Migration, breeding and population size of Curlew *Numenius arquata* in Orenburg Region, Russia

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Curlews *Numenius arquata* were once numerous in Orenburg Region but the ploughing of virgin steppes earlier this century lead to major declines. These declines started in the 1920s and were most rapid in the 1950s as a consequence of widescale environmental change following conversion of natural steppe habitats to agriculture. Extensive surveys of the whole region were made by both foot and vehicle between 1970 and 1991. These surveys are thought to have located all breeding areas used. Curlews arrive from mid-April and depart from late July. Clutches were found from 15 April in most years, with hatching at the end of May, and fledged young seen from early July. In most years the total breeding population is estimated to be 42-46 pairs, with between 37-52 non-breeders also present. With a production of between 95-115 young, the average post-breeding population is assessed as 208-259. Roost counts in late July of between 370-400 suggest an annual influx of Curlews from neighbouring regions. Habitat use, diet and necessary conservation measures are briefly reviewed.

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В Оренбургской области большие кроншнепы *Numenius arquata* в прошлом были многочисленны, но распашка целинных степей в начале текущего столетия привела к резкому сокращению численности. Такое сокращение началось в 1920-х годах и было наиболее быстрым в 1950-х годах, вследствие широко-масштабных изменений окружающей среды вслед за превращением естественных степных биотопов в сельскохозяйственные угодья. С 1970 по 1991 гг. были проведены обширные обследования всей области: как пешеходные, так и автомобильные. Насколько известно, во время этих обследований были найдены все населенные кроншнепами места. Прилетают большие кроншнепы с середины апреля и отлетают с конца июля. Почти во все годы кладки были найдены с 15 апреля, вылупление птенцов было зарегистрировано в конце мая, и летные молодые наблюдались с начала июля. Большинство лет общая численность гнездящихся птиц оценивалась в 42-46 пар, при наличии еще 37-52 негнездящихся особей. На основании продуктивности от 95 до 115 молодых особей, средняя послегнездовая популяция насчитывала 208-259 особей. Учеты численности на ночевках в конце июля (от 370 до 400 особей) наводят на мысль о ежегодном налете кроншнепов из соседних районов. В статье также приведен краткий обзор использования биотопов, питания и необходимых мер по охране вида.

Introduction

In the 19th and at the beginning of the 20th centuries the Curlew *Numenius arquata* was a common breeding bird and abundant on autumn migrations in the Orenburg Region of Russia (Eversmann 1866; Zarudny 1888; Raisky 1913, 1955). Along the Ilek and Khobda rivers it was even more common "than for example the common larks [Skylarks *Alauda arvensis* - G.S.]..."(Zarudny 1888). In July during the period of pre-migration movements hundreds of Curlews gathered in flocks to roost on the sandy beaches and islands of the Ilek river and produced so much noise "that it could be heard in the calm evenings for up to two versts [about 7,000 feet] along the river..." (Raisky 1913).

A decline in numbers of Curlew started in Orenburg Region in the 1920s and was caused by the drying out of numerous rivers and lakes due to general climatic changes and by the ploughing of virgin steppes that were used by Curlews for breeding and foraging (Raisky 1955). The steepest decline in numbers of the species occurred in the 1950s and was connected with governmentally planned development of all those steppes and fallows that were suitable for agriculture.

Agricultural developent of steppes in the middle of the current century has led to the appearance of new human settlements with numerous artificial ponds made nearby for agricultural purposes. However, despite the creation of these new habitats around

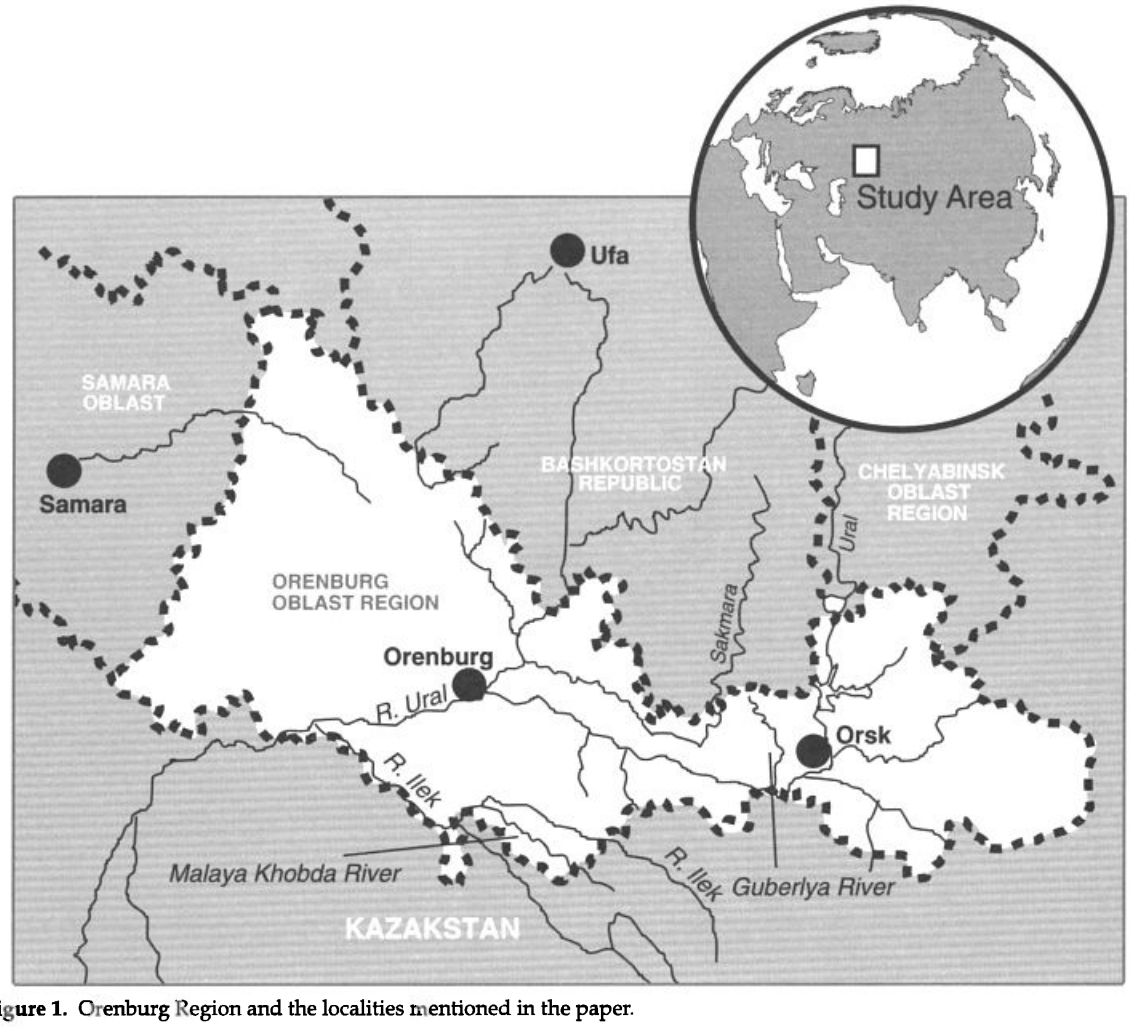

Figure 1. Orenburg Region and the localities mentioned in the paper.

the ponds this has not lessened the rate of decline in Curlew numbers inhabiting the Orenburg Region.

Consequently, what was once common species in the 19th and at the beginning of the 20th centuries, Curlew is nowadays a rare bird. As a consequence, from 1970-1991 we have collected data on their distribution, numbers and population trends in the southern Ural steppes within the Orenburg Region (Figure 1).

Study Area and Methods

Orenburg Region occupies almost all the steppe territory of the southern Urals, being situated at the southern edge of the Ural mountains in the middle reaches of the Ural river (between 50°30' to 54°22' N, and 50°40' to 61°35' E). The total extent of the region is 124,000 km² (Vetrov 1969). The climate is sharply continental. River systems are most developed in the northern and north-western parts of the region. The area is situated mostly in steppe zone, forest-steppes occupying a rather small part. Xerophylic herbaceous vegetation prevails, while forests and shrubs cover about 4.1% of the territory, with marshes and swamps about 0.03%. A total of 87% of the region is used for agriculture, which has intensified in the latest 38 years after the ploughing of virgin steppes.

The main breeding grounds of Curlew in Orenburg region - the basins of the Chagan, Ilek, Malaya Khobda, and Guberlya rivers and the Ilekskoye plateau in the area between the Ural and the Ilek rivers (Figure 1), - were discovered from vehicle-based surveys round the whole region between 1978-1979. Breeding Curlews were found in 25 out of 35 districts of the region (75.2% of the total area). Transect censuses of breeding pairs were conducted by foot between 1980-1984, in the period from 1-15 May annually, in 18-25 districts where the Curlews occur. Eight to ten persons - hunting guides and game managers, took part in these surveys. Within the limits of every district we explored initially 3-12 breeding habitats in selected places.

The size of these habitats was determined from maps and later defined more exactly in the field. Repeated censuses on survey plots as well as on transects and plots simultaneously (the methods depended on the size and configuration of each locality) were used to estimate breeding densities: transect censuses were made of 100 m width at intervals of 500 m across the whole study area; at least two transects were made if the study area was less than 500 m wide. About 20% of the localities were surveyed using the plot census method, and 15-20% using transect census methods.
Data on the biology of Curlew were collected between 1970-1991, vehicle-censuses (with 100 m

wide transects) were undertaken between 1978-1990. The total length of foot censuses was 7,430 km, and of vehicle censuses - 19,200 km.

Results

Curlews appear in the region after 10-20 April (the earliest date of arrival was 10 April 1984). During spring migration they fly either individually or in small flocks (of three to five) in a north-eastern direction. The most intense migration is observed for seven to eight days between 20-30 April, but by the end of April the migration is finished. The total duration of spring migration is 20-21 days.

Immediately after their arrival Curlews occupy breeding territories and start displaying. They nest as single pairs in the steppe-like sites on flood-plains and river terraces, and on the shores of lakes and ponds with a distance of 0.5-1.0 km between pairs. The birds do not form breeding colonies, though sometimes in the most suitable places two or three pairs may nest close together. Usually one to three unpaired Curlews also remain close to these pairs.

The lowest breeding densities were recorded on the agricultural fields and in the Dyoma river flood-plain. Sometimes breeding in agricultural habitats was observed in other places. One pair nested in 1981 and 1982 on the spring wheat field close to the Tamda river mouth. In 1985-1991 one or two pairs bred on an irrigated field with perennial herbs (Sainfoin *Onobrychis* sp.) on the Chagan river fluvial terrace.

Full clutches were found after 15-20 May (the earliest record was on 11 May 1984). Hatching occurred after the end of May (the earliest date was 29 May 1974). Fledged young Curlews were observed after early July (the earliest record was 3 July 1976). Up to 10 July broods remained within breeding habitats. However, after 10-20 July, when post-breeding movements started, broods united into small flocks of 10-13 and were recorded foraging in steppe, on tillaged fields, and on meadows along the steppe rivers and ponds. In the southern Ural steppes Curlews feed mostly on Acrididae, Coleoptera, and, probably, Lumbricidae. For roosting (either in the afternoon or at night), the Curlews gather in flocks of 20-30 on the sandy beaches and spits of the Ilek and Malaya Khobda rivers.

As the breeding places of Curlew in Orenburg Region are restricted in number, all the breeding pairs were recorded every year: in the dry season of 1984 a total of 38 pairs were found, whilst in the other years between 42-46 pairs were located. Unpaired birds account for 33-36% of the total population number, *i.e.* 37-52 more individuals. Therefore, a total of 113-114 Curlews occur in Orenburg Region at the beginning of the breeding season (first half of May). All complete clutches (n=11), recorded during our studies, contained four eggs.

In the second half of July the breeding areas of Curlews were surveyed again by vehicle and broods with fledged young were counted. Of these censuses, 60% were followed by foot censuses, allowing the under-estimation of data obtained from vehicle censuses to be assessed (under-estimates averaged 30%). The average number of fledged Curlew for many years was 2.5 per brood.

Part of the Curlews clutches evidently perish, but exact data and reasons are not known yet in the region. Only the census data on breeding bird numbers and average brood sizes were used to estimate annual productivity. The latter ranged from 95 to 115 young birds that, together with adults (breeders and unpaired birds), made annually 208-259 individuals. At the same time, according to our vehicle-census data, 370-400 Curlews inhabit the Orenburg Region between 20-30 July, as found principally at the roosts of the Chagan, Ilek and Khobda rivers. This increase in population numbers in late July was evidently caused by arrival of birds from other regions. Several times we observed that Curlews moved in flocks of three to ten birds to the Chagan river valley from the Samara, Saratov and even Uralsk Regions, to the Ilek river valley from the northern part of Aktyubinskaya Region, and to the Guberlya river valley in flocks from the north-east.

After late July (the earliest date of the start of departure was 28 July 1977) until about 10 August intense autumn departure is observed; it is most pronounced along the southern tributaries of the Ural river (Ilek, Or, Urta-Burtya rivers). However, small late flocks and single birds are recorded in some years as late as the middle of September (up to 14 September in 1982). The general direction of autumn migration is to the south-south-west and the total migration period lasts for 1.5 months. The main factors which are now limiting the numbers of Curlews in the southern Ural steppes are the lack of suitable breeding sites as a consequence of the ploughing of steppes, and also of human disturbance (from agricultural activities such as cattle grazing).

In the last 30 years the number of game-hunters in the region has increased fourfold and recently exceeded *c.* 28,000. Nevertheless, we do not suppose that Curlew are actively hunted, as they are only occasionally shot. Indeed, when the game season begins most Curlew have already flown south from the region.

The measures which would lead to an increase in Curlew numbers in Orenburg Region would include the conservation of their breeding sites and publicity concerning necessary conservation among the local inhabitants.

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