

The status and distribution of the Mute Swan *Cygnus olor* in the USSR: a review of recent censuses

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The present status of Mute Swans in the USSR is characterised by a tendency for the numbers and range of the species, which had in the past contracted, to be re-established. In order to monitor these processes All-Union counts of the numbers of breeding and moulting Mute Swans have been carried out in recent years.

With the first, rather incomplete, count of 1974 it was established that there were 4,300 breeding pairs and 29,300 non-breeding birds. In the second, more complete count, in 1978, 7,700 breeding pairs and 43,100 non-breeding birds were counted. The total numbers in 1987 were 22,000 breeding pairs and 240,000 non-breeding birds; ie. there were about 284,000 swans in the spring of that year and no less than 350,000 birds by the end of the breeding season. The process of re-establishment of numbers and ranges of Mute Swans in the USSR is far from complete. There are areas where the species, after disappearing, has not reappeared, even though conditions are favourable. At the same time, the population density has not reached the maximum possible indices.

The process of further recolonization of Mute Swans in the USSR will continue, if favourable living conditions are conserved in the principal breeding grounds, from which there is a constant dispersal.

During the last 100 years, Mute Swans, *Cygnus olor*, have undergone considerable changes in numbers throughout much of their range. By the beginning of the 20th century most populations of this species, especially those in eastern Europe and Asia, were in a state of decline. In many areas, the numbers of Mute Swans became so low, that in subsequent years this species disappeared from vast areas and its breeding range contracted into isolated pockets. By the 1930s, even many of these pockets ceased to exist and the few remaining breeding areas became separated by large distances and, as the connections between them dwindled, they became progressively more isolated. In some areas, by the end of the 1930s there were increases in some of these remaining "micro-populations". It is noteworthy that the process clearly took place at the same time in populations which were separated by considerable distances and which differed sharply from each other in their natural habitat (e.g. the area near the Baltic Sea and the area north of the Caspian Sea). Later on, especially in the 1950s, along with a growth in the numbers of Mute Swans in the areas where they remained, new populations started to form. However, in spite of a growth of the

population overall (due to rapid increases in some areas), some populations did not increase noticeably. At present, the breeding range of the Mute Swan within the USSR is not continuous and in some areas has an intricate pattern, being made up of pockets of varying size. The pattern of vegetational succession differs between areas inhabited by the Mute Swan so that future changes in numbers may also be expected to differ between areas. Because of this, it is necessary to continue to monitor the numbers of Mute Swans and to evaluate their habitat throughout the entire range.

Methods

The first all-Union count of the numbers of Mute Swans was carried out on the initiative of the Caspian Ornithological Research Station of the Astrakan reserve in 1974. The count was carried out by state hunting boards, hunters' societies, regional sections of nature conservation organisations, research institutes, universities and some individual experts. More than 200 people took part in the survey. Counts in breeding areas were made during April-June and in

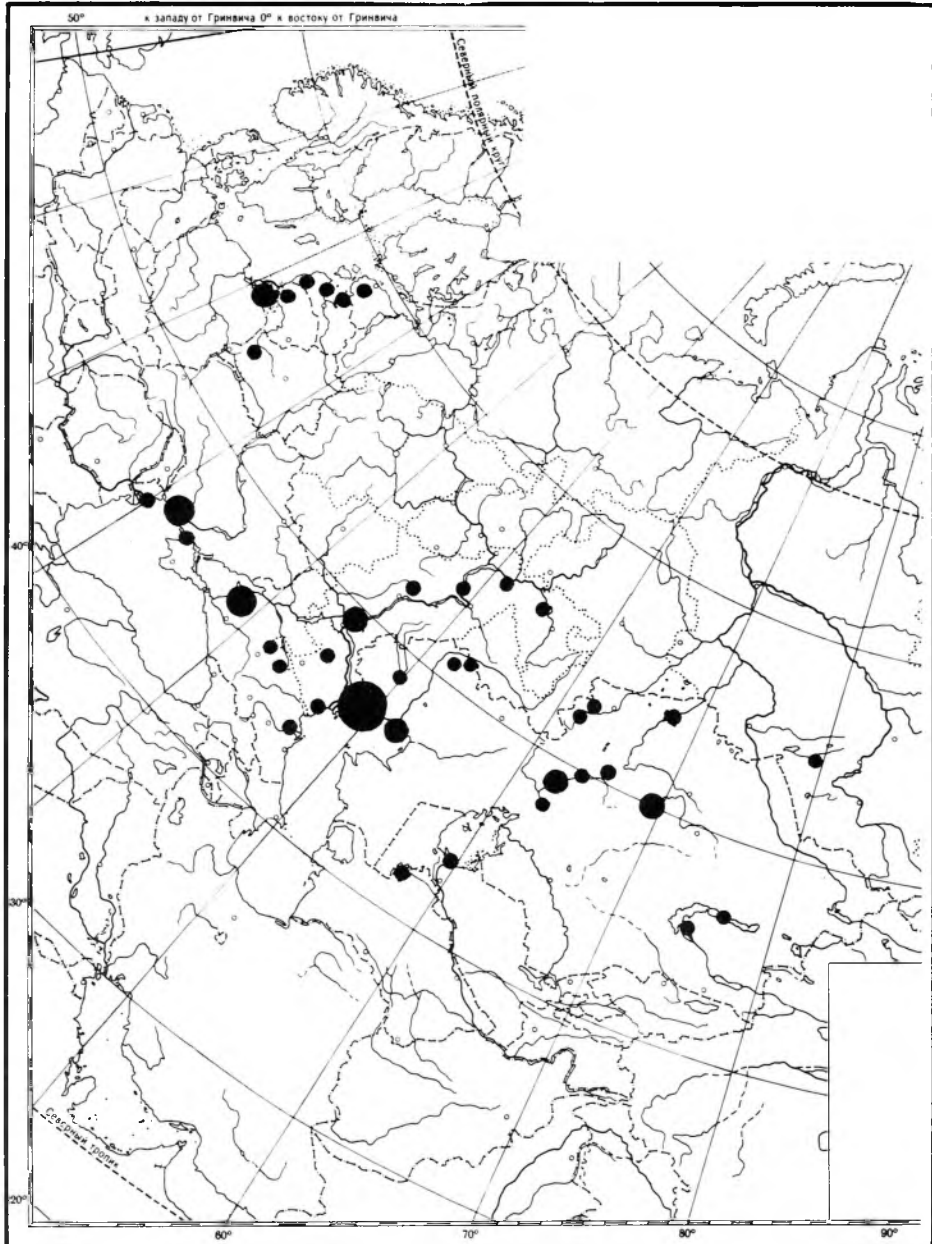


Figure 1. The distribution of Mute Swans in the USSR.

moulting areas during July-September. The number of breeding birds was estimated from the number of nests as well as the number of single birds and pairs whose behaviour indicated breeding. At the same time, counts of flocks of non-breeding birds were carried out. In the moulting period congregations of moulting individuals and birds with broods were

recorded separately as in previous censuses in the Volga Delta (Krivonosov 1963). In 1978 the all-Union count of numbers of Mute Swans was carried out for the second time and was more complete. Breeding and moulting areas were covered more thoroughly and the total number of participants was 350. The results of these counts have been published (Krivonosov 1981,

Table 1. Numbers of Mute Swans in the USSR

	No. of breeding pairs			No. of non-breeders		
	1974	1978	1987	1974	1978	1987
Caspian Sea	2,400	3,500	13,370	17,000	24,400	215,900
Black Sea	30	40	760	7,000	3,900	9,300
Kazakhstan	500	2,400	4,000	2,000	8,800	11,000
Baltic	500	1,100	1,750	1,400	2,100	2,500
N. Caucasus	300	300	600	1,700	3,600	900
Other areas	570	330	1,420	200	320	140
Total pairs	4,300	7,670	21,900	—	—	—
Total birds	8,600	15,340	43,800	29,300	43,120	239,740
GRAND TOTAL (breeders and non-breeders)	—	—	—	37,900	58,460	283,540

1987). The third all-Union count was carried out in 1987 and more than 400 people took part in this survey. The experience of organising three all-Union counts of the numbers of Mute Swan allows me to conclude that the modern level of material and technical equipment, knowledge of geography of their habitats and the existence of experts makes it possible to give a fairly accurate estimate of the total numbers of Mute Swans and their rates of change in the USSR. Analysis of the composition of the participants in the counts showed that 42% were game-keepers, 25% professional ornithologists, 17% workers in nature conservation organisations, 11% workers at hunting farms and 5% others, including amateurs. The proportions differed in different regions. Thus in the Baltic states, there were more workers from nature conservation organisations and amateurs, while in the Ukraine there were more ornithologists and in the Russian Federal Republic more gamekeepers. As far as the quality and speed of the presentation of the results is concerned, the best way is to organise the survey using the established Administrative Regions, wherever there is a fairly wide network of counters, together with a management centre for processing the information which is well-informed about the state of the habitats and has previous experience of the numbers of birds. Sometimes the functions of such a "centre" were carried out by a single specialist.

Results

The results of all three counts are presented in Table 1. and the distribution of swans is shown in Figure 1. On the basis of the analysis of the distribution of Mute Swans within the territory of the USSR, five main breeding and moulting

grounds were identified; the Baltic region, the northern Caucasus, the Black Sea, the Caspian Sea and Kazakhstan. In addition to the above mentioned areas, there are several other small breeding grounds (Krivonosov *et al.* 1976). Let us look at the changes in numbers and distribution of swans in each of these areas during the entire period, ie 13 years.

I Baltic region

The Baltic region is the eastern outpost of the North European population. The Baltic population was established at the beginning of the 1930s; earlier attempts at breeding were not successful. The process of dispersal increased significantly in the mid-1950s and the 1960s. The increase in the numbers of breeding birds was caused by general protection and as a result of an overall increase in their numbers in the countries of northern Europe. In 1972 in the three Baltic republics, 130 small breeding grounds were found, containing about 300 breeding pairs and 430 non-breeding birds. In 1974 there were 500 pairs and 1,000 non-breeding birds (Yygi *et al.* 1976). In 1978 1,100 breeding pairs and 2,100 non-breeding birds were recorded there. In 1987 the total numbers of Mute Swans in the Baltic region had increased by 39% to a total of 1,750 breeding pairs and 2,500 non-breeding birds. The increases differed regionally; in Lithuania it was 65%, in Latvia 8% and in Estonia 80%, in the Kaliningrad region 75%. In 1987 the numbers increased not only because of an increase in the traditional habitats but also because of an extension of the breeding range. Thus, in the adjoining part of Belorussia in 1978 only six breeding pairs were recorded, but in 1987 there were 42 pairs and 196 non-breeding birds. The considerable increase in the number of Mute Swans in Belorussia

is a result of immigration of birds from the Baltic region. These Baltic breeding areas include swans inhabiting the western regions of the Ukraine, mainly the Volyn region (about 100 breeding pairs).

II Black Sea

In the 1970s the Black Sea Region was mainly an area of mass-moulting of non-breeding birds. In 1974 7,000 birds were recorded, in 1978 4,000 birds. In 1987, 760 pairs and 9,300 non-breeding birds were recorded. A considerable increase took place in the breeding part of the population, with a smaller increase in the numbers of non-breeding birds to 33% above the previous maximum (in 1974). The area of the Black Sea breeding grounds has been increasing. However, at present more than 85% of the breeding grounds and almost all moulting grounds are concentrated in the coastal areas (Ardamatskaya & Korzyukov 1991).

III Northern Caucasus

The numbers of breeding birds in the northern Caucasus, which comprises the Rostov region, the Krasnodar and Starmopol territories, did not change from 1974 to 1978 (300 pairs), but by 1987 the number of breeding birds had doubled while the numbers of non-breeding birds declined noticeably.

IV Caspian Sea

The Caspian breeding grounds are the largest in the USSR. Here, more than half of the birds which breed in the USSR are concentrated, together with about 90% of the non-breeding birds. Although, on a number of occasions during this period, the numbers in the population decreased as a result of extremely cold winters, the overall result of the changes was upwards. From 1978 to 1987 the number of breeding pairs tripled while the number of non-breeding birds increased eight-fold. The main breeding area is the Volga delta where in 1974 2,400 pairs were recorded, in 1978 3,500 and in 1987 11,000 pairs. The habitat remained favourable for this population, as is proved not only by the numbers of birds, but also by such parameters as clutch-size and survival rate of the broods, as well as favourable breeding and feeding habitats.

The proximity of huge areas of shallow water between the mouths of the Volga and the Ural and further east along the sea coast, which are overgrown by Stoneworts (Charophyta) and the

pondweed *Potamogeton pectinalis* L. plays an important part in the well-being of this population. Non-breeding birds and immature birds which comprise up to three-quarters of the population, concentrate here to moult and stay most of the year, with the exception of winter. The total number of non-breeder and immature birds in this population has varied in different years from 17,000 to 216,000 birds. At the same time, during the last 10 years the numbers of breeding birds in the coastal shallow waters in the north part of the Caspian Sea have also increased. This was made possible by the overall increase of the Caspian population and the proximity of the largest breeding grounds of the Volga delta and the formation, as a result of an decrease in the level of the Caspian Sea, of a broad belt of reeds in coastal shallow waters. It is interesting that the formation of this local population occurred, not by colonisation from the Volga delta, but from the Ural delta and the adjoining shallow coastal waters to the east and west. From here, a very rapid colonisation took place, especially to the west and in 1986 the population in the Volga delta merged with the Guryev population.

The delta population of Mute Swans formed a dense breeding centre, leading to the dispersal of birds into lakes in the interior of the Caspian lowlands in the territory of Dagestan, Kalmykiya and Volgograd and also the Ural Districts. Colonisation of Mute Swans along the Volga delta to the north also merits mention. In 1978 in the Saratov region only four breeding pairs were found, in 1987 742 pairs and 3,000 non-breeders were recorded in spring in this region. Two breeding pairs were also found in the Melesski region in the Ulyanorsk District. Further north, in the Tatar ASSR, six pairs bred and, including non-breeders, about 100 birds were present. Thus one can speak about the formation of a new Central Volga range for the Mute Swan.

V Kazakhstan

In Kazakhstan the breeding range of the Mute Swan is discontinuous. Populations are separated by great distances from each other and are here included in the Kazakhstan region for convenience. In 1978, 2,400 breeding pairs and 9,000 non-breeding birds were recorded there. The largest breeding grounds are in the Turgay region where there were 955 breeding pairs and 1,500 non-breeders; 2,800 birds moulted. In the Tselingrad region, mainly in the Kurgaldzin reserve, 800 pairs bred and 4,000 birds moulted. In 1974, there was no information about the breeding of the Mute Swan in the northern Kazakhstan

region, but in 1978 at least 15 pairs bred there. In the Ural region in 1974 about 100 pairs nested, in 1978 130 pairs. In 1987 the number of birds in the Kazakhstan region had increased only slightly in comparison with other regions (the numbers of breeding birds by 66%, non-breeders by 25%), mostly due to increases in the northern regions of Kazakhstan, in particular in the Ural region (where it increased more than three-fold) and the northern region of Kazakhstan where they increased nine-fold. In the southern regions of the republic, on the contrary, in recent years there has been either a reduction in numbers or numbers have remained stable.

It is difficult to predict what the future holds for the populations of Kazakhstan. On the one hand, an abundance of lakes suitable for breeding allows one to speculate about great potential for growth in these populations. However, at the same time, the continued reduction of the size of the lakes in many regions, coupled with periodic drying out of the lakes due to changes in ground water level, makes one more cautious. The Kazakhstan region includes the breeding areas of the Aral Sea. As a result of the sharp fall in the level of the Aral Sea, the breeding sites in the coastal regions and the Lower Amur-Darya River have been transformed or have disappeared which have caused the local population to decline sharply (to approximately 100 pairs). On the eastern coast and in the lower reaches of the Syr Darya River, Mute Swans have, for many years, only been seen on migration. Probably, Mute Swans from northern regions of Kazakhstan disperse along the southern Urals (Bashkiriya and the Chalebinsk region) where, according to preliminary estimates, there may be 80-100 breeding pairs and the numbers are steadily growing.

VI. Other regions

In the territory of Uzbekistan and Turkmeniya very small numbers of Mute Swans inhabit some reservoirs which have been built in recent decades. Thus, on the largest of them, the Sarykamysh Reservoir, about 15 pairs breed. The total numbers of Mute Swans in Uzbekistan do not exceed 100 breeding pairs and in Turkmeniya about 50 pairs. The most eastern breeding grounds are in the Novosibirsk region where, according to approximate information, about 500 pairs breed. Further east, only non-breeding birds have been recorded - in the Aginski Region of the Chita district. These birds come here from the Mongolian region. Thus, in other regions in 1987 there were 1,420 breeding pairs and 140 non-breeding birds.

Total Numbers

The total numbers of the species in the USSR in 1987 was 22,000 breeding pairs and 240,000 non-breeding birds, i.e. in the spring of 1987 there were about 284,000 swans and, by the end of the breeding season, no fewer than 350,000 birds. It should be noted that the numbers during the last five years were not the highest on record. The numbers of Mute Swans in many regions were higher prior to the severe winters of 1984/85 1985/86. These two severe winters cause a reduction in numbers, but already by 1988, the numbers had recovered in most regions. With regard to the results of the count, one can conclude that the process of re-establishment of the numbers and the range of the Mute Swan in the USSR is far from complete. There are huge areas from which the species disappeared and where it has still not reappeared, even though conditions are favourable. At the same time, at most well-populated sites, such as the Caspian Sea, the population density has not reached its maximum possible level. The process of further recolonisation by Mute Swans will continue if favourable living conditions are maintained and there is a fairly high population in the principal breeding grounds, such as the Volga delta, the Baltic republics, the region north of the Black Sea and others. The formation of breeding grounds in new areas occurs only as a result of constant emigration of birds from these regions.

The Future

In recent years in the USSR there has been a great interest from scientists and hunters in the phenomenon of a sharp increase in numbers and re-establishment of the range of the Mute Swan in the country. Some have suggested that swan-hunting be allowed. In connection with the necessity of forming one's attitude towards the species, I consider that Mute Swans should not be included on any list of hunted species under any circumstances. As far as Mute Swans and a number of other species are concerned, it is necessary to work out other ways of their usage, such as subjects for breeding and for export, for bird-watching, photography, or as indicators of habitat change, pollution etc. It is necessary to work out ways to regard these birds as sources of aesthetic enjoyment. The prolonged co-existence of people and swans is possible only by harmonising relations between swans and human society.

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