STATUS AND TRENDS OF GOOSE POPULATIONS IN THE WESTERN PALEARCTIC IN THE 1980s

JESPER MADSEN

ABSTRACT This paper reviews the status and trends of goose populations wintering and/or breeding in the western Palearctic in the 1980s. Counts have been performed in almost all countries harbouring geese in winter, and are coordinated by the IWRB Goose Research Group. Nine species occur in substantial numbers, including the introduced Canada Goose, forming 24 more-or-less strictly defined populations. In total there are approximately 2 million geese in these populations. Since the 1970s the number of western Palearctic geese has nearly doubled. Goose numbers have increased in 14 populations, remained stable in seven, have decreased in two and in one population the trend is unknown. The situation of the Lesser White-fronted Goose and the Svalbard Light-bellied Brent Goose population is critical.

INTRODUCTION

Since the 1950s increasing efforts have been devoted to counts of geese staging and wintering in the western Palearctic region. This activity has been prompted for several reasons: firstly, because geese make traditional use of staging and wintering quarters and discrete populations can be identified, counts provide a relatively efficient way of monitoring populations, which is basic for their protection and management as well as for more detailed population studies. Secondly, counts have been instrumental in evaluating the relative national as well as international importance of sites for the various populations. This has supported the development of conservation programmes such as the Ramsar Convention, 1971. Thirdly, the mere fact that geese are spectacular and fascinating birds has sustained the enthusiasm of the many volunteers, without whose efforts the surveys would have failed.

The number of reports and papers dealing with the status of various goose species or populations in the Palearctic is overwhelming and reflects the high level of activity. The first account covering all populations of the region was presented by Timmerman et al. (1976), and was later followed by accounts by Ogilvie (1978) and Madsen (1987).

The aim of this paper is to present an updated status of the sizes and trends of goose populations wintering in the Palearctic, without interpretation of the observed trends as this is the theme of other papers at this symposium. This paper is a more detailed presentation than that given by Pirot et al. (1989) and updates a few of the estimates given there.

MATERIAL AND METHODS

Those goose populations which breed and/or winter in the Palearctic region, including introduced and feral species which have developed wild populations, are considered. Goose counts are organised nationally for various purposes, either by national research institutes or by other organisations. International coordination is made by the Goose Research Group of the International Waterfowl and Wetlands Research Bureau (IWRB). Counts are mainly conducted by networks of volunteers counting from the ground. In some areas the ground counts are supplemented by aerial surveys.

Table 1 shows the months in which national censuses are carried out for each species. Counts are performed at some scale in almost all Palearctic
Table 1. Status of goose counts in the western Palearctic. Italic numbers indicate that counts are carried out in almost all areas or sites. Other numbers indicate that major sites are covered.

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<th>Country</th>
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</tbody>
</table>

1Anser anser and Branta leucopsis are surveyed at five years intervals
2Counts of Anser albifrons flavirostris are complete only in November and April.

Species codes:

countries harbouring geese in winter (Fig. 1). The status of goose counts in the USSR, Albania, Iran and Iraq remains unclear. Recent improvements in coverage have been achieved in Poland, Rumania and Turkey. However, especially in the eastern part of the region there are still gaps in the coverage.

The mid-January census has traditionally been the back-bone in the surveys but in many countries counts are also organised at other times of the winter season, especially in autumn. For many populations it has been realised that the best coverage is not necessarily achieved in mid-winter, but rather in autumn or spring. In nine out of 24 populations staging or wintering in the Palearctic special counts are organised once or twice per winter season.

Ringing with plastic rings with individual
### Table 2. Population estimates and trends of geese breeding and/or wintering in the western Palearctic, together with an estimate of census coverage and a status of ringing schemes.

<table>
<thead>
<tr>
<th>(Sub-)species or population</th>
<th>Breeding range</th>
<th>Winter range</th>
<th>Estimated pop. size</th>
<th>Trend</th>
<th>Census coverage</th>
<th>Ringing schemes</th>
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<td>Anser f. fabalis</td>
<td>N Scand./Siberia</td>
<td>NW Europe</td>
<td>80 000</td>
<td>+</td>
<td>2</td>
<td>N, F (P/S)</td>
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<td>Anser f. rossicus</td>
<td>N Scand./N Siberia</td>
<td>Europe</td>
<td>300 000</td>
<td>+</td>
<td>2</td>
<td>N</td>
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<td><strong>Pink-footed Goose</strong></td>
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<tr>
<td>Anser brachyrhynchos</td>
<td>Iceland/E Greenland</td>
<td>Britain &amp; Ireland</td>
<td>110 000</td>
<td>+</td>
<td>3</td>
<td>F (P/S)</td>
</tr>
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<td>Svalbard</td>
<td>NW Europe</td>
<td>25 000</td>
<td>+/-</td>
<td>3</td>
<td>F (P/S)</td>
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<td>NW Europe</td>
<td>400 000</td>
<td>+</td>
<td>3</td>
<td>F (P/S)</td>
</tr>
<tr>
<td>Anser a. albirostris</td>
<td>Siberia</td>
<td>C. Europe</td>
<td>100 000</td>
<td>-</td>
<td>2</td>
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<tr>
<td>Anser a. albirostris</td>
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<td>Black Sea/Turkey</td>
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<td>+/-</td>
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<td>Britain &amp; Ireland</td>
<td>22 000</td>
<td>+</td>
<td>3</td>
<td>F (P/S), N</td>
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<td>Black Sea/W Asia</td>
<td>25 000-50 000</td>
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<tr>
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<td>Iceland</td>
<td>Britain &amp; Ireland</td>
<td>100 000</td>
<td>+</td>
<td>3</td>
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<tr>
<td>Anser anser</td>
<td>N Scotland</td>
<td>N Scotland</td>
<td>2 000</td>
<td>+/-</td>
<td>2</td>
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<td>Anser anser</td>
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<td>Britain &amp; Ireland</td>
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<tr>
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<td>Spain/Netherlands</td>
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<td>C. Europe</td>
<td>N Africa</td>
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<td>+/-</td>
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<tr>
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<td>Black Sea</td>
<td>Black Sea</td>
<td>20 000</td>
<td>?</td>
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<td>England</td>
<td>England</td>
<td>50 000</td>
<td>+</td>
<td>2</td>
<td>N</td>
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<tr>
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<td>Scandinavia</td>
<td>Baltic Sea</td>
<td>50 000</td>
<td>+</td>
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<td>Netherlands</td>
<td>70 000</td>
<td>+</td>
<td>3</td>
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<tr>
<td>Branta leucopsis</td>
<td>E Greenland</td>
<td>Scotland &amp; Ireland</td>
<td>32 000</td>
<td>+/-</td>
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<td>Scotland</td>
<td>10 000</td>
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<td>N Siberia</td>
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<td>170 000</td>
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<td>Ireland</td>
<td>20 000</td>
<td>+/-</td>
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<tr>
<td>Branta b. hrota</td>
<td>Svalbard</td>
<td>Denmark/E England</td>
<td>4 000</td>
<td>+/-</td>
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<td>35 000</td>
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</table>

1Sources see text; where census coverage is 3, estimates are based on 5-years means, otherwise on most recent population estimates.
2Increase (+), stable (+/-), decrease (-).
3An estimate of annual coverage of the populations: 90-100% (3), 50-90% (2), less than 50% (1).

codes as well as with traditional steel rings has become an important tool in population studies in the Palearctic and has provided background information on migration patterns, site faithfulness and rates of mixing between populations. At present there are ringing schemes operating in 18 out of 24 populations (Table 2).
RESULTS

Population estimates and trends

Nine goose species, including the Canada Goose, which has been introduced from North America, occur in substantial numbers in the Palearctic. In Table 2 population estimates are presented. The estimates have been derived from several published and unpublished sources, which are listed in the species accounts below. The majority of the data are from the period 1982-1986. In populations which are well monitored each winter, the estimates are averages of the five most recent censuses. Twenty-four populations can be identified, of which three are introduced/feral, and in total approximately 2 million geese spend the year or part of it in the Palearctic. The most recent population counts give a total of 2.1 million geese. The White-fronted Goose is the most numerous species (672,000 geese) and the population of Tundra Bean Geese is probably the largest goose population (300,000 - 500,000). Of the 24 populations, 14 have increased since the 1970s, 7 have been relatively stable, 2 have decreased, and in 1 population the trend is unknown.

Bean Goose *Anser fabalis*

Two subspecies are regularly observed in the Palearctic: the Taiga Bean Goose *A. f. fabalis* and the Tundra Bean Goose *A. f. rossicus*. The existence and distribution of the two subspecies or forms is, however, still debated. Some authors consider the two as intergrading (Ogilvie 1978, Rutschke 1987), others consider them as good subspecies, notwithstanding the recognition of intermediate forms (Roselaar 1977, van Impe 1980a,b, van den Bergh 1985, Huyskens 1986, Burgers & Smit pers. comm.). However, from a population management and conservation point of view, it appears relevant to separate the two forms into populations as they show morphological, ecological and distributional differences.

The *fabalis* population breeds in a zone from northern Scandinavia, North Russia to the west Siberian lowlands east of the Ural mountains and winters in south Sweden, Denmark, The Netherlands and, to some extent, on the coasts of the (former) German Democratic Republic and Poland.

The *rossicus* population breeds in northern Siberia and migrates south of the Baltic Sea to staging areas in the German Democratic Republic and Poland, from which one group moves on to wintering areas in The Netherlands, western part of the Federal Republic of Germany, France and Spain and another group migrates to the central European flood plains in Hungary, Czechoslovakia and Austria. Neck-banding has revealed that there is some interchange of individuals between the two groups, even within the same winter (van den Bergh 1984), so with the present knowledge it appears not to be justified to consider them as separate populations.

So far counts of Bean Geese have been incomplete, and we have only vague population estimates, which are undoubtedly too low. The estimates presented in Table 2 are thus conservative, based partly on yet unpublished sources and partly on data from Fog (1982), who did not, however, distinguish the two subspecies. Huyskens (1986) has suggested that the *rossicus* population numbers approximately 500,000 and the *fabalis* population about 100,000. Recent counts from the autumns of 1986 and 1987 indicate that the estimate for *rossi-
cus is not unrealistic but we must await the complete data set to present a new estimate. Judging from counts in The Netherlands, the rossicus population has increased in numbers since the 1970s (Ebbinge et al. 1987); however, it is unknown whether a shift from more eastern winter regions has contributed to the increase. The fabalis population staging in southern Sweden in autumn has increased from c. 20 000 in the early 1960s to 50 000 - 70 000 in the 1970s and 1980s (Nilsson 1988 and own obs.). Since the geese staging in Sweden represent the major part of the population, the population as a whole has probably increased during the last decades.

Pink-footed Goose Anser brachyrhynchus

There are two populations of Pink-footed Geese in the world: one breeding in Iceland and East Greenland and wintering in Scotland and England, and one breeding in Svalbard and wintering in Denmark, The Netherlands and Belgium. Judging from ringing recoveries there is only slight interchange of individuals between the two populations (Ebbinge et al. 1984, Wildfowl and Wetlands Trust unpubl. obs.). Since the first counts in the British Isles in 1950/51, the Iceland/Greenland population has been steadily increasing from 30 000 to a hitherto peak number of 172 000 in 1987/88 (Ogilvie 1978, 1977-1985, Salmon 1986-1988). The Svalbard population has increased from 10 000 - 12 000 in the 1950s to a relatively stable level of 25 000 - 30 000 in the 1980s (Madsen 1987).

White-fronted Goose Anser albifrons

There are three populations of European White-fronted Goose A. a. albifrons and one of Greenland White-fronted Goose A. a. flavirostris (Table 2). All three albifrons populations breed in Siberia. One population winters in northwest Europe from the (former) German Democratic Republic to France and southern Britain, with the major mid-winter concentration in The Netherlands. A second population winters in central Europe and a third on the east coast of the Black Sea and in Turkey. The flavirostris population breeds in west Greenland and winters in the British Isles.

The population of flavirostris is well defined, whereas there exists no good documentation of the integrity and rate of interchange of individuals between the three populations of albifrons. Ogilvie (1978) split the Black Sea/Turkey population into two but, apart from some geographical separation of the geese in mid-winter, there is at present no justification for dividing the flocks into populations.

Since the 1960s, the albifrons population wintering in northwest Europe has increased six fold from approximately 60 000 to approximately 400 000 (Ebbinge et al. 1987, Kuijken & Meire pers. comm.). According to Dick (1987) and Sterbetz (pers. comm.), the number of White-fronted Geese in Austria and Hungary has decreased during the last two decades and this is probably the case for the entire central European population. The trend of the Black Sea/Turkey population is not well known although there has been an increasing number wintering in Bulgaria from 1977 to 1989 (Michev et al. 1991), whereas numbers have been relatively stable in Turkey from 1967 to 1988 (Dijksen & Koning 1986, Dijksen & Blomert 1988). In Rumania counts of geese have only just been started by the Rumanian authorities in January 1988 (aerial survey in the Danube Delta) and it is premature to present a good estimate for the mid-winter number of White-fronted Geese there. The population of flavirostris has increased in numbers from 14 400 - 16 000 in the 1970s to 22 000 - 25 000 in 1985-1987 (Rutledge & Ogilvie 1979, Norris & Wilson 1988).

Lesser White-fronted Goose Anser erythropus

The Lesser White-fronted Goose breeds in a zone from northern Scandinavia to East Siberia. In the Palearctic region it winters in southeast Europe and around the Caspian Sea. Both from autumn staging areas in Hungary (Sterbetz 1982) and the Scandinavian breeding grounds (Norderhaug & Norderhaug 1982) an alarming decrease in the population size is reported to have taken place during the last 3-5 decades. In the Soviet breeding range the and eastern populations have declined, whereas the central population has remained stable, num-
bering approximately 110,000 (V. Vinogradov, pers. comm.). In the western Palearctic part of the USSR approximately 25,000 - 50,000 Lesser White-fronted Geese winter. The numbers in the Caspian Sea area are reported to have been relatively stable during the last two decades (Vinogradov pers. comm.).

A reintroduction programme has been launched in Sweden in an attempt to improve the breeding stock and alter its migration route from the traditional direction towards south-southeast to the southwest towards northwest Europe (von Essen 1982).

**Greylag Goose *Anser anser***

The Greylag Goose has a disjunct breeding distribution in the western Palearctic and six populations can be identified, including one feral (see Hudec 1984 and Madsen 1987 for distribution of populations (1) to (5):

1. A population breeding in Iceland and wintering in Scotland.
2. A resident population in northwest Scotland.
3. A population breeding in northwest Europe and wintering in Spain and The Netherlands.
4. A population breeding in central and northeast Europe and wintering in North Africa.
5. A population breeding in western USSR and wintering at the Black Sea and in western Asia.
6. A feral population breeding and wintering in the British Isles.

The wintering quarter of the Icelandic population overlaps that of the resident population in Scotland and that of the feral population. The resident and the feral populations are counted in late summer before the arrival of the Icelandic geese. In continental Europe the dividing lines between the populations are not quite clear; ringing recoveries show that some mixing between populations occurs, especially of moult migrants (Paludan 1965, von Essen & Beinert 1982, Gromadzki & Majewski 1984). Breeding birds seem, however, to show clear adherence to breeding and wintering grounds.

Since the start of the censuses in 1952 and up to 1987 the Icelandic Greylag Goose population has increased from 25,000 to 110,000 (Ogilvie 1978, 1977-1985, Salmon 1986-1988). The resident population in Scotland seems to be stable or increasing slightly, totalling 2000 - 3000 geese (Ogilvie 1982, Owen et al. 1986). The British/Irish feral population has been increasing, numbering approximately 14,000 geese in 1986 (Owen & Salmon 1988). The northwest European population has increased from approximately 30,000 in 1967/68 to 120,000 - 130,000 in the 1980s (Madsen 1987). The estimates are, however, crude since there are difficulties in making full counts in winter. The central European population numbers approximately 20,000 geese and seems to be relatively stable (Hudec 1984, Dick 1987). Information about the Black Sea population is very scant (Hudec 1984), and there exist no reliable population estimates; population trends are unknown.

**Canada Goose *Branta canadensis***

Canada Geese have been introduced in both Scandinavia and England and have formed wild populations. In Scandinavia the geese have developed traditional use of wintering sites while the British geese are mainly resident. Both populations are increasing (England: Ogilvie 1977, Salmon 1986-1988; Sweden: Fabricius 1983, Nilsson 1988; Norway: Heggberget 1991) and the estimates in Table 2 are conservative. Salmon (1988) estimates that the English population numbered close to 50,000 in 1987/88; the Scandinavian population is similar in size with approximately 50,000 geese in the second half of the 1980s (Madsen & Andersson in press).

**Barnacle Goose *Branta leucopsis***

There are three populations of Barnacle Geese in the world, all three wintering in the western Palearctic: one population breeds in East Greenland and winters along the northern and western coasts of Ireland and on certain islands in northwest Scotland; a second breeds in Svalbard and winters in the Solway Firth in southwest Scotland; a third population breeds in northern Russia and winters in The Netherlands.

Despite the fact that the winter ranges of the Greenland and Svalbard populations are very close there is only slight interchange of individuals. Fur-
thermore, there is little contact between the two and
the Russian population (Ogilvie & Owen 1984). The
Greenland population has been monitored ap­
proximately every five year since 1956. It has in­
creased from 12 000 - 14 000 in 1956-1961 to 25 000
- 32 000 in the 1980s (Ogilvie 1983, Wildfowl and
Wetlands Trust, unpubl. obs.). When the Svalbard
population was first monitored in 1950 550 geese
were counted. Since then it has grown to reach a
hitherto peak number of 11 400 in 1987/88 (Owen
1984 and own obs.). The Russian population is the
largest of the three populations. In 1960/61 it num­
bered approximately 20 000 geese, increasing to a
level fluctuating between 42 000 - 54 000 in the
1970s and increasing again reaching a peak of
126 000 birds in 1988/89 (Ebbinge 1982 and own
obs.). Since 1971 a colony of Barnacle Geese, most
probably originating from the Russian population,
has developed on the island Gotland in the Baltic.
This population has been growing rapidly (K.
Larsson, pers. comm.), numbering approximately
1000 breeding pairs in 1988. A small colony has
also been established in Estonia (E. Leito pers.
comm.).

Brent Goose Branta bernicla

Three populations of two subspecies of Brent
Geese winter in the western Palearctic: the Dark­
bellied Brent Goose B. b. bernicla population
breeding in north Siberia and wintering in western
Europe, and two separate populations of Light­
bellied Brent Goose B. b. hrota. One population of
Light-bellied Brent Goose breeds in northeast Can­
da and northeast Greenland and winters in Ireland;
the other breeds in Svalbard and Franz Josef Land
and winters in Denmark and northeast England.

In 1960 the Dark-bellied Brent Goose popula­
tion numbered c. 30 000 individuals and grew to
c. 40 000 in the late 1960s. In the 1970s the rate of
growth increased but then levelled off in the 1980s;
the population reached a peak of 235 000 in 1988/
89. The Svalbard Light-bellied Brent Goose pop­
ulation is one of the smallest goose stocks in the
world. In the 1960s it numbered less than 2000 in­
dividuals, but increased to 3000 - 4000 in the 1970s.
In the 1980s there has been a slight increase in the
population size; in the second half of the 1980s the
population numbers 4000 - 5000 (Fog 1972,
Madsen 1984, 1987). The Irish wintering popula­
tion has increased from a relatively stable level of
8000 - 13 000 in the 1960s and 1970s to a present
level of 18 000 - 24 000 (Ogilvie 1978, 1977-1985,
O’Briain 1986, own obs.).

Red-breasted Goose Branta ruficollis

The only population of Red-breasted Goose
breeds in north Siberia and winters at the Black Sea
(Rumania, Bulgaria, Greece) and the Caspian Sea.
Prior to the 1960s the Red-breasted Geese wintered
only at the Caspian Sea but since then some of the
wintering grounds there have been abandoned and
part of the population has shifted to the Black Sea
(Vinokurov 1982, Puscariu 1983, Ivanov & Poma­
kov 1983). Based on aerial surveys during the post­
hatching period (July-August) in 1978-1979, Vino­
kurov (1982) estimated the population at 22 000 -
27 000 geese. Similar surveys in the 1980s have re­
vealed that the population has increased to a level
of approximately 35 000 individuals (Vinokurov
pers. comm.).

DISCUSSION

In general the western Palearctic geese are thriving.
The numbers of most goose populations are either
stable or increasing and only two populations have
decreased recently (Lesser White-fronted Goose,
central European White-fronted Goose popula­
tion). During the last decade goose numbers have
nearly doubled. In a review of the 1970s Ogilvie
(1978) accounted for 1 049 000 geese in the western
Palearctic populations, and in the 1980s we can ac­
count for at least 2 029 000 geese. Fifteen popula­
tions have been monitored since the 1960s and the
sum of geese in these indicates the growth that has
taken place during the last 20 years (Fig. 2).

The status of two populations is, however, criti­
cal. The Lesser White-fronted Goose has almost
disappeared from its former European staging and
wintering grounds and the Scandinavian breeding
population has decreased drastically. The status of
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REFERENCES


SAMENVATTING

In tabel 2 van dit artikel staat een overzicht van de omvang en verspreiding van de ganzenpopulaties die rond 1988 broeden en/of overwinteren in het Palearctische gebied. Deze gegevens zijn gebaseerd op tellingen die werden uitgevoerd door een internationale ganzen-werkgroep (Goose Research Group) van het IWRB (International Waterfowl and Wetlands Research Bureau). Deze tellingen vinden plaats in vrijwel alle landen waar de ganzen overwinteren (Tabel 1; Fig. 1).

Er zijn 9 ganzensoorten redelijk tot zeer talrijk in het westelijk Palearctische gebied, inclusief de ingevoerde Canadagans. Deze negen vormen 24 tamelijk nauwkeurig te definiëren populaties. In totaal betreft het twee miljoen ganzen!

Het aantal ganzen in het westelijke palearctisch gebied is bijna verdubbeld gedurende de afgelopen tien jaar. De omvang van 14 populaties is duidelijk toegenomen. In zeven populaties zijn de aantallen stabiel; in twee populaties is sprake van een duidelijke afneming in aantallen. In één populatie is de aantalsontwikkeling onbekend. Een zorgwekkende afneming in aantallen vindt plaats bij de Dwerggans in noordelijk Skandinavië en van de Rotgans populatie van Spitsbergen die overwintert in Denemarken en Oost Engeland.