Status of snipe *Gallinago* spp. and Woodcock *Scolopax rusticola* in the south-east of Western Siberia

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This paper summarises available material from the region, including results of studies carried out in the Kemerovo region and neighbouring areas of Novosibirsk and Tomsk regions between 1979-1991. Four species of snipe (Common Snipe *Gallinago gallinago*, Swinhoe's Snipe *Gallinago megala*, Pintail Snipe *Gallinago stenura*, and Great Snipe *Gallinago media*) were recorded breeding in the Kuzbass industrial area. Jack Snipe *Lymnocryptes minimus* is said to have bred there in the past, but was only recorded on migration during the present study. The highest numbers of Swinhoe's Snipe and Pintail Snipe, which are forest species, were found in the boreal zone. Eight habitat types within the study area were used by Swinhoe's Snipe. Its densities varied from 2.0-5.0 pairs.km^{-2} in birch-aspen areas of forest steppe to 34.2-62.6 pairs.km^{-2} in industrial clear-fells in mountain boreal forests. Pintail Snipe is less numerous in the study area. Anthropogenic forest changes, mainly the creation of clear-fells of various ages, leads to an increase in the numbers and range of this species. Common Snipe and Great Snipe are widely distributed in the region. Their preferred habitats are marshy areas in river-valleys and on the shores of lakes, and swampy lowlands near ponds in forest-steppe and in the foothills of mountains. In such areas the number of Common Snipe varies from 6.0-9.0 pairs.km^{-2} in forest-steppe to 18 pairs.km^{-2} in mountain forests. Densities of Great Snipe in marshy areas of forest exceed six pairs.km^{-2} A lack of large marshy areas results in these species breeding on extremely small territories, so neither Common Snipe nor Great Snipe aggregate when breeding. In general, only one to three displaying birds are found at each display site, and only in a few sites are there as many as seven to 12 birds. Drainage and ploughing of marshy areas has led everywhere to a decline in the breeding numbers of these two species. Woodcock *Scolopax rusticola* were recorded throughout the study area, both breeding and on migration.

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В настоящей статье сведены имеющиеся материалы из региона, включая результаты исследований, проведенные в Кемеровской области и прилегающих районах Новосибирской и Томской областей в 1979 - 1991 годах. Четыре вида бекасов (обыкновенный бекас *Gallinago gallinago*, лесной дупель *Gallinago megala*, азиатский бекас *Gallinago stenura* и дупель *Gallinago media*) были обнаружены гнездящимися в промышленной зоне Кузбасса. В прошлом там же гнездился, предположительно, и гаршнеп *Lymnocryptes minimus*, нами же он был встречен только на пролете. Максимальные численности лесного дупеля и азиатского бекаса (двух лесных видов), былы зарегистрированы в бореальной зоне. В районе исследований лесной дупель найден в восьми типах местообитания. Плотность населения этого вида варьировала в пределах 2.0-5.0 пар на 1 кв. км березово-осиновых участков лесостепи до 34.2-62.6 пар/км^2 на промышленных вырубках в горных бореальных лесах. Азиатский бекас менее обилен в районе исследований. Антропогенные изменения леса, в основном вырубки разных возрастов, ведут к увеличению численности и распространения этого вида. Обыкновенный бекас и дупель широко распространены в регионе. Предпочитаемыми гнездовыми биотопами этих видов являются болотистые участки в речных долинах и на берегах озер и заболоченные низины около прудов в лесостепи и в предгорьях. В таких местах плотность обыкновенного бекаса колеблется от 6.0-9.0 пар/км^2 в лесостепи до 18 пар/км^2 в горных лесах. Плотность дупеля в заболоченных лесных участках превышает шесть пар на 1 кв. км. Недостаток обширных заболоченных местностей ведет к тому, что эти виды гнездятся на крайне небольших территориях, так что ни бекас, ни дупель не создает скоплений на гнездовьях. В целом, только 1-3 токующие особи встречаются на единичном току, и лишь на немногих токах были встречены до 7-12 особей. Осушение и распашка заболоченных мест повсеместно привели к сокращению численности гнездовой популяции этих двух видов. Вальдшнеп *Scolopax rusticola* был отмечен по всему району исследований, как гнездящимся, так и на пролетах.

Introduction

The south-eastern part of Western Siberia includes the following montane areas of West-Siberian Plain: the Salair mountain range (up to 590 m above sea level), the Kuznetskiy depression, the Kuznetskiy Alatau mountain range (up to 2,178 m above sea level) and the Mount Shoriya upland (up to 1,596 m above sea level). This area borders with the Altai and the Sayan mountains in the south, with Priobskoye Plateau in the west, and with the Chulym-Yenissey Plateau in the north and north-east (Figure 1). The study area occupies a total of 98,000 km^2. The Kuznetskiy depression has a complicated hilly relief as it is crossed by numerous rivers and flat-bottom valleys. The forest-steppe zone is divided by mountain taiga belts, formed in the areas between large rivers. The Inya, Tom', Kondoma, Yaya and Kiya rivers are the main tributaries of the Ob' river and form 15% of its annual flow. Within the study area, which belongs to the Salair-Kuznetskiy subprovince of mountain taiga dominated by *Abies sibirica*, three altitudinal landscape zones are recognised: steppe, forest-steppe and mountain taiga belts. In total, 53% of this area is covered with forest. The climate in the region is highly continental, its peculiarities being

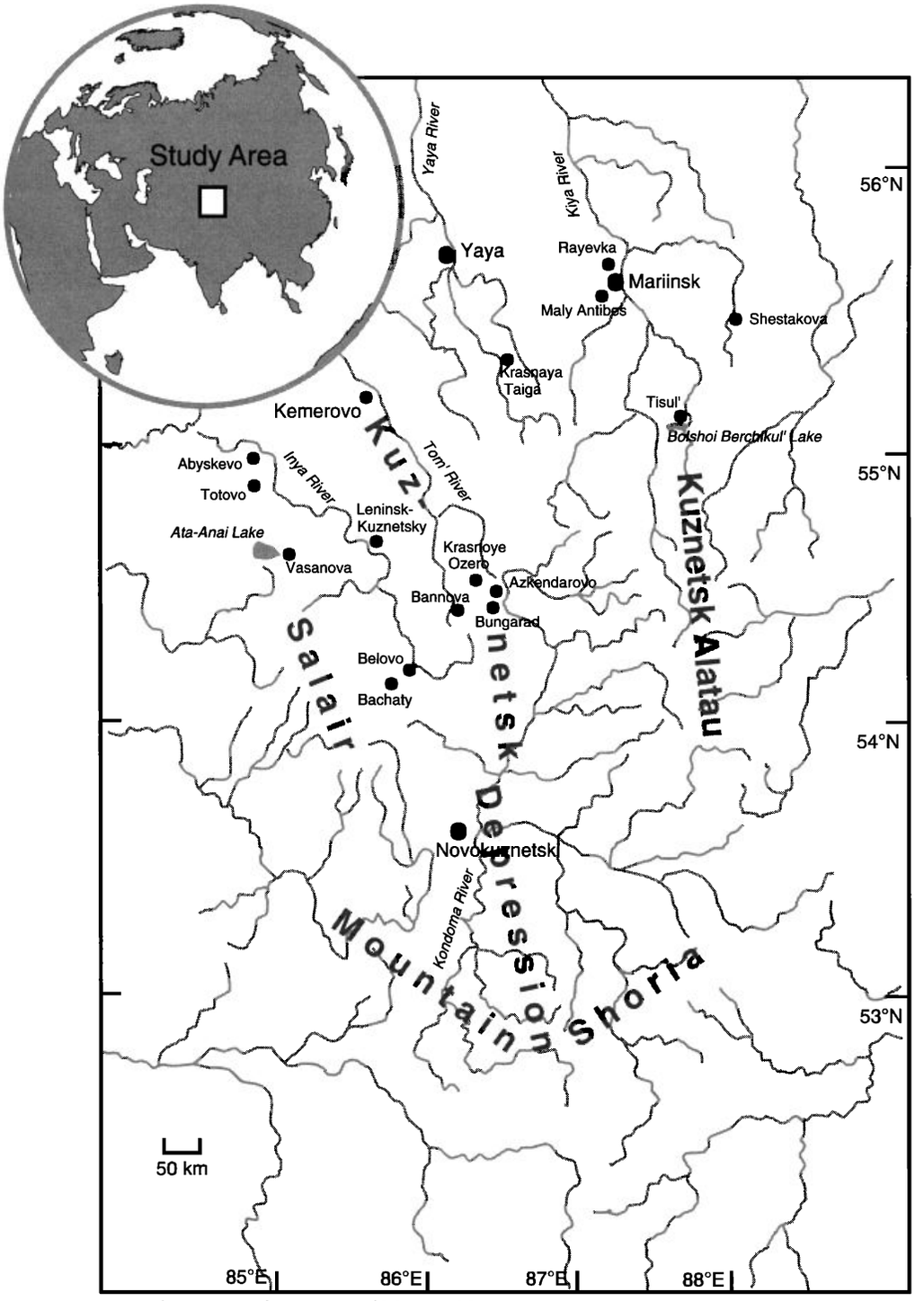

Figure 1. Map showing south-east area of Western Siberia.

mostly connected with the complicated relief of the area.

Faunistic studies carried out in the region can be separated into two main periods: before the 1930s, *i.e.* before the start of intense economic development of this area, and from the 1930s to the present, when human influences on the natural environment have greatly increased. In the former period, ornithological studies were made mostly in the south-western part of the region - in the foothills and low altitudes of the Salair mountain range and in the Kuznetskiy depression (Johansen 1914; Khakhlov 1937). Nowadays, long-term studies are being conducted in the south of the Kemerovo region, on Mount Shoriya and in the Kuznetskiy Alatau mountain range (Poslavsky *et al.* 1979; Golovina 1986). The area between the Tom' and Kiya rivers still remains an ornithological gap. Within the region even the list of bird species is a long way from being completed. For 127 (57%) of 215 bird species known for this area, there are no data in the literature on their status. There are sporadic records of nests and chicks, which confirm breeding, for only 24% of bird species (Poslavsky & Shkarin 1979).

The Kuznetskiy depression (called in Russia Kuzbass) is one of the world's largest coal-fields. One third of the coal extraction which takes place here is conducted using open-cast mining and covers an area of 36 km^2. This method of coal-mining involves extensive land-use due to the formation of numerous excavation areas, dumps, slag-collectors, *etc.* Mount Shoriya and the Salair mountain range are famous for their iron resources and non-ferrous metals, which are also exploited using open-cast technology. In order to excavate one million tons of coal, up to 43 ha of virgin or agricultural lands are transformed, and for the same amount of iron, up to 600 ha are needed. From the time the Kuzbass first began to be developed until 1981, 36,000 ha had been industrially transformed, 50% of which had formerly been agricultural land.

About 1,400 ha are being developed annually for different purposes. Besides being the region where a quarter of Siberian industry is concentrated, the Kemerov region is also one of the most populated areas - 30.5 people km^{-2} (Tomakov & Kovalenko 1984). Exploitation of new coal-mines and ore resources, ploughing of virgin lands for agricultural purposes, formation of water reservoirs and ponds as well as wood-cutting and partial recultivation of transformed lands in the last 50-70 years has led to man-made landscapes being widespread within the study area. The effect of such habitat transformation on bird fauna has been well-studied in Central Siberia and Altai (Reimers 1966; Kuchin 1982).

Methods

During the study period (1979-1991), survey routes totalling more than 7,000 km in length were surveyed by foot and with vehicles, and over 700 km of rivers and lake shores were explored by boat. Bird censuses were conducted by counting both visually and vocally recorded individuals on a transect. The mean distance of detectability was estimated for each species separately and densities calculated by dividing the number of birds seen on the transect by the transect length x mean detectability, either for a 1 km^2 standard unit (according to Ravkin 1967) or for 10 km of shoreline. In Great Snipe *Gallinago media*, Common Snipe *G. gallinago* and Swinhoe's Snipe *G. megala* only song-displaying males were censused.

Results and Discussion

In the south-east of Western Siberia, six species of snipe and woodcock occur, most of which are traditional quarry species. Two species, Swinhoe's Snipe and Pintail Snipe *G. stenura*, are at the south-western limit of their breeding range.

Jack Snipe *Lymnocryptes minimus*

In monographs on birds of the USSR (Kozlova 1962; Ivanov 1976), south-east Western Siberia is not included within the breeding range of this species. However, Johansen (1898) wrote that in Tomsk province, which includes the Kemsov region, "... Woodcock, Great Snipe, Common Snipe and Jack Snipe are breeding waders which are well-known to every game-hunter...". In later publications of the 1920-1960s, this species was not mentioned at all. A juvenile Jack Snipe *Lymnocryptes minimus* was shot during migration in the vicinity of Kemerovo town on 12 September 1980 and, in the summer of 1989, a single bird was recorded on 7 July in the marshy area near the town of Mariinsk. In Tomsk region during 1974-1975, this species was observed only on spring migration from 8 to 21 May (Dubovik *et al.* 1977). Further west, in the Barabinskaya forest-steppe, it was recorded on spring migration in 1978 from 29 May onwards. According to Yurlov (1979), migration through this area lasts eight to 12 days. During autumn migration the Jack Snipe is rarely observed; in the Altai foothills in 1962-1978 it was recorded from 16 September to 21 October (Kuchin & Kuchina 1979).

Great Snipe *Gallinago media*

In the 1930s, this species was recorded as a numerous and widespread wader in the Kuznetskiy steppes and the foothills of the Salair mountain range. Nowadays, it is not as numerous. Thus, its density in 1983 did not exceed 2 individuals.km^{-2} in the marshy areas of forest-steppe zone (near the Titovo settlement, Promyshlennaya district). In the forest zone, its density reached 12 individuals.km^{-2} locally in the vast marshy areas near the Shestakovo settlement (Chebulinsk district).

According to published data, the density of Great Snipe in different habitats of the middle taiga zone between the Ob' and the Irtysh rivers, in 1979 ranged from 0.7-2.0 individuals.km^{-2} (Vartapetov 1984). Strelkov (1974) considered it to be the most

numerous species in the Ob' river flood-plain, where he recorded up to 40-60 birds on a single lek.

Between 1893 and 1901, the earliest spring arrivals at the forest-steppe were recorded between 28 April and 5 May and once on 20 May. In 1928 (12 May and 24 May), slightly later arrival dates were recorded by different observers (Khakhlov 1937). During our study, the earliest spring records of Great Snipe were on 29 April 1979 near Mariinsk, on 11 May 1980 near the settlement of Azhendarova (Krapivino district), on 29 April 1983 near the settlement of Maly Antibes (Mariinsk district), and on 28 April 1985 at the Ata-Anai Lake (Promyshlennaya district). In the northern part of Tomsk region, Great Snipe arrived in spring 1973-1975 between 5 and 8 May or from late April onwards (Dubovik *et al.* 1977).

The most common breeding habitats of Great Snipe are on plains with damp meadows in hollows with *Betula pubescens* thickets and grass-sedge vegetation, as well as tussocky swamps with herb-grass vegetation near water bodies. In summer it is found also on flooded meadows along rivers, in boggy depressions within forests, and on the shores of lakes in the forest-steppe zone.

A nest with three eggs was found in a willow thicket by Khakhlov (1937) on 15 June 1928, in the foothills of the Salair mountain range. During our studies, a nest with a complete, well-incubated clutch, which was also situated under willow shrub, was found on 11 June 1985 on the swampy shore of Bolshoi Berchikul' Lake (Tisul' district). The egg measurements (mm) were: 45.2 x 31.5, 46.0 x 32.0, 45.0 x 32.4, 45.7 x 33.0. An adult Great Snipe with a downy chick was observed on a floating peat-moss mat on the shore of Ata-Anai Lake on 10 July 1983. Based on these records, we can assume that clutches are completed and incubation starts usually by 20 May to 12 June. In the north of Tomsk region, complete clutches with fresh eggs were found from the end of May until the 22 June (Strelkov 1974).

During post-breeding movements, the species is recorded in the first ten-day period of July at Ata-Anai Lake, where it forages and roosts in flocks with other wader species on the floating peat-moss mats. From the middle of August, Great Snipe become common on migration: in 1984-1991 it was usually shot during the opening of the hunting season on 24 to 31 August. The latest autumn record of Great Snipe was on 17 September 1985. Near Tomsk, the majority of Great Snipe leave the breeding areas in the middle of August (Strelkov 1974; Gyngazov & Milovidov 1977).

Common Snipe *Gallinago gallinago*

Tugarinov (1927) considered this wader to be the most numerous in the steppe zone, while it was noticeably less common in the forested areas near the Novokuznetsk, Bachaty, Leninsk-Kuznetskiy settlements and on the shores of the Ata-Anai Lake. Its density on the Tom' river flood-plain near Novokuznetsk town, for example, was one pair km^{-2} (Khakhlov 1937). Our census data suggest that the Common Snipe is a widespread breeding species which does not occur at high densities.

Drainage of boggy areas for agricultural purposes force the species to breed in the very small areas of suitable habitat around the steppe lakes, in damp meadows, near temporary flood-plain lakes and on swampy lowlands in the foothills. No more than three singing males were found in any single location. It was only in the vast boggy areas, which still remain in some parts of the region, that higher numbers were recorded. Thus, at the edge of a bog near the Bannovo settlement (Krapivino district) the number of displaying males recorded in 1982 was equivalent to 18 individuals.km^{-2} Bog drainage during economic development is leading to a decline in the number of Common Snipe everywhere. For example, after the bog near Raevka settlement in the Mariinsk region was drained, the number of Common Snipe decreased from 16 pairs in 1978 to only four pairs in 1987.

In the tussocky areas within the southern taiga and in the open eutrophic fens among sub-taiga forests, Common Snipe density ranged from three to 18 individuals.km^{-2} (Vartapetov 1984). The earliest spring arrival dates on the Kuznetskiy steppe were in 1892-1902 from 20 April to 8 May. On the outskirts of Kemerovo, a Common Snipe was shot on 17 April 1982, and another was shot near Leninsk-Kuznetskiy settlement on 27 April 1956. In 1975-1979, spring migration was observed from 20 to 27 April (Petunkin *et al.* 1979). At Ata-Anai Lake peak arrival was observed from late April to the middle of May.

Song-flights were recorded from 10 May to 8 June 1980 near Azhendarovo settlement. In the forest-steppe zone close to Abyskevo settlement, these displays were observed on 7 June 1985, whereas near Titovo, they were observed on 29 June and 8 July 1985. A nest with four fresh eggs was found near the Azkendarovo settlement on 15 May 1979. This nest was situated in a small depression in a tussocky swamp, under one of the tussocks, and was camouflaged from above with dry sedge-grass. Clutches of three to four fresh eggs were also found at Ata-Anai Lake on 29 May 1987 and 24 May 1988. Egg measurements (n = 39) ranged from 38.5-40.5 x 28.0-31.5 mm. The earliest record of downy chicks was on 4 June 1979, not far from Azkendarovo settlement. The latest downy chicks were found on 7 July 1985, near the Titovo settlement. At Ata-Anai Lake, downy chicks were recorded on 16 June 1986, 19 June 1987 and 11 June 1988. During the period of post-breeding movements, the species was recorded at Ata-Anai Lake from mid-July until early October, and the most intense migration took place from 15 August to 10 September.

During autumn migration Common Snipe form large aggregations in open boggy areas. Thus, on a 20 ha peat-bog near Ata-Anai Lake, about 200 Common Snipe were flushed on 8 August 1989. Similarly, the density of birds in the fens within the southern taiga is three times higher than during the breeding period (Vartapetov 1984).

Swinhoe's Snipe *Gallinago megala*

The largest numbers of this species are recorded in the forest zone and the smallest in the forest-steppe zone, where it breeds only in small, isolated birch groves. Its density increases eastwards from three to 28 individuals.km^{-2} (Golovina 1986). In the southern part of the region its numbers reach 11.6-62.6 pairs.km^{-2} within the mountain taiga belt (Poslavsky *et al.* 1979; Poslavsky & Sokolov 1980). We identified eight general habitat types, which supported high densities of this wader from two to 58 pairs.km^{-2}. The Swinhoe's Snipe is most numerous in open areas within mixed forest, and in the taiga with small local clear-fells, where its density reaches 18-60 pairs.km^{-2}. In the forests of the Kuznetskiy Alatau mountain range its density is only one individual.km^{-2}, and in the southern taiga ranges from 0.3-2.0 individuals.km^{-2} (Vartapetov 1984; Gureev 1989). The number of Swinhoe's Snipe and its distribution are positively affected by the anthropogenic transformation of forests, including various types of wood-cutting. This influence leads in general to the appearence of new suitable habitats, and thus allows the species to expand its breeding range (Reimers 1966; Kuchin 1982).

Swinhoe's Snipe arrive on the breeding grounds in late April or early May. The earliest spring records at Ata-Anai Lake are 28 April 1985 and 2 May 1989. Song-flights were observed in a clear-fell within the mountain taiga forest near Azkendarovo settlement on 14-18 May 1979 and on 10-13 May 1980; 10 and 12 birds respectively, were displaying on an area of 2 ha. The latest displaying Swinhoe's Snipe was observed on 3 July 1979, not far from Krasnoye Ozero settlement (Krapivino district). Fresh clutches were found at Azkendarovo settlement on 17 and 20 May 1980, close to the Pichugino settlement (Tisul' district) on 24 May 1986. Nests are placed in open areas near stumps, shrubs and heaps of brushwood. A nest is a small depression, covered inside with dry grasses and leaves, which usually contains three to four eggs. Thirty-six eggs measured were all 41.0-43.0 mm long and 27.0-31.0 mm wide. A nest with downy chicks was found on 8 June 1980 in the mixed forest near Azkendarovo settlement. The female, displaying distraction behaviour, remained in the vicinity, approaching to within 2-3 metres of the observer. Two already dried chicks were sitting in the nest, the third one was found nearby. Other records of downy chicks are as follows: on 14 June 1984 near Krapivino settlement, and on 18 July 1987 at the Krasnaya Taiga settlement (Izhmorka district). In the Western Altai the earliest complete clutches were found on 25 May 1975 and on 27 May 1976; downy chicks were observed on 20 June 1971, and broods with fledglings on 17 July 1973 (Tsherbakov 1979, 1990).

At Ata-Anai Lake the Swinhoe's Snipe is recorded from mid-July onwards, and its number peak by the 20 August. During autumn migration this wader is less numerous than the Common Snipe. Analysis of bag-returns during late August showed that this wader represents only 4.5% of all shot waterfowl and shorebirds.

Pintail Snipe *Gallinago stenura*

The Pintail Snipe breeds in southern Siberia, in the subalpine belts of mountain ranges (Kozlova 1962). During the breeding period, it was collected on 5 June 1913 not far from Taskaevo settlement (Barabinskaya forest-steppe), and on 10 June 1928 near the Bachaty settlement in the pine-forest zone (Johansen 1914; Khakhalov 1937). According to Johansen (1914), a female and her chick were collected close to Tomsk town. In the Western Altai, Pintail Snipe breeding habitats are located in the forest belt between 800 m and 2,000 m above sea level. Song-flights were observed in the Central Altai from 18 May to 25 June (1980-1981). After 10 June, the intensity of displaying decreased, and after 25 June, ceased. Song-flights are made mostly in the evenings and at night (Malkov & Malkov 1983; Tsherbakov 1990). A young wounded Pintail Snipe was caught on the outskirts of Kemerovo in the middle of August 1981. At Ata-Anai Lake, young birds of this species were shot on 31 August 1986 and 29 August 1987.

Woodcock *Scolopax rusticola*

Woodcock have been recorded breeding in the Kuznetskiy Alatau and the Salair mountain ranges and in the Kuznetskiy steppe. Woodcock are also known in the Tomsk region and the area of the middle Ob' river (Khakhlov 1937; Gyngazov & Milovidov 1977). Khakhlov (1937) reported that Woodcock were numerous in the taiga of the Salair mountain range and on the Tom' river flood-plain, where they were collected on 4 and 20 June 1928. Spring migration at the Kuznetskiy steppe occurred in 1891-1901 from 28 April to 19 May. In 1928, song-flights were recorded from 16 May until late June (Khakhlov 1937). In 1975-1979, Woodcock were reported from 20-27 April near the town of Kemerovo, and from 22 April to 4 May in the vicinity of Tomsk town (Dubovik *et al.* 1977; Petunkin *et al.* 1979). A nest with an incomplete clutch (two eggs) was found during our study on 16 May 1984 in the mixed forest near the Vasanovo settlement (Promyshlennaya district). This nest was 15 cm wide and 3 cm deep and was placed between the protruding roots of an old birch tree. The nest was lined inside with dry grasses, leaves and moss. The egg measurements (mm) were: 44.2 x 31.8, 44.0 x 32.0. In summer 1979, a single Woodcock was observed from 27 June until 5 July in the damp meadow near the Krasnoye Ozero settlement. Young birds were collected in the mixed forest near the Bungarad settlement (Krapivino district) on

30 August and 10 September 1979.

In the Altai mountains, autumn migration finishes in the second half of September. The latest bird was shot on 6 November 1978 near the town of Gorno-Altaisk (Kuchin & Kuchina 1979).

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