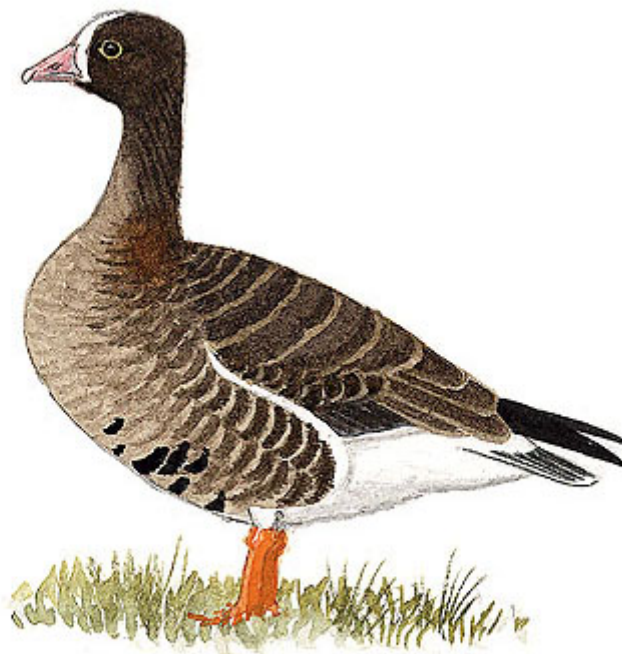


**INTERNATIONAL ACTION PLAN FOR THE
LESSER WHITE-FRONTED GOOSE (*Anser erythropus*)**

Compiled by:

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Timetable

First draft: November 1994
Workshop: December 1994 - Strasbourg, France
Second draft: January 1994
Implementation workshop: November 1995, Poland
This version: February 1996

Reviews

This action plan should be reviewed and updated every three years. An emergency review will be undertaken if sudden major environmental changes, liable to affect the population, occur within the species' range.

Geographical scope

The action plan needs to be implemented in Azerbaijan, Bulgaria, Finland, Germany, Greece, Hungary, Kazakhstan, Lithuania, Norway, Romania, Russia, Sweden, Turkey and Ukraine.

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SUMMARY

During the twentieth century populations of the Lesser White-fronted Goose *Anser erythropus* have everywhere undergone drastic declines in numbers and in the extent of the breeding and wintering ranges. Since the 1940s, the population has probably fallen by more than 90% to fewer than 50,000 individuals (Europe c.1,000 wintering; Caspian region possibly 30,000; eastern Palearctic c.6,000), and the decline is apparently continuing. Indeed, a recent review meeting of experts on the species could account for no more than 2,000 birds throughout its entire West Palearctic range (Lorentsen and Madsen 1995). The reasons for this are virtually unknown, the combination of negative factors acting on the breeding grounds (e.g. habitat loss, disturbance, shooting, increased predation) being probably insufficient to explain the rapid decline of the 1950s, and the apparent catastrophic decline of recent years. Damaging factors at staging areas and in the winter quarters, e.g. habitat loss and shooting appear to be key factors. More information is needed on numbers, distribution, habitat requirements and threats in the central part of the species' range.

In all European range-states except Romania, the Lesser White-fronted Goose is protected. Recently, increased habitat protection and a general shooting ban on geese in Greece and Hungary where geese are protected within Ramsar sites have probably been a cause of increasing numbers of Lesser White-fronted Geese staging and wintering there. In Sweden, a re-introduction programme where young Lesser White-fronted Geese are fostered by adult Barnacle Geese has had some success.

The short-term aim of this action plan is to maintain the current population of the Lesser White-fronted Goose in known areas throughout its range and to locate and assess the existing poorly known breeding and (especially) staging and wintering areas of the species, and, if possible, remove the current threats. In the longer term, the aim is to conserve and manage all major sites to encourage increased use by the species and ultimately a population recovery.

Threats and limiting factors

- * **Hunting - unknown, probably high**
- * **Predation - unknown, probably high**
- * **Disturbance and habitat loss on the breeding grounds - unknown, probably low; helicopter disturbance locally high**
- * **Habitat loss on the staging/wintering grounds - unknown**

Conservation priorities

- * **Locate and assess key areas - essential**

- * **Promote the use of international conventions for the protection of the species together with direct discussions between range states - high**
- * **Promote the legal protection of the species and key sites - high**
- * **Reduce the hunting pressure - high**
- * **Manage habitats and prevent further losses in the staging and wintering grounds - high**
- * **Monitor the remaining populations and carry out research on the biology of the species - high**
- * **Raise public awareness of the species, particularly amongst hunters and landowners - high**

INTRODUCTION

The world population of the Lesser White-fronted Goose *Anser erythropus* breeds in a belt from northern Fennoscandia and northern Russia to far east Siberia. The population winters from the Balkans in the west to the Caspian Sea; further east, wintering grounds are found in China and the Korean peninsula.

Throughout its range the population has undergone a dramatic decrease within the last 50 years (Fennoscandia: Soikkeli 1973, Norderhaug and Norderhaug 1982; Hungary: Sterbetz 1982; Russia: Vinogradov 1990, Rogacheva 1992, A. Andreev unpubl. report). The reasons for the decline are not known, but are generally believed to be found in the staging or wintering areas (Madsen *et al.* 1993).

The Lesser White-fronted Goose is classified by IUCN as globally threatened in the category Rare (Groombridge 1993). According to the new criteria developed by IUCN (Mace and Stuart 1994), it is classified as globally threatened in the category Vulnerable (Collar *et al.* 1994), and at the European level it is also considered Vulnerable (Tucker and Heath 1994). The Lesser White-fronted Goose is listed in Annex I of the EU Wild Birds Directive and is protected under the Bonn Convention (Appendix II) and the Bern Convention (Appendix II).

The present size and trend of the Lesser White-fronted Goose population wintering in the western Palearctic is unknown, because recent counts are not available from what is thought to be the main winter quarters, in Azerbaijan and Russia. Probable total numbers during mid-winter are now well below 50,000 birds, and this estimate is now considered to be far too optimistic. A recent meeting of experts could account for no more than 2,000 birds throughout its entire West Palearctic range (Lorentsen and Madsen 1995). The population wintering in China and the Korean peninsula probably only numbers around 6,000 individuals (A. Andreev unpubl.).

Action must be taken now, firstly to locate and evaluate the remaining staging and wintering sites of the Lesser White-fronted Goose, secondly to safeguard the population from pressures which may adversely affect it.

PART 1. BACKGROUND INFORMATION

Distribution

*** Breeding range**

The Lesser White-fronted Goose breeds in the sub-arctic/low-arctic zone from northern Scandinavia in the west to eastern Siberia in the east, with the range's centre of gravity lying in central Siberia. Within the western Palearctic the Lesser White-fronted Goose breeds in the Scandinavian mountain ranges (Norderhaug and Norderhaug 1984). In Russia, the species used to breed in a belt extending from the Kola peninsula to the Bolshezemelskaya tundra, but at present it is suggested that a viable breeding population is found only in the Bolshezemelskaya tundra.

The range in Fennoscandia has contracted markedly during the twentieth century. The distributions in the western and eastern parts of the range have become fragmented: in northern Scandinavia only small groups (loose associations of a few pairs/families) are found in Finnmark, and the situation in Russia is likely to be the same (Rogacheva 1992).

Figure 1. Breeding, staging and wintering areas of the Lesser White-fronted Goose *Anser erythropus* in the former U.S.S.R. (redrawn from Vinogradov 1990).

* **Staging areas and winter quarters**

The autumn staging areas and winter quarters of the Scandinavian population are poorly known. Autumn and spring staging areas are found in Hungary (Sterbetz 1982), and from late autumn to early spring small numbers are observed in Romania (Munteanu *et al.* 1991 and unpubl.), Bulgaria (Boev 1985, Georgiev *et al.* 1994) and Greece (Handrinos and Goutner 1990, Handrinos 1991). Further to the east, staging areas are found in the Ob valley in Kazakhstan, and major wintering grounds are found in Azerbaijan (Vinogradov 1990), and possibly in Iran and Iraq. According to Vinogradov (1990) massive shifts in winter distribution have occurred in the Caspian region within the last 30–40 years. Wintering areas in Iran have been abandoned, and the status of wintering sites in Iraq is unknown. Spring staging areas are poorly known. In western Finland, small flocks stage in May (Soikkeli 1973, J. Markkola pers. comm.). Recent use of satellite tracking has enabled important staging areas to be located on the Kanin peninsula, Russia. Potentially important staging areas have been found in Brandenburg, Germany, S.W. Lithuania, the Azov Sea and in northern Kazakhstan. There is unconfirmed information that further staging areas exist in the Baltic republics.

Population

* **Numbers and trends on breeding grounds**

The Fennoscandian breeding population was estimated at more than 10,000 individuals in the first half of the twentieth century (Norderhaug and Norderhaug 1984), but since then the population has crashed, and by 1992 numbers were estimated at c.50 pairs. In Sweden the population is considered close to extinct (Sweden: von Essen 1993; Norway: Øien and Aarvak 1993; Finland: J. Markkola pers. comm.). In the early 1990s, 30–60 birds gather in a post-moulting site in Porsanger Fjord in Norway (August–September) (Aarvak and Brøseth 1994).

Drastic reductions in population size and range have also been recorded in northern Russia since the middle of the twentieth century (Vinogradov 1990), and in European Russia the population is estimated at 3,500–5,500 individuals (Vinogradov 1990), but this information has to be regarded as a best guess only, and V. Morozov (pers. comm.) considers this figure too high.

From surveys on the breeding grounds Vinogradov (1990) estimated the total population in Russia to exceed 100,000 individuals; according to Vinogradov (1990) the population in Taimyr has been stable during recent decades. However, these figures have not been confirmed by recent winter counts, as only c.30,000 were accounted for in the Caspian region in the 1980s (Vinogradov 1990). Rogacheva (1992). V. Morozov (pers. comm.) question the high estimate and state that in many regions of central Siberia and northern Russia the population has decreased. The far east Siberian population has declined sharply in recent decades (A. Andreev pers. comm.).

* **Numbers and trends in staging and wintering areas**

The declines recorded on the breeding grounds have been reflected at the Hungarian autumn staging areas; before the 1950s the autumn population was suggested to number c.100,000 birds; in the late 1960s this had fallen to c.5,000 (Sterbetz 1982), and the decrease has continued since, so that in the late 1980s only 200–600 birds were observed

annually (Farago *et al.* 1991 and unpubl.). Encouragingly, in the winters of 1992/93 and 1993/94, increasing numbers (up to 1,200) have been observed wintering/staging in Hungary (S. Farago pers. comm.).

A decrease has also been observed in the spring staging areas in Finland. Before the 1950s several hundred birds were observed each spring, but numbers have declined sharply (Soikkeli 1973) and now only small flocks (usually fewer than 50 birds) are seen (Norderhaug and Norderhaug 1982, J. Markkola pers. comm.). In recent years, up to 97 different individuals have been observed on a pre-nesting staging area at the Porsanger Fjord in northern Norway (Aarvak and Øien 1994).

In Romania and Bulgaria, fewer than 10 Lesser White-fronted Geese are usually observed during mid-January waterfowl censuses, though in January 1992 a total of 900 was estimated in Romania (D. Munteanu pers. comm.), and Lesser White-fronted Geese are generally overlooked in the large flocks of wintering White-fronted Geese *Anser albifrons*. Nankinov (1993) has described a hitherto unknown wintering site of up to 1,000 Lesser White-fronted Geese in northern Bulgaria, but these numbers need to be confirmed.

In Ukraine, only small groups or single birds are observed in flocks of White-fronted Geese (T. Ardamatskaya and V. Serebryakov pers. comm.).

In Greece, up to 1,600 were observed in the 1960s, but since then numbers have declined, and January counts in the 1980s have varied from none to 142 (Handrinos and Goutner 1990, Handrinos 1991). In recent winters, a small but stable winter population of up to 140 birds has become established in north-east Greece (H. Jerrentrup and G. Handrinos pers. comm.).

In Azerbaijan, 30,000 birds have been reported wintering, though this information is not supported by more recent data. A partial survey in February 1996 suggested only 1085 birds, of which only 2.7 - 5.6% were immatures, suggesting poor breeding success in 1995 (Fauna and Flora International unpubl.). The survey did not include the southern shore of Sarasuy lake, where in the past, huge numbers of unspecified geese have been seen from the air (E. Sultanov pers. comm. and *in litt.*). This area is difficult to access. Other former mass wintering sites in the Caspian region have been completely abandoned (Vinogradov 1990, V. Morozov pers. comm.). In Iran, former wintering sites have also been abandoned (Wetlands International unpubl.).

The status of the Lesser White-fronted Goose in Turkey is uncertain. Few specimens have been observed among wintering White-fronted Geese (L. von Essen pers. comm.).

In summary, the breeding and wintering population of Lesser White-fronted Goose in the western Palearctic has undergone an alarming decline (more than 90%) and range contraction in the second half of this century, and this is apparently continuing. The east Palearctic population is now estimated at c.6,000 birds, based on mid-winter counts (Rose and Scott 1994, J. Lu pers. comm.). Hence, it is realistic to assume that the population decline has affected the whole of the world population and that the total has declined to fewer than 50,000 individuals, a figure which must be treated as an absolute

maximum (Europe fewer than 1,000 wintering; Caspian region possibly 30,000 and almost certainly far fewer; eastern Palearctic 6,000).

Life history

Very little information is available about the life history of the species in the wild.

*** Migration**

In Hungary, the last birds of winter/spring are usually seen in late March (Sterbetz 1982). In western Finland and Norway the first birds usually arrive in early May and migration continues until early June (Norderhaug and Norderhaug 1982, T. Aarvak pers. comm.). The geese arrive on the breeding grounds from late May to mid-June and leave the breeding areas from mid-August through September (Norderhaug and Norderhaug 1982, Rogacheva 1992). In Siberia, non-breeding birds undertake a moult-migration to areas north of the breeding range (Rogacheva 1992), while non-breeders in Fennoscandia moult at high altitudes (Ekman 1922, T. Aarvak and J. Markkola pers. comm.). The first autumn influx of birds in Hungary usually occurs in September (Sterbetz 1982).

*** Feeding and habitat requirements**

Nesting habitat includes the taiga and tundra zone, in particular the scrub ecotone (Uspenski 1965, Rogacheva 1992). In Scandinavia, the geese nest inland at relatively high altitudes, up to 700 m (Ekman 1922). The species is strictly herbivorous, foraging on a variety of plants along lake and river margins and in marshes (Lorentsen and Spjøtvoll 1990). During pre-nesting in northern Norway the geese feed on saltmarshes (Aarvak and Øien 1994).

In winter, the geese traditionally occurred in the steppe zone/semi-arid zone, foraging on short grassy, so-called sodic-pasture, vegetation (Sterbetz 1968, 1990). In Hungary, Lesser White-fronted Geese feed predominantly in this habitat, using other types only when there is no steppe available (Sterbetz 1990). Kovács (1995) observed that the species uses pioneer vegetation at the bottom of recently-drained fishponds in the Hortobágy. Because of lack of recent knowledge about winter occurrence, present habitat usage is poorly known.

Threats and limiting factors

The reasons behind the dramatic population decline are not known, so the causes can only be guessed at.

* **Disturbance on the breeding grounds**

Conditions have been relatively stable throughout the century, but, especially in Scandinavia, increasing tourism and angling cause disturbance in some breeding areas. The pre-nesting staging area in Porsanger Fjord, Norway, is next to a helicopter airport which causes much disruption of the activities of the geese.

Importance: unknown, but probably low;
helicopter disturbance locally high

* **Habitat loss and physical development on the breeding grounds**

Habitat loss through the creation of reservoirs for hydroelectric power has happened in Scandinavia. Intensification of reindeer-rearing by the Laps and consequent increased grazing pressures on the tundra may also have had negative influences.

Importance: unknown

* **Predation**

The arctic fox *Alopex lagopus* probably causes some nest predation, but the level is unknown. A recorded spread of the red fox *Vulpes vulpes* at higher levels in mountains into the breeding range of the Lesser White-fronted Goose, may have played a role in the decline. In Fennoscandia, red foxes appear to be a severe threat (J. Markkola pers. comm.).

Importance: unknown, but probably high

* **Habitat loss and modification on the staging/wintering grounds**

The traditional feeding conditions have deteriorated through the transformation of the steppes, the former wintering habitat of the birds (Sterbetz 1968, 1990), into cultivated land. This development has happened throughout most of the assumed wintering range. In Greece, marshland habitat, which is favoured for feeding, is converted into agricultural land (Handrinos and Goutner 1990, H. Jerrentrup and T. Nazirides pers. comm.). The spring staging areas in western Finland are grasslands (salt and fresh) traditionally extensively used for hay-cutting and livestock-grazing. However, the condition of the grasslands as goose feeding habitat has deteriorated because of lack of cutting and grazing, which has caused much of the formerly short-grazed vegetation to grow too tall (J. Markkola pers. comm.).

Importance: unknown, but probably high

* **Hunting**

Over-exploitation from hunting has perhaps played a role, but there is scant information about former hunting pressures on the geese. Despite the fact that the Lesser White-fronted Goose is protected throughout its range in the western Palearctic, birds are still shot because of misidentification with other quarry species of geese or because of indiscriminate waterfowl shooting. This is known to be the case in Russia where spring hunting of waterfowl is allowed (Rogacheva 1992), and in Finland (J. Markkola pers. comm.), and undoubtedly in the other range-states as well. It was formerly a problem in Greece (Handrinos and Goutner 1990, H. Jerrentrup and T. Nazirides pers. comm.) but since 1993 all goose hunting has been banned in key sites, and any remaining threat would be from illegal goose hunting. Apart from the direct negative impact, hunting in or near roosting and feeding sites causes disturbance which can reduce the availability of suitable habitat. In northern Scandinavia, and probably also in the Russian breeding

range, mass capture of moulting Lesser White-fronted Geese took place at certain sites as late as in the 1950s (Curry-Lindahl 1959).

Importance: unknown, but probably high

To summarise, the combination of negative factors potentially acting on the breeding grounds is probably not sufficient to explain the rapid rate of decline that took place in the 1950s. Probably the sharp decline has been caused primarily by negative factors in the winter quarters, i.e. habitat loss and excessive hunting.

* **Vulnerability indices**

Assessed on the basis of a declining population and the lack of recent knowledge about the status of breeding and wintering areas throughout the world range, the species appears to be **highly vulnerable**.

* **Extinction risk**

The fragmentation of the breeding range and the continued population decline greatly increase the risk of local and regional extinctions. For the world population the extinction risk is assessed to be **medium to high**.

Conservation status and recent conservation measures

* **Azerbaijan**

Protected. The major wintering area in Azerbaijan was formerly a reserve with some shooting regulations and with farmland managed especially to attract Lesser White-fronted Geese, e.g. unharvested seed crops (V. Vinogradov pers. comm.). The status of these regulations under the new Azerbaijan regime is unknown. A partial survey was carried out in January - February 1996.

* **Bulgaria**

The species is protected by the Act 342 (1986), and is listed as endangered in the Red Data Book of Bulgaria (Boev 1985). The major certain staging area, Shabla Lake, has recently been designated as protected. Goose hunting is not permitted at Ramsar sites. Action is taken to give better protection and habitat management to Lake Shabla (prepared by the Ministry of Environment, the Bulgarian Academy of Science and the Bulgarian Society for the Protection of Birds). A penalty, soon to be increased from US\$2.30 to US\$460, is imposed for shooting a Lesser White-fronted Goose.

* **Finland**

Protected. Staging areas near Oulu are protected. Marshes are managed for the Lesser White-fronted Geese (grazing and mowing). See also actions undertaken in Sweden.

- * **Germany**
Strictly protected. A regular visitor on passage in very small numbers. The main sites are Unterer Niederrhein (Nordrhein Westfalia), wetlands in northern Germany (Schleswig-Holstein, Lower Saxony) and eastern Germany (eg Galenbecker See in Brandenburg). The main sites are protected as nature reserves and Unterer Niederrhein and Galenbecker See are Ramsar sites. Illegal hunting and shooting in error through misidentification are likely threats.

- * **Greece**
Protected. The three most important sites, Evros delta, Kerkini Lake and Lake Mitrikou, are Ramsar sites and EU Special Protection Areas (RCB 1990). Since 1993, hunting of all goose species has been banned, and this has probably led to the recent establishment of a small wintering population. However, hunting of other game species continues in areas used by the Lesser White-fronted Geese. Habitat restoration is carried out in the Evros delta, with the aim of maintaining its lagoon characteristics.

- * **Hungary**
Strictly protected. The major autumn staging areas in Hungary are protected, including a general shooting ban on waterfowl. Goose hunting is no longer permitted at Ramsar sites, and this may be the cause of the recent increase in wintering and staging numbers of the Lesser White-fronted Goose. However, illegal hunting away from these areas may pose a threat. The hydrology of the fishpond system in the Hortobágy is managed specifically to create conditions for feeding Lesser White-fronted Geese as well as roosting Cranes *Grus grus*.

- * **Kazakhstan**
Protected.

- * **Lithuania**
Recent information suggests there is an important staging area in the south-west, with counts of 200-500. Several birds have been reported shot (Svasas in press)

- * **Norway**
Protected. Pre-nesting staging areas in the Porsanger Fjord, northern Norway, are protected; breeding areas are partly within national parks. See also actions undertaken in Sweden.

- * **Romania**
Presently a quarry species but likely to become protected in the near future.

- * **Russia**
Protected. Part of the central breeding area in Taimyr is within the Taimyr State Reserve.

* **Sweden**

Protected. Former breeding areas are partly within national parks. A reintroduction project was launched in 1981 (von Essen 1991, 1993). Semi-captive Barnacle Geese *Branta leucopsis* are used as foster parents to goslings of Lesser White-fronted Geese and these families are released into former breeding areas of Lesser White-fronted Geese. The intention is to restore a breeding population in Sweden by reducing winter mortality through the change of migration routes of the Lesser White-fronted Geese from the original south-easterly direction to the south-west, towards wintering grounds of the Barnacle Geese in the Netherlands. In Finland, a restocking project has been underway since 1989 in which juvenile birds are released in areas with a dispersed breeding population. The Swedish project has had some success: introduced birds have established a migration to the Netherlands, have reappeared in the release areas, and a small breeding population has been established (von Essen 1993 and pers. comm.). It is too early to evaluate the Finnish project. Observations on the wild population in Norway have the aim of pin-pointing possible limiting factors and threats.

* **Turkey**

Protected. The species occurs only occasionally.

* **Ukraine**

Protected.

* **International**

In Scandinavia, different initiatives, under the auspices of an informal Nordic Lesser White-fronted Goose Working Group, have been taken to meet the decline of the breeding population.

PART 2. AIMS AND OBJECTIVES

AIMS

1. In the short-term aims to maintain the current population of the Lesser White-fronted Goose in known areas throughout its range.
2. In the medium to long term, to ensure an increase in the Lesser White-fronted Goose population.

OBJECTIVES

1. POLICY AND LEGISLATIVE

1.1. To finalise detailed conservation planning with member states in the flyway of the Lesser White-fronted Goose

The signing, ratification and implementation of the relevant international wildlife conventions (especially Ramsar and Bonn, and the Agreement on the Conservation of African-Eurasian Migratory Waterbirds under the Bonn Convention) by range-states should be encouraged and pursued. However, this process may take several years; because of the urgency of action for the Lesser White-fronted Goose direct negotiations with range-states about the conservation of the species and its habitat will be required.

Priority: high
Time-scale: short

1.2. To protect the Lesser White-fronted Goose and its habitat through national and international legislation

Encourage actions to ensure that the species receives the fullest possible legislative protection in all range-states. Where the current protection is inadequate, sites of international importance should be given more protection, including the creation of refuge areas with feeding and roosting opportunities.

Priority: high
Time-scale: short

1.3. To promote agricultural and other land use policies that benefit the species

It is anticipated that agricultural practices in eastern Europe will change because of the change in political systems. The effect on the habitat of the Lesser White-fronted Goose is unclear but the problem should be addressed once the major staging and wintering sites have been located.

The Lesser White-fronted Goose is considered a priority in the Conservation Strategies for European inland wetlands and agricultural habitats currently being prepared by BirdLife International (Tucker *et al.* in press). These will address habitat wide measures which could be implemented to benefit this and other species.

Priority: high
Time-scale: medium

2. SPECIES AND HABITAT PROTECTION

2.1. To prevent hunting and associated disturbance

Despite the fact that the Lesser White-fronted Goose is protected in all European range-states except Romania, birds are still shot. At key sites, all waterfowl shooting should be regulated to prevent avoidable mortality of Lesser White-fronted Geese. To minimise the disturbance effect of hunting, core zones with no shooting should be designated at all key sites, including roosting and feeding habitats. In core breeding areas in Russia, spring shooting should be prevented. Generally, harmonisation of hunting seasons between neighbouring range-states should be promoted in order to reduce hunting during late winter and spring.

Priority: high

Time-scale: short

2.2. To prevent further loss of habitat on the breeding grounds

Promote protection of core breeding areas through designation as protected areas and the diversion of industrial development and tourism to other areas.

Priority: medium

Time-scale: medium

2.3. To manage habitat on staging and wintering grounds

For known staging and wintering areas, management plans should be prepared, prioritising the conservation needs and habitat requirements of Lesser White-fronted Geese. Sites in the Kanin peninsula, Russia and Brandenburg, Germany should be protected and adequately managed.

Priority: high

Time-scale: short, ongoing

2.4. To reintroduce and restock populations when other conservation measures fail

Re-introduction and restocking may be accepted as an alternative way to minimise the risk of extinction of the species but should be applied only when other efforts to conserve the wild population appear to fail and the IUCN criteria for reintroductions are met (Kleiman *et al.* 1994). Re-introduction should only be carried out in areas where the species has disappeared, and measures should be taken to minimise risks to natural populations. As long as captive stocks of Lesser White-fronted Geese exist and can be maintained, there is no urgency for re-introduction and restocking. Therefore, these activities should have lower priority compared to measures focusing on the remaining wild populations. Reintroduction and restocking should be discontinued if a natural recovery of the wild population can be verified.

Priority: low

Time-scale: long

3. MONITORING AND RESEARCH

3.1. To locate and assess key areas

Key staging and wintering sites of the populations breeding in Fennoscandia and Russia should be located and carefully monitored. The status of staging and wintering sites in Kazakhstan and Azerbaijan should be checked. Use of satellite-tracking on individuals from Scandinavia and central Siberia may give the most efficient first answers about winter dispersal and migratory movements. The tracking could be followed up by ground surveys, with the Azov Sea an early target. Moulting grounds should be located.

Priority: essential

Time-scale: short/medium

3.2. To monitor remaining populations

The monitoring of the remaining breeding population in Scandinavia and the staging and wintering populations in Hungary, Greece, Romania and Bulgaria (and Turkey) should continue in order to assess the trends of the wild population. Counts of age ratios and brood size should be carried out; this has been done successfully in Hungary for some years (Sterbetz 1986) but unfortunately has now stopped. Distribution, habitat use and threats should be described.

Priority: high

Time-scale: short/ongoing

3.3. To conduct studies relevant to the conservation of the species

Comprehensive field studies of the habitat and behavioural ecology of the Lesser White-fronted Goose throughout its annual cycle should be carried out in order to permit greater understanding of the species' habitat requirements. This will create an informed basis for site and habitat protection and management. On the breeding grounds, factors affecting breeding success should be studied.

Priority: high

Time-scale: short

4. PUBLIC AWARENESS AND TRAINING

4.1. To increase awareness of the importance of the Lesser White-fronted Goose and the threats facing the species

Relevant government departments and NGOs should be encouraged to raise public awareness of the importance of the Lesser White-fronted Goose within their range-states.

Priority: high

Time-scale: short

4.2. To educate hunters and landowners

An internationally coordinated education programme aimed at hunters and landowners should be developed to make them aware of the vulnerability of the species, the problems in identification and the need to avoid hunting in key areas.

Priority: medium

Time-scale: medium

4.3. To train reserve wardens in census techniques

In particular, distinguishing Lesser White-fronted Geese in mixed *Anser* flocks and distinguishing different age-classes.

Priority: medium

Time-scale: medium

REFERENCES

- Aarvak, T. and Brøseth, H. (1994) Prosjekt dverggås. Årsrapport 1994. Norwegian Ornithological Society (Rep. 1–1994).
- Aarvak, T. and Øien, I. J. (1994) Dverggås *Anser erythropus* – en truet art i Norge. *Vår Fuglefauna* 17: 70–80.
- Boev, N. (1985) Lesser White-fronted Goose (*Anser erythropus*). P.58 in B. Botev and T. Peshev, eds. *Red Data Book of Bulgaria*. Sofia: BAS.
- Collar, N. J., Crosby, M. J. and Stattersfield, A. J. (1994) *Birds to watch 2: the world list of threatened birds*. Cambridge, U.K.: BirdLife International (BirdLife Conservation Series no. 4).
- Curry-Lindahl, K. (1959) *Våra fåglar i Norden*. Stockholm.
- Ekman, S. (1922) *Djurvärldens Utbredningshistoria på den Skandinaviska halvön*. Stockholm.
- von Essen, L. (1991) A note on the Lesser White-fronted Goose *Anser erythropus* in Sweden and the results of a re-introduction scheme. *Ardea* 79: 305–306.
- von Essen, L. (1993) Projekt Fjällgås. Projektbeskrivning och resultat intill 1992.10.31. Report from Swedish Hunters' Association.
- Farago, S., Kovacs, G. and Sterbetz, T. (1991) Goose populations staging and wintering in Hungary 1984–1988. *Ardea* 79: 161–164.
- Georgiev, D., Stoikov, S., Marinov, M. and Stoyanova, S. (1994) Lesser White-fronted Goose (*Anser erythropus*). *Neophron* 1/94: 11.
- Groombridge, B., ed. (1993) *1994 IUCN Red List of threatened animals*. Gland, Switzerland, and Cambridge, U.K.: International Union for Conservation of Nature and Natural Resources.
- Handrinos, G. I. (1991) The status of geese in Greece. *Ardea* 79: 175–178.
- Handrinos, G. L. and Goutner, V. (1990) On the occurrence of the Lesser White-fronted Goose *Anser erythropus* in Greece. *J. Orn.* 131: 160–165.
- Kleiman, D. G., Stanley Price, M. R. and Beck, B. B. (1994) Criteria for reintroductions. Pp. 287 - 303. Olney, P. J. S., Mace, G. M. and Feistner, A. T. C. (eds.) *Creative Conservation: Interactive management of wild and captive animals*. London: Chapman & Hall.
- Kovács, G. (1995) The Birdlife of the Hortobágy fishponds (in Hungarian). In *Alfoldi Mozaik*. Min. Env. and Reg. Policy, Budapest.
- Lorentsen, S.-H. and Madsen, J. (1995). Recommendations on Urgent Action for the Conservation of the Lesser White-fronted Goose. *Unpubl. report of Wetlands International Goose Research Group*.
- Lorentsen, S.-H. and Spjøtvoll, Ø. (1990) Note on the food choice of breeding lesser white-fronted goose *Anser erythropus*. *Fauna Norv. Ser. C., Cinclus* 13: 87–88.
- Mace, G. and Stuart, S. (1994) Draft IUCN Red List categories. *Species* 21–22: 13–24.
- Madsen, J., Komdeur, J. and Cracknell, G. (1993) International action for the Lesser White-fronted Goose *Anser erythropus*. *Proc. 7th Nordic Orn. Congress*: 120–123.
- Munteanu, D., Weber, P., Szabó, J., Gogu-Bogdan, M. and Marinov, M. (1991) A note on the present status of geese in Romania. *Ardea* 79: 165–166.

- Nankinov, D. N. (1993) A new wintering area of the Lesser White-fronted Goose *Anser erythropus* in Bulgaria. *Ornis Svecica* 3: 165–166.
- Norderhaug, A. and Norderhaug, M. (1982) *Anser erythropus* in Fennoscandia. *Aquila* 89: 93–101.
- Norderhaug, A. and Norderhaug, M. (1984) Status of the Lesser White-fronted Goose, *Anser erythropus*, in Fennoscandia. *Swedish Wildl. Res.* 13: 171–185.
- Øien, I. J. and Aarvak, T. (1993) *Status for dverggs Anser erythropus in Fennoskandia*. Norwegian Ornithological Society.
- Ramsar Convention Bureau (1990) *Directory of wetlands of international importance. Ramsar Switzerland Conference 1990*. Gland, Switzerland: International Union for Conservation of Nature and Natural Resources.
- Rogacheva, H. (1992) *The birds of central Siberia*. Husun Druck- und Verlagsgesellschaft.
- Rose, P. M. and Scott, D. A. (1994) *Waterfowl population estimates*. Slimbridge, U.K.: International Waterfowl and Wetlands Research Bureau (IWRB Spec. Publ. 29).
- Soikkeli, M. (1973) Decrease in numbers of migrating Lesser White-fronted Geese *Anser erythropus* in Finland. *Finnish Game Res.* 33: 28–30.
- Sterbetz, I. (1968) Der Zug der Zwerggans auf der Ungarischen Puszta. *Ardea* 56: 259–266.
- Sterbetz, I. (1982) Migration of *Anser erythropus* and *Branta ruficollis* in Hungary 1971–1980. *Aquila* 89: 107–114.
- Sterbetz, I. (1986) Percentage of juvenile Lesser White-fronted Geese (*Anser erythropus* L., 1758) in Hungary. *Aquila* 92: 81–88.
- Sterbetz, I. (1990) Variations in the habitat of the Lesser White-fronted Goose (*Anser erythropus* L., 1758) in Hungary. *Aquila* 96–97: 11–17.
- Tucker, G. M. and Heath, M. F. (1994) *Birds in Europe: their conservation status*. Cambridge, U.K.: BirdLife International (BirdLife Conservation Series no. 3).
- Uspenski, S. M. (1965) *Die Wildgänse nordeurasiens*. Wittenberg-Lutherstadt: Neue Brehm-Bücherei.
- Vinogradov, V. (1990) *Anser erythropus* in the USSR. Pp.199–203 in G. V. T. Matthews, ed. *Managing waterfowl populations. Proc. IWRB Symp., Astrakhan, 1989*. Slimbridge, U.K.: International Waterfowl and Wetlands Research Bureau (IWRB Spec. Publ. 12).

ANNEX 1. RECOMMENDED CONSERVATION ACTIONS BY COUNTRY

*** Azerbaijan**

- 1.2. Promote fullest possible protection of all key sites.
- 2.1. Encourage positive habitat management to maintain and increase the use by the Lesser White-fronted Goose.
- 3.1. Assess status of wintering sites; carry out a full survey of the Sarasuy lake.
- 3.2. Monitor the use of sites by geese and carry out research into habitat requirements and threats to wintering birds.
- 4.1. Raise public awareness of the threats faced by the species and its importance.
- 4.3 Encourage and train reserves staff to count Lesser White-fronts separately in mixed flocks, and to monitor age ratios.

*** Bulgaria**

- 1.2./1.3. The conservation of the Lesser White-fronted Goose should be considered when new agricultural legislation and policies are prepared and appropriate measures for ensuring the quality of the feeding habitats should be promoted in agricultural practices.
- 2.2. Promote the designation of Lake Shabla as a Ramsar site and an increase in the no-hunting zone around the lake.
- 3.1./2.2./
2.3. Confirm the status of the newly described sites for the species in northern Bulgaria. In case it is regularly used, designation as a protected area should be promoted and habitats managed to the benefit of the geese.
- 3.2. Monitor the use of sites by geese and carry out research to determine habitat requirements of the geese and local threats.
- 4.1. Raise public awareness of the threats faced by the species and its importance.
- 4.2. Raise awareness amongst hunters of the importance of the species, the problems in identifying it and the need to avoid hunting in key areas.

*** Finland**

- 2.2. Promote the full protection of the remaining breeding area from development and tourism.

- 2.3. Promote management of the spring staging areas near Oulu for the benefit of the geese.
- 3.2. Continue annual monitoring of numbers of geese utilising the site.
- 3.2. Regularly monitor the breeding population.
- 4.2. Raise awareness amongst hunters of the importance of the species, the problems in identifying it and the need to avoid hunting in key areas.

* **Germany**

- 2.2./3.1 Locate and assess key staging areas, and promote fullest possible protection.
- 3.3. Initiate studies of the habitat requirements during staging; local threats should be determined.

* **Greece**

- 1.2./1.3/
2.2./2.3. Promote the fullest possible protection of key sites in north-east Greece in order to maintain and increase wintering numbers.
- 2.3. Continue with the implementation of core zones where the geese can feed and roost undisturbed.
- 3.2. Continue monitoring of the species.
- 3.3. Initiate studies of habitat and behavioural ecology.
- 4.2. Raise awareness amongst hunters of the importance of the species, the problems in identifying it and the need to avoid hunting in key areas.

* **Hungary**

- 3.2. Continue monitoring of the species.
- 3.3. Studies of the habitat and behavioural ecology of the geese should be initiated; age ratios and brood size should be assessed annually; threats to the geese should be determined.
- 4.2. Raise awareness amongst hunters of the importance of the species, the problems in identifying it and the need to avoid hunting in key areas.

* **Kazakhstan**

- 1.2./2.2. Promote fullest possible protection of key sites and manage habitats for the benefit of the Lesser White-fronted Goose.
- 2.1. Promote control of hunting in areas used by the Lesser White-fronted Goose.
- 3.1. Locate staging areas.
- 3.2./3.3. Monitor the use of sites by geese and carry out research to determine habitat requirements and threats to the staging population.
- 4.1. Raise public awareness of the threats faced by the species and its importance.
- 4.2. Raise awareness amongst hunters of the importance of the species, the problems in identifying it and the need to avoid hunting in key areas.

* **Lithuania**

- 1.2./2.2. Promote fullest possible protection of key sites.
- 2.1. Promote control of hunting in areas used by the Lesser White-fronted Goose.
- 3.1. Locate staging areas.
- 3.2./3.3. Monitor the use of staging sites by geese and establish the extent of any shooting problem.
- 4.2. Raise awareness amongst hunters of the importance of the species, the problems in identifying it and the need to avoid hunting in key areas.

* **Norway**

- 2.2. Promote fullest possible protection for the remaining breeding areas, pre-nesting and post-nesting staging areas from development and tourism.
- 2.3. Promote regulation of helicopter flights in the pre-nesting area in Porsanger Fjord.
- 3.2. Monitor annually the population of pre-nesting and post-nesting staging geese, as well as the breeding population.

* **Romania**

- 1.2. Promote full protection from hunting for the species.
- 3.2./3.3. Monitor wintering numbers annually and determine habitat use.
- 4.1. Raise public awareness of the threats faced by the species and its importance.

- 4.2. Raise awareness amongst hunters of the importance of the species, the problems in identifying it and the need to avoid hunting in key areas.

* **Russia**

- 2.2. Promote fullest possible protection for key areas for breeding, staging or wintering from physical development and hunting.
- 3.1. Locate and assess core areas for nesting, moulting, and pre-nesting and post-breeding staging.
- 3.3. Initiate studies of factors affecting breeding success.
- 3.3. Initiate studies of the habitat requirements during staging; local threats should be determined.
- 4.1. Raise public awareness of the threats faced by the species and its importance.
- 4.2. Raise awareness amongst hunters of the importance of the species, the problems in identifying it and the need to avoid hunting in key areas.

* **Sweden**

- 2.2./2.3. Although the wild population is regarded as practically extinct, the relevant authorities should keep the conservation focus on former breeding areas, in case the wild population may recover and return, or in case sites may be used as centres of reintroduction.

* **Ukraine**

- 3.1. Possible wintering sites should be located and assessed.
- 4.1. Raise public awareness of the threats faced by the species and its importance.
- 4.2. Raise awareness amongst hunters of the importance of the species, the problems in identifying it and the need to avoid hunting in key areas.