Numbers of juvenile Dunlins *Calidris alpina* ringed at the Vistula Mouth (southern Baltic, Poland) in relation to arctic breeding conditions

J. Gromadzka

Gromadzka, J. 1998. Numbers of juvenile Dunlins *Calidris alpina* ringed at the Vistula Mouth (southern Baltic, Poland) in relation to arctic breeding conditions.
International Wader Studies 10: 85-87.

The breeding conditions for waders in those arctic areas from where Dunlins *Calidris alpina* migrate to the southern Baltic, expressed by two kinds of estimation over six years, are compared with changes in numbers of juvenile Dunlins ringed in the same years in one of the southern Baltic staging posts during autumn migration - at the Vistula mouth. Changes in numbers of juveniles caught at the Vistula mouth from year to year seem to reflect natural fluctuations in the age structure of Dunlin flocks migrating through the ringing area.

J. Gromadzka, Ornithological Station, Nadwialańska 108, 80-680 Gdansk 40, Poland.

Громадзка, Я. 1998. Число молодых чернозобиков *Calidris alpina*, окольцованных в устье р. Висла (на юге Балтийского моря, Польша) в зависимости от условий гнездования в арктике. *International Wader Studies* 10: 85-87

Приведено сравнение условий гнездования куликов в тех районах арктики, откуда чернозобики *Calidris alpina* мигрируют на юг Балтийского моря, выраженных двумя типами оценок в течение шести лет, с колебаниями численности молодых чернозобиков, окольцованных в те же самые годы в одном из мест остановки на юге Балтики во время осенней миграции - в устье р. Висла. Межгодовые изменения численности молодых птиц, пойманных из года в год в устье р. Висла, отражают, по-видимому, естественные колебания в возрастной структуре стай чернозобиков, мигрирующих через район кольцевания.

Introduction

As a consequence of ringing waders at the Vistula mouth near Gdansk for many years (Gromadzka 1981, 1989, 1989a) we have noticed that the proportions of different age groups in samples of captured waders have varied between years. Only preliminary conclusions concerning the Curlew Sandpiper *Calidris ferruginea* have been published previously (Gromadzka 1988).
Dunlin *Calidris alpina*, being the most numerous migrant wader at the Vistula mouth in autumn, is a most intriguing species. It has often been asked whether the between-year changes in the ages of birds trapped during autumn Dunlin migration at this site, reflect accurately natural fluctuations in the age structure of flocks migrating through the catching area.

Only since 1988, however, has it been possible to follow annual changes in the breeding conditions for birds on northern tundras following the collation and publication of these data by Russian ornithologists working in the arctic (Tomkovich 1989; Kondratyev 1992; Yurlov 1993; Ryabitsev 1993). When analysing these data it is important to note that in the same year breeding conditions for waders may be different in different areas of their breeding range and that the factors responsible for breeding success are likely to be complex.

This paper compares the breeding conditions in different years from the breeding areas of Dunlins which migrate to the southern Baltic (Gromadzka 1989; Gromadzka & Ryabitsev 1998) with between-year variation in the numbers of juvenile Dunlins ringed at the Vistula mouth in those years.

Methods

The study area at the Vistula mouth and methods of wader trapping have been described in earlier papers (Gromadzka 1981, 1989, 1989a). Numbers of juvenile Dunlins trapped in different years are shown in Figure 2. The trapping period (15 July and 27 September) was the same each year. The number of walk-in traps used each year was similar (*c.* 30 traps); they were placed at all locations that were intensively used by waders on the western side of the Vistula mouth.

The breeding conditions for waders between 1988 and 1991, shown in simplified graphic form in Figure 1, were taken from the papers published in the *Wader Study Group Bulletin* (Tomkovich 1989; Kondratyev 1992; Yurlov 1993; Ryabitsev 1993). The hatching success of Dunlin on Yamal Peninsula (Western Siberia) in different years is shown in Figure 2. This was estimated by Ryabitsev (pers. comm.), according to the method of Mayr (1935) and modified by Payevski (1985). The area of the Dunlin studies on Yamal has been described by Ryabitsev (1983).

Results

Between 1988 and 1993 arctic breeding conditions for waders were generally good in 1988, 1990, 1991 (Figure 1) and 1993 (P. Tomkovich in litt.; M. Gromadzki pers. comm.). The years 1989 and 1992 were bad for waders (Figure 1; P. Tomkovich in litt.), the latter one being particularly bad. The characterisation of the breeding conditions and breeding success in this way is very approximate, but no better information exists.

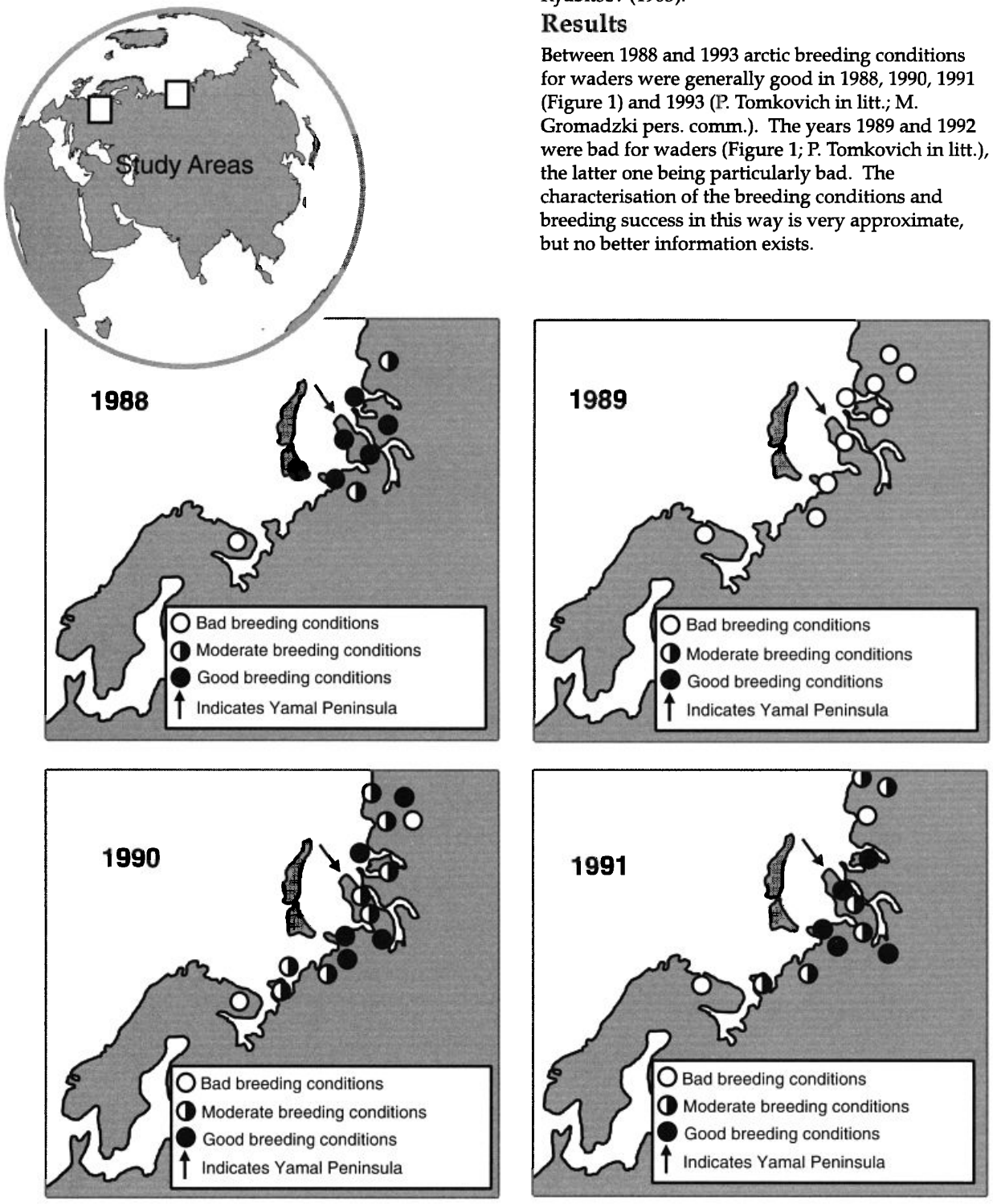

Figure 1. Breeding conditions for waders in tundra zone in different years (according to Tomkovich 1989; Kondratyev 1992; Yurlov 1993; Ryabitsev 1993).

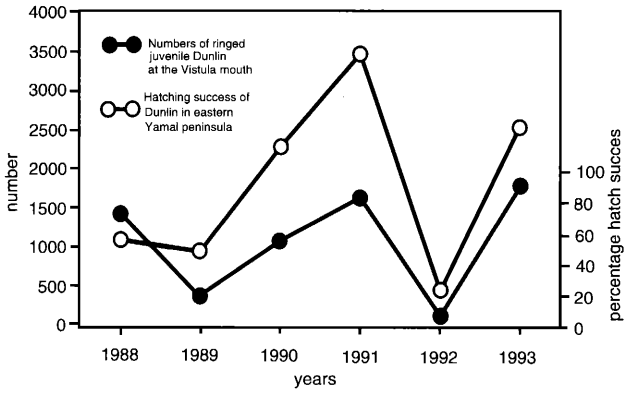

Figure 2. Numbers of ringed juvenile Dunlins at the Vistula mouth and hatching success of the Dunlin in eastern Yamal Peninsula in different years.

Numbers of trapped juvenile Dunlins at the Vistula mouth were low in 1989, very low in 1992 and higher in other years (Figure 2). The low number of juveniles in 1992 was noticed also at other European sites where Dunlins have been studied during autumn migration (H.-U. Rösner, J. Pettersson, N. Baccetti in litt., pers. comm.) and also during spring migration of 1993 (*e.g.* at the Black/Azov Sea: I. Chernichko pers. comm., own studies).
The comparison of results of Dunlin trapping in autumn at the Vistula mouth and hatching success in Yamal is shown in Figure 2. Both curves show very similar trends for the whole period (1988-1993).

Discussion

We conclude that from the results of Dunlin trapping at the staging site at the Vistula mouth we may estimate the success of breeding by this species. When using *c.* 30 walk-in traps during autumn migration of the main wader stream at the Vistula mouth (mid-July - end of September) and the number of juvenile Dunlins exceeded 1,000 trapped individuals, we may suppose that the breeding season generally was good for the species; when it exceeded 2,000 ringed birds the breeding season was very good; and when it was below 500 the breeding success was particularly poor.

The correlation between the two curves in Figure 2 is striking given that the two sites are *c.* 3,000 km apart and that the data were obtained by very different measurements. It may indicate that either the breeding success for Dunlin each year is similar over the very large area from which birds migrate to the Baltic, or that Yamal Dunlins make up a large proportion of those occurring at the Vistula mouth; the density of breeding Dunlins on the Yamal being very high (Ryabitsev 1993).

It was noticed that in years with a high proportion of juvenile Dunlins migrating in autumn through the Vistula mouth, the proportion of juveniles of other *Calidris* species that occur commonly there was also high: for example Curlew Sandpiper and Little Stint *Calidris minuta* (Gdansk Ornithological Station unpublished).

The results show that both the total number of trapped waders and the proportion of different ages in trapped samples can be used, at least in this southern Baltic staging area, to indicate annual differences in breeding success on distant breeding grounds.

References

Gromadzka, J. 1981. Results of twenty years of wader ringing at the mouth of the Vistula in Poland. *Wader Study Group Bull.* 32: 23-24.

Gromadzka, J. 1988. Long term number fluctuations of Curlew Sandpiper on southern Baltic. *Wader Study Group Bull.* 54: 16.

Gromadzka, J. 1989. Breeding and wintering areas of Dunlin migrating through southern Baltic. *Ornis Scand.* 20: 132-144.

Gromadzka, J. 1989a. Wader migration along the Baltic coast of Poland. *BTO News* 162: 6-7.

Gromadzka, J. & Ryabitsev, V. K. 1998. Siberian Dunlins *Calidris alpina* migrate to Europe: first evidence from breeding. *International Wader Studies* 10: this volume.

Kondratyev, A.Y. (ed.). 1992. Breeding conditions for waders in the tundras of the USSR in 1989. *Wader Study Group Bull.* 64: 51-54.

Mayr, E. 1935. Bernard Altum and the territory theory. *Proc. Linnean Soc.* N.Y. 45-46: 24-38.

Payevski, V.A. 1985. *Demography of birds.* Nauka, Leningrad. In Russian.

Ryabitsev, V.K. 1983. *Territorial relations and communities dynamics of birds in subarctic.* Nauka, Ekaterinburg. In Russian.

Ryabitsev, V.K. (ed.). 1993. Breeding conditions for waders in the tundras of Russia in 1991. *Wader Study Group Bull.* 71: 20-25.

Tomkovich, P.S. (ed.) 1989. Breeding conditions for waders in the tundras of Russia in 1988. *Wader Study Group Bull.* 57: 40-41.

Yurlov, A.K. (ed.). 1993. Breeding conditions for waders in the tundras of Russia in 1990. *Wader Study Group Bull.* 67: 57-62.