

International Single Species Action Plan for the Western Palearctic Population of the LESSER WHITE-FRONTED GOOSE, *Anser erythropus*

Comments from SWEDEN on Version 3.0. - Third and Final Draft, May 2008

Reception date: 28 June 2008 (email)

Sweden considers it of vital importance that the single species action plan for this species will be finalised and adopted, and has also economically supported the finalization of the draft.

However, we find that the draft SSAP and annexes generally needs to be updated in relation to what has happened during recent years and therefore we have rather extensive and detailed comments on the documents (please find enclosed).

If our comments are well received and included into the SSAP we would be happy to support it.

Introduction and Acknowledgements

This Third and final Draft of the Action Plan draws on the conclusions of the international 'Workshop on Protection of Lesser White-fronted Goose' held in Lammi, Finland, 31 March – 2 April 2005, and takes into account all inputs received in response to circulation of the First Draft for technical review. It also reflects the decision of the Scientific Council of the Convention on Migratory Species of 18 November 2005 (see Annex 9a) and the conclusions of the AEWa Secretariat's negotiations with the Governments of Finland, Germany, Norway and Sweden during January 2007 (AEWA 2007; Annex 10) following circulation of the Second Draft.

The following individuals commented on the first draft: Tomas AARVAK, BirdLife Norway/Norwegian LWfG Project; Åke ANDERSSON, Swedish supplementation project; Anna-Carin ANDERSSON, Uppsala University, (Sweden); Luba BALYAN, Armenian Society for the Protection of Birds; Marie BJÖRKLUND, County Administrative Board of Norrbotten (Sweden); Sergey DERELIEV, AEWa Secretariat; Morten EKKER, Norwegian Directorate for Nature Management; Per HANSSON, Västerbottens Ornitologiska Förening (Sweden); Thomas HEINICKE, Germany; Baz HUGHES, The Wildfowl & Wetlands Trust (UK); Lauri KAHANPÄÄ, Friends of the Lesser White-fronted Goose (incorporating comments from Antti Haapanen and Martti Soikkeli); Elena KREUZBERG, Uzbekistan; Petri LAMPILA, Finnish LWfG Conservation Project; Torsten LARSSON, Swedish Environmental Protection Agency; Teemu LEHTINIEMI, BirdLife Finland; Szabolcs LENGYEL, University of Debrecen (Hungary); Juha MARKKOLA, Finland; Juha MERILÄ WWF Finland/Finnish LWfG Conservation Project; Johann MOOIJ, Aktion Zwerggans/Friends of the Earth (Germany); Vladimir MOROZOV, Russian Federation; Ingar J. ØIEN, BirdLife Norway/Norwegian LWfG Project; Nikolai PETKOV, Bulgarian Society for the Protection of Birds; Minna RUOKONEN, University of Oulu (Finland); Ivan RUSEV, Ukraine; Wolfgang SCHOLZE, Aktion Zwerggans/Friends of the Earth (Germany); SWEDISH ORNITHOLOGICAL SOCIETY/BirdLife Sweden; Sami TIMONEN, Finnish LWfG Conservation Project; Petteri TOLVANEN, WWF Finland/Finnish LWfG Conservation Project; Maire TOMING, Lesser White-fronted Goose Working Group, Estonia; Seppo VUOLANTO, Ministry of Environment, Finland; Sergey YEROKHOV, Kazakhstan.

Comment [PÖ1]: In order to be in line with the outcome of the first meeting with the Committee for supplementation and reintroduction concerning the Fennoscandian population the reference to the negotiation mission should come first and then the reference to the CMS Scientific Council.

Comment [psn2]: Use "supplementation" instead of "reintroduction" regarding the Swedish project/intervention throughout the document in accordance with definitions by IUCN (e.g., 1998).

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Executive Summary

Population and range decline

The global population of Lesser White-fronted Goose has declined rapidly since the middle of the 20th century. The decrease in numbers has been accompanied by fragmentation of the breeding range and is continuing to affect all populations, giving rise to fears that the species will go extinct unless the downward trend is halted and reversed. Overhunting and habitat loss are considered to be the main threats. BirdLife International estimates a decrease in numbers in the range of 30% to 49% during the period 1998–2008.

Three subpopulations can be recognised as surviving components of the species' formerly more extensive breeding range:

- Fennoscandian population (breeding in the Nordic countries and the Kola Peninsula of north-westernmost Russia);
- Western main population (nesting in northern Russia to the west of the Taimyr Peninsula); and
- Eastern main population (nesting from the Taimyr Peninsula eastwards and wintering in China).

In the Fennoscandian region, the local Swedish population that was close to extinction has been supplemented by captive-bred birds, a project which also established a human-modified flyway. With exception of the Swedish local population, the Fennoscandian' and Western main populations underwent significant declines during the twentieth century and continue to decrease, due primarily to hunting pressure and habitat loss along migration routes and in wintering areas. The supplemented population appears to be increasing slowly, but views differ markedly in relation to the ethical and scientific merits of captive breeding, supplementation and flyway manipulation as conservation tools for this species.

Scope of this Action Plan

This Action Plan deals with conservation of two of the three populations – namely the Fennoscandian population and Western main population – given that the Eastern main population does not occur within the AEWA Agreement Area or the territory of Member States of the European Union. The Eastern main population is therefore only mentioned when a global context or comparison is required. The Action Plan also takes into account the population supplemented with captive-bred birds in Swedish Lapland, migrating to winter in The Netherlands.

Principal Range States

Lesser White-fronted Geese occur regularly in at least 21 States within the European Union and/or AEWA Agreement Area. These are referred to as 'Principal Range States' in the Action Plan and have the major responsibility for its implementation. These states are listed below. The letters in brackets denote the relevant populations of Lesser White-fronted Goose (F = Fennoscandian; WM = Western main; S = supplemented):

EU Principal Range States

Bulgaria (WM)
Estonia (F)

Finland (F)
Germany (WM)
Greece (F)
Hungary (F)

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Comment [kmi3]: This has nothing to do with range and population decline and should be discussed elsewhere in the document

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Lithuania (F)
The Netherlands (R)
Poland (F,WM)
Romania (WM)
Sweden (F,S)

Non-EU Principal Range States

Azerbaijan (WM)

Iraq (WM)
Islamic Republic of Iran (WM)
Kazakhstan (F,WM)
Norway (F)
Russian Federation (F,WM)
Syria (WM)
Turkey (F,WM)
Turkmenistan (WM)
Ukraine (F,WM)
Uzbekistan (WM)

Comment [PÖ4]: Should not this be S as in supplemented as it reflects the Swedish supplemented population?

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Threats

There is evidence that the most important factors driving the continued decline in numbers and fragmentation of range of the Lesser White-fronted Goose (both the Fennoscandian and Western main subpopulations) are those that cause high mortality among fully grown birds. Demographic elasticity analysis of Norwegian LWfG show that annual survival of birds up to 2 years of age also affects population growth very much It is also clear that these factors operate primarily on the staging and wintering grounds, given that studies in the breeding range have failed to detect any adverse impacts that are of significant magnitude to explain the population crash. Although the species is legally protected, on paper at least, across virtually its entire range, hunting is considered to be the primary cause of mortality and the single most important threat that this Action Plan has to tackle. The loss and degradation of suitable habitat along migration routes and in wintering areas is currently considered to be an important but secondary threat to survival of full-grown birds. However, its significance as a likely driver for the historical declines and range changes during the 20th century should not be underestimated.

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Comment [psn5]: Demographic elasticity analyses of Norwegian LWfG survival data show that it's mainly the high mortality among subadult (0-2 yr-old) birds that cause the negative population growth, see page 16.

Focus and content of the Action Plan (see Chapter 5)

Action Plan Goal

To restore the Lesser White-fronted Goose to favourable conservation status within the AEW Agreement Area no later than WHICH YEAR(?).

Action Plan Purpose

To stop and reverse the current population decline and range contraction.

Results required for delivering the Purpose and Goal

Result 1: Mortality rates are reduced

Result 2: Further habitat loss and degradation is prevented

Result 3: Reproductive success is maximised

Result 4: No introgression of DNA from other goose species into the wild population occurs as a result of further releases and DNA introgression from released birds from captive breeding programmes.

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Result 5: Key knowledge gaps filled

Result 6: International cooperation maximised

For each Result, Objectively Verifiable Indicators, Means of Verification, Priority and Timescale are identified, in addition to the specific activities needed to achieve the desired Result (see Chapter 6).

Principles of Implementation

1. An International Lesser White-fronted Goose Working Group shall be established, consisting of governmental representatives of all Range States. The governmental

Comment [kmi6]: Is it possible that the Action plan more clearly could answer the question on HOW the illegal hunting in Russia and Kazakhstan should be targeted in practice. HOW should destruction of key wetlands in Central Asia and the Middle East be halted, and HOW could restoration and protection of such wetlands be implemented?

representatives shall be free to bring in their own experts and to call on their support as required. The Working Group shall be chaired by the AEWA Secretariat (subject to additional, dedicated human and financial resources being made available to the Secretariat) and will operate in accordance with Terms of Reference to be developed by the AEWA Secretariat, approved by the Range States and endorsed by the AEWA Technical Committee.

2. The main priority for the conservation of the Lesser White-fronted Goose is the maintenance of the populations breeding in Fennoscandia and Russia.
3. The efficiency of conservation measures is to be assessed by the International Lesser White-fronted Goose Working Group in consultation with independent conservation scientists.
4. Implementation and future modification of this International Single Species Action Plan – and all related decisions – shall be undertaken with transparency and accountability so that progress can be subject to scientific scrutiny at any time.
5. Each Range State shall consider support for ‘on-the-ground’ conservation measures, particularly along the Lesser White-fronted Goose flyway(s) that traverse(s) its territory.
6. Particular attention shall be paid to mortality due to hunting and urgent targeted measures shall be implemented to reduce the magnitude of this threat, the success of which shall be promptly and regularly reviewed and scientifically evaluated.
7. Supplementing wild populations with captive-bred birds shall be considered if other conservation measures are not as quickly efficient as needed and should populations continue to decline. As with any other captive breeding, reintroduction or supplementation initiatives this project will be subject to consideration by the *Committee for LWfG captive breeding, reintroduction and supplementation in Fennoscandia* (see below).
8. The SSAP should be regularly adapted and updated every 5 years.

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Comment [P07]: This committee is an advisory committee and according to the revised ToR and RoP it reviews and gives advice and recommendations. The text should be updated in accordance with the revised ToR and RoP of the Committee. This should be updated throughout the document when reference is given to this committee.

1. Biological Assessment

1.1 General Information

The Lesser White-fronted Goose *Anser erythropus* is the smallest of the geese in the genus *Anser*. The species is globally threatened, being recognised as Vulnerable by IUCN – The World Conservation Union (IUCN, 2006), and ranked by BirdLife International as ‘SPEC 1’ within Europe, denoting a European species of global conservation concern (BirdLife International, 2004). It is listed on Annex 1 of the European Union Birds Directive (79/409/EEC), in Column A of the Action Plan under the African-Eurasian Migratory Waterbird Agreement (AEWA) and in Annex II ‘Strictly protected species’ of the Bern Convention.

Lesser White-fronted Geese are long-distance Palearctic migrants, currently breeding discontinuously in the sub-arctic zone from northern Fennoscandia to eastern Siberia. The wintering/staging areas and migration routes are only partially known – see Figure 1.

Figure 1. Global distribution of wild populations of Lesser White-fronted Goose for the period 2000–2005. Dashed lines show the linkages between breeding and wintering areas for the Eastern main population, but the precise migration routes followed are unknown.

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Three subpopulations can be recognised, (‘Fennoscandian’, ‘Western main’ and ‘Eastern main’ – see section 1.2 for further explanation) as surviving components of the species’ formerly more extensive breeding range (Fox 2005, Lorentsen et al. 1999). In the Fennoscandian region, the Swedish local population that was close to extinction has been

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supplemented by captive-bred birds, a project which also established a human-modified flyway. With exception of the Swedish local population, two of the three wild subpopulations ('Fennoscandian' and 'Western main') underwent significant declines during the twentieth century and continue to decrease, due primarily to hunting pressure and habitat loss along migration routes and in wintering areas, though a lack of systematic count data makes calculation of reliable trends difficult for the Western main subpopulation. The supplemented population appears to be increasing slowly and shows high adult survival rates, but views differ markedly in relation to the ethical and scientific merits of captive breeding, supplementation and flyway manipulation as conservation tools, particularly with regard to the desirable timing for applying such measures.

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Among existing overview documents are the 1996 International Action Plan prepared for BirdLife International on behalf of the European Commission (Madsen 1996) and a synthesis report prepared for the Scientific Council of the Convention on Migratory Species (UNEP/WCMC 2003). Both of these documents have been fully taken into account in preparing the present Action Plan. An internet portal www.piskulka.net (operated by the Fennoscandian Lesser White-fronted Goose Conservation Project) provides regularly updated news, links and literature references for all matters concerning wild Lesser White-fronted Geese. The implementation and effectiveness of the 1996 Action Plan were evaluated as part of a 2004 review of species action plans for Europe's most threatened birds. This concluded that while implementation of the Lesser White-fronted Goose Action Plan had made significant progress within the EU, losses due to hunting remained high in non-EU countries, especially Kazakhstan and Russia (Nagy & Crockford 2004; see also Nagy & Burfield 2006 for a summary of 'lessons learned' for species action plans).

International meetings focusing on the conservation of the species have been held regularly, most recently in Odessa, Ukraine (March 2004), Edinburgh, UK (April 2004), Lammi, Finland (April 2005) and Xanten, Germany (January 2007). The technical presentations and discussions at these meetings have been drawn on in preparing this Action Plan.

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1.2 Taxonomy

Phylum: Chordata
 Class: Aves
 Order: Anseriformes
 Family: Anatidae
 Tribe: Anserini (Vigors, 1825)
 Species: *Anser erythropus* (Linnaeus 1758)
 Synonym: *Anas erythropus* (additional synonyms may be found at <http://www.worldbirdinfo.net/>)

No subspecies are recognised. However, former genetic studies on maternally inherited mitochondrial DNA (Ruokonen et al. 2004; Ruokonen & Lumme 2000) suggested that there are three distinctive populations in the wild that can be traced back to the last ice age and which should therefore be treated as three discrete management units for conservation purposes. This position was not accepted by some other stakeholders, who argued that these three populations have resulted from recent fragmentation – due to adverse human impacts – of a once continuous population, though there is no published scientific evidence supporting this position. Recent studies on DNA microsatellites (Ruokonen et al. 2007) show that there is genetic exchange between the Fennoscandian and Western main populations, but they still recommended to treat these two populations as separate management units.

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In this Action Plan the three populations/subpopulations are referred to for convenience as the:

- Fennoscandian population (breeding in the Nordic countries and the Kola Peninsula of north-westernmost Russia);

- Western main population (nesting in northern Russia to the west of the Taimyr Peninsula); and
- Eastern main population (nesting from the Taimyr Peninsula eastwards and wintering in China).

This Action Plan deals with conservation of two of the three populations – namely the Fennoscandian population and Western main population – given that the Eastern main population does not occur within the AEW Agreement Area or the territory of Member States of the European Union. The Eastern main population is therefore only mentioned when a global context or comparison is required. The Action Plan also takes into account the population supplemented with captive-bred birds, in Swedish Lapland. This population migrates to winter in The Netherlands.

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1.3 Population Development

Global population estimate

The most recent estimate of the global mid-winter population is 28,000 to 33,000 individuals, derived from combining estimates for the two western populations (Fennoscandian and Western main) = 8,000 to 13,000 individuals, and the Eastern main population = 20,000 individuals (Delany et al. 2008, Delany & Scott 2006). This compares with previous published global estimates of 25,000 to 30,000 individuals (Lorentsen et al. 1999) and 22,000 to 27,000 (Delany & Scott 2002). The estimate for the Western main population is based on autumn surveys in the staging area in Kustanay region, north-west Kazakhstan (Tolvanen & Pynnönen 1998, Tolvanen & al. 2000). The estimate for the Eastern main population (14,000) published in Delany & Scott (2002) was an underestimate, because at the most important wintering site (East Dongting Lake nature reserve) alone, up to 16,600 individuals were counted in 2004 (Barter 2005). In spite of an increased population estimate owing to improving knowledge, both Eastern and Western main populations are considered to be declining (Delany & Scott 2006).

The crash in numbers and contraction in range of the Fennoscandian population is well documented (see below), but less detailed information is available for either the Western main or Eastern main populations, which breed in Russia.

Comment [psn8]: Does this include the Swedish subpopulation or does it only denote the Norwegian subpopulation?

Fennoscandian population

The wild Fennoscandian population in the Nordic countries (i.e. excluding the unknown number of birds nesting in the Kola Peninsula of westernmost Russia – see below) was estimated in 2004 at only 20-30 breeding pairs and there has been a sustained, statistically significant, negative trend in the population in the period 1990-2003¹ (since 1990 (Tolvanen et al. 2004b; Aarvak & Øien 2004). This continues a long-term decline, from an estimated 10,000 individuals in the early twentieth century (Norderhaug & Norderhaug 1984). The supplemented Swedish population is stable or slowly increasing and was estimated at 80-100 birds in 2007 (see separate section). Other observations in Sweden include footprints of adults and young seen at a suitable locality in 1996 (Pääläinen & Markkola 1999), and a male showing breeding behaviour was seen in the same area in 1998 (A. Andersson, M. Björklund pers. comm.). In Finland, nesting was last confirmed in 1995 (Øien et al. 2001), though birds continue to be seen close to potential breeding areas virtually annually (P. Tolvanen pers. comm.). Figure 2 shows the overall trend in the Fennoscandian population over 25 years, but note that during the latter part of this period there was little organised searching for breeding birds in Finland and none in Sweden (P. Tolvanen pers. comm.). However, survey work in northern Sweden in 2005 generated two records for the spring migration period (end of April)

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¹ For the period 2001-2007, after a sharp decline between the years 2000 and 2001, the population seems to have been stable. There is no published reference for this to date.

and two records during the breeding season (June/July), but without any evidence of nesting (M. Björklund, pers. comm.). Figure 3 shows the contraction in range from the 1950s to the present day.

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Figure 2. Trend in wild Fennoscandian Lesser White-fronted Goose numbers 1980 to 2004 (excluding birds nesting on the Kola Peninsula, Russia) and supplemented Swedish population. Source: based on Andersson 2005, BirdLife International 2004, Norderhaug & Norderhaug 1984; updated with information provided to the 2005 Lammi workshop by I.J. Øien.

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Figure 3. The breeding distribution of the Lesser White-fronted Goose in Fennoscandia before 1950 (above left), 1960-1980 (above right), at the beginning of the 1990s (below left; after von Essen et al. 1996), and in 2005 (below right).

At the Valdak Marshes, northern Norway, the most important staging area in Norway, numbers of Lesser White-fronted Geese staging in spring decreased by more than one-third between 1990 and 2003 (Aarvak & Øien 2004). A decline of 65% between 2000 and 2003 was recorded at a second spring staging area, the Bothnian Bay coast of Finland (Markkola et al. 2004), though this probably also reflects changes in migration routes, as well as random effects such as weather conditions.

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Aikio et al. (2000) concluded that the status (including precise breeding and moulting areas, numbers and trends) of birds nesting on the Kola Peninsula of north-westernmost Russia was unclear and that more detailed research was required. A field expedition in June 2001 gathered some additional information and the report on this work concludes: "it is still possible that the total Lesser White-fronted Goose breeding population of the whole Kola peninsula could be perhaps some tens of pairs, taking into account the huge area of potentially suitable and mostly intact breeding habitat" (Timonen & Tolvanen 2004).

Supplemented population in Swedish Lapland

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A Lesser White-fronted Goose captive-breeding programme was established in Sweden by Lambart von Essen in the late 1970s and the first releases into the wild took place in 1981 (e.g. von Essen 1996). The breeding stock was built up mainly with birds and eggs originating from waterfowl collections in the UK and continental Europe. During the period 1981 to 1999, 348 captive-bred and ring-marked Lesser White-fronted Geese were released into a small remaining natural population in Swedish Lapland. Barnacle Geese *Branta leucopsis* were used as foster-parents and the supplemented Lesser White-fronted Geese followed their foster parents to wintering grounds in The Netherlands. The birds using this artificially established migration route, which avoided countries with unsustainably high hunting pressure, show a high survival rate. In 1981, 11 captive-bred young were released. In 1979 an adult LWfG with four young and in June 1982 ten LWfG without rings were observed in the Lapland release area, indicating that a small natural population was present there (Å Andersson, unpubl. data). A total of 66 young fledged from breeding attempts in the release area between 1981 and 1999 (Tegelström et al. 2001). The number of fledglings reared between 1999 and 2007, ranged from 13 to 20 annually, with a total for the seven-year period of at least 136 fledglings from 51 broods (Å Andersson pers com) 120 geese of the supplemented population were recorded in The Netherlands during the winters of 2003-2005 (Koffijberg 2005).

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In 1999, 30-40 Lesser White-fronts of mostly Belgian origin were released in central Sweden and guided by ultra-light aircraft to Germany. Most were recaptured when they returned to the release site, but a few remained free-flying and have been observed mainly in Denmark and Germany, but occasionally also in Finland. No breeding by these birds has been reported (L.

Kahanpää pers. comm.). Note that, contrary to what is commonly suggested, this commercial film-project has no connection with the Swedish captive-breeding programme and the supplemented Swedish population.

No captive-bred geese were released during the period 2000–2004, following the discovery that some birds in the captive breeding stock were carrying genes of Greater White-fronted Goose *Anser albifrons* (Andersson 2004). Analysis of the nuclear genetic variation showed that the genetic differentiation between the wild Fennoscandian population and the captive breeding stock is three times as large as between the wild populations of Fennoscandia and Central Asia. Thus, since seven wild-caught Swedish LWfG were among the founders of the captive stock used up to 2004 (Tegelström et al. 2001), it partially represents the original Fennoscandian population from a genetic perspective (cf. Ruokonen et al 2007).

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Finnish captive-breeding and reintroduction programme

In 1986 a captive breeding population was established in Finland (Markkola et al. 1999). Between 1987 and 1997 about 150 captive-bred Lesser White-fronts were released in Finnish Lapland, but high mortality occurred and no breeding attempts were made by the reintroduced birds. This reintroduction programme did not aim to modify goose migration routes (Markkola et al. 1999). Releases were stopped from 1998 (Markkola et al. 1999), though Lesser White-fronted Geese continued to be bred in captivity.

In July 2004, three Lesser Whitefront goslings were released contrary to the moratorium in northern Finland (together with their Barnacle Goose foster parents, the male of which was satellite-tagged). One of the young Lesser White-fronts was sighted among Barnacle Geese in The Netherlands in December 2004, though not in the company of its foster parents, or of reintroduced Swedish birds. There were plans to release between one and three similar families in 2005, subject to the outcome of a legal challenge over the legitimacy of the 2004 release, but a lack of suitable birds for release prevented this. (L. Kahanpää pers comm; see also the website of the Friends of the Lesser White-fronted Goose www.math.jyu.fi/~kahanpaa/Kotisivut/AnserErythropus/LWfG.html).

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New captive-breeding and release initiative

A new international, German-based project aims to breed up to 400 Lesser White-fronted Geese in four years and to release them in Lapland. It is intended to use ultra-light aircraft as 'foster parents' to guide the birds from Swedish Lapland to wintering grounds in the Lower Rhine area of Germany. Intensive experimental work has already been conducted over the course of six years (source: Operation Lesser White-fronted Goose/Aktion Zwerggans, www.zwerggans.de).

On 20 October 2005 the Swedish Environmental Protection Agency decided to issue a permit to Aktion Zwerggans, subject to certain conditions being met (e.g. genetic screening of the used birds with three different methods), for: (a) the release in Västerbotten county of up to 25 Lesser White-fronted Geese in both 2006 and 2007; and (b) implementation of a pilot project on the use of ultra-light aircraft as a means of guiding the released geese on a new flyway through Sweden (and then through Denmark and north-west Germany to the Lower Rhine). However, plans modified in 2007 to use offspring from imported wild Lesser White-fronted Geese from Russia, were delayed due to the time-lag before the new Russian birds start to breed in captivity. The Swedish EPA aim to support the German project with suitable captive bred material in 2010-2011.

The Swedish EPA has initiated that the Swedish captive-breeding programme from 2006 is based exclusively on wild-caught LWfG and their offspring. A first shipment of eight wild birds from Western Russia was received in 2006 and another group of six birds in mid-February 2007. By May 2008, a total of 24 wild birds from Russia had been received and the

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plan is that additional wild-caught LWfG will enlarge this founder population for captive breeding in Sweden.

In November 2005, the Scientific Council of the Convention on Migratory Species concluded, as part of its wider recommendation on Lesser White-fronted Geese (see pages 34–35 and Annex 9a), that: “For the present, we do not support the introduction of Lesser Whitefronts into flyways where they do not occur naturally. We have borne in mind the powerful argument concerning the improved safety of birds in these flyways, as well as practical considerations, such as current proposals that could quickly be put into effect. However, we consider that modifying the natural behaviour of Lesser Whitefronts in this respect, as well as unknown ecological effects in the chosen new flyways, and other such considerations, make this technique inappropriate until such time as it may become essential, particularly when major disruption or destruction occurs of key components of the natural flyways. We do not believe that to be the case at present.”

Following consultations in 2006 and 2007 between the German government, Aktion Zwerggans, the main sponsor of the proposed project, the Fennoscandian range states and the AEWA Secretariat, it was agreed that implementation of the Aktion Zwerggans experimental pilot project would be postponed to enable sufficient stock to be built up derived entirely from wild-caught Russian birds (AEWA 2007; Annex 10); see also page 36.

1.4 Distribution throughout the Annual Cycle

The three wild subpopulations (see section 1.2) and the supplemented Swedish population have differing migration routes and wintering grounds, though there is known to be partial overlap in the case of the Fennoscandian and Western main populations. The main flyways are indicated in Figure 1.

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Supplemented population

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As described above, a human-created flyway has now been established between the release area for captive-bred birds in Swedish Lapland and The Netherlands, crossing north-west Germany. There are sporadic records from other countries, often of individual birds mixing with flocks of other goose species, mostly Barnacle Geese. All released individuals have been colour-ringed, but as there have been no releases since 1999 and because the offspring of released birds are not ringed, the proportion of colour ringed birds in the population has gradually declined. Nevertheless, colour-ringing has enabled a relatively comprehensive picture of their movements to be established.

Table 1: Occurrence of Lesser White-fronted Goose in Principal Range States of the European Union and AEWA Agreement Area

Fennoscandian subpopulation			
EU Range States	Breeding	Staging	Wintering
Bulgaria	NO	YES	YES
Estonia	NO	YES	NO
Finland	[YES] (wild population possibly extinct)	YES	NO
Germany	NO	YES	NO
Greece	NO	YES	YES
Hungary	NO	YES	YES (occasional)
Lithuania	NO	YES	NO

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Poland ²	NO	YES (?)	YES (occasional)
Sweden	YES (wild population supplemented with captive-bred birds)	YES (wild supplemented population)	NO
non-EU Range States	Breeding	Staging	Wintering
Kazakhstan	NO	YES	NO
Norway	YES	YES	NO
Russian Federation	YES (Kola Peninsula only)	YES	NO
Turkey	NO	YES (?)	YES (?)
Ukraine	NO	YES	YES (?)
Supplemented population			
The Netherlands (EU)	NO	NO	YES
Sweden (EU)	YES	YES	NO
Western main subpopulation			
EU Range States	Breeding	Staging	Wintering
Bulgaria	NO	YES	YES
Germany ³	NO	YES (?)	NO (?)
Poland	NO	YES (?)	YES (?)
Romania	NO	YES (?)	YES (?)
non-EU Range States	Breeding	Staging	Wintering
Azerbaijan	NO	YES	YES
Islamic Republic of Iran	NO	YES (?)	YES
Iraq	NO	YES (?)	YES
Kazakhstan	NO	YES	NO
Russian Federation	YES	YES	NO
Syria	NO	YES (?)	YES
Turkey	NO	YES	YES (?)
Turkmenistan	NO	YES (?)	YES (?)
Ukraine	NO	YES	YES
Uzbekistan	NO	YES	YES

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(?) = uncertain and/or significant shortage of information

1.5 Survival and Productivity, Life Cycle and Habitat Requirements

The following is a brief summary of the key points influencing the Action Plan.

² The available information for Poland makes this country a 'borderline' case for listing as a Principal Range State. It is included here on a provisional and precautionary basis, but further discussion and data are required to clarify Poland's exact status.

³ Status unclear; though recorded annually, there is a mixture of birds from the reintroduced population (most records in western Germany), vagrants from the Western main population and perhaps regular migrants from the Fennoscandian population in eastern Germany.

Survival and productivity

Rather good productivity and survival data are available for the Fennoscandian population and an elasticity analysis has been performed (Lampila 2001, Markkola & Lampila 2003), but patchy count data and the low number of ringing recoveries means that evidence for the Western main population is essentially anecdotal. Lampila (2001) demonstrated that low survival was the key factor determining the negative population development for Fennoscandian Lesser White-fronts.

Further research has shown that the productivity of the Fennoscandian population has less annual variation than it is the case for other arctic geese (this may be because the species breeds further south than other arctic geese species). Survival of 1st calendar year (1cy) and 2nd calendar year (2-cy) birds is however relatively poor. Recent modelling work shows that increases in both adult and 1-cy/2-cy survival are required in order for the current population decline to be arrested and reversed. A small increase in adult survival can have a greater impact on the overall population level than a similar increase in juvenile/subadult survival. (J. Markkola, P. Lampila pers. comm; Markkola and Lampila 2003). However, demographic elasticity analysis indicate that survival of juveniles and 1-2 yr-olds is also important for population growth rate. Hunting pressure is considered the main cause of adult mortality.

In future productivity of Lesser White-fronted Geese could be assessed by counting the proportion of juvenile birds in autumn staging flocks at Porsanger Fjord, Norway (Fennoscandian population) and north-west Kazakhstan (Western main population). However, this would require a long-term, intensive and consistent effort. Calculating survival rates would be more challenging still, since it would require counts in both spring and autumn. This is something already being done for the small Fennoscandian population, but would be a major undertaking for the Western main population.

In contrast to the lower adult survival rate (84% per year) in the wild Fennoscandian population, adult survival within the supplemented Swedish population appears to be high, though further published data/analyses are required to indicate the underlying reasons for this.

2. Available Key Knowledge

Greece (EU)

Lake Kerkini, Lake Mitrikou and the Evros Delta are key staging and/or wintering sites for the Fennoscandian population, except the for the Swedish supplemented population that migrates to the Netherlands (Kazantzidis, S. & Nazirides, T. 1999). For example, 54 Lesser White-fronts were recorded at Lake Kerkini in November 2007 and 52 were recorded in the Evros Delta in early January 2004. One of the latter birds had been colour-ringed in northern Norway. In January 2005, eight colour-ringed individuals, ringed at the Valdak Marshes in Norway, were recorded in the Evros Delta (Didier Vangeluwe pers. comm., per T. Aarvak). Up to 40 Lesser White-fronts were recorded from the Evros Delta in winter 2005/2006. The maximum count during winter 2006/2007 was 49 (in early March), while 54 was the peak count for winter 2007/2008 (also in March). Individuals colour-ringed in Norway continue to be seen, while two satellite-tagged birds (caught at the Valdak Marshes in May 2006) reached the Greek wintering grounds via a moult migration to the Taimyr Peninsula, followed by autumn migration via the Yamal Peninsula, Ob Valley, north-west Kazakhstan and the northern Shore of the Black Sea. The same individuals migrated north in spring 2007 via stop-overs in Hungary and Lithuania, demonstrating for the first time that at least some birds of the Fennoscandian population migrate to and from Greece by undertaking an enormous loop migration – see map Figure 4; for further details visit http://www.piskulka.net/Recent_observations.htm.

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Comment [psn14]: Markkola and Lampila must have pooled the elasticities of all pij of age classes 2-yr-olds and older. This is misleading since most 2-yr-olds do not breed. Using Norwegian data and pooling 2-yr-olds with 1-yr-olds and juveniles, elasticities are higher in this group than among adults (3 yrs old and older).

Comment [psn15]: And why not in the Netherlands?

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Comment [psn16]: Again, elasticity and demographic analyses rather suggest that it's the lower juvenile and subadult yearly survival that cause the lower/negative growth rate. The 2nd sentence of the paragraph is speculation and should be erased.

Deleted: On the other hand, there appears to be evidence that productivity of the reintroduced population is lower than that of the wild Fennoscandian population.

Comment [kmi17]: Important to include new info for winter 2007/2008 regarding illegally shot satellite-tagged bird in Evros delta (see www.piskulka.net)

Netherlands (EU)

The supplemented Swedish population migrates to wintering grounds in The Netherlands, using mainly sites in the provinces of Friesland, Noord-Holland and Zuid-Holland. The winter population currently numbers some 100 to 120 individuals. The number of birds observed indicate that birds from outside Sweden also might be present. (Koffijberg et al. 2005).

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Norway

The most recent published estimate for the Norwegian population, is 20-30 breeding pairs in 2005, while field surveys of the core breeding area in summer 2006 and summer 2007 recorded 10–11 and 13 breeding pairs, respectively (http://www.piskulka.net/Recent_sightings.htm). There is one important staging area in northern Norway – the Valdak Marshes. Another staging area is the Varangerfjord area, but the significance of this site has decreased during the last 10 years. Monitoring at both sites has shown a continued decline in numbers.

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Sweden (EU)

Formerly bred in large numbers, the wild population was close to extinction in the late 1970s. In 1979 an adult Lesser White-fronted Goose with four young, and in June 1982 ten Lesser White-fronts without rings, were observed in the Lapland area where releases of captive-bred ringed birds commenced in 1981 (Å Andersson, unpubl. data), (see section 1.3 for further information). Given the great extent and remoteness of suitable habitat, it is possible that additional nesting pairs remained. Since 1977 a captive-breeding and supplementation programme has resulted in a free-flying population breeding in Swedish Lapland and wintering in The Netherlands, currently estimated to be 80-100 birds, with 15 breeding pairs. No releases have occurred since 1999, following the discovery of genes of Greater White-fronted Goose among the captive stock (Ruokonen et al. 2000, Ruokonen et al 2007, see also page 13). Nevertheless, the population continues to show a moderate rate of increase.

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3. Threats

3.1 Background

The format for AEWI International Single Species Action Plans requires an assessment of the threats facing the Lesser White-fronted Goose global population as well as the three wild subpopulations (see Table 2), according to the following criteria:

Critical	a factor causing or likely to cause very rapid declines (>30% over 10 years);
High	a factor causing or likely to cause rapid declines (20-30% over 10 years);
Medium	a factor causing or likely to cause relatively slow, but significant, declines (10-20% over 10 years);
Low	a factor causing or likely to cause fluctuations ;
Local	a factor causing or likely to cause negligible declines ;
Unknown	a factor that is likely to affect the species but is not known to what extent.

A graphical representation – or ‘problem tree’ – of the threats affecting the species and how these threats are related to one another is also required.

The international expert ‘Workshop on the Protection of the Lesser White-fronted Goose’ held in Lammi, Finland, in 2005 reviewed the threats facing the species and provided the basis for these elements of the Action Plan.

Comment [psn18]: Is this overall assessment updated in the face of new data and knowledge? Some of the prevalent opinions on LWfG genetics in Lammi 2005 are outdated today.

3.3 Description of Threats

The 1996 'International Action Plan for the Lesser White-fronted Goose' (Madsen, 1996) listed the following issues under the heading of "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

Madsen concluded "Probably the sharp [population] decline has been caused primarily by negative factors in the winter quarters, i.e. habitat loss and excessive hunting".

More recently, the 'Report on the status and perspective of the Lesser White-fronted Goose *Anser erythropus*' prepared for the Convention on Migratory Species (UNEP World Conservation Monitoring Centre, 2003) concluded that "Exploitation by man is the most severe threat throughout the region and affecting all flyways. Most severe is the hunting practised in Russia, China and Kazakhstan.... More than 95% of the Lesser White-fronted Goose population is being affected... These three countries are not Parties to CMS, leading to difficulties in the implementation of international action".

There is strong evidence that the most important factors driving the continued decline in numbers and fragmentation of range of the Lesser White-fronted Goose (both the Fennoscandian and Western main subpopulations) are those that cause high mortality among the birds. It is also clear that these factors operate primarily on the staging and wintering grounds, given that studies in the breeding range have failed to detect any adverse impacts that are of significant magnitude to explain the population crash. Although the species is legally protected, on paper at least, across virtually its entire range, hunting is considered to be the primary cause of mortality and the single most important threat that this Action Plan has to tackle. The loss and degradation of suitable habitat is currently considered to be an important but secondary threat to survival of full-grown birds. However, its significance as a likely driver for the historical declines and range changes during the 20th century should not be underestimated.

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Because of the dramatic decline of population numbers, there is a view that the species is likely to have suffered significant loss of genetic diversity, which might threaten reproductive success and ultimately viability of the wild populations, for example in Norway. However, a study conducted by Ruokonen et al. (2004) suggested that there is probably a regular influx of male birds from western Russia, ensuring gene flow between the populations and thereby reducing or eliminating the possible harmful effects of inbreeding. This would be in conformity with the hypothesis that birds from the small Fennoscandian population are increasingly likely to pair with birds from the Western main population where the two populations' flyways overlap. Furthermore, recently published research suggests that genetic variability in the Fennoscandian population is as high as in the Russian population. Thus, despite its small size, the Fennoscandian population shows no signs of inbreeding (Ruokonen et al. 2007).

Comment [psn19]: This concerns the Norwegian population. The focus of this text section seems global.

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In recent years, concern has been raised about the potential for reintroduced or supplemented birds originating from captive-bred stock to introduce alien genes, notably those of Greater White-fronted Goose and Greylag Goose *Anser anser*, into wild populations. This issue is dealt with in detail on pages 33–37.

Comment [psn20]: Unclear. Do you mean "inbreeding" in terms of sign. deviation from Hardy-Weinberg genotype frequencies, or do you mean "inbreeding depression", i.e. reduction in survival and growth of LWfG offspring in the population?

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The completion of a fully comprehensive threat assessment is limited by the fact that knowledge of the species' numbers, distribution and movements is still far from complete. Further details of each of these issues are provided below.

(a) Threat factors causing high mortality of fully grown birds⁴

Hunting

Staging/wintering grounds

Importance: Critical

Hunting has a critical impact on the species as whole; it is thought that more than 95% of the global population is affected by over-hunting (UNEP/WCMC, 2003). Within the AEWa area, hunting pressure is extremely high in both the Russian Federation and Kazakhstan. Over-hunting in China is also a key threat to the East Asian population (UNEP/WCMC, 2003). Hunting pressure arises from several sources, including subsistence hunters and sport hunters, the latter category also involving 'hunting tourism' whereby hunters (generally from richer western countries) pay to hunt desirable quarry species, often in eastern countries where hunting controls may be poorly enforced. It should be underlined that Lesser White-fronted Goose is officially protected by hunting legislation throughout virtually its entire range. Illegal hunting (whether subsistence or sport) is therefore the key issue. In many cases, it must be assumed that accidental shooting is the reason for high mortality, when Lesser Whitefronts are mixed with the very similar 'look alike' species Greater White-fronted Goose *Anser albifrons*, which is an important legal quarry species, and hunters cannot distinguish between the two (when birds are in flight it is even difficult for experienced ornithologists to separate the species). Additionally there are high levels of ignorance and/or disregard of the applicable hunting laws.

High hunting pressure has been observed at many locations in Russia and Kazakhstan. The loss in Kazakhstan of birds fitted with satellite transmitters and rings has supported the anecdotal evidence that hunting pressure is especially high here (UNEP/WCMC, 2004).

Indirect pressure as a result of hunting includes disturbance caused by hunting for other species and may lead to loss of condition, thereby contributing to adult mortality. This type of disturbance has occurred, for example, at traditional autumn staging areas in Finland (UNEP/WCMC, 2004) even though the Lesser White-fronted Goose itself is strictly protected under the Finnish Nature Conservation Act. Heavy hunting pressure is common in the coastal wetlands along the western shore of the Black Sea where Lesser White-fronted Geese winter. In January 2008, one individual was found shot by poachers near a reservoir in southern Bulgaria (Anonymous, 2008), and in both December 2007 and April 2008 an adult Lesser White-front, colour-ringed in Norway, was found shot inside the Lake Kerkini Wildlife Refuge in Greece (www.piskulka.net).

There are indications that Lesser White-fronts are being accidentally shot by goose hunters at Porsangen Fjord in Norway during the birds' autumn staging period. *A. albifrons* does not occur in this area (only *A. anser*, *A. erythropus* and *A. fabalis*), and only *A. anser* is legal quarry. Nevertheless, it appears that two juveniles were killed in autumn 2005.

The supplemented Swedish/Dutch population is not subject to significant hunting pressure and this has been one of the main arguments used in favour of restocking/supplementation and flyway modification projects.

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Predation

⁴ While this section focuses on the AEWa Agreement Area, key threats to the Eastern main population are mentioned briefly to provide an appropriate global context for the species as a whole.

Breeding grounds

Importance: Local

Studies suggest that the breeding success and juvenile production of Lesser White-fronted Goose is broadly comparable to other goose species and that predation rates cannot explain the rapid population declines recorded. The expansion of Red Fox *Vulpes vulpes* and Great Black-backed Gull *Larus marinus* may elevate the predation threat for the Fennoscandian population and reintroduced Swedish population, while (as for other geese) predation may be higher in years when small mammal prey is less abundant.

There is anecdotal evidence that disturbance by White-tailed Eagles *Haliaeetus albicilla* and Golden Eagle *Aquila chrysaetos* may be having a significant impact on the dwindling Fennoscandian population of Lesser White-fronted Goose (M. Ekker, T. Aarvak pers. comm.). [From Sweden one suspected case of nest predation has been reported \(Å. Andersson pers. comm.\)](#) American Mink *Mustela vison* have spread throughout Scandinavia and may also contribute to higher predation (T. Lehtiniemi, pers. comm.).

Land abandonment

Staging and wintering grounds

Importance: Medium

Abandonment of traditional agricultural land-management practices is a strong trend in many countries of central and eastern Europe and Central Asia (e.g. Kazakhstan), and has been a significant factor in parts of Fennoscandia. In some cases, such as the decline in mowing of coastal and sub-alpine meadows at staging sites around the Baltic Sea, this may lead to deterioration and loss of key Lesser White-fronted Geese feeding habitat due to the progressive encroachment of shrubs and trees. However, the situation has improved markedly in the Baltic region over the last ten years and most actual and potential staging meadows are managed by grazing/mowing thanks to EU agri-environmental payments (J. Markkola, pers. comm.). In Kazakhstan, the period from 1955 to 1990 was one of intensive grain production and the littoral and near-littoral areas of all key lakes were regularly cultivated and sown with grain. During the last 10 to 15 years, however, much of this land has been abandoned and the distances to the main goose feeding areas have increased to 10-20 km or more (S. Yerokhov, pers comm). In Sweden, hay cutting in Norrbotten county has declined from 200,000 ha in 1927 to about 1,000 ha nowadays. Most of the land formerly managed for hay was located along the river-valley migration routes once used by Lesser White-fronted Geese (M. Björklund, pers comm).

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(d) Potential genetic introgression of White-fronted Goose, Barnacle Goose and/or Greylag Goose DNA into the wild Fennoscandian population from captive-bred released birds.

Comment [psn21]: Do you really mean "potential" or should this word be erased?

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Genetic studies have shown that a proportion of individuals within the captive breeding populations used for the Finnish and Swedish reintroduction/supplementation programmes was carrying DNA of other goose species, notably Greater White-fronted Goose⁵ (Ruokonen et al. 2000, Ruokonen 2001, Ruokonen et al. 2007). The percentage of captive-reared birds carrying alien genes in the Swedish captive stock was estimated at 36% (Ruokonen et al. 2007). [Combining breeding-notebook and genetic data, Tegelström \(unpubl. data\) estimated that](#) the proportion of released birds carrying alien genes was lower and at least 5-10%. It has been concluded that the occurrence of alien genes arose through hybridisation in captivity because no signs of hybridisation have been found in the wild populations of Lesser or Greater White-fronts (Ruokonen et al. 2004). There is a risk that released birds carrying DNA from other goose species could pair and breed with wild Lesser White-fronts, thereby causing introgression of alien genes into the wild Fennoscandian population. Given that the Fennoscandian and Western main populations partially overlap outside the breeding season,

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⁵ Lesser White-fronted Goose individuals found to be carrying genes of Greylag Goose *Anser anser* have never been used for reintroduction in Sweden (T. Larsson, pers comm).

contamination of Western main birds could also occur. There is not full consensus among Lesser White-fronted Goose stakeholders concerning the significance of this risk since interspecific hybridization varies and is not uncommon among some bird genera (Randler 2006, McCarthy 2007).

The status of the supplemented free-flying population has been the subject of particular controversy. Some experts have argued that all these individuals must be caught and taken back into captivity to protect the genetic status of wild birds. The Swedish authorities among others, have countered that the free-flying supplemented population should be maintained, noting *inter alia* that it constitutes the only genetic link with the original wild population in Sweden. The latter position appeared to be strengthened by a 2005 decision of the High Administrative Court in The Netherlands, ruling that Special Protection Areas should be established for wintering birds from the reintroduced Swedish population.

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- Comment [psn22]: ??? Keep or erase?
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Nevertheless, further releases of captive-bred birds were suspended (though one Lesser Whitefront family was released in Finland in 2004 in spite of the moratorium) and birds from the captive-breeding stock that have been confirmed as carrying alien genes have been removed, though it is not possible to identify (and therefore to remove) all birds carrying such genetic material. The workshop held in Lammi, Finland in 2005, agreed that any future releases should only be based on genetically 'clean' stock, preferably derived from the wild due to the technical impossibility of identifying all birds carrying alien DNA.

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The Swedish authorities opened discussions with their Russian counterparts with a view to obtaining wild birds to build up a new captive-bred population from which future releases could be made. The first shipment of eight wild birds from Russia was received in 2006, another group of six birds was received in 2007, and by May 2008, a total of 24 wild birds from Russia had been received.

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The IUCN Guidelines for Reintroductions, issued in 1995 by the IUCN Species Survival Commission (SSC), have no formal legal status but are generally regarded as the most authoritative internationally published guidance on species reintroductions (IUCN 1998). While the need for conformity with the IUCN Guidelines has been cited by both proponents and opponents of Lesser White-fronted Goose supplementation and reintroduction initiatives, the guidance actually doesn't extend to the more controversial aspects of the Lesser White-front programmes, namely the possible introgression of congeneric DNA into the wild population and modification of flyways.

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Given the lack of detailed internationally accepted guidance, the Action Plan compilers undertook (at the Lammi Workshop) to submit a dossier on the issue for review by the Scientific Council of the Convention on Migratory Species (CMS) with a request that the Council should provide independent, authoritative advice on the future of restocking/reintroduction programmes for Lesser White-fronted Goose.

Taking into account the views expressed at the Lammi Workshop, as well as at earlier meetings and in relevant publications, and drawing on the first draft of this Action Plan, a dossier was transmitted by BirdLife International to the CMS Secretariat in July 2005. Some stakeholders felt that the dossier was incomplete and/or did not accurately represent the actual situation. In such cases, the stakeholders concerned were encouraged to provide the Scientific Council with additional information. Thirteen such contributions were taken into account by the Scientific Council in preparing its conclusions and recommendations, finalised in November 2005 at the 13th Meeting of the CMS Scientific Council, Nairobi, Kenya, 18 November 2005 (attached as Annex 9a; independent expert comments provided by Dr Robert C. Lacy are appended as Annex 9b).

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The following are the Scientific Council's conclusions (numbered for clarity, but otherwise quoted verbatim):

1. "It is desirable to have a wide genetic diversity among wild Lesser Whitefronts.
2. There appears to be no undisputed answer at present to the question of whether the Fennoscandian population (as represented by the birds breeding in Norway) is genetically distinct from the nearest breeding birds to the east, in northern Russia. Given the uncertainty, we take the cautious approach that there might be a potentially valuable genetic distinction, and that we should not deliberately interfere with it (for instance, by boosting the Fennoscandian population with wild birds from elsewhere), unless or until such interference may become inevitable.
3. Given the small size of the wild Fennoscandian population, if possible, a captive breeding population of birds from this source should be established and maintained as a priority. We recognise that there are risks involved in taking eggs and/or young birds from the wild population, but that careful use of a known surplus (that is, those birds that would have died or been killed in their first winter) may be a practical conservation option.
4. We consider that every effort should be made to conserve the Fennoscandian birds down their traditional migration routes into southeastern Europe and the Caspian/Central Asian region. We recognise that this is a major challenge. We endorse the current LIFE project that aims to safeguard the birds and their habitats along the western route. It is our opinion that all appropriate efforts should also be made to conserve the wild populations of the species in its other flyways.
5. We consider that doubts do remain about the genetic make-up of the existing free-flying birds, originally introduced into the wild in Fennoscandia, and which winter in the Netherlands. It does seem to us that not all, but a large part, of the scientific community will never be completely satisfied concerning the level of genetic contamination from the Greater White-fronted Goose *Anser albifrons* and other species, which many will regard as impossible to eliminate. Despite genuine efforts to improve the genetic purity of existing captive flocks we consider that these flocks are not to be regarded as potential sources for release to the wild.
6. Given the possibility that the above-mentioned free-flying birds, or their descendants, may pose a risk to the genetic make-up of the wild Fennoscandian population, the Scientific Council is of the opinion that these birds should be caught or otherwise removed from the wild. We do not say this lightly, nor underestimate the practical and other difficulties involved. We recommend that a feasibility study be undertaken as a matter of urgency.
7. We believe that there is nothing against establishing a group in captivity of purebred Lesser Whitefronts from the wild, western Russian stock, and it may well prove valuable to have such a group in the future. However, we do not believe that it is appropriate to release such birds to the wild now or in the immediate future.
8. For the present, we do not support the introduction of Lesser Whitefronts into flyways where they do not occur naturally. We have borne in mind the powerful argument concerning the improved safety of birds in these flyways, as well as practical considerations, such as current proposals that could quickly be put into effect. However, we consider that modifying the natural behaviour of Lesser Whitefronts in this respect, as well as unknown ecological effects in the chosen new flyways, and other such considerations, make this technique inappropriate until such time as it may become essential, particularly when major disruption or destruction occurs of key components of the natural flyways. We do not believe that to be the case at present. We give due weight to arguments about the continuing decline of the very small Fennoscandian population, and to the estimates of how long it may continue to be viable, but we are not persuaded that such a fact alone is enough to justify radical action.
9. We consider that it would be appropriate to re-examine the issues once more in five years."

The additional comments by [the independent expert R. Lacy](#) included a replenishment or ‘dilution’ approach to the introgression of alien genes, whereby pure-bred birds (i.e. without alien genes) could be introduced into the population identified as carrying alien genes (see Annex 9b).

The Scientific Council’s conclusions were not acceptable to all Range States and preliminary negotiations concerning this section of the draft Single Species Action Plan (July 2006 version) failed to reach a consensus. In January 2007 the AEWA Secretariat undertook a series of consultations with representatives of the governments of Finland, Germany, Norway and Sweden, with the aim of securing a consensus compromise on a way forward for this element of the Action Plan (AEWA 2007; Annex 10 to this SSAP). The following are the verbatim conclusions of the negotiation mission, as drafted by the AEWA Secretariat and supported by the parties (governments) concerned. They constitute the basis for dealing with issues of captive breeding, reintroduction and supplementing (‘supplementation’) of the Fennoscandian population in the framework of the SSAP.

1. “The parties agree that the main priority for the conservation of the LWfG is the preservation of the wild populations breeding in Fennoscandia and Russia and that the work on the SSAP and any decisions should follow the code of transparency and accountability so that they can be subject to scientific scrutiny at any time. The parties will be considering support for conservation on the ground along their flyways. Particular attention shall be paid to mortality due to hunting and urgent targeted measures should be implemented to reduce the magnitude of this threat, the success of which shall be promptly and regularly reviewed and evaluated. Supplementation with captive-bred birds should be considered if other conservation measures are not as quickly efficient as needed and should populations continue to decline. As with any other captive breeding, reintroduction or supplementation initiatives this project will be subject to consideration by the Committee for LWfG captive breeding, reintroduction and supplementation in Fennoscandia (*see conclusion 3 below*). The efficiency of conservation measures is to be assessed by the International LWfG Working Group (*see conclusion 2 below*).
2. The parties agree that an International LWfG Working Group should be established, consisting of governmental representatives of all Range States, who would be free to bring in their own experts and use their support. The group will be chaired by the AEWA Secretariat (*efficient chairmanship would be possible only if additional support staff (coordinator for the SSAP) and supplementary budget are made available to the Secretariat*) and will operate in accordance with ToR developed by the AEWA Secretariat, approved by the Range states and endorsed by the AEWA Technical Committee.
3. The parties agree on the establishment of a Committee⁶ for LWfG captive breeding, reintroduction and supplementation in Fennoscandia, consisting of governmental representatives of Sweden, Finland, and Norway, who would be free to bring in their own experts and use their support. The Committee will be chaired by the AEWA Secretariat (*efficient chairmanship would be possible only if additional support staff (coordinator for the SSAP) and supplementary budget are made available to the Secretariat*) and will operate in accordance with ToR developed by the AEWA Secretariat, approved by the three states and endorsed by the AEWA Technical Committee.
4. The parties agree that a captive stock of wild Fennoscandian birds should be established, subject to the conclusions of a feasibility study. **The long-term future of all captive breeding programmes will be reviewed by the Committee for LWfG**

⁶ The parties agreed that this Committee will operate as a subgroup of the International Working Group for the implementation of this Action Plan.

captive breeding, reintroduction and supplementation in Fennoscandia.

Comment [psn23]: This sentence is repeated/duplicated in the next paragraph. Erase it here since also the sentence in the next paragraph says "all captive breeding programmes"?

5. The parties agree that the Swedish captive breeding programme could carry on as long as it is based on wild birds only. The long-term future of all captive breeding programmes will be reviewed by the Committee for LWfG captive breeding, reintroduction and supplementation in Fennoscandia.

6. The parties agree that the current free-flying flock, breeding in Sweden and wintering in the Netherlands, will remain in the wild, subject to genetic screening and refinement, i.e. removal of apparent hybrids, which will be undertaken following the conclusion of a feasibility study. Further on the dilution with purebred birds is considered a principally viable option. The long-term future of all reintroduction and supplementation programmes will be reviewed by the Committee for LWfG captive breeding, reintroduction and supplementation in Fennoscandia taking full account of, amongst others, the success of conservation actions, including revival of the wild Fennoscandian population, and other pertinent factors. Decisions regarding the Swedish free-flying population should also take into account the conclusions of the independent review and evaluation of available LWfG genetic studies (*see conclusion 8 below*).

7. The parties agree that the implementation of the pilot experimental project of the NGO 'Aktion Zwerggans' will be postponed by three years. As with any other captive breeding, supplementation or reintroduction initiatives this project will be subject to consideration by the Committee for LWfG captive breeding, reintroduction and supplementation in Fennoscandia.

8. The parties agree that a review and evaluation of the existing genetic LWfG studies by an independent expert(s) with proper scientific expertise and experience (ideally in molecular DNA analysis of birds, conservation genetics and statistical proficiency) should be undertaken⁷. This work will be commissioned by the AEWA Secretariat to an independent expert(s) selected by the Secretariat too. The conclusions of this independent evaluation will be submitted to the Committee for LWfG captive breeding, reintroduction and supplementation in Fennoscandia and the International LWfG Working Group for their consideration."

Comment [psn24]: ??? unclear: "Furthermore"?

Comment [PÖ25]: See comment on p7.

Table 2a. Relative importance of threats to wild subpopulations of Lesser White-fronted Goose.

Threat	Fennoscandian population	Western main population	Eastern main population ⁸
(a) Factors causing increased adult mortality			
Hunting	Critical	Critical	Critical

⁷ In the report of its January 2007 negotiation mission the AEWA Secretariat referred to the significant accumulated body of LWfG genetic studies, but noted certain discrepancies (or even contradictions) in some of the studies' conclusions, leading to differing views of implied conservation strategies. The Secretariat therefore suggested that all available studies should be reviewed and evaluated by an independent, appropriately experienced scientific expert (or team of experts). In the Secretariat's opinion, such a review could help to unify stakeholders around a consensus view and assist with designing future conservation action.

⁸ This Action Plan focuses on Lesser White-fronted Goose in the AEWA Agreement Area and the territory of Member States of the European Union (i.e. the Fennoscandian and Western main subpopulations) and is not giving detailed consideration to the Eastern main subpopulation. However, threats to the latter population are shown here for completeness and to underline that certain key threats are applicable to all subpopulations.

Poisoning	Unknown	Local	High
Human disturbance	Medium	Medium	?
(b) Factors causing reduced reproductive success			
Human disturbance	Local?	Local	Local
Predation	Local?	Local	Local
Genetic impoverishment	Low	Unknown	Unknown
(c) Factors causing habitat loss/degradation/conversion			
Agricultural intensification	High formerly; now probably Low	High	High
Construction of dams and other river regulation infrastructure, wetland drainage	Medium?	High	High
Climate Change	Unknown	Unknown	Unknown
Over-grazing	Local	Unknown?	Unknown?
Land abandonment (incl. declining grain production, loss of hay meadows, scrub/forest encroachment)	Locally high	High	Unknown?
Pollution of wetlands/waterbodies	Unknown?	Unknown?	Unknown?
(d) Potential genetic introgression of DNA from other goose species into wild population	Potential risk exists	Potential risk exists	?
(e) Knowledge limitations	Fundamental gaps	Fundamental gaps	Fundamental gaps

Comment [psn26]: Should be at least “Unknown” due to the fact that the Norwegian population of approximately 15 breeding pairs has reached a critical level regarding possible genetic impoverishment.

Table 2b. Relative importance of threats to supplemented population of Lesser White-fronted Goose⁹.

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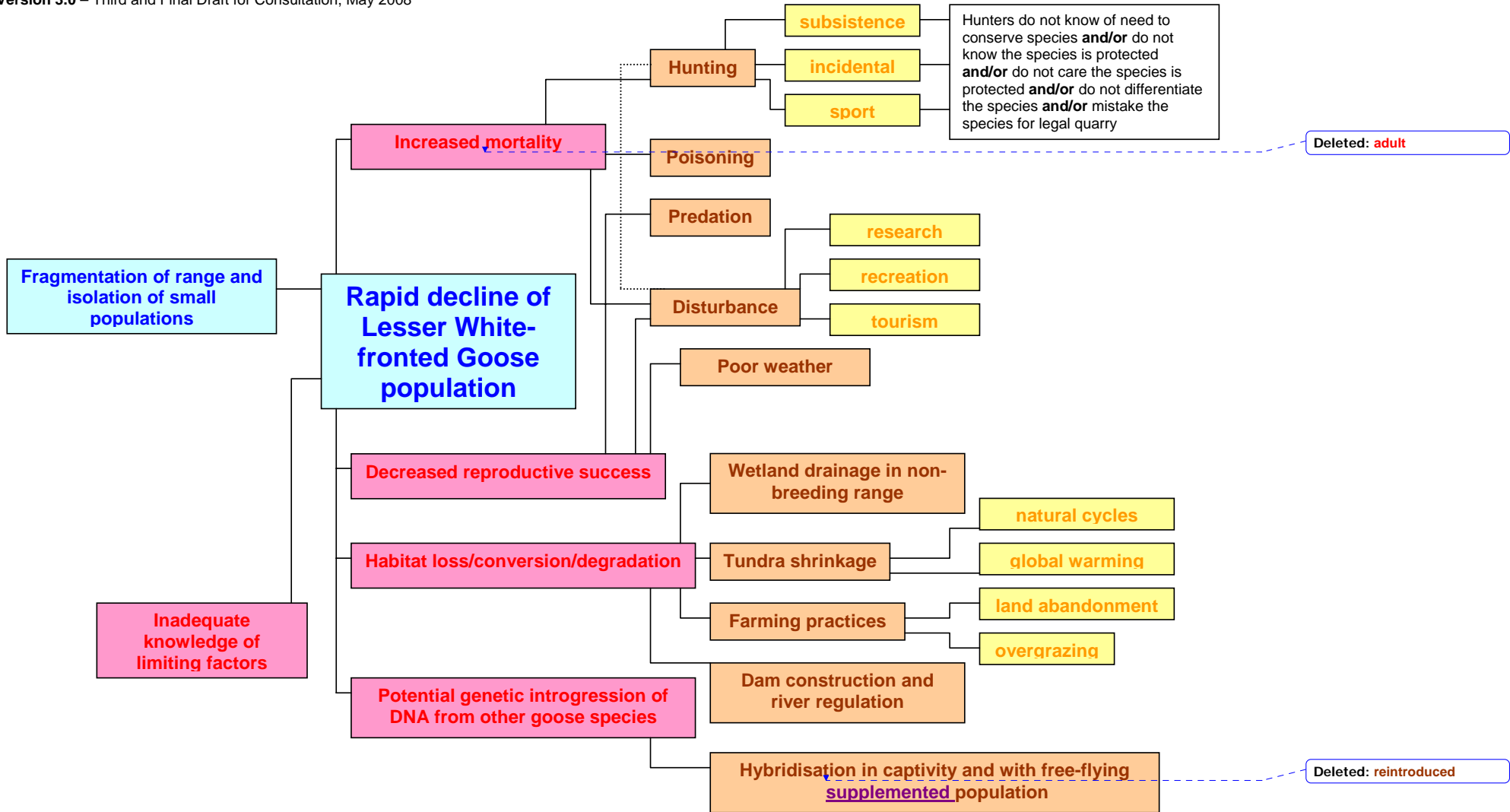
⁹ See pages 34–37 for details of: (a) Conclusions of the CMS Scientific Council in November 2005 regarding the reintroduced population; (b) the consensus compromise reached in 2007 as a result of the negotiation mission conducted by the AEWa Secretariat.

Threat	Supplemented population (Sweden/The Netherlands)
(a) Factors causing increased adult mortality	
Hunting	Low
Poisoning	Low
Human disturbance	Local
(b) Factors causing reduced reproductive success	
Human disturbance	Unknown
Predation	Local
(c) Factors causing habitat loss/degradation/conversion	
Agricultural intensification and wetland drainage	Low
Construction of dams and other river regulation infrastructure	Low
Climate Change	High
Over-grazing	Unknown
Land abandonment	Local
Pollution of wetlands/waterbodies	Low
(d) Genetic introgression of DNA from other goose species into reintroduced population and potential for entry into wild population	Theoretical risk exists
(e) Knowledge limitations	Fundamental gaps

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Comment [psn27]: "Unknown" is probably the more appropriate term. This does not in any way say that it's unimportant.

Overleaf is a 'problem tree' diagrammatic representation of the key threat factors described above.



4.4 Site and Habitat Protection and Research

Annex 3a provides a listing of Important Bird Areas known to be of significance for Lesser White-fronted Goose. Annex 3b is a listing of additional sites, as provided by reviewers of the first draft of this Action Plan (in all cases the sites were listed by nationals of the countries concerned), but this will need further development to ensure that it includes only those sites that are of real importance for the species' conservation, rather than sites that are used only occasionally by vagrants etc.

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Annex 6 provides a table, by Range State, of site protection measures. While the Fennoscandian population is well covered by site protection designations (at least along the westernmost flyway) this is not the case for the Western main population, which lacks adequate site protection in many Range States. In some cases there is insufficient information available for assessing the adequacy of site/habitat protection measures.

4.5. Recent Conservation Measures

Table 5 summarises the mechanisms and institutional arrangements for the Principal Range States (see section 1.4 for definition), while Annex 7 provides additional information concerning recent and ongoing conservation measures in each country.

Table 5. Summary of mechanisms and institutional arrangements for conservation of Lesser White-fronted Goose *Anser erythropus*.

Country	National Action Plan for Lesser White-fronted Goose?	National Working Group for Lesser White-fronted Goose?	National Monitoring Programme for Lesser White-fronted Goose?	Monitoring Programme in Protected Areas?	Routines for Informing the Responsible Authorities Regarding Nesting Areas and Nest Sites?
Azerbaijan	No	No	No	No	N/A
Bulgaria	No	No	Partial	No	N/A
Estonia	No	Yes	Yes	Yes	N/A
Finland	No	Yes	Yes	Yes	(Yes)
Germany	No	Yes	No	No	N/A
Greece	?	No?	Yes	Yes	N/A
Hungary	No	Yes	Yes	Yes	N/A
Iran, Islamic Republic of	No	No	No	?	N/A
Iraq	No	No	No	No	N/A
Kazakhstan	No	No	No	No	N/A
Lithuania	No	No	No	?	N/A
Netherlands	?	N/A	Yes	Yes	N/A
Norway	Yes	Yes	Yes	Yes	Yes
Poland	No	No	No	?	N/A
Romania	No	No	Partial	No	N/A
Russian Fed.	No	Yes	Partial	Partial	?
Sweden	In prep	Yes*	Yes*	Yes*	Yes
Syria	No	No	No	?	N/A
Turkey	No	No	No	Partial	N/A
Turkmenistan	No	No	No	No	N/A
Ukraine	No	Yes	No	No	N/A
Uzbekistan	No	No	No	No	N/A

* Applies mainly to [the supplemented population](#)

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Transboundary EU LIFE Project – Fennoscandian population

An international project ‘*Conservation of the Lesser White-fronted Goose on European migration route*’, funded by the EU’s LIFE mechanism, began in April 2005 and will be concluded in 2008. The project is led by WWF Finland, with nine additional partners in Estonia, Finland, Greece, Hungary and Norway. For further information see <http://www.wwf.fi/lwfg>.

The aim of the project is to improve and monitor the conservation status of the species at the most important breeding, staging and wintering sites along the European flyway by:

- Locating the most important breeding areas, and securing favourable conservation status of these areas
- Eliminating the most important threats (high mortality due to hunting and poaching, loss of feeding and roosting habitats, and human disturbance)
- Monitoring the population and effects of the project actions

The project is focusing on the following sites:

- Norway – Porsangen Fjord and Varangerfjord; breeding grounds in Finnmark
- Finland – Hailuoto/Liminganlahti area, Bothnian Bay coast, Finnish Lapland
- Estonia – Matsalu National Park, Nigula
- Hungary – Hortobágy National Park
- [Greece – Evros Delta, Lake Kerkini, Nestos Delta, Lake Mitrikou](#)

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Specific project activities include:

- Catching and colour ringing Fennoscandian LWfG
- Satellite and radio transmitter tracking
- Preparing National Action Plans for LWfG in Estonia, Finland and Norway.
- Restoring and managing of LWfG habitat – Haeska Islets, Matsalu Bay, Estonia
- Providing safe feeding and roosting areas by habitat management in Hortobágy National Park, Hungary
- Raising public awareness, especially amongst hunters, landowners and farmers – Estonia, Hungary, Greece
- Monitoring the Fennoscandian population and the effect of LIFE Project actions – Norway, Finland, Estonia, Hungary, Greece

5. Framework for action

5.1 Lesser White-fronted Goose Action Plan Goal, Purpose, and Results

This section identifies and defines the **Goal**, the **Purpose**, and **Results** of the *Action Plan* and describes **indicators** and **means of verification** for monitoring its implementation and effectiveness.

The Goal is the ultimate conservation objective to which this Action Plan contributes, namely **restoration of Lesser White-fronted Goose to a favourable conservation status**. The Purpose refers to the actual role of the Action Plan itself, namely **to stop and reverse the**

current population decline. The Results are the changes required for this Purpose to be realised.

A priority has been assigned to each Result, according to the following scale:

Essential: a Result that is needed to prevent further large declines in the population that could lead to the species' extinction.

High: a Result that is needed to prevent a decline of more than 20% of the population within 20 years.

Medium: a Result that is needed to prevent a decline of less than 20% of the population within twenty years.

Low: a Result that is needed to prevent local population declines or which is likely to have only a small impact on the population across the range.

However, owing to the strongly contrasting sizes of the subpopulations, some refinement of these categories should be applied practice. Hence, an Action may be High for a given subpopulation, even if the overall impact on the global population size would place it in the 'Low' category. In the case of the Lesser White-fronted goose, unless such considerations are taken into account, all actions for the Fennoscandian subpopulation would automatically become 'Low' priority.

Timescales are attached to each Result using the following criteria:

Immediate: to commence within the next year.

Short: to commence within the next 3 years.

Medium: to commence within the next 5 years.

Long: to commence within the next 10 years.

Ongoing: an action that is currently being implemented and should continue.

Completed: an action that was completed during preparation of the action plan.

The Results and Objectively Verifiable Indicators have been selected to address the challenges set out in Chapter 3, in particular:

- to eliminate mortality of birds due to biologically unsustainable hunting pressure – in spite of the legal protection afforded to the species across most of its range;
- to ensure that all of the key sites, including roosting and feeding sites, used by Lesser White-fronted Geese are adequately protected and managed;
- to minimize disturbance and predation on the breeding grounds, thereby helping to maximize productivity;
- to prevent further anthropogenic introgression of DNA from other goose species into the wild population of Lesser Whitefronts;
- to fill the still-significant knowledge gaps concerning the species' numbers and movements.

Comment [psn28]: With reference to age-specific elasticities, survival of juveniles and subadults is equally or more important

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Comment [psn29]: With reference to the recent review on hybridization in birds (McCarthy 2007), the modified sentence is more realistic. It also discriminates between anthropogenic and natural processes.

Table 6. Action Plan Goal and Purpose

	Objectively Verifiable Indicator	Means of Verification
<p>Action Plan GOAL To restore the Lesser White-fronted Goose to favourable conservation status within the AEWA Agreement Area</p>	<p>Neither of the wild populations in the Agreement Area qualifies as 'threatened' according to the IUCN Red List criteria because the Western Main population exceeds 25,000¹⁰ individuals, the Fennoscandian population exceeds 1,000¹¹ individuals and neither population is declining. Breeding range is stable or expanding. Adequate managed and protected habitat is available at all the key sites along the species' flyways.</p>	<p>Conservation Status Assessment of Migratory Waterbirds, Wetlands International Assessments by the International Lesser White-fronted Goose Working Group established to coordinate implementation of this Action Plan</p>
<p>Action Plan PURPOSE To stop and reverse the current population decline and range contraction.</p>	<p>Neither the Western Main population nor the Fennoscandian population is declining. A 5-year moving average of the finite rate of population increase (λ) is above 1.0</p>	<p>For the westernmost flyway: counts of spring flocks at Matsalu Bay, Estonia, at Porsangerfjord, Norway; counts of spring and autumn flocks at Hortobágy, Hungary. For the main flyway: counts of autumn flocks in Kustanay oblast, Kazakhstan, <i>covering a large-enough area to avoid effects of local fluctuations caused by year-to-year variations in location and extent of suitable roosting/feeding sites.</i></p>

Comment [psn30]: Favourable reference population size seems to be given, but favourable reference distribution is not specified/quantified. FCS requires that both FRD and FRP are fulfilled.

Comment [psn31]: Unclear what is the favourable reference distribution range. The distribution of breeding areas in 1978?

¹⁰ Figure derived from the AEWA Action Plan Table 1. This is necessary for a species being not listed as Column A species.

¹¹ Figure derived from the IUCN Red List criterion D for small populations.

Table 7 Action Plan Results

Result	Objectively Verifiable Indicator	Means of Verification	Priority	Timescale
Result 1: Mortality rates are reduced	A 5-year moving average of the percentage of 2nd calendar-year birds is above 10 % ¹² .	Counts of flocks at Hortobágy, Hungary, at Matsalu Bay, Estonia, at Porsangerfjord, Norway and in Kustanay oblast Kazakhstan in spring.	Essential	Medium/long
Result 2: Further habitat loss and degradation is prevented	All Important Bird Areas and other key sites for Lesser White-fronted Goose are protected and managed with the aim of achieving 'Favourable Conservation Status'.	Natura 2000 database up-dated with monitoring data. National government reports to the European Commission, CMS, CBD, AEWA, Ramsar Convention and Bern Convention. Periodic independent assessments to be carried out by national BirdLife partners as part of their IBA Monitoring Programme.	High	Long
Result 3: Reproductive success is maximised	Five-year running mean of juveniles reaches 35% for both Fennoscandian and Western main populations.	Counts of autumn flocks at Matsalu Bay, Estonia and north-west Kazakhstan in October.	Medium	Long

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¹² This indicator is based on the assumption that juvenile mortality correlates with adult mortality, and years with high proportion of 2nd year birds is a good year for the entire population.

<p>Result 4: No introgression of DNA from other goose species into the wild population occurs as a result of further releases of captive-bred birds, and DNA introgression from already released birds from captive breeding programmes is minimised</p>	<p>Any future release of captive-bred birds involves only individuals reared from wild-caught stock. Apparent hybrid geese are removed from existing free-flying introduced flock, subject to findings of a feasibility study.</p>	<p>National reports from governments. Reports from International LWfG Working Group (and captive-breeding Sub-group) Papers published in peer-reviewed scientific journals Review and evaluation of existing studies of LWfG genetics is conducted by independent scientific expert. Long-term future of all captive breeding programmes is reviewed by a specialist Sub-group of the International LWfG Working Group.</p>		Short
<p>Result 5: Key knowledge gaps filled</p>	<p>Knowledge gaps filled by 2015</p>	<p>Monitoring & expedition reports Papers published in peer-reviewed scientific journals</p>	Essential	Medium
<p>Result 6: International cooperation maximised</p>	<p>All Lesser White-fronted Goose Range States are parties to the key international conservation agreements The International Lesser White-fronted Goose Working Group (and sub-group on reintroduction) is established and operating effectively National Action Plans, based on this SSAP, are established, implemented and progress shared with other Range States via the International Working Group</p>	<p>Status of Contracting Party lists issued by relevant agreements Progress reports by the AEWA Secretariat Reports and assessments issued by the International Working Group (once established)</p>	Essential	Short/Ongoing

Comment [P034]: The priority should be “**Medium**”. Logically the maximization of reproductive success should have at least as high priority as the genetical issues. As well as the the habitat loss and lowering of mortality rates should have a higher priority. So far the genetical issues has never been proved to have any connection with the downward trend of the species in the area.

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Comment [psn32]: This is unrealistic and naive if the text is read as it stands with the true meaning of the words. Since the detectability (morphological, vocal and genetical) of individuals with historic hybrid ancestry is very low.

Comment [psn33]: There is no pure introduced flock. How do you separate between descendants of released birds from captive breeding and descendants of the natural population?

6. Activities

Result 1: Direct mortality of adults due to hunting is prevented

The most important and most urgent activities under this Action Plan are those aimed at halting the currently unsustainable (and mostly illegal) hunting pressure on Lesser White-fronted Geese:

1. Ensure that, in principle, hunting legislation affords adequate protection to Lesser White-fronted Goose;
2. Ensure that sufficient human and financial resources are allocated for enforcement of hunting legislation, and that these resources are deployed to control and manage hunting effectively and sustainably;
3. Ensure that sufficient human and financial resources are allocated for identifying the traditional flyway and stop-over sites, and making that flyway safe for the geese.
4. Ban goose hunting at all key sites for Lesser White-fronted Goose (as listed in Annex 3 to this Action Plan) during the period when Lesser White-fronts are usually present, given the difficulty of reliably distinguishing goose species in flight (especially the near impossibility of separating Greater and Lesser White-fronts, even from relatively close range and in good light);
5. Plant lure crops to direct Lesser White-fronted Goose away from areas where hunting pressure is known to be high and towards refuge zones;
6. As far as possible, redirect hunting from adults to juveniles in areas where Greater White-fronts and Lesser White-fronts occur together away from key sites.

These actions are applicable in all Range States, but especially in those countries of the staging and wintering range where hunting pressure is known to be particularly high, e.g. Kazakhstan, Russian Federation, Ukraine.

In addition to these measures, it has been suggested that efforts should continue to establish a safer migration route, while giving the highest possible priority to the protection needs of the existing wild population (see Result 4 below). However, the November 2005 recommendation of the Scientific Council of the Convention on Migratory Species, combined with the conclusions of the January 2007 AEW Secretariat negotiation mission (see pages 34–37 for details), mean that proposals have been deferred for at least three years (i.e. 2010 or later) to enable sufficient captive-reared stock derived exclusively from wild-caught birds to be built up before this option can be tested.

Result 2: Further habitat loss and degradation is prevented

Measures to halt and reverse habitat loss and degradation, and to maximise positive site management, will serve to underpin increased survival of full-grown birds achieved through the hunting-control measures outlined above.

1. Ensure that all key sites for Lesser White-fronted Goose (breeding, staging and wintering) are afforded appropriate protected area status at national and international levels, including classification as Special Protection Areas in EU Member States;
2. Ensure that all key sites for Lesser White-fronted Goose have a management plan that addresses the conservation requirements of Lesser White-fronted Goose and that is resourced, implemented, monitored and periodically updated;
3. Monitor habitat quality in the breeding range to ensure that any anthropogenic pressures, including the potential impacts of climate change, are identified as early as possible;

Comment [psn35]: This depends on which age-classes “adults” include. If “adults” are 3-yr-olds and older (i.e. those who breed), reducing mortality among 0-2 yr-olds will have greater effect on population growth rate.

Comment [kmi36]: The practical problem of separating adults and juveniles in the field by the hunter, especially in bad light, makes this very difficult in practice. Furthermore the fundamental problem concerns the lack of compliance. So as long as the the lack of compliance has not been solved, this suggestion would probably have close to no effect.

Comment [psn37]: This is questionable since pooled elasticity of juvenile and subadult survival (0-2 yr olds) is higher than that of adult bird. This suggests change in juvenile and subadult survival affects population growth rate more than does adult survival. Furthermore, is this recommendation/activity realistic?

4. Take measures to restore and/or rehabilitate Lesser White-fronted Goose roosting and feeding habitat in the staging and/or wintering range.

These actions are applicable in all of the Range States.

Result 3: Reproductive success is maximised

1. Avoid infrastructure development and other sources of human disturbance, including recreation/tourism liable to have an adverse impact on the know core breeding areas;
2. Take measures to avoid overgrazing and nest trampling if/where this is known to be a problem;
3. Take measures, where feasible, to minimise predation, where this is shown to be a significant limiting factor;
4. Take measures to eliminate waterbird hunting on the breeding grounds (Russian Federation and Norway) and in all staging areas close to the breeding grounds (Fennoscandia, Russian Federation).

These actions are applicable in the few Range States that share the species' entire breeding range, namely Finland, Norway, Sweden and Russian Federation.

Result 4: No introgression of DNA from other goose species into the wild population occurs as a result of further releases of captive-bred birds, and introgression from already released birds from captive breeding programmes is minimised.

As set out in Chapter 3, there has been a lack of consensus among Lesser White-fronted Goose stakeholders on the use of captive breeding, reintroduction/supplementation, and flyway modification as valid conservation tools to be integrated with measures directed at conservation of the surviving wild population. Proponents have argued that all efforts to date have failed to stop or reverse the decline of the Lesser White-fronted Goose and that reintroduction/restocking must also be used to secure the species' survival, citing the high adult survival rates achieved through diverting the flyway through 'safe' countries. Opponents have argued that introduction in areas that do not form part of the species' natural range is scientifically and ethically unsound and believe that efforts and resources should be devoted to conservation of the wild Fennoscandian population as long as it continues to exist, with reintroduction remaining an option if all other measures fail. They also highlight the risk of anthropogenic introgression of DNA from other goose species into the wild population, following the discovery of such DNA among captive breeding stock.

As detailed in Chapter 3 (pages 34–35), the Scientific Council of the Convention on Migratory Species presented a series of conclusions and recommendations on these issues in November 2005. The full text of the Scientific Council's statement, together with the independent expert statement, made by Dr Robert C. Lacy, can be found in Annexes 9a and 9b, respectively.

The Scientific Council's findings proved controversial and the AEW Secretariat conducted a series of consultations with the key Range States in 2007 resulting in an agreement between the parties concerned. The conclusions set out in this agreement form the basis of the Single Species Action Plan's approach to this issue. They are detailed on pages 35-37 and in Annex 10. The following is a summary only of the key points agreed by the parties:

- The main priority for the conservation of the Lesser White-fronted Goose is the preservation of the wild populations breeding in Fennoscandia and Russia and that the work on the SSAP and any decisions should follow the code of transparency and accountability so that they can be subject to scientific scrutiny at any time. Particular attention shall be paid to mortality due to hunting and urgent targeted measures should be implemented to reduce the magnitude of this threat, the success of which shall be

Comment [psn38]: See comment on page 48.

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Comment [psn39]: Today, the Swedish captive breeding-stock for supplementation consists exclusively of wild-caught LWfG, so the text seems outdated.

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promptly and regularly reviewed and evaluated.

- An International LWfG Working Group should be established, consisting of governmental representatives of all Range States, who would be free to bring in their own experts and use their support. The group will be chaired by the AEWa Secretariat.
- A Committee for LWfG captive breeding, reintroduction and supplementation in Fennoscandia should be established under the auspices of the International Lesser White-fronted Goose Working Group.
- The long-term future of all captive breeding programmes will be reviewed by the Committee for LWfG captive breeding, reintroduction and supplementation in Fennoscandia.

In the meantime:

- A captive stock of wild Fennoscandian birds should be established, subject to the conclusions of a feasibility study.
- ~~The captive breeding programme and population supplementation in Sweden should continue as long as it is based on wild birds only.~~
- The current free-flying flock, breeding in Sweden and wintering in the Netherlands, will remain in the wild, subject to genetic screening and refinement.
- The implementation of the pilot experimental project of the NGO 'Aktion Zwerggans' will be postponed until 2010 when offspring from the Russian birds will be available.
- A review and evaluation of the existing genetic LWfG studies by an independent expert(s) with proper scientific expertise and experience should be undertaken to dimension the introgression problem and clarify what the genetic data may clearly show.

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Result 5: Key knowledge gaps filled

Knowledge gaps represent a significant constraint. The following activities are priorities for further research:

1. Locate sources of possible financial support for further conservation-oriented research;
2. Use a combination of satellite tracking and field surveys to locate the key breeding grounds for the bulk of the Western main population;
3. Assess the hunting pressure at key sites and identify any factors that may make Lesser White-fronted Geese more vulnerable to being shot than other goose species;
4. Use a combination of satellite tracking and field surveys to locate the key breeding, staging and wintering sites for the Fennoscandian population;
5. Conduct a Population Viability Assessment (PVA) for the remaining wild Fennoscandian population;
6. Use a combination of satellite tracking and field surveys to locate the key staging and wintering grounds for the bulk of the Central Asian population;
7. Undertake further field surveys of suitable breeding habitat and staging areas on the Kola Peninsula to update the estimate for the Fennoscandian subpopulation;
8. Establish an effective network of coordinated counts in the wintering grounds (or main staging areas if wintering areas are not known), to monitor overall population trends as accurately as possible;

9. Evaluate spatial use patterns at the habitat level to identify areas where hunting directly threatens Lesser White-fronts and to direct local conservation efforts (e.g. planting of 'lure' crops) to hunting-free refuges and corridors;
10. Continue to refine genetic knowledge and techniques for genetic assessments;
11. Develop a strategy for genetic management of the species both in the wild and in captivity based on the findings of the CMS Scientific Council;
12. Assess the current status of key sites for Lesser White-fronted Goose with regard to the species' ecological requirements, taking into account protected area status, habitat quality, conservation management and active threats.
13. Increase knowledge of breeding site fidelity for males and females and exchange with other populations;
14. Undertake studies on predation by White-tailed Eagle;
15. Investigate the importance of small mammal cycles on reproduction of Lesser White-fronted Goose.

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Comment [psn40]: Table 8 says based on the results of the AEWA negotiation mission. This would be the correct reference here in order to more in line with the outcome from the first meeting of the LWfG committee on captive breeding, supplementation and reintroduction. The advice from the Scientific Council is also partly outdated due to new knowledge and also in relation to the outcome of the negotiation mission..

These activities apply to all Range States and non-Range States, since international cooperation, including financial and technical support, will not be limited to the countries where additional research is actually conducted.

Result 6: International cooperation maximised

Table 4 shows the current applicability of key international cooperation instruments to Lesser Whitefront Range States. There are currently significant gaps. These gaps should be rectified in order to maximise international cooperation for the effective implementation of this Action Plan and wider measures that are likely to benefit Lesser Whitefront conservation.

This activity is addressed to the following Range States:

- **AEWA:** Azerbaijan, Estonia, Greece (signatory but entry-into-force is pending ratification), Islamic Republic of Iran, Iraq, Kazakhstan¹³, Russian Federation, Turkey, Turkmenistan, [Norway](#)
- **Bern Convention:** Russian Federation
- **CBD:** Iraq
- **Ramsar Convention:** Turkmenistan (Note: under the current provisions of this Convention, there is no mechanism for the EU/EC to become a Contracting Party)

¹³ Iraq and Kazakhstan are parties to the Convention on Migratory Species (CMS). Although not parties to AEWA they are therefore committed to implementation of this Action Plan through the CMS. Other states within the AEWA Agreement Area that are parties to CMS and which are in the process of adhering to AEWA share a similar obligation.

Table 8. National activities by Range States required to deliver each Action Plan Result

Result	National activities and applicable Principal Range States ¹⁴	Responsibility for implementation
<p>Result 1: Mortality rates reduced</p>	<ul style="list-style-type: none"> • Ensure by 2010 that, in principle, hunting legislation affords adequate protection to Lesser White-fronted Goose (ALL¹⁵); • Ensure that sufficient human and financial resources are allocated for enforcement of hunting legislation and that these resources are deployed to control hunting effectively (ALL); • Ensure that sufficient human and financial resources are allocated for identifying the traditional flyway and stop-over sites, and making that flyway safe for the geese (ALL); • By 2010, ban goose hunting at all key sites for Lesser White-fronted Goose (as listed in Annex 3 to this Action Plan) during the period when Lesser White-fronts are usually present, given the difficulty of reliably distinguishing goose species in flight (ALL); • By 2010 establish no hunting zones (covering both roosting and feeding sites) at all Lesser White-fronted Goose IBAs, SPAs and Ramsar sites (ALL); • Plant lure crops to direct Lesser White-fronted Goose away from areas where hunting pressure is known to be high and towards refuge zones (ALL); • Redirect hunting from adults to juveniles in areas where Greater White-fronts and Lesser White-fronts occur together away from key sites (Russia, Kazakhstan). 	<p>Column to be completed by Range States</p>
<p>Result 2: Further habitat loss and degradation is prevented</p>	<ul style="list-style-type: none"> • Ensure that all key sites for Lesser White-fronted Goose (breeding, staging and wintering) are afforded appropriate protected area status at national and international levels, including classification as Special Protection Areas in EU Member States (ALL); • Ensure that all key sites for Lesser White-fronted Goose have a management plan that: (a) addresses the conservation requirements of Lesser White-fronted Goose and (b) is resourced, implemented, monitored and periodically updated (ALL); • Monitor habitat quality in the breeding range to ensure that any anthropogenic pressures, including the potential impacts of climate change, are identified as early as possible (Finland, Norway, Russia, Sweden); • Take measures to restore and/or rehabilitate Lesser White-fronted Goose roosting and feeding habitat in the staging and/or wintering range (ALL). 	<p>Comment [psn41]: Delete. See page 49.</p>

¹⁴ Defined in Chapter 1.4

¹⁵ This indicates that the corresponding activity needs to be implemented by all Range States.

<p>Result 3: Reproductive success is maximised</p>	<ul style="list-style-type: none"> • Avoid infrastructure development and other sources of human disturbance, including recreation/tourism liable to have an adverse impact on the known core breeding areas (Finland¹⁶, Norway, Russia, Sweden); • Take measures to avoid overgrazing and nest trampling if/where this is known to be a problem (Finland, Norway, Russia, Sweden); • Take measures, where feasible, to minimise predation, where this is shown to be a significant limiting factor (Finland, Norway, Russia, Sweden); • Take measures to eliminate waterbird hunting on the breeding grounds (Russia, Norway, Sweden) and in all staging areas close to the breeding grounds (Finland, Norway, Russia, Sweden). 		<p>Formatted: Font: Bold</p> <p>Formatted: Font: Bold</p> <p>Formatted: Font: Bold</p>
<p>Result 4: No introgression of DNA from other goose species into the wild population occurs as a result of further releases of captive-bred birds, and introgression from already released birds from captive breeding programmes is minimised</p>	<ul style="list-style-type: none"> • Establish a special website to serve as a 'clearing house' for information on this issue. • Ensure that any future release of captive-bred birds involves only individuals reared from wild-caught stock. • Remove any apparent hybrid geese from the existing free-flying <u>supplemented</u> flock, subject to findings of a feasibility study (Sweden). • Conduct a review and evaluation of existing studies of LWfG genetics; to be carried out by an independent, appropriately experienced scientific expert or group of experts (specialist Sub-group of the International LWfG Working Group). • Review long-term future of all captive breeding programmes (specialist Sub-group of the International LWfG Working Group). 		<p>Deleted: introduced</p> <p>Comment [psn42]: See comment on page 48.</p>

¹⁶ Finland is included as there remains a possibility that the wild population is not extinct and/or habitat could be recolonised.

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<p>Result 5: Key knowledge gaps filled</p>	<ul style="list-style-type: none"> • Locate sources of possible financial support for further conservation-oriented research; • Use a combination of satellite tracking and field surveys to locate the key breeding grounds for the bulk of the Western main population; • Assess the hunting pressure at key sites; • Use a combination of satellite tracking and field surveys to locate the key breeding, staging and wintering sites for the Fennoscandian population; • Conduct a Population Viability Assessment (PVA) for the remaining wild Fennoscandian population; • Use a combination of satellite tracking and field surveys to locate the key staging and wintering grounds for the bulk of the Central Asian population; • Undertake further field surveys of suitable breeding habitat and staging areas on the Kola Peninsula to update the estimate for the Fennoscandian subpopulation; • Establish an effective network of coordinated counts in the wintering grounds (or main staging areas if wintering areas are not known), to monitor overall population trends as accurately as possible; • Evaluate spatial use patterns at the habitat level to identify areas where hunting directly threatens Lesser White-fronts and to direct local conservation efforts (e.g. planting of 'lure' crops) to hunting-free refuges and corridors; • Continue to refine genetic knowledge and techniques for genetic <u>assessments</u>; • Develop a strategy for genetic management of the species both in the wild and in captivity <u>based on the results from the AEWA negotiation mission in January 2007</u>; • Assess the current status of key sites for Lesser White-fronted Goose with regard to the species' ecological requirements, taking into account protected area status, habitat quality, conservation management and active threats. • Increase knowledge of breeding site fidelity for males and females and exchange with other populations; • Undertake studies on predation by White-tailed Eagle; • Investigate the importance of small mammal cycles on reproduction of Lesser White-fronted Goose. 	<div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Deleted: testing</p> <p>Formatted: Highlight</p> </div>
<p>Result 6: International cooperation maximised</p>	<p>Achieving this result requires action (as of May 2008¹⁷) by the following Range States:</p> <p>AEWA: Azerbaijan, Estonia, Islamic Republic of IRan, Iraq, Kazakhstan, <u>Norway</u>, Russian Federation, Turkey, Turkmenistan</p> <ul style="list-style-type: none"> • CMS: Azerbaijan, Estonia, Iraq, Russian Federation, Turkey, Turkmenistan • Bern Convention: Russian Federation • CBD: Iraq • Ramsar Convention: Turkmenistan (Note: under the current provisions of this convention there is no mechanism for the EU/EC to become a Contracting Party) 	

¹⁷ Derived from lists of parties posted on the websites of the relevant Treaty Secretariats in May 2008.

7. Implementation

Principles of implementation

The following ‘principles’ have been drawn up from the conclusions of the AEWA Secretariat’s negotiation mission in January 2007:

- An International Lesser White-fronted Goose Working Group shall be established, consisting of governmental representatives of all Range States. The governmental representatives shall be free to bring in their own experts and to call on their support as required. The Working Group shall be chaired by the AEWA Secretariat (subject to additional, dedicated human and financial resources being made available to the Secretariat) and will operate in accordance with Terms of Reference to be developed by the AEWA Secretariat, approved by the Range States and endorsed by the AEWA Technical Committee.
- The main priority for the conservation of the Lesser White-fronted Goose is the maintenance of the wild populations breeding in Fennoscandia and Russia.
- The efficiency of conservation measures is to be assessed by the International Lesser White-fronted Goose Working Group [in consultation with independent conservation scientists](#).
- Implementation and future modification of this International Single Species Action Plan – and all related decisions – shall be undertaken with transparency and accountability so that progress can be subject to scientific scrutiny at any time.
- Each Range State shall consider support for ‘on-the-ground’ conservation measures, particularly along the Lesser White-fronted Goose flyway(s) that traverse(s) its territory.
- Particular attention shall be paid to mortality due to hunting and urgent targeted measures shall be implemented to reduce the magnitude of this threat, the success of which shall be promptly and regularly reviewed and evaluated.
- Supplementing wild populations with captive-bred birds shall be considered if other conservation measures are not as quickly efficient as needed and should populations continue to decline. As with any other captive breeding, reintroduction or supplementation initiatives this project will be subject to consideration by the *Committee for LWfG captive breeding, reintroduction and supplementation in Fennoscandia* (see [below](#)).
- The SSAP should be regularly adapted and updated every 5 years.

Comment [P043]: See comment regarding the advisory committee on page 7

Immediate steps required

Immediate steps towards the implementation of this SSAP include:

- Explicit endorsement by Range States of this International Single Species Action Plan;
- Establishment of the International Lesser White-fronted Goose Working Group referred to above;
- Establishment of a Sub-group (under the auspices of the International LWfG Working Group) dedicated to the issues of captive breeding, reintroduction and supplementing of wild populations in Fennoscandia (as agreed by the parties to the AEWA Secretariat negotiation mission in January 2007);
- Establishment of National Lesser White-fronted Goose Taskforces (or similar groups) in each Range State;
- Establishment and resourcing of the position of ‘Lesser White-fronted Goose Single Species Action Plan Co-ordinator’ within the AEWA Secretariat;

- Coordinated reporting and information sharing through the International Working Group and/or the AEWA Secretariat, as appropriate;
- Preparation within one year of a National Action Plan for each Range State, in co-operation with the International Working Group and relevant National Taskforce, and based on this International Single Species Action Plan (see *AEWA Conservation Guidelines No. 1*);
- Implementation of National Action Plans, including through allocation of adequate and appropriate resources;
- Review of the International and National Action Plans at least every five years;
- Maintaining and further developing research and monitoring programmes for supporting and assessing implementation of the International Single Species Action Plan.

8. References

Lorentsen, S.-H., Øien I.J. & Aarvak. 1998. Migration of Fennoscandian Lesser White-fronted Geese *Anser erythropus* mapped by satellite telemetry. *Biological Conservation* 84: pp 47–52.

McCarthy, E. 2007. *Handbook of Avian Hybrids of the World*. Oxford University Press, New York.

Randler, C. 2006. Behavioural and ecological correlates of natural hybridization in birds. *Ibis* 148: pp 459-467.

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Annex 2

Listing by Range State of the most recent data available concerning status, numbers and trends of Lesser White-fronted Goose (source: see References column)

Range State	Breeding Season					Passage and Wintering					Baseline Population ³	References	
	No. of breeding pairs	Quality ¹	Year(s) of Estimate	Trend ²	Quality ¹	Year(s) of Estimate	No. of individuals staging (S) or wintering (W)	Quality ¹	Year(s) of Estimate	Trend ²			Quality ¹
Sweden ⁴	15	G O	2007	+ 1	G O	2004	80-100 (S)	G O	2007	+ 1	G O	Not known	A. Andersson 2008, von Essen 1996

Notes to Table:

¹ **Quality:** **GO = Good (Observed)** based on reliable or representative quantitative data derived from complete counts or comprehensive measurements.
GE = Good (Estimated) based on reliable or representative quantitative data derived from sampling or interpolation.
ME = Medium (Estimated) based on incomplete quantitative data derived from sampling or interpolation.
MI = Medium (Inferred) based on incomplete quantitative data derived from indirect evidence.
P = Poor/suspected not based on quantitative data, but reflects 'best guess' derived from circumstantial evidence.
U = Unknown no information on quality available.

² **Trend** in the last 10 years: **+2** Large increase of at least 50%; **+1** Small increase of 20-49%; **0** Stable, with overall change less than 20%; **-1** Small decrease of 20-49%; **-2** Large decrease of at least 50%; and **F** Fluctuating with changes of at least 20%, but no clear trend.

³ **Baseline population:** earliest population figure available for breeding or non-breeding populations.

⁴ **Supplemented** birds.

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Supporting information to use in conjunction with the table

Estonia

Vernacular name: Väike-laukhani (Estonian)

Before the 20th century crash of the Fennoscandian population, a major migration route passed through north-western Estonia. The species used to be a regular passage migrant until the 1970s. However, during the period 1970-1984 there were no verified observations. Since 1985, small numbers, including some birds from the supplemented Swedish population, have again been recorded and for a time it was presumed that all these birds derived from the Swedish supplementation programme. However, since 1996 it has become clear that the Matsalu Bay region of western Estonia remains an important spring staging area for the wild Fennoscandian population and it is thought that small numbers also occur regularly in autumn, though more information is needed for the autumn period (Tolvanen et al. 2004). Most recently, in late September and early October 2005, two or three LWfG were seen in coastal meadows at Haeska, Ridala, while up to 14 were seen together at the same site during spring migration in May 2005 (reported by multiple observers on <http://www.piskulka.net/>).

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Germany

Vernacular name: Zwerggans

The species regularly passes through Germany in small numbers. Since 1990, 30-100 observations of Lesser White-fronted Geese have been reported annually. The great majority of birds were observed in the northern part of Germany. Important sites are listed in Section 4.4. Birds of the wild Fennoscandian population tagged with satellite transmitters have been

recorded in Mecklenburg-Vorpommern and Brandenburg during autumn migration (Lorentsen *et al.* 1998, Aarvak & Øien 2003). At most German sites, Lesser White-fronted Geese are observed in the company of Greater White-fronted Geese *Anser albifrons* and are thought most likely to belong to one of the wild populations. Data indicate that birds from more than one subpopulation migrate through Germany, with some individuals of the Western main population also wintering, especially in Brandenburg, Sachsen, Sachsen-Anhalt and Nordrhein-Westfalen (Mooij & Heinicke in prep.). Birds from the Swedish supplementation programme, typically associating with Barnacle Geese, have been recorded increasingly frequently in Niedersachsen and Schleswig-Holstein (a total of 29 individuals was recorded in mid-November 1999; van den Bergh 2000), and there is a handful records for Brandenburg and Mecklenburg-Vorpommern. There is one record of a bird from the Finnish reintroduction project in Mecklenburg-Vorpommern (Mooij & Heinicke in prep).

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Under the title of 'Operation Lesser White-fronted Goose' (*Aktion Zwerggans*) a programme is currently being developed to lead released birds from captive breeding, using microlight aircraft, from a former breeding site in Swedish Lapland to a traditional wintering area in the Lower Rhine area of Nordrhein-Westfalen.

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The species is fully protected in Germany but Greater White-fronted Geese are still hunted in places and both species occur in mixed groups (Lorentsen *et al.*, 1998).

Netherlands

Vernacular name: Dwerggans

The supplemented Swedish population migrates to wintering grounds in The Netherlands. Birds have been recorded regularly from sites in Friesland, Noord-Holland, Zuid-Holland and Zeeland (e.g. van Roomen *et al.* 2003). The Dutch Government has recently commissioned a study of the distribution and numbers of Lesser White-fronted Geese in The Netherlands (Koffijberg *et al.* 2005). The population currently numbers some 80-100 individuals (Å Andersson, pers comm).

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Sweden

Vernacular name: Fjällgås (Swedish); Gilljobás (Lappish/Sami)

Formerly bred in large numbers, the wild population was close to extinction in the late 1970s. In 1979 an adult Lesser White-fronted Goose with four young, and in June 1982 ten Lesser White-fronts without rings, were observed in the Lapland area where releases of captive-bred ringed birds commenced in 1981 (Å Andersson, unpubl. data). Given the great extent and remoteness of suitable habitat in northern Sweden, it is possible that additional nesting pairs remained in other areas 1982 and that a few pairs of the original population still breed in such areas in Sweden. Since 1977 a captive-breeding and supplementation programme has resulted in a free-flying local population breeding in the Swedish Lapland. These birds migrate to The Netherlands, following the flyway of Barnacle Goose (*Branta leucopsis*) foster parents. The supplemented population stages on the Swedish coast of the Gulf of Bothnia and at additional inland areas in southern Sweden, and is currently estimated at 80-100 birds with 15 breeding pairs (Å Andersson, pers. comm.). No releases of birds into the wild have been made since 1999, following the discovery of introgressed genes of Greater White-fronted Goose (*Anser albifrons*) among the captive stock (Å Andersson, 2004). Nevertheless, the population continues to show a moderate rate of increase. The historical spring flyway of Swedish Lesser Whitefronts was probably from Finland across the Baltic Sea/ Bay of Bothnia and along the Swedish coastline. There were important staging areas at some places along the coast in northern Sweden and the flyways then followed the river valleys into the country's interior and the breeding areas in the mountains. There are still occasional observations of Lesser Whitefronts along this flyway and rivers of northernmost Sweden, as shown by spring/summer records of five individuals in Norrbotten county in 2005. These birds are

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almost certainly not from the supplemented population, though, as yet, there are no studies to confirm this. The birds of the supplemented population use more southerly flyways.

Syria

Vernacular name: [to be added]

Vagrant, with three records up to 1995.

Following the discovery of a Russian satellite-tagged Lesser White-fronted Goose wintering in eastern Syria, an expedition to the region was organised in February 2007 with the aim of visiting and researching three poorly known sites very close to the Iraq border. Unfortunately, the satellite-tagged bird departed for Iraq just prior to the expedition, but many significant findings were made nevertheless. The highlight was the discovery of at least eight, and probably many more, Lesser White-fronts, suggesting that Syria may be an important wintering area for the Western main population (http://www.piskulka.net/Satellite_tracking.htm). Further research is required to build on these observations.

(b) Status in other AEWA/EU countries

Belgium

Almost annual observations of birds from the Swedish supplementation programme.

Denmark

Rare migrant, with 55 individuals recorded between 1950 and 1998; records since the 1980s are most likely of birds from the supplemented Swedish population. Studies of literature indicate that a significant number of birds were shot in Denmark during the 1960's (Hakon Persson, pers. comm.).

Spain

In recent years, small numbers of wintering/staging Lesser White-fronted Geese have been recorded, notably from the Doñana area in Andalucía but also from Villafáfila in Castilla-León. With the exception of one individual, all records in Spain fall within the period typical for wintering Norwegian Greylag Goose (*Anser anser*) and most sightings have been of birds within flocks of Greylag Geese. Two or three of these individuals originated from the Finnish reintroduction scheme, but nothing is known about the origins of the other birds, which were mainly unmarked. It is possible that they belong to the supplemented Swedish/Dutch population, to the wild Fennoscandian population, or even from further east (Persson, 2004.) though this is considered unlikely by some other experts.

Annex 3b

List of additional sites of possible significance for Lesser White-fronted Goose, as identified by reviewers of the first draft of this Action Plan.

Sites of importance for Swedish supplemented population

Sweden			
Hjälstaviken		820 ha	2000
Svensksundsviken		3,300 ha	2000
Västra Mälaren		30,481	2005
Ölands ostkust		10,490	2000

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Annex 3a

List of Important Bird Areas (IBAs) of significance for Lesser White-fronted Goose, alphabetically by country; (note that Russian IBAs of importance for the east Siberian population are not included; source: data provided by BirdLife International, March 2005)

Comment [PO45]: Sweden consider the list to be not correct and reflecting the IBA's where the species is found, and furthermore that the table for the supplemented population is deleted. Please find a correct list included below.

Country	International site name	Area (ha)	Year	Location (lat/long)	Season	Min	Max
Armenia	Lake Sevan	150000	1995		unknown	0	26
Azerbaijan	Kizil Agach Bay	132500	?		non-breeding	0	1058
Belarus	Mid-Pripyat	90447	1995		passage	50	250
Estonia	Põhja-Liivimaa	23457	1997		passage	0	44
Estonia	Väinameri	279557	1998		passage	11	50
Finland	Käsivarsi fjelds	220078	1996		breeding	0	1
Finland	Oulu region wetlands	81781	1997		passage	50	50
Finland	Sammutinjäkä-Vaijoenjämä	51750	1996		breeding	0	0
Georgia	Javakheti Plateau	200000	1996		passage	0	0
Georgia	Kolkheti	150000	1998		non-breeding	0	0
Germany	At least 18 sites SN : Sites for vagrants must be deleted				wintering/passage/non-breeding		
Greece	Evros delta	19000	1988		non-breeding	0	116
Greece	Lake Kerkini	12000	1996		passage	12	110
Greece	Lake Mitrikou (Ismarida)	6500	1997		non-breeding	20	0
Greece	Nestou delta and coastal lagoons	22000	?		non-breeding	0	26
Greece	Porto Lagos, Lake Vistonis, and coastal lagoons (Lakes of Thrace)	15300	1990		non-breeding	0	40
Hungary	Hortobágy	136300	1996		passage	70	450
Iran, Islamic Republic of	Anzali Mordab complex	15000	1977		non-breeding	32	
Iran, Islamic Republic of	Dez river marshes and plains	20000	1974		non-breeding	190	
Iran, Islamic Republic of	Gomishan marshes and Turkoman steppes	20000	1977		non-breeding	1773	
Iran, Islamic Republic of	Hilleh river delta	42600	1975		non-breeding	21	37
Iran, Islamic Republic of	Incheh Borun lake and marshes	50	1973		non-breeding	36	
Iran, Islamic Republic of	Karun river marshes	2500	1977		non-breeding	590	
Iran, Islamic Republic of	Lake Alagol, Lake Ulmagol and Lake Ajigol	1540	1974		non-breeding	150	

Iran, Islamic Republic of	Lake Bakhtegan, Lake Tashk and Kamjan marshes	338000	1972	non-breeding	90	
Iran, Islamic Republic of	Lake Maharlu	21600	1975	non-breeding	40	102
Iran, Islamic Republic of	Miankaleh Peninsula and Gorgan Bay	97200	1977	non-breeding	4900	
Iran, Islamic Republic of	Seyed Mohalli, Zarin Kola and Larim Sara	1600	1977	non-breeding	359	
Iran, Islamic Republic of	Shur Gol, Yadegarlu and Dorgeh Sangi lakes	2500	1977	passage		175
Iran, Islamic Republic of	Shur Gol, Yadegarlu and Dorgeh Sangi lakes	2500	1977	non-breeding	70	
Iraq	Haur Al Hawizeh	250000	1965	non-breeding		
Iraq	Haur Al Suwayqiyah	50000	1973	non-breeding	70	
Iraq	Haur Chubaisah area	42500	1965	non-breeding		
Kazakhstan	Kulykol Lake	8300	1994	passage	879	5482
Kazakhstan	Koybagar –Tontegyr Lake group	160000	2002	passage	72	1440
Kazakhstan	Lebyasje Lake	2350	2002	passage	13	506
Kazakhstan	Bozshakol Lake	3500	1997	passage	45	1442
Kazakhstan	Batpakkol Lake	650	2000	passage	7	1500
Kazakhstan	Khack Lake	5520	2003	passage	41	870
Kazakhstan	Zhaksy-Zharkol Lake	1000	2004	passage	-	257
Norway	Inner part of Porsanger fjord	2000	2005	non-br (during br season)	40	60
Norway	Varangerfjord	60000	2005	passage	0	10
Romania	Vladeni fish-ponds	1200	1996	passage	30	46
Russia (European)	Arski fish-ponds	1000	1995	passage	200	300
Russia (European)	Berkubinski forest	500	1997	passage	500	1000
Russia (European)	Bulgarski	25000	1990	passage	10	20000
Russia (European)	Central Forest Biosphere Reserve and adjacent areas	63680	1994	passage	20	200
Russia (European)	Curonian (Courish) Bay	4300	1999	passage	20	0
Russia (European)	Dadynskiye lake	45000	1996	passage	10	300
Russia (European)	Delta of the River Don	53800	1997	passage	30	50
Russia (European)	Flood-plain of Kotorosl' and Ust'e rivers	4200	1997	passage	43	0
Russia (European)	Kamsko-lkski area	100000	1988	passage	10	20
Russia (European)	Kargopol' area	175000	1996	passage	1	1000
Russia (European)	Koporski Bay	6000	1997	passage	15	30
Russia (European)	Kulaksay lowland	5000	1997	passage	200	350
Russia (European)	Kuloy river	150000	1999	passage	2000	3000

Russia (European)	Lake Ilmen' and adjoining marshy plain	250000	1993		passage	15	20
Russia (European)	Lake Manych-Gudilo	50000	1995		passage	13800	0
Russia (European)	Middle reaches of Bolshaya Rogovaya river	35000	1990		breeding	30	30
Russia (European)	Mouth of Samur river	7000	1996		passage	30	40
Russia (European)	Mouth of Svir river	65000	1996		passage	8	30
Russia (European)	Neman river Delta and the coast of the Curonian Bay	41000	1999		passage	20	0
Russia (European)	Novotroitskoye Reservoir	4000	1999		passage	0	20
Russia (European)	Petrocrepost Bay	49200	1999		passage	0	500
Russia (European)	Pinezhski Nature Reserve	51480	1995		passage	1	20
Russia (European)	Ptich'ye (Bird's) Lake	5000	1999		passage	0	20
Russia (European)	Sarpinskaya lake-system	450000	1999		passage	20	0
Russia (European)	Shalkaro-Zhetykolski lake system	81250	1996		passage	500	1500
Russia (European)	Sondugski Zakaznik and surroundings	35500	1995		passage	100	0
Russia (European)	Sources of the River Luga	49600	1997		passage	14	0
Russia (European)	Southern coast of Ladoga Lake	68000	1997		passage	15	20
Russia (European)	Sviyago-Kubninskaya forest-steppe	32000	1992		passage	0	200
Russia (European)	Torna - Shoina watershed	15000	1995		passage	1500	0
Russia (European)	Turali lake	2000	1997		passage	100	0
Russia (European)	Turalinskaya lagoon	250	1997		passage	4	15
Russia (European)	Unskaya bay	40000	1999		passage	200	0
Russia (European)	Valley of Sysola river	110000	1996		passage	50	150
Russia (European)	Yeyski salt-lakes	24000	1996	non-br (during br season)		500	500
Russia (European)	Zolotarevskaya	62000	1987		passage	35	0
Sweden	Lake Tjälmejaure-Laisdalen valley	22200	2007		breeding	10	15
Sweden	Sjaunja	208000	1996		breeding	0	5
Sweden	Taavavuoma	28400	-		breeding	0	1
Sweden	Vindelfjällen mountains (including Lake Tärnasjön)	550000	-		breeding	0	2
Sweden	River Umeälven delta	1500	2001		passage	1	5
Sweden	Hjälstaviken	820	2004-07		passage	20	40
Sweden	Svensksundsviken	3300	2004-07		passage	10	40
Sweden	Västra Mälaren	30481	2004-07		passage	0	10
Sweden	Ölands ostkust	10490	2004-07		passage	0	10

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Turkey	Saros bay		1000	1986				non-breeding	25	0		
Ukraine	Chauda		56000	1999				passage	580	580		
Ukraine	Pivdennyj Bug river valley (Goloskiv village)		3000	1999				passage	20	70		
Ukraine	Styr' river valley (Luchytsi village)		2400	1999				passage	40	140		
Ukraine	Syvash Bay		245000	1998				passage	0	1000		
Ukraine	Yagorlyts'ka and Tendrivs'ka Bays		72000	1999				passage	50	1000		
Ukraine	Karkinit'skiy and Dzarylgatskiy bay		87000					passage	50	100		
Ukraine	Dniester delta		22000					winter, autumn, early spring	10	1000		
Ukraine	Shagani, Alibay, Burnas lagoon		19000					winter, autumn, early spring	10	1000		

Annex 4

Supplemented population

Netherlands			Medium	Low				High	High	High
Sweden	High	Medium	High	Medium	High	High	High	High	High	High

Annex 6

Netherlands ⁵						?	?	?	?	?
Sweden ⁵	2	100	100	90	100	5	75	75	75	75

¹ Estimates of the number of IBAs where the species breeds or spends the non-breeding season were obtained from the BirdLife International World Bird Database (data extracted March 2005) and/or from national experts.

² Estimates of the % of the population present in the IBA suite of an individual country provided by national experts.

³ European Union members only.

⁴ National protected areas: Only includes areas which meet the IUCN definition of a protected area: "an area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means."

⁵ Supplemented population.

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Annex 7

Range State	Research and Conservation Efforts over the Last Ten Years
Sweden	Breeding ecology, genetics, migration routes, monitoring of population & reproduction, captive breeding & <u>supplementation</u> , site protection

Deleted: reintroduction

Annex 8

(j) IUCN Guidelines for Reintroduction

Comment [PO46]: Guidelines for Supplementation should also be referred to.

These *Guidelines*, published in 1995 by the IUCN Species Survival Commission (SSC), have no legal status but are generally regarded as the most authoritative international guidance available concerning species reintroductions in general. As a component on actions being taken in response to a complex international conservation challenge, Lesser White-fronted Goose reintroductions should be compatible with IUCN/SSC guidance.

The *Guidelines* state the aims and objectives of reintroduction as follows:

“The principle aim of any re-introduction should be to establish a viable, free-ranging population in the wild, of a species, subspecies or race, which has become globally or locally extinct, or extirpated, in the wild. It should be re-introduced within the species’ former natural habitat and range and should require minimal long-term management.

The objectives of a re-introduction may include: to enhance the long-term survival of a species; to re-establish a keystone species (in the ecological or cultural sense) in an ecosystem; to maintain and/or restore natural biodiversity; to provide long-term economic benefits to the local and/or national economy; to promote conservation awareness; or a combination of these.”

Guidance is provided on Pre-project Activities (biological, socio-economic and legal); Planning, Preparation and Release Stages; and Post-release Activities.

Annex 10

Final Report of the AEWA Secretariat’s negotiation mission, January 2007.

4) Swedish captive breeding programme

Sweden required support for the continuation of their captive breeding programme. At the meeting Sweden agreed to carry on its captive breeding programme only with birds from the wild (captured in Russia), while the existing captive stocks, from which birds were introduced into the wild in the past, will no longer be considered for any conservation action. The birds of that stock are still kept, but are not bred. The first shipment of eight wild birds from Russia was received in 2006 and another group of six birds was expected in mid-February ~~2007~~.

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5) Swedish free-flying flock

Currently there are approximately ~~80-100~~ free-flying birds, most or all of which are descendants of released individuals from the captive stock, birds of which were found to carry alien genes of the Greater White-fronted Goose. This flock breeds in the Swedish Lapland and winters in the Netherlands. The current draft of the SSAP suggests, following the CMS Scientific Council recommendation, that the free-flying flock should be captured or otherwise removed from the wild.

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