

AEWA EUROPEAN GOOSE MANAGEMENT PLATFORM



**9th MEETING OF THE
AEWA EUROPEAN GOOSE MANAGEMENT
INTERNATIONAL WORKING GROUP**



18-20 June 2024, Tromsø, Norway

**EVALUATION OF THE AEWA INTERNATIONAL SINGLE SPECIES
MANAGEMENT PLAN FOR THE SVALBARD POPULATION OF THE PINK-
FOOTED GOOSE (*ANSER BRACHYRHYNCHUS*)**

RESULTS ACHIEVED AND IMPLEMENTATION PERFORMANCE

DRAFT PRELIMINARY REPORT

1. Executive summary

The AEWA-EGMP ISSMP for the Svalbard Pink-footed Goose expires in 2025. This report evaluates the results and performance of the ISSMP. The ISSMP has achieved most of the planned results, particularly results given essential and high priority. However, it is important to maintain and adjust the adaptive management of the population for several reasons: (1) A continuation of the adaptive harvest management (AHM) programme is important to ensure that a stable population can be maintained in order to maintain agricultural conflicts to an acceptable level and to avoid potential negative effects on Arctic tundra ecosystems. (2) The AHM managed to stabilise the population but did not manage to reach the population target set out in the ISSMP. It is needed to reflect on the target and on additional and/or alternative actions to reach it. (3) The effects of goose grazing on tundra vegetation may change in light of observed and anticipated rapid warming of the Arctic and, (4) The population has rapidly and unexpectedly expanded its breeding range to Novaya Zemlya in north Russia and its non-breeding range to include Finland and Sweden, partly based on an emigration from the traditional flyway. This is likely to continue in the coming decade, with yet unknown effects on the overall population size and the biodiversity and human-related interests. To manage this situation, a dynamic and adaptive framework is required. The conclusion is that there is a need to continue with the implementation of the plan, but it requires a revision. It is recommended to proceed with a full revision including goal, purpose, objectives and action framework.

2. Glossary and acronyms/initialisms

To be written

3. Introduction

Development of the Plan

Paragraph 4.3.4 of the Action Plan in Annex 3 to the African-Eurasian Migratory Waterbird Agreement (AEWA) provides that Parties to the Agreement “shall cooperate with a view to developing single species management plans for populations which cause significant damage, in particular to crops and fisheries”. In addition, target 2.4 of AEWA’s Strategic Plan for 2019-2027 aimed for adaptive harvest management regimes to be in place and effectively implemented at flyway level within the framework of Species Action or Management Plans for, *inter alia*, populations which cause significant conflicts with certain human economic activities. The Svalbard population of the Pink-footed Goose (*Anser brachyrhynchus*) was selected as the first test case for an AEWA International Single Species Management Plan to be developed throughout the population’s flyway range by 2012 (Norway, Denmark, the Netherlands and Belgium). Numbers of the Svalbard-breeding population of Pink-footed Goose had increased considerably over the past decades, from c. 15,000 in the 1960s and reaching an estimated population size of 69,000 individuals in 2010. The growth of the population is a conservation success, yet its increasing population size has progressively brought them into conflict with agricultural interests as well as having other environmental and social implications. Several key management issues were identified: (i) the potential for an escalation in agricultural conflicts, particularly in Norway, (ii) concern about degradation of vulnerable tundra vegetation in Svalbard due to increasing goose grazing intensities and (iii) risks of crippling of geese due to shotgun shooting.

The initial stakeholder workshop was held in November 2010 and the final draft was adopted by the 5th Meeting of the Parties to AEWA, in May 2012. An implementation inception workshop was held in August 2012. The revision of the plan was planned for 2022; however, due to Covid pandemic

restrictions the plan's validity was extended with a view to a revised version being brought to the 9th Meeting of the Parties to AEWA for adoption in 2025. Initial range states included Norway, Denmark, The Netherlands and Belgium but due to a recent expansion of the range into Sweden and Finland, these countries became observers to the process.

The compilation of the data for this evaluation report was done by the EGMP Pink-footed Goose Task Force members. The synthesis was funded financially by the Danish Environmental Protection Agency. The synthesis of the goose grazing effects on Arctic tundra was financially supported by the Norwegian Environment Agency. We thank all contributors and donors.

4. Key concepts and processes provided for in the Plan

The ISSMP for the Svalbard population of the Pink-footed goose constitutes the first AEWA (and European) adaptive flyway management plan implemented for a waterbird population. It builds on a participatory structured decision-making framework with goals, management objectives, alternative actions, monitoring and iterative evaluation of implemented actions. The ISSMP introduced for the first time a population target agreed among range states and stakeholders. The target reflected a provision for safeguarding the population against risk of decline as well as an upper tolerance level in terms of socioeconomic interests and environmental risk. Since it was intended to initially reduce the population and subsequently maintain it at the population target by recreational harvest, the ISSMP had a focus on developing an adaptive harvest management framework. By the time the plan was developed, there was no precedent for setting Favourable Reference Values in the context of AEWA implementation, but in the population target is also embedded an expression of an *ad hoc* Favourable Reference Population level (a population size with minimal risk of extinction even under highly variable levels of harvest), and the plan's objectives include maintenance of range and ecological integrity (i.e. habitat).

- **Implementation structures (e.g. Working Group, Task Forces under WG, coordination, etc)**

During 2012-2015, the ISSMP implementation process was coordinated by the AEWA Pink-footed Goose International Working Group (AEWA PfG IWG). The AEWA PfG IWG was coordinated by Aarhus University under the supervision of the AEWA Secretariat and it also acted as data centre compiling monitoring data and undertaking the annual population assessments including proposals for the optimal harvest strategy. Coordinated field censuses of the population size (spring and autumn) and juvenile production (autumn) have been carried out annually in each range state and the monitoring schemes have been adjusted in a dynamic process to capture changes in distribution and behaviour of the geese. Range states and observers constituting the AEWA PfG IWG met annually to monitor the progress of the plan and to recommend management decisions. Since 2016, the plan has been included under the AEWA European Goose Management Platform (EGMP). A Pink-footed Goose Task Force has been established under the EGMP. In most range states, national working groups have been established to support the implementation of the plan.

- **Goal, Purpose and Objectives of the Plan**

The initial version of the goal and objectives were described in the ISSMP¹ but were specified in a later version².

¹ Madsen, J., & Williams, J. H. (eds) (2012). *International Species Management Plan for the Svalbard Population of the Pink-footed Goose *Anser brachyrhynchus**. AEWA. AEWA Technical Series Nr. 48

² Madsen, J., Williams, J. H., Johnson, F. A., Tombre, I., Dereliev, S., & Kuijken, E. (2017). Implementation of the first adaptive management plan for a European migratory waterbird population: The case of the Svalbard pink-footed goose *Anser brachyrhynchus*. *Ambio*, 46 (Supplement 2), 275-289. <https://doi.org/10.1007/s13280-016-0888-0>

The goal of the ISSMP is to maintain the favourable conservation status of the Svalbard Pink-footed Goose population at flyway level while taking into account biodiversity, economic and recreational interests.

To achieve this goal the following set of objectives has been agreed, in consultation with national authorities and key stakeholders:

- I. Maintain population range and ecological integrity.
- II. Minimise agricultural conflicts.
- III. Maintain sustainable and stable population.
- IV. Avoid increase in tundra vegetation degradation in the breeding range.
- V. Allow for recreational use that does not jeopardize the population or social acceptance (reduce crippling due to hunting).

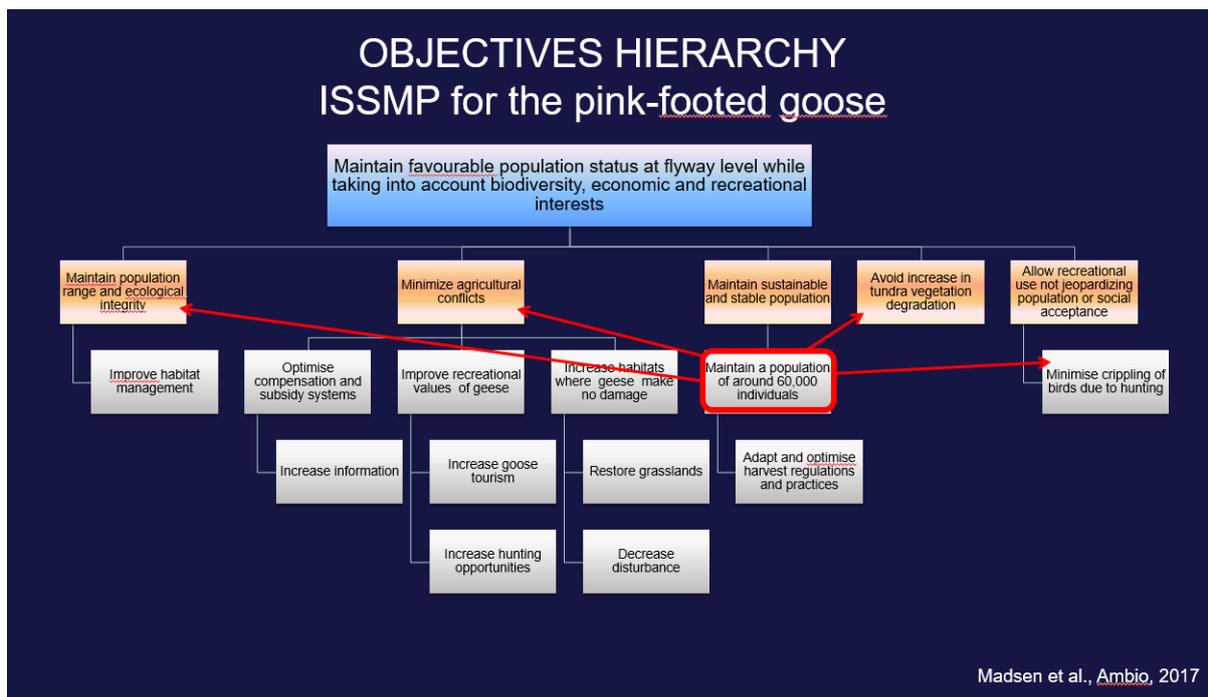


Figure 1. Objectives Hierarchy ISSMP for the Pink-footed Goose

• Plan Evaluation

Overall, the evaluation follows the AEWA guidelines and template for the Evaluation of AEWA international Single and Multi-species Action and Management Plans (agreed by the AEWA Technical Committee, September 2023). However, when the ISSMP for the Svalbard population of the Pink-footed goose was compiled and later implemented, there was no stringent format for AEWA ISSMPs, nor for evaluation criteria. Hence, indicators to evaluate results and implementation performance were rather vague (see Madsen & Williams 2012, Table 8). Therefore, the results and performance cannot *sensu stricto* be quantified in the way recommended by the guidelines.

5. Two-step evaluation

The two-step evaluation follows the decision tree for the retirement, extension, and revision of AEWA species action and management plans (see document [AEWA/MOP 8.22](#))

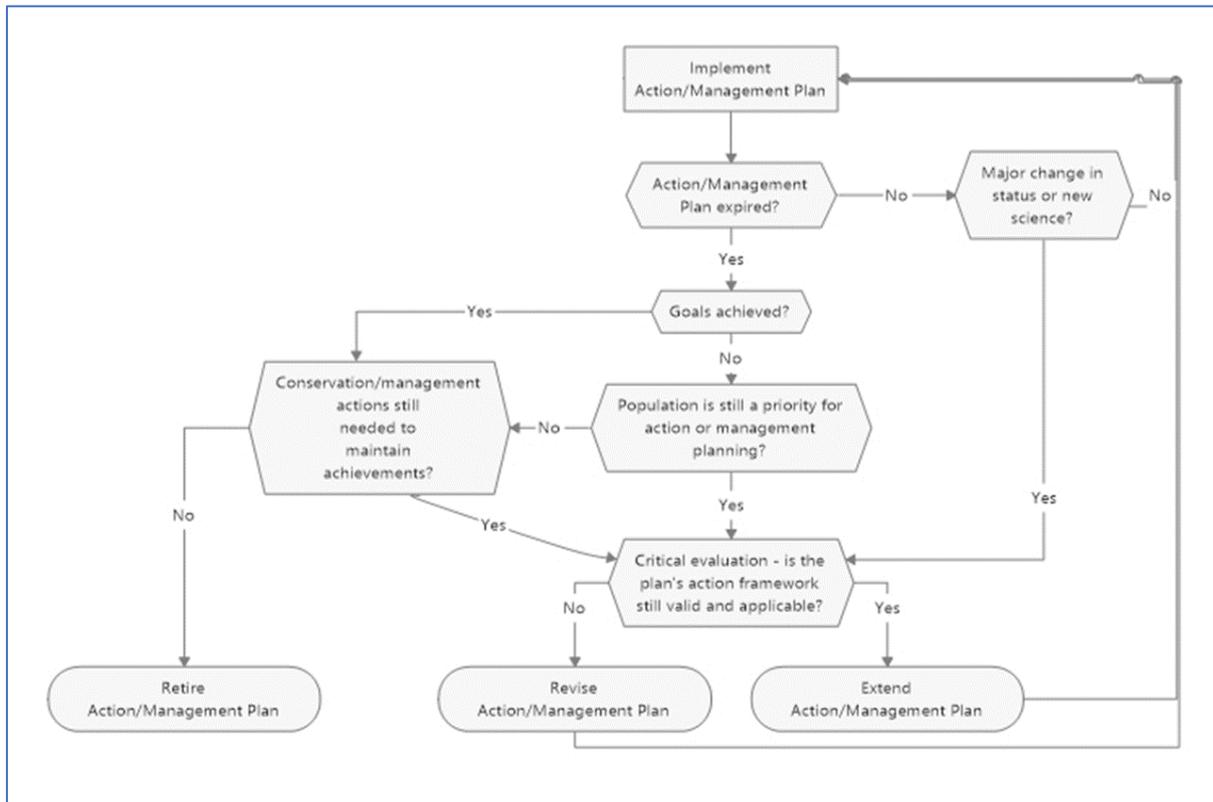


Figure 2. Procedure for the retirement, extension, and revision of AEWA species action and management plans

Step 1

I. Have the goal and purpose been achieved?

As specified in Annex 1 and 2 to this report, the goal has been achieved: (1) the range has been maintained and even expanded, (2) the agricultural conflicts have subsided, (3) the population has stabilised (yet, above the population target), primarily as a result of increased harvest levels in agreement with the implemented adaptive harvest management framework, (4) the extent and intensity of goose grazing effects on tundra vegetation in Svalbard has been slowed down and, (5) crippling due to hunting has decreased despite increasing harvest rate which is ascribed to a change in hunting practises, awareness raising and practical courses in effective goose shooting. The existence of the plan itself and communication have also been an important alleviating issue in the farmers' communities.

II. Is the population / species still considered by the AEWA Technical Committee a priority for action or management (with recovery objectives) planning?

To be decided by the Range States at the EGMP International Working Group meeting in Tromsø, Norway, June 2024. Since the population is subject to a management plan with population control objective, the decision on prioritisation is a prerogative of the Range States rather than the AEWA Technical Committee.

III. Do the Range States participating in the implementation of the management plan consider the necessity of continuing concerted actions to address the issue of damage to crops or fisheries?

The objectives of the ISSMP include reducing the agricultural conflict as well as reducing threats to Arctic ecosystems. The maintenance of a stable population at current levels has been a key concerted action to achieve this and has unanimously been backed by the Range States.

Updates have been reported and discussed at regular PfG Task Force meetings and annual meetings of the EGMP International Working Group.

IV. Are conservation or management actions still needed to maintain achievements?

Continued implementation of management actions is needed, as follows:

(1) the ISSMP is based on an adaptive management framework. A continuation of the adaptive harvest management programme is important to ensure that a stable population can be maintained in order to maintain agricultural conflicts to an acceptable level and to avoid potential negative effects on Arctic tundra ecosystems,

(2) AHM managed to stabilise the population but did not manage to reach the population target set out in the ISSMP. It is needed to reflect on the target and on additional and/or alternative actions to reach it,

(3) the effects of goose grazing on tundra vegetation may change in light of observed and anticipated rapid warming of the Arctic and,

(4) the population has rapidly and unexpectedly expanded its breeding range to Novaya Zemlya in north Russia and its non-breeding range to include Finland and Sweden, partly based on an emigration from the traditional flyway. This is likely to continue in the coming decade, with yet unknown effects on the overall population size and the biodiversity and human-related interests. To manage this situation, a dynamic and adaptive framework is required.

V. Recommendations for the future of the Plan

It is recommended to continue with the implementation of the ISSMP for the Svalbard population of the Pink-footed Goose.

Step 2

Is the Plan's action framework still valid?

I. Are there new insights, biological or other background information, emerging issues or threats?

Yes. The population has naturally expanded its range to include breeding in Novaya Zemlya, north Russia and has established relevant staging and wintering areas in Finland, Sweden and eastern Denmark (in Poland and Germany as well). The new group has grown from few hundred birds to >4,000 birds within the last 15 years, and part of the growth has been due to individuals shifting from the traditional flyway to the new range (Madsen et al. 2023). Furthermore, an increasing number of birds from the breeding grounds in Svalbard are also flying via Sweden and Finland to Svalbard in spring. Hence, Finland, Sweden and Russia now qualify as Range States. The development of the migration system, new breeding grounds and use of new staging and wintering grounds is still evolving, and it is uncertain how the situation will look like in 10-20 years.

II. If there are new issues, does the action framework of the Plan need to be changed to address these?

Yes. The spread of the population means that Finland and Sweden (AEWA Range States) have accepted to become Range States of a revised ISSMP for the Pink-footed Goose. The AEWA Technical Committee and the EGMP Pink-footed Goose Task Force have recommended that the population is treated as one biogeographic population. It has to be decided by the Range States whether or not to manage the population as one or split it into two Management Units (MU) with MU-specific Favourable Reference Values, management objectives and actions. These issues will require a review and adjustment of the action framework.

Further to that, the 8th Session of the Meeting of the Parties to AEWA (September 2022, Budapest, Hungary) adopted a format for AEWA Single and Multi-species Management Plans, which is the first of its kind, and provides a standardised approach to planning management processes.

III. Is the intervention logic of the Plan working?

a. To what extent have actions been implemented?

Ten essential key actions were identified in the ISSMP (See Annex 1). Using the below Score system (0-5), the distribution of scores was:

Score 1: 1 (not implemented)

Score 2: 1 (limited progress)

Score 3: 3 (good progress)

Score 4: 1 (significant progress)

Score 5: 4 (implemented)

Average: 3.6

Action score	Not assessed	Not implemented / not achieved / no progress / regress	Limited progress	Good progress	Significant progress	Implemented / achieved	Mean result / objective score
0							0
1							0.1 – 1.0
2							1.1 – 2.9
3							3.0 – 3.9
4							4.0 - 4.9
5							5

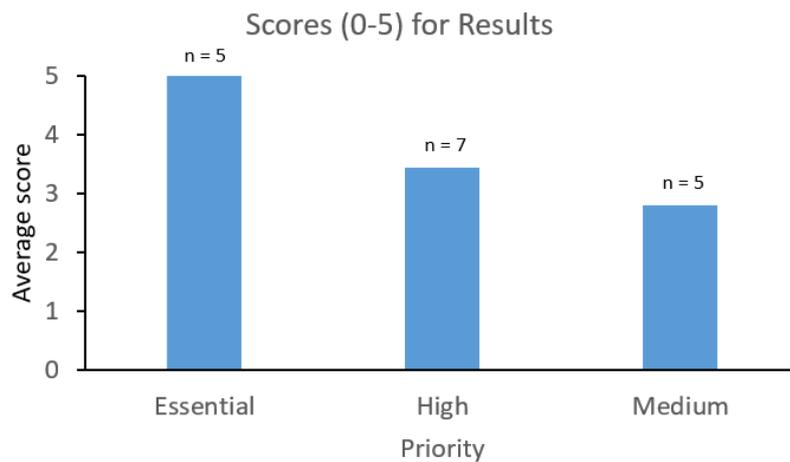
Figure 3. Scoring of actions

b. To what extent have results and objectives been achieved?

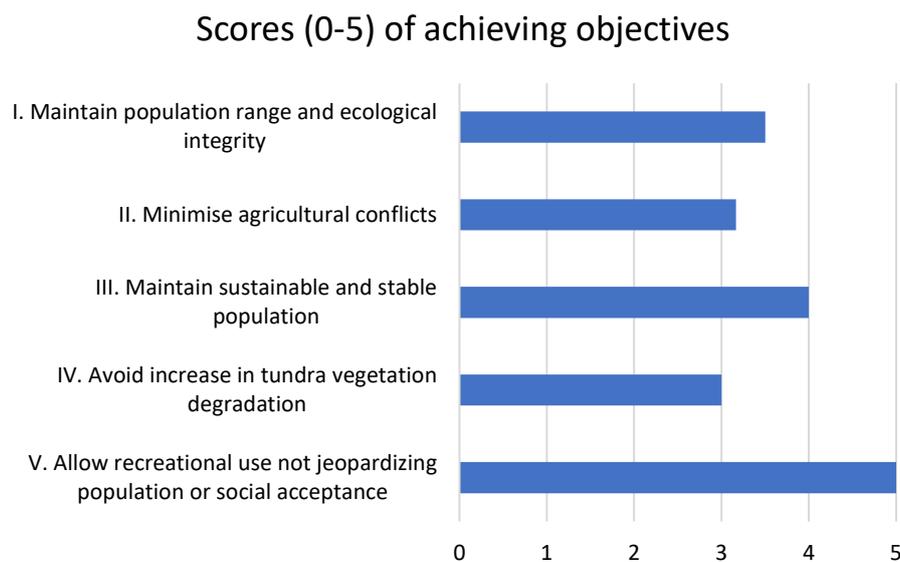
Results: A total of 17 results were identified in the ISSMP, given medium, high or essential priority (Table 8 in the ISSMP; Annex 1). The scoring of achievements of results ranged from score 1-5, with an average of 3.7 (see Annex 1). Results regarded as essential all scored 5; results regarded as high on average 3.4 and medium on average 2.8.

c. What were the main obstacles hindering implementation and achieving defined results and objectives?

Overall, there has been good progress and a relative high degree of implementation in achieving objectives and results. It has been achieved to stabilise the population size, however not at the target of 60,000, but approximately 10-20,000 individuals above (spring population size). To bring the population closer to the target, it would have been necessary to take further action to increase the harvest or alternative actions to reduce adult survival reproduction. However, it is unclear what is hindering further increase in harvest levels to achieve the optimal quota, and this needs further investigation in order to target an awareness raising in the hunters' communities.



Objectives: The five objectives scored an average of 3.7. Objectives were scored on basis of 1-3 means objectives (see Annex 1).



The proposed action to prevent the establishment of breeding colonies of PfG from the mainland in Norway has not been prioritised, but available information suggests that the number of breeding attempts are nevertheless quite small. However, it should be borne in mind, that the agricultural conflict appears to have been reduced, and it does not appear that the grazing ('grubbing') by geese on tundra vegetation has such a negative impact as originally feared, and this stabilisation has reduced the necessity for population control on the mainland of Norway. This calls for a new discussion about the population target.

Restoration of grassland habitat was identified as a key action to minimise agricultural conflicts. This has not been implemented except from seminatural grassland restoration projects in Belgium benefitting PfG. It has not been given priority in other range states, despite the possibilities for restoration of overgrowing seminatural grassland to provide foraging habitats for PfG in both Norway and Denmark.

Particularly in Norway, priority has been given to tailor a national subsidy scheme to allow PfG (and Barnacle Geese in North Norway) to forage undisturbed on grasslands in spring.

Development of national management plans including promotion of ecotourism has not been given high priority. Public outreach initiatives and dissemination have been taken in Belgium, Denmark and Norway, including film reportages and publishing a goose cookbook, but the more strategic approach to increase ecotourism and outreach initiatives has lacked funding.

5. Conclusion and recommendations

It is recommended to proceed with a full revision including goal, purpose, objectives and action framework.

[This full evaluation report will be submitted to the AEWA Technical and Standing Committees for review and approval of the recommended continuation option]

6. Annexes

Annex 1: Objectives, Results and Actions according to the ISSMP for the PfG, and scoring of achieved results and performance (excel file).

Annex 2: Indicators of objectives (I-V).

Annex 1. Objectives, Results and Actions according to the ISSMP for the PfG, and scoring of achieved results and performance.

Available as a separate Excel file under EGM IWG9 meeting documents on the meeting webpage:
<https://egmp.aewa.info/meetings/iwg/detail/9th-meeting-aewa-european-goose-management-international-working-group-egm-iwg9>.

Annex 2 – Indicators of objectives (I-V)

Objective I. Maintain population range and ecological integrity

Indicators of range (2013-2022)

Country	Autumn	Winter	Spring
Norway	Stable	NA	Increase
Denmark	Increase	Increase	Increase
The Netherlands	Increase (28%)	Increase (28%)	NA
Belgium	Increase	300 km ² => 500 km ²	NA
Overall	Increase	Increase	Increase

Note 1: One of the drivers of range increment has been the increase in growing of maize, particularly in DK, but also in NL and BE, intensively exploited by PfG during autumn and winter

Note 2: Intensified shooting in NO and DK has not caused a decline in distribution of geese. In NO it has been shown that better organisation of the hunt in local areas has led to less hunting disturbance, elongated stay of geese and more geese shot (Tombre et al. 2022; Ambio 51: 728-742).

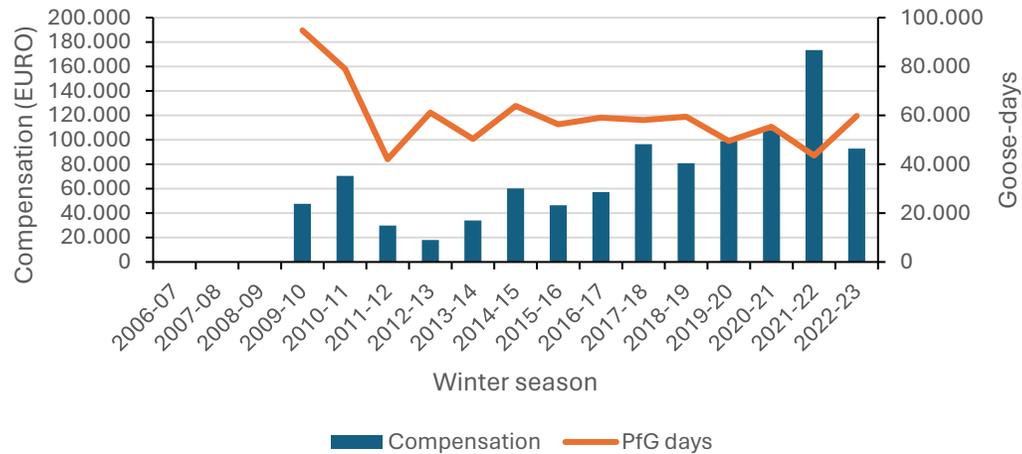
Note 3: PfG have expanded their range outside the breeding season to Sweden and Finland within the last 15-20 years and to Novaya Zemlya for breeding (Madsen et al. 2023; Current Biology)

Note 4: Breeding range in Svalbard, NO is not included in the analysis; an expansion is observed

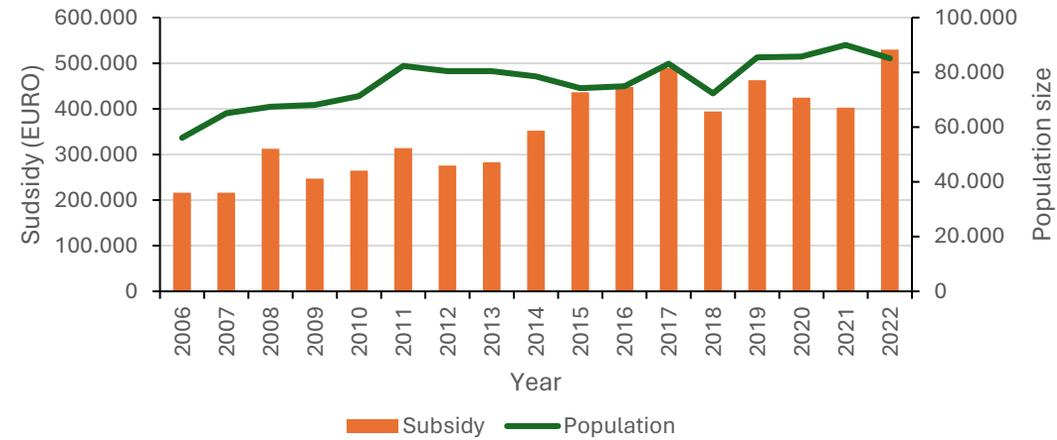
Objective II. Minimise agricultural conflicts

Indicators of agricultural conflict

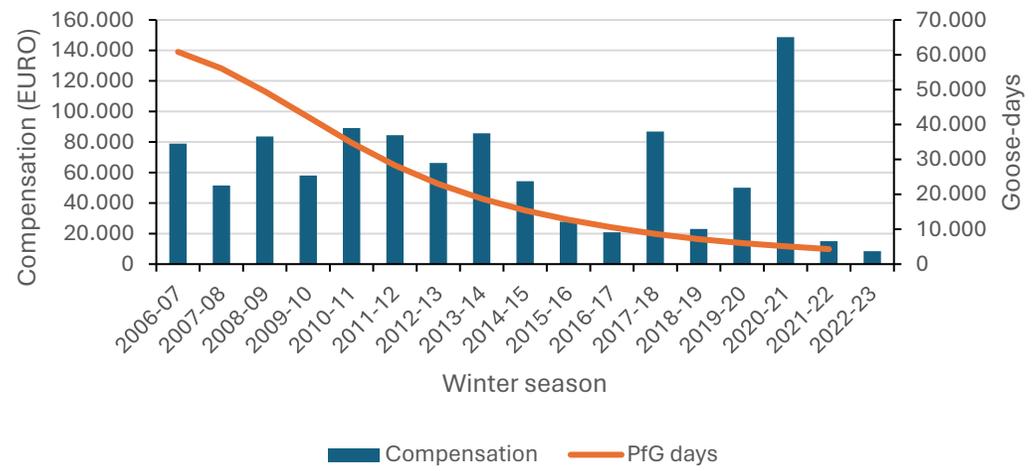
Belgium - compensation



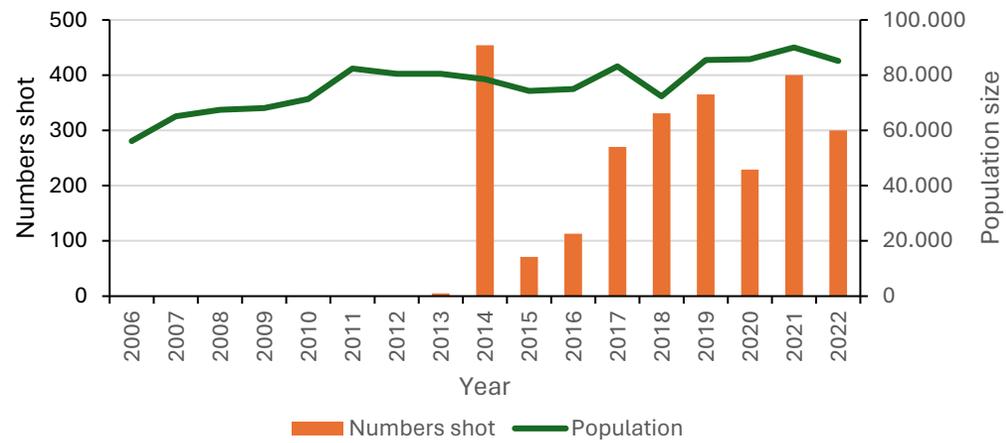
Norway - subsidies



The Netherlands - compensation



Denmark - derogation shooting



Indicators of agricultural conflict

Note 1: In Belgium, the compensation system was gradually implemented over the first years, but has been stable during the last c. 7 years; payments are partly corrected for the price of wheat; the extraordinary high compensation paid in 2021-22 reflects high market prices due to the war in Ukraine. If wheat prices are taken into account, the level of compensation aid for PfG damage across years is flattened, and in accordance with the fluctuating number of PfG-days spent in Belgium.

Note 2: In The Netherlands, compensation paid for PfG damage has decreased, however, with some recent unexplained spikes. The decrease corresponds with the observed decline in PfG-days in the last 10 years.

Note 3: In Norway, a subsidy scheme has been designed to allow PfG to graze undisturbed on grassland in spring. The scheme is politically negotiated and has only partly been adjusted based on goose densities. Nevertheless, there is an overall correspondence between the subsidies paid and goose numbers (here taken as the overall IPM-estimated population size in spring, not taking into account the increasing numbers spring-staging in Sweden-Finland).

Note 4: In Denmark, where no compensation nor subsidy scheme is in place, the number of PfG shot under derogation to protect crops in February-March has been used as a proxy of the agricultural conflict (only available since 2014). The number of geese shot has fluctuated, which is in accordance with the stable population size (here the IPM-estimated spring population size).

Relationship between goose abundance and socio-economic indicators

Assessment of goose damage to agricultural crops - is there a relationship between goose abundances and yield loss?

Report to the AEWA European Goose Management Platform

June 2023

Effects of grazing by pink-footed geese

The experimental study in Norway showed an increasing damage by increasing grazing pressure, but with annual and site variations. The results were corroborated by modelling predicting an increase in damage under a scenario of increases in abundance. The level of damage amounted to an average of 21% of the first harvest yield, which is close to what has been measured in south Iceland (average 28%).

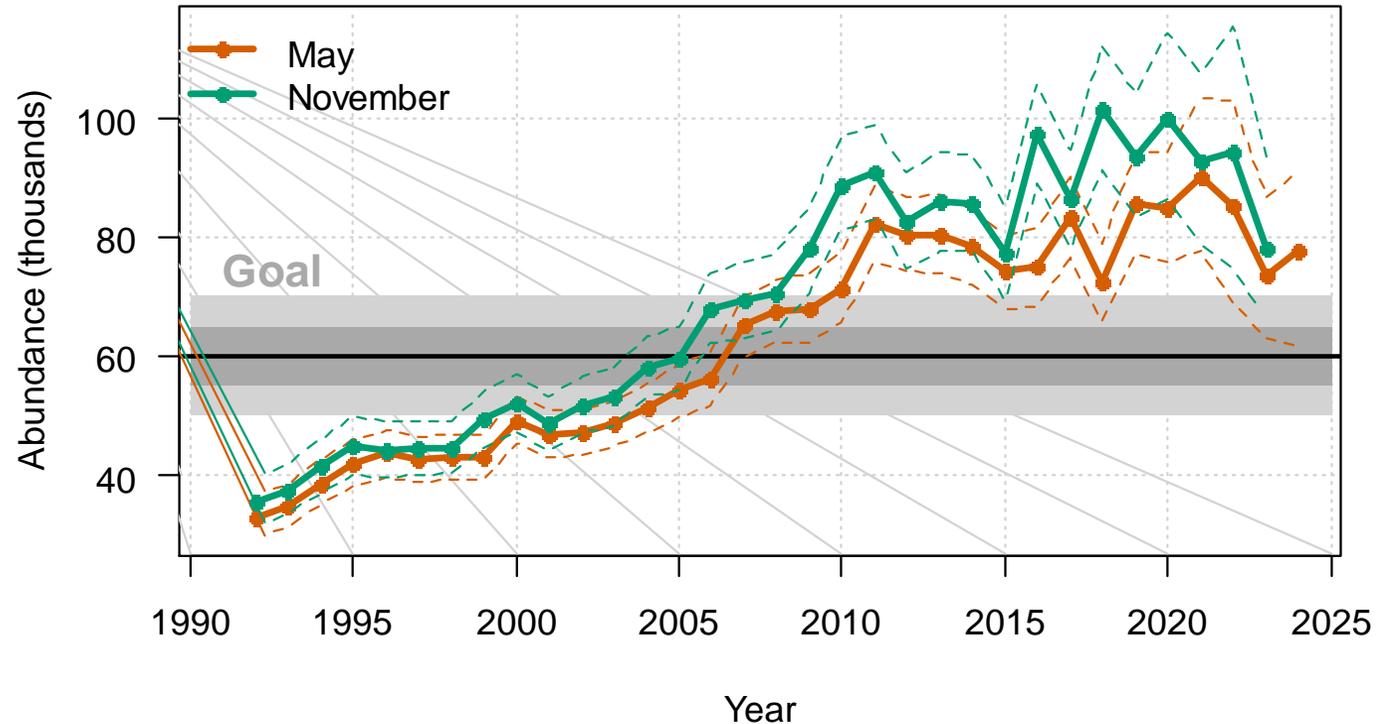
References to studies:

Olsen, Bjerke & Tombre (2017), *Journal of Applied Ecology* 54: 1836-1846.

Baveco et al. (2017), *Ambio* 46: S20-S223

Objective III. Maintain sustainable and stable population

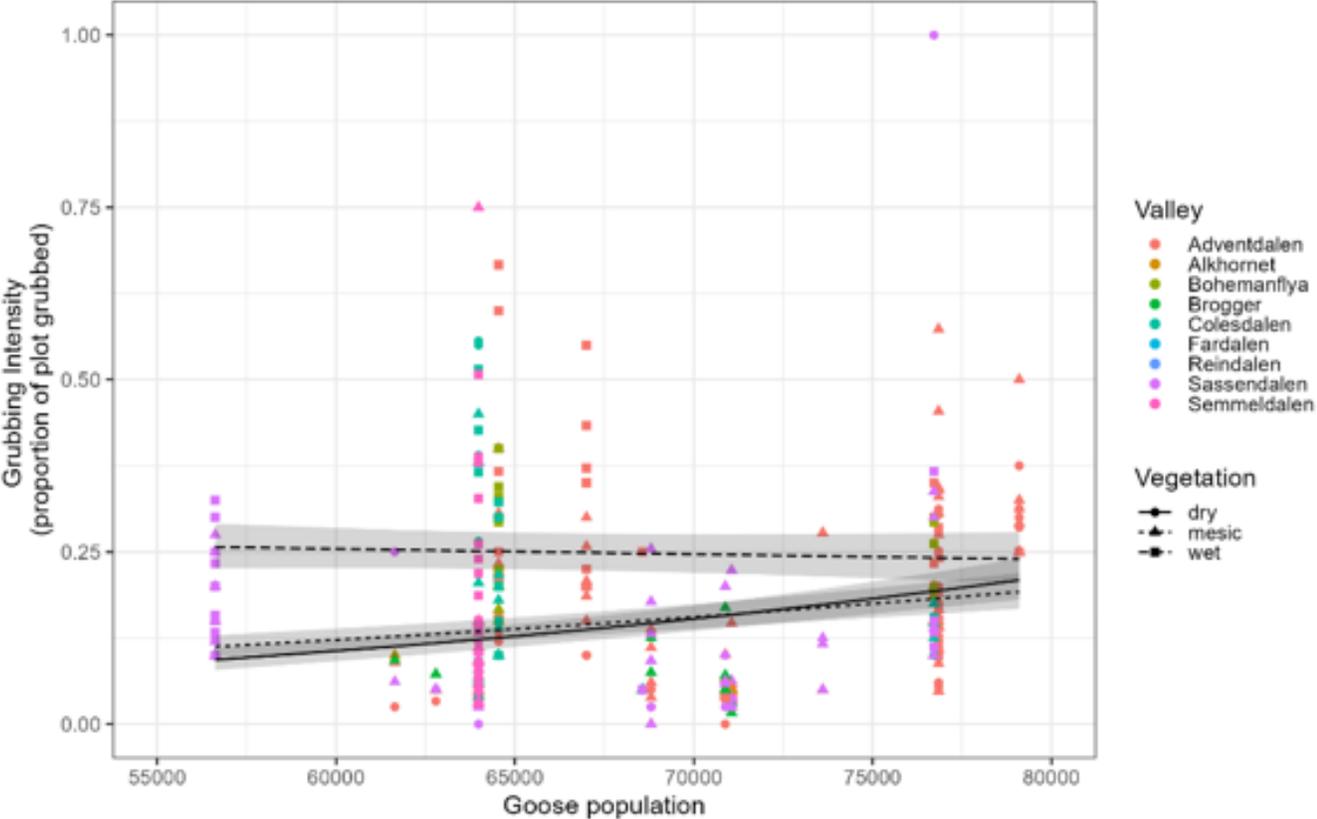
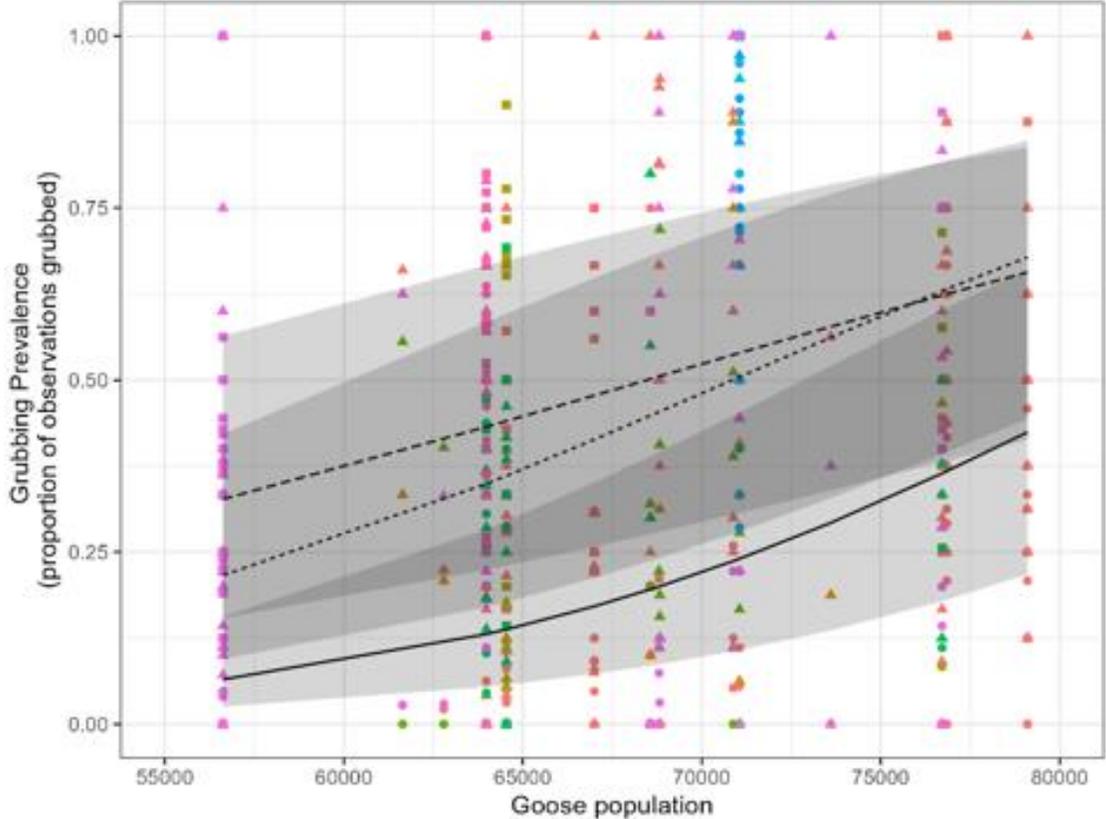
Population development (IPM estimate)



Note 1: An adaptive harvest management program was implemented for the PfG in 2012 with the purpose of stabilising the population at a goal around 60,000 individuals (+/- 10,000). Since the implementation the harvest rate has increased, which has been a major factor causing a stabilisation of the population size. So far, the population fluctuates around 70-85 thousand in spring. See Johnson et al. 2024; Doc. AEWA/EGMIWG/9.8/Rev.1.

Objective IV. Avoid increase in tundra vegetation degradation

Relationship between goose abundance and ecosystem effects (tundra)



- Valley
- Adventdalen
 - Alkhorvet
 - Bohemanfiya
 - Brogger
 - Colesdalen
 - Fardalen
 - Reindalen
 - Sassendalen
 - Semmeldalen
- Vegetation
- dry
 - mesic
 - wet

Source: Ravolainen et al. 2024, in prep.

Objective IV. Avoid increase in tundra vegetation degradation

Relationship between goose abundance and ecosystem effects (tundra)

Note 1: A collaborative study has compiled and standardised data on the extent and intensity of goose grubbing of the tundra in Svalbard, based on repeated transect data collected between 2005 and 2022. The extent and intensity has been analysed for wet, mesic and dry tundra and put in relation to the spring population size of PfG. Snow cover in May, when most goose grubbing takes place, was taken into account in the analyses.

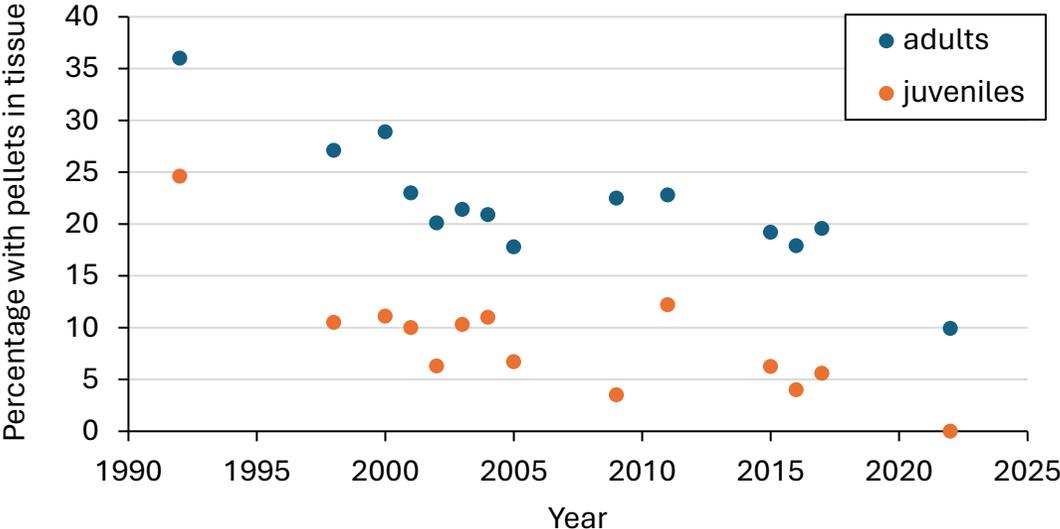
Note 2: For all three habitat classes, there is an increase in extent of grubbing with increasing population size (ranging between 57 and 78 thousand individuals), but there is no significant relation in the intensity of grubbing.

Note 3: Combined with information about the rate of recovery of vegetation in plots grubbed by geese, the study concludes that there is an effect of grubbing on the system state (including vegetation composition) but so far with no signs of degradation as originally feared.

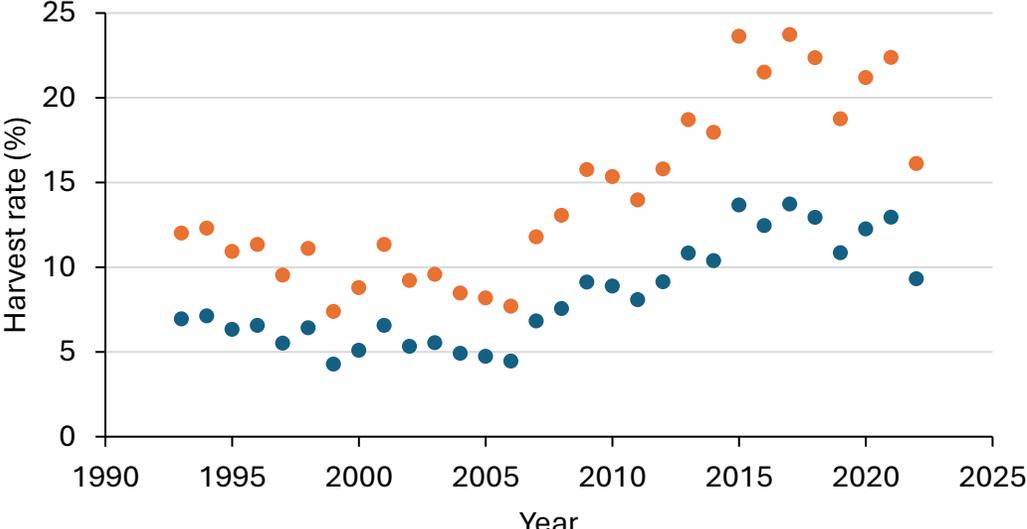
Objective V. Reduce crippling due to hunting

Indicators of crippling due to shotgun shooting

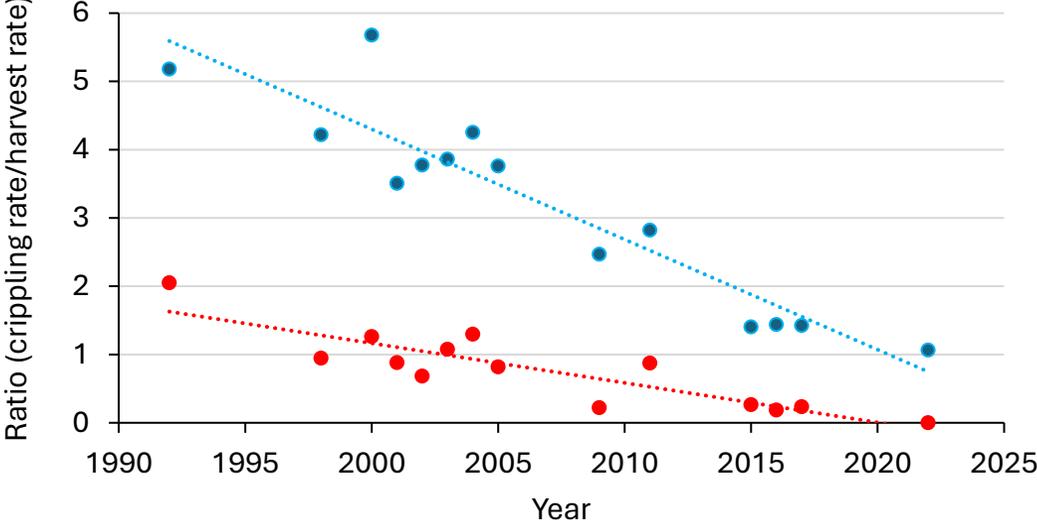
Crippling rate



Harvest rate (IPM)



Crippling ratio



Objective V. Reduce crippling due to hunting

Indicators of crippling due to shotgun shooting

Note 1: X-ray of geese caught in spring, after the hunting season in Denmark and Norway, has shown a gradual decline in the crippling rate since the 1990s, which has been related to an awareness campaign and various regulations to reduce crippling due to shotgun shooting, initially in Denmark, followed by Norway, i.e., the two range states where the Svalbard population of the PfG is huntable .

Note 2: Since the implementation of the ISSMP for the PfG, the harvest rate has increased. This might have caused an increase in the crippling rate. The crippling ratio, which is taken as the ratio between the crippling rate and the harvest rate for adult and juvenile geese, respectively, corrects for variation in the harvest rate. It shows that there has been a continuous decrease in the crippling ratio, in 2022 reaching a record low level. The decline is ascribed to a change in hunting practises in both Norway and Denmark, which includes shooting in teams using decoys, blinds and calls to attract geese, shooting at shorter ranges and using the right shotguns and ammunition for goose shooting.