7.1.

Hunting

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.

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:

- 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;
- there must be adequate provision of disturbance-free refuges wherever hunting takes place;
- 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;
- hunting and associated disturbance should not be permitted during the spring migration and pre-breeding period (after 31 January);
- 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;
- sport-hunting should not influence local flock survival to the detriment of objectives on range conservation.

Greenland

In Greenland White-fronted Geese occur in areas remote from human habitation, but occasionally frequented in summer 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 goose conservation, their present 'wilderness' status 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.

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 from areas of key importance. Clearly such survey needs includes the requirement to monitor, at intervals, numbers of existing protected sites.

The education of hunters and other '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

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.

In practical terms 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, a network of refuge areas and hunter education.

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

In practical terms it is likely that all actions in Iceland will be highly constrained given the current limited resource 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

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 darvic ringing and resighting has given a database of the highest quality information. It is of the greatest importance so as to underpin the continued conservation of the population with high quality science. It is of the greatest importance, at flyway level, that this monitoring and research continues at at least the present level.

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.

Resources for conservation in Ireland are limited although high priority has been given to the geese in recent years. 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 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

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 the Irish Republic. It is of the greatest importance, at flyway level, that existing monitoring and research continues and is expanded.

A network of protected sites exists, protected under national statute and, increasingly, by international designation. These sites are subject to conservation management.

There are particular agricultural conflicts in a few parts of the range. It is important that these are resolved according to principles derived at the IWRB workshop on Farmers and Waterfowl.

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).

Summary

A summary of suggested major policies for Greenland White-fronted Geese is given in Table 2.3.7.2, together with suggested priorities. These are elaborated in Chapter 2.4.

Table 2.3.7.1.

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
HABITATS									
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
POPULATION AND RESEARCH									
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
INTERNATIONAL CO-OPERATION									
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
LEGAL STATUS									
Protection in spring pre-breeding period	Limited	Y	n/a	Limited	Limited	Y	Y	Y	Y
EDUCATION									
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

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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 2.3.7.2.
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
HABITATS									
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
POPULATION AND RESEARCH									
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
INTERNATIONAL CO-OPERATION									
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
LEGAL STATUS									
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
EDUCATION									
Hunter identification skills	High	Y	n/a	Very high	Y	Y	Y	Y	Y

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Hunter education	Y	Y	n/a	Very high	Y	Y	Y	Y	Y
International links between schools etc.	Y	Y	Y	Y	Y	Y	n/a	Y	Y
Opportunities for site twinning programme	Y	Y	n/a	Y	Y	Y	n/a	Y	Y

INTERNATIONAL OBLIGATIONS

Compliance with relevant EEC Directives	Y	n/a	Y	n/a	Y	Y	Y	Y	Y
Ramsar Convention: wise use of wetlands etc.	Y	Y	Y	Y	Y	Y	Y	Y	Y
Bonn Convention: compliance	Y	Y	Y	Y	Y	Y	Y	Y	Y

Chapter 2.4 Operational objectives and options

The operational objectives are precise statements designed to ensure that future conservation is clearly understood and directed. These objectives are long-term statements and conservation options have to be selected which will achieve these objectives.

It is especially important to the long-term management of a dynamic resource like a goose population, that objectives are well reasoned and that the reasoning is clearly understood.

Section 2.4.1 Rationale

In the light of local facts and constraints described in the earlier parts of the plan, especially Chapter 2.3, it is now necessary to consider how the ideal conservation objectives can be achieved, or if necessary modified.

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 requires the involvement of a range of non-governmental organisations in all countries.

In Greenland, Namminersornerullitik Oqartussat (the Greenland Home Rule Government) has the responsibility for the protection of the geese on their breeding grounds.

On their spring and autumn migratory staging areas, the government of Iceland has responsibility for the protection of the geese and their habitats.

On their wintering grounds, the governments of Ireland and the United Kingdom have joint responsibility for the well-being of the population and its habitats.

Conservation will primarily be guided by the requirement to prevent the population from becoming threatened or endangered, and to maintain or enhance its abundance across and beyond its traditional geographic range. It will secondarily be guided by the requirement that 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 to as many people as possible across the international range.

- 1¹. 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 objectives (e.g. 2 and 3). Whilst there is scope for population expansion, and this should be encouraged, 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 to formerly used areas, derives from the risks of having the population distributed at only a few centres of population (Stroud et al. 1990). Threats to these sites could have a disproportionate impact of the whole population. It also enhances regional avifaunal diversity. Maintenance of range conforms to legal requirements under the EEC Birds Directive for Ireland and the UK (Stroud et al. 1990: section 2.3.4).

2. With ever expanding pressure from the human population, Greenland White-fronted Goose habitats will be subject to a greater degree of threat for the foreseeable future. In order to effect this objective, it is necessary to establish a network of protected areas to provide a minimum extent of necessary habitat (see Stroud et al. 1990 for further explanation). The selection of these areas needs to take into consideration needs at both different times and different places (Wilson et al. 1991). 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 condition for geese.
3. Avoidance of agricultural conflict is possible by a range of measures. Such an objective 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 (Owen & Pienkowski 1991) - of benefit to a wide range of other species (Curtis et al. 1991).
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 conservation policies both within and between nations. This co-operation can best be effected by the coming together of Range States to agree a common conservation plan.
5. Since the successful conservation of Greenland White-fronted Geese is the joint and equal responsibility of the governments of Greenland (Denmark), Iceland, Ireland and the

¹Numbered paragraphs relate to section 2.2.4 Ideal Objectives

United Kingdom, international co-operation is required in the implementation of all aspects of this plan. This will ensure its effective implementation.

Operational objectives and outline prescriptions are summarised in Table 2.4.1.1.

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Table 2.4.1.1.**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	
	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	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.
			2.4 Prepare and implement management plans for designated sites of importance	
			Species	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.		

Table 2.4.1.1.**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 2.4.1.1.**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>
<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.</p>	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>

PART 3

PRESCRIPTION

Section 3.3.3 Plan review

Section 3.3.3.1. Introduction

It is essential to review, at predetermined intervals, this conservation plan. The effectiveness of the plan must be measured by comparing achievement against objectives. The biggest problem is deciding the length of the interval between reviews.

Some objectives may be achieved in a very short period, whilst others will only be realised over a very long period of time, if ever. Different objectives within countries will have varying time scales whilst between countries the range of variation may be huge. The best solution would be to apply an individual review period to each objective. Unfortunately this would be the least practical of approaches and would lead to an overwhelming burden of administration.

Clearly this is a dilemma which can only be resolved by using other criteria to determine review intervals. Given that three years is a relative convenient period of time, and long enough to assess most objectives, species conservation plans are usually subject to a major review at this interval. The plan should also have a minor review at annual intervals and emergency reviews wherever necessary.

Section 3.3.3.2 Annual review

The main purpose of the annual review is to ensure that the population is being managed in accordance with the approved conservation plan. It is important that any serious unexpected events or trends which could affect conservation are taken into account.

Section 3.3.3.3 Three Year Review

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, measuring achievement against objective takes place at three year intervals.

The prime function of the review is to ensure that the long term objectives and options, as stated in the plan, are still pertinent, and that the prescriptions have been, and will continue to be, effective in achieving the desired objectives.

The first stage is to update Part 1 of the conservation plan as appropriate. The updated Part 1 will then be used as the basis for reviewing Part 2. This process is best carried out by an individual or small team to produce, if required, a draft revised

plan. The plan will then be taken through a formal acceptance procedure.

Section 3.3.3.4. Emergency review

Mechanisms for emergency action are important if sudden major environmental changes occur within the range of the Greenland White-fronted Goose liable to affect the population.

Section 2.2.2 specifies arbitrary thresholds beyond which population change should be considered abnormal.

The conservation plan makes provision for an emergency review meeting of Range States to be convened. This meeting will be convened by the Secretariat, and will discuss possible causes of the population change in light of other available information. It will address conservation options in the light of all available information.