

Geese migration at the Shoyna River, Kanin peninsula, Russia

Report on the Shoyna expedition 2002

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Abstract

From May 15th until June 20th 2002 a field expedition to the Shoyna-marsh (Kanin peninsula, Russia) was organised with participants from the University of Groningen and the Moscow Bird Ringing Centre.

Field work consisted of regular migration counts, behavioural observations and vegetation measurements. The Shoyna marsh turned out to be one of the largest stopover sites of Brent (about 6000) and Barnacle geese (about 25 000, almost 10% of the total Russian flyway population). Also a small number of Barnacle geese remained on the marsh for breeding.

The main food item of both Brent and Barnacle geese were young shoots of *Carex* (species to be determined) and *Puccinellia* on the lower parts of the marsh. Other preferred items were the young shoots of *Plantago schrenkii* and *Triglochin maritima*. On the higher parts vegetation consisted mainly of *Festuca rubra* and *Juncus balticus*. Additionally Brent geese were often observed foraging on algae in the many small lakes on the marsh.

Vegetation measurements consisted mainly of growth measurements of marked plants inside and outside small greenhouses, that were erected upon arrival. At the end of our stay we could see a clear difference between the greenhouses and the controls and growth data will confirm this difference. Additionally we gathered many samples of the vegetation and goose droppings for further chemical analysis.

In the period 20 May – 16 June 2002 an ecological field party with participants from the University of Groningen (Rudi Drent, Jouke Prop, Goetz Eichhorn and Sandra vd Graaf) and from Moscow Bird Ringing Centre (Konstantin Litvin, Elena Gurtovaya, and Julia Karagicheva) camped in a log cabin on the north side of the Shoyna River to study goose migration. Our party was dropped at Shoyna village (67° 53'N, 44°08'E, Kanin peninsula, Russia) by helicopter from Archangelsk and reached the field site by snowscooter over the frozen river ice on 20 May, and were picked up by boat on 16 June. From Shoyna village we returned to Archangelsk by means of the coastal trading vessel *Orion* 17-18 June.

The local salt marsh is a very flat area with many small lakes and ponds and gullies. It is regularly inundated in late summer by the 3-meter tides usual on the river, had a snow cover of some 70% upon arrival and most of the channels and lakes had sufficiently thick snow and ice bridges to allow easy access over the entire marsh. The area lies beyond the 0° May isotherm and the mean air temperature during our May stay was only 1.5° C with occasional snow and aside from two brief foggy periods little precipitation.

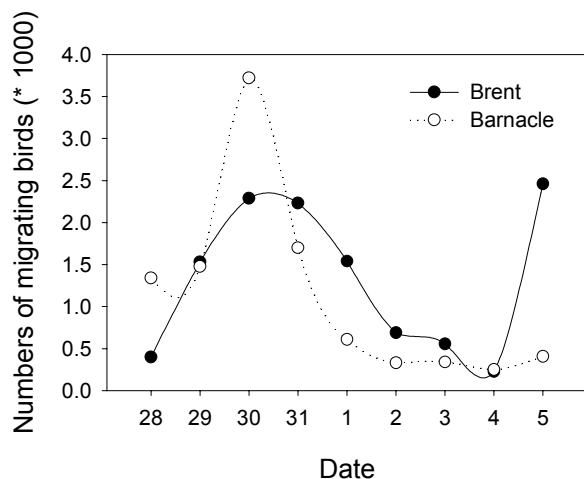
Staging geese

The Shoyna marsh has been known as a breeding station for Barnacle Geese since the early nineties and there were a few pairs already in the later nesting zone when we arrived. Of second importance numerically were Brent. Although of daily occurrence, several hundred Bean geese were already present upon arrival but less than 5 pairs remained to breed, White-fronted Geese were few in number and rarely stayed long. Local hunters commented that White-fronts were more common in former days.

Brent Goose

First observation 24 May (11 birds), main migration 29-30-31 May and 1 June, with mass departure 5 June with a westerly wind, and a 'clean-up' exodus 11 June (again with W winds).

The staging period can be put at 5-6 days and may involve up to three thousand individuals (9400 arriving brent were counted 28 May-4 June, not all of which landed on our marsh; 6000 were estimated to have passed the counting station on 5 June, including all but a few hundred of the geese staging locally). Body mass from a sample of ten males (arriving birds) obtained from hunters averaged 1610 g (range 1426-1832). Since we have only glimpses of marked birds we can offer no hard data on turnover but consider it likely that a good portion of the Shoyna birds remained several days.



Barnacle Goose

Present in small numbers 20 May, main movement 29-30-31 May with peak concentration on the marsh 30 and 31 May with an estimated 25 thousand barnacle geese; mass departure 5 June. The breeding birds are dispersed over the entire marsh nesting in the higher portions in grassy nests. First eggs were noted 1 June and in a sample of 39 nests the peak laying dates were 6 and 7 June. Clutch size averaged 4.25 eggs (n=13). K. Litvin will attempt an estimate of current nesting numbers to compare with the pioneering publication of

Filchagof & Leonovich (1992, *Polar Res.* **11**: 41-46). Only a fraction of the staging birds remain to breed and it is a matter of speculation which goal the others are bound for. The majority of the Russian population are believed to nest on Novaya Zembla and this goal seems geographically feasible for the birds staging on Shoyna.

Shoyna undoubtedly represents the largest staging concentration known from the White Sea except for the islands on the lower Dvina River (Archangelsk). The report of local hunters that Shoyna became a spring staging site around 1965 is of interest in relation to the size of the Russian population of the Barnacle Goose at that time (approximately 25 thousand, *i.e.* ten per cent of the current numbers). It will be appreciated that at least ten per cent of the Russian population make use of the Shoyna marsh at the present time. The area is reported to be used heavily in September as well.

Vegetation

The Shoyna marsh consists, like the salt marsh of Schiermonnikoog, of high and low sites. On the low sites there is a scattered vegetation of *Carex* (species to be determined) and *Puccinellia* (species to be determined). On the higher parts we find a combination of *Festuca* (most likely *F. rubra*) and *Juncus* (probably *J. balticus*), in between this high vegetation often grows *Triglochin maritima*. On arrival these high parts were all covered with dead material from previous years, however at the end of our stay young green tillers were appearing from under this layer. On intermediate high parts there often was a *carex* vegetation with more dead material in between or almost pure stands of *Plantago schrenkii*.

Barnacle geese were mostly observed foraging on the low vegetation and mainly on the young *Carex* shoots. This observation was confirmed by analysis of the stomach content of a few birds shot by local hunters. Additionally the barnacle geese eat also a lot of young shoots of

Triglochin, *Plantago* and seeds. The higher parts of the marsh were used by the nesting population for nest sites.

In addition to the 'classical' salt marsh plants Brent geese in particular exploited algae in the numerous shallow freshwater ponds.

Experiments and measurements

Because of a lack of time not all planned experiments could be conducted. Overall, however, we can be very satisfied with the amount of data we gathered on site.

We erected greenhouses on two vegetation types that were important for the geese in order to measure growth rates. A set of 5 greenhouses and controls was set up in a *Carex* vegetation, another set of 5 was setup in a mixture of *Puccinellia* and *Carex*. For this last set we made 5 additional plots a week later on vegetation that had only just emerged from the snow. On all plots we marked 20 plants of either *Carex* or *Puccinellia* and measured them every 6 days. In the end of the 4 weeks-period we could see a clear difference in greenness and amount of biomass between the greenhouses and the controls. We are convinced that the gathered data on leaf lengths will demonstrate a clear difference of speed of growth for the different treatments.

A second experiment we set up did not proceed so well. This second experiment was setup to investigate whether the vegetation in the area was limited by nutrients and the effects of the geese on the vegetation. We used treatment combinations of fertilising and enclosure plots. However, the geese were so abundant that no enclosure kept the geese out sufficiently and also we could not detect any effect of the fertiliser by bare eye. We will of course have to analyse our samples first before we can state this with certainty.

Additionally we gathered many vegetation and dropping samples to get an estimate of food choice, digestibility of the different plant species and phenological changes in quality (nitrogen content and digestibility) of the different plants over the season. On several locations with different vegetation types transects were established on which we regularly counted droppings, in order to get an estimate of the utilisation of these areas by the geese. Observations were made on the foraging behaviour of both Brent and Barnacle geese. When the majority of the geese had left the area we laid out some more transects on which we measured several vegetation and abiotic parameters in combination with the former presence of herbivores (geese, small mammals, reindeer; mostly by droppings or other tracks).