Waterbirds around the world

A global overview of the conservation, management and research of the world's waterbird flyways

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The Red-breasted Goose *Branta ruficollis* in the new millennium: a thriving species or a species on the brink of extinction?

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**ABSTRACT**
The Red-breasted Goose *Branta ruficollis* is a globally threatened species breeding in the Russian arctic, migrating through Kazakhstan and Russia, and wintering in Ukraine, Romania and Bulgaria. In the 1960s, the single population of the species shifted its wintering range from the south-west Caspian Sea to the north-west Black Sea. Coinciding with this shift, the numbers were thought to have declined by about 50%, from 60 000 birds in the 1960s to 30 000 in the 1970s. A recovery in numbers was recorded as early as the beginning of the 1990s, and during the next decade the population increased to 88 000. Numbers then plummeted to only 23 000 in 2002, since when there has been a moderate recovery. Because of these rapid declines, the species’ IUCN Red List category could be upgraded from Vulnerable to Endangered. Past and present conservation, research and monitoring activities throughout the flyway have achieved some results, but full implementation of activities has been hampered by constraints such as lack of human, logistic and financial capacity in the Range States. To improve the situation, it is necessary to review and update the International Species Action Plan for the Red-breasted Goose, and to launch a major project for the species throughout the flyway.

**INTRODUCTION**
This paper focuses attention on the globally threatened Red-breasted Goose *Branta ruficollis*, its population history and particularly its current status, the extent of our knowledge, and the past and ongoing conservation, research and monitoring programmes. The main purpose of the paper is to review the present situation and outline the constraints and priorities for future work.

**METHODS**
This paper is based mainly on information from published studies and reports, reviews, unpublished reports and theses, and the personal comments of a number of contributors.

**RESULTS AND DISCUSSION**
**Range and flyway**
The Red-breasted Goose is a monotypic species occurring in central and western Eurasia (Fig.1). Its breeding range is confined to the Russian arctic, where it occurs on three peninsulas in west-central Siberia: the Taimyr (c. 70% of the population), Yamal and Gydan (Madsen et al. 1999). The northern and southern limits of the breeding grounds are at about 73°N and 68°N, respectively. The eastern limit is generally considered to be in the Taimyr at 108-110°E. However, in the late 1990s, Red-breasted Geese were discovered breeding in Yakutia, which extends the species’ range to 114°E (Syroechkovskiy, Jr. 1999).

The first section of the migration route of the Red-breasted Goose is oriented in a south-westerly direction down the eastern side of the Ural Mountains towards Kazakhstan, along a “corridor” only 100-150 km wide (Hunter & Black 1996). In this section, there are several staging areas in the Ob River floodplains, the first of which is still north of the Arctic Circle. Further south, there are staging areas in the middle Ob near Khanty-Mansisisk and in the region between Surgut and the River Vakh. On reaching Kazakhstan, the geese stage at several sites in the north-western part of the country (Kustanay region): in the Tobol-Ishim forest-steppe, and in the watersheds of the Ubagan, Ulkayak and Irgizin rivers in the Kazakh uplands. From there, the orientation of the flyway turns westwards, and the next known staging sites are at the Manych-Gudilo Lakes and Velvskoye Reservoir in Russia, to the west of the northern end of the Caspian Sea (Scott & Rose 1996).

From these last known staging areas, the geese enter their wintering range. Most of the recent literature on the Red-breasted Goose gives the contemporary wintering range of the entire population as the west coast of the Black Sea. However, in the last few years it has been shown that under certain conditions some geese may spend the winter along the north coast of the Black Sea and even around the Sea of Azov. The most important wintering sites are the Shabla and Durankulak lakes in Bulgaria, the Razeln-Sinoie complex and Danube Delta in Romania, Sivash Lagoon and the deltas of the Danube, Dniester and Dnepr.
rivers and adjacent “limans” in Ukraine (Dereliev 2000a, 2000b, Dereliev et al. 2000, Hulea 2002, Rusev et al. 1998, 1999) and, in warm winters, even the Kuma-Manych Depression in Russia (E.E. Syroechkovskiy, Jr. pers. comm.). Recent observations have shown that the Red-breasted Goose, although showing much higher fidelity to coastal areas than other wintering geese such as the Greater White-fronted Goose *Anser albifrons*, can be found over 100 km inland.

The wintering range of the Red-breasted Goose has not always been as it is today. In the twentieth century, there occurred a significant westward shift in the winter quarters by about 1 800 km. Up until the 1960s, the entire population spent the winter on the south-west coast of the Caspian Sea, particularly in the Kizil-Agach area in Azerbaijan. In that decade, the entire population abandoned the Caspian coast and moved to winter on the Black Sea coast. The last observations of large flocks (25 000 birds) in Azerbaijan were in 1970. Already in the late 1960s, similar numbers of Red-breasted Geese were being recorded on the west coast of the Black Sea in Romania. Large flocks of Red-breasted Geese (15 000 birds) were first recorded in Bulgaria in the late 1970s. This major shift in wintering range has been attributed to reduced food availability in the south-west Caspian because of a change from cereals and rice crops to cotton and vineyards, habitat loss, excessive hunting pressure, and possibly some other unknown factors (Isakov 1979).

**Population history**

Records prior to 1954 are scarce, but it is thought that the numbers of Red-breasted Geese were similar to, or larger than, those of today. The first reliable estimation of numbers comes from 1956, when 60 000 Red-breasted Geese were reported to winter in the Caspian region (Fig. 2). Between 1956 and 1967, the population was thought to vary between 50 000 and 60 000 individuals (Uspenskiy & Kishko 1976). Coverage in 1967 and 1968 was the best that had been achieved up to that time, and produced a total of 49 000 birds, equally divided between the Caspian Sea and Black Sea regions. From 1969 to 1990, however, the maximum numbers recorded in the non-breeding areas did not exceed 30 000 (Hunter & Black 1996). There are suggestions that the population might have crashed as a consequence of the birds being forced to leave their traditional, but degraded, winter quarters in the Caspian region, and/or because of the effects of DDT on populations of the Peregrine Falcon *Falco peregrinus*, which is known to protect nesting geese from Arctic Foxes *Alopex lagopus* (Vinokurov 1990, Syroechkovskiy, Jr. 1995). However, it has been suggested that this decline was less dramatic than has been supposed, and that the big difference in numbers was due to a lack of adequate monitoring in the newly established wintering areas (Syroechkovskiy, Jr. 1995, Hulea 2002).

In 1991, a total of 43 180 birds were counted – the first time that over 30 000 had been recorded since the end of the 1960s. This was followed by a count of 75 881 in 1993 – the highest population size ever recorded for the species. In the following few years, fluctuating numbers were recorded, but the overall trend was one of increase. Peak numbers of 88 000 were recorded in 1996 in the staging areas in Kazakhstan, and again in 2000 in the wintering areas (Tolvanen & Pynnonen 1998, Hulea 2002, S. Yerokhov in litt.). However, within a period of only two years, numbers in the wintering areas crashed by more than 70% to only 23 000 birds in 2002. Several hypotheses have been put forward to explain this rapid decrease: (1) a new shift in the wintering range; (2) insufficient coverage of monitoring in recent years; and (3) a genuine population decline. The first of these hypotheses has been the subject of much discussion, but there have been no signs of a return of birds to Azerbaijan.
The hypothesis that there was a genuine decline in the population between 2000 and 2002 has received the greatest support. S. Yerokhov (pers. comm.) reported a rapid decline in the numbers of staging Red-breasted Geese in Kazakhstan over the same period, and this was confirmed by Tolvanen et al. (2001). In Bulgaria at least, food was very scarce in the winters of 2000/01 and 2001/02 because of the limited amount of winter cereals in these years. The Red-breasted Geese were forced to concentrate along roads to feed on spilled grain – an unprecedented situation. Starvation and the harsh winters most probably led to high mortality. These events coincided with poor breeding conditions in the tundra. Reports of the breeding seasons of 2000 and 2001 in the annual bulletin of the International Arctic Birds Breeding Conditions Survey (Soloviev & Tomkovich 2001, 2002) from most of the monitored localities on the Yamal, Gydan and Taimyr peninsulas indicated an absence or low numbers of lemmings and voles, numerous predators (Arctic Foxes), low density of breeding birds of prey (Peregrine Falcon and Rough-legged Buzzard Buteo lagopus), and unstable, dry and unfavourable weather conditions: all prerequisites for low breeding success of the Red-breasted Goose population. Other "traditional" adverse factors at staging and wintering areas, such as excessive hunting pressure and disturbance, could also have contributed to the population decline.

Counts of geese in the next two winters (2002/03 and 2003/04) indicate that there has been a gradual recovery in the population to about 52 800 birds. This might have been a consequence of improved breeding conditions due to higher numbers of lemmings and lower predation levels in 2002 (Soloviev & Tomkovich 2003), and improved conditions in winter due to better food availability.

The geometric mean of the number of birds recorded in the last four winters (2000/01 to 2003/04) is only 35 900. This compares with a geometric mean of 75 500 in the previous four winters (1996/97 to 1999/2000), and represents a decline of 52%.

The future of the Red-breasted Goose seems uncertain. All the available information indicates that this species is highly susceptible to rapid fluctuations in population size due to slight changes in environmental conditions. Recoveries from population crashes might not always be quick and successful. Some critical sites in the wintering range are under increased threat from infrastructure development due to growing investments in Bulgaria and Romania. Global climate change poses an even greater threat. Based on modelling of climate change, it has been predicted that between 67% (scenario with moderate temperature rise of 1.7°C) and 85% (scenario with extreme temperature rise of 5°C) of the breeding tundra habitat will be lost by 2070-2099 because of changes in the vegetation (Zöckler & Lysenko 2000).

Conservation status

The Red-breasted Goose is a globally threatened species currently classified as Vulnerable according to B2a + b(iii) of the IUCN Red List criteria (BirdLife International 2004a). It was also listed in the category Vulnerable in the 1994 and 2000 editions of the IUCN Red List, and was listed in the category Threatened in the 1988 edition.

The recently recorded decline ranges between >70% (from the highest count in 2000 to the lowest count in 2002) and 52% (from the mean numbers in 1996-2000 to the mean numbers in 2001-2004). Since this decline was observed over a very short period of time (less than 10 years), it meets IUCN Red List criterion A1a (≥70% population decline) or A2 (≥50% population decline), and the status of the species could therefore be upgraded to Endangered.

At European level, the Red-breasted Goose is classified as SPEC 1 (Species of European Conservation Concern, Category 1) due to its globally threatened status (BirdLife International 2004b).

Conservation activities, research and monitoring

World-wide conservation activities for the Red-breasted Goose are co-ordinated through an International Species Action Plan, which was elaborated by the Wildfowl & Wetlands Trust on behalf of BirdLife International and published with the support of the European Commission, DG Environment (Hunter & Black 1996). This Action Plan was endorsed by the European Union through the Ornis Committee as well as by the Bern Convention. Some of the Range States have developed their own National Species Action Plans.

In the autumn of 1996, an International Red-breasted Goose Working Group was established within the framework of the Wetlands International Goose Specialist Group. The Working Group consists mainly of experts from the species’ range states, and has been chaired by the Bulgarian Society for the Protection of Birds (BSPB)/BirdLife Bulgaria.

Most of the conservation activities throughout the range of the Red-breasted Goose are in some way related to the protection of roosting sites. Many wetlands where Red-breasted Geese congregate during the non-breeding season are managed in accordance with management plans officially endorsed by the state, or are subject of management plans currently under development. In addition, some existing protected areas are being extended.

Since the geese are dependent on winter cereals as a food supply during the winter months, purchase schemes have been implemented by NGOs in Bulgaria and Romania. The general idea is to create buffer zones of protected agricultural land around the wetlands or to establish secure feeding areas inland. These schemes are in direct competition with investors whose plans are to establish tourist infrastructure and facilities near and around the coastal lakes. Since the investors are able to afford much higher prices than the NGOs, these schemes are only partially successful and the threat of habitat destruction at the key sites remains very high.

Despite the efforts of state authorities and NGOs to control hunting, shooting is still a major problem in some countries. Although a protected species throughout its range, the Red-breasted Goose is still being shot because it forms mixed flocks with the hunted Greater White-fronted Goose. Some key roosting sites, although protected, are often in winter practically under siege by hunters, who approach critically close to the wetlands and sometimes even to the shoreline. This hunting not only results in some direct mortality of Red-breasted Geese, but also has an indirect negative impact on the population as a whole.
because of the strong disturbance factor. Shooting causes disturbance not only at the roosting sites, but also in the feeding areas, which are unprotected. Hunting is also a problem in the staging areas, but the severity of this is often unknown.

In the last decade, there have been very few studies that have focused on the Red-breasted Goose and its habitat. In the second half of the 1990s, Dr. John Quinn carried out a detailed scientific study of the behavioural ecology of the Red-breasted Goose in arctic Russia as part of his PhD study at the University of Oxford (Quinn 2000). This research deals, among other issues, with the habitat choice of breeding geese and nesting associations of geese and birds of prey. The winter feeding ecology of the Red-breasted Goose in Romania was studied by Dr. Dan Hulea during his PhD study at the University of East Anglia (Hulea 2002). In addition to habitat selection, food availability and feeding preferences, foraging dynamics and crop damage, this study covers the numbers and regional movements of the geese. Research by the author (for the Bulgarian-Swiss Biodiversity Conservation Programme, BSPB/BirdLife Bulgaria and Sofia University) in Bulgaria in the second half of the 1990s focused on phenology and dynamics of numbers, distribution at roosting and feeding sites, age ratio and body condition, diet and crop damage (Dereliev 2000a, 2000b).

The wintering range is currently the best monitored part of the species’ flyway. Already by the end of the 1960s, with the start of the International Waterbird Census, most of the key sites were being covered with the aid of sporadic expeditions by western ornithologists. The first monitoring schemes to cover the entire wintering period commenced as early as the beginning of the 1990s. In Bulgaria, B. Ivanov (in litt.) attempted monthly counts at Shabla and Durankulak lakes for a period of three years in the early 1990s, and BSPB/BirdLife Bulgaria has been running a monitoring scheme of fortnightly counts since the winter of 1995/96. In this winter and the next, simultaneous monthly counts were carried out with Romania, and these were also attempted, with varying degrees of success, from 1998/99 to 2000/01.

The BirdLife Partnership launched a promising new initiative in the winter of 2003/04 as part of the activities of the International Red-breasted Goose Working Group. This initiative is known as the Red-breasted Goose Common Monitoring and Research Programme (RBGCMP). Its general goal is to provide up-to-date information on the status of the species and its habitats, movements, ecology and conservation needs to facilitate the drawing up and implementation of adequate conservation activities. The initiative is co-ordinated by BSPB/BirdLife Bulgaria, and currently operates only within the wintering range (in Romania by SOR/BirdLife Romania and in Ukraine by UTOP/BirdLife Ukraine). In the first stage of the programme, it is planned to extend the scope of the simultaneous counts in the coastal wetlands in the three countries and to strengthen the programme. Later, it is planned to expand the programme to cover the entire range of the species. The programme receives financial support from RSPB/BirdLife UK in Romania and Ukraine, and from WWT in Bulgaria.

No special monitoring of the Red-breasted Goose has been carried out in the staging and breeding areas in recent years. However, there have been regular expeditions to Kazakhstan mainly by Finnish and Norwegian ornithologists supported by local experts. The main focus of these expeditions has been staging Lesser White-fronted Geese Anser erythropus, but they have contributed invaluable data on the Red-breasted Geese there. The second notable monitoring scheme is the Annual International Arctic Birds Breeding Conditions Survey, which has been carried out since 1998 and provides important data from the breeding grounds.

**Constraints and priorities for the future**

Whether the Red-breasted Goose will be a thriving species in the new millennium or a species on the brink of extinction largely depends on adequate conservation measures. The formulation and implementation of such measures should be backed by rigorous research and monitoring programmes. All of these activities suffer from the same constraints of lack of sufficient human, logistical and financial capacity. Even in the wintering range, where conservation, research and monitoring activities have been most concentrated in the last decade, such problems hinder effective implementation. The situation is most serious in Ukraine, where the geese occupy vast coastal areas but human capacity is not adequately developed. Similar constraints exist in Romania as well, and to a much lesser extent also in Bulgaria. The ongoing activities rely on small grants, which do not allow institutional development and the necessary increase in capacity. In the staging and breeding areas, we are facing an even more complicated situation. In some parts of the flyway (“white spots”), no information has been available for a number of years because of a total absence of projects and expert coverage.

Largely for the above-mentioned reasons, the International Red-breasted Goose Working Group has not yet been able to provide co-ordination of activities outside the wintering range. It is an unfortunate fact that the species’ flyway stretches across five countries, all of which are either developing or in transition (OECD 2003). Thus, the governments are encountering difficulties in providing financial and other support for implementation of necessary activities as described in the International and National Species Action Plans. NGOs in these countries are not well developed institutionally and are financially unstable, depending almost entirely on external funding. In addition, the framework of the International Species Action Plan is not sufficiently operational to provide good guidance to implementers.

Short- and medium-term actions should be undertaken in order to overcome these handicaps. In the first place, the International Species Action Plan should be reviewed, updated and rewritten in the shorter AEWA format, with a view to improving its usefulness at the operational level. A major part of the further implementation of the Action Plan should be carried out within the framework of a large-scale flyway project (GEF or similar). While supporting basic scientific research and the strengthening of ongoing monitoring and conservation activities, the project should focus mainly on human and institutional capacity building. Thus, firstly it would improve international co-ordination, and secondly it would have a catalytic effect on the development of networking throughout the flyway.

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