The Mute Swan in Europe – A preliminary assessment of numbers, distribution and potential risks in dissemination of HPAI – H5N1.

Simon Delany, Wetlands Internationmal, 14 February 2006

Numbers and distribution

There are two metapopulations of Mute Swan *Cygnus olor* in western Eurasia, divided for the purposes of conservation management into five populations, as follows:

Population	Population estimate	Population trend
Mainland NW & Central Europe	250,000	Increasing
Britain	37,500	Increasing
Ireland	10,000	Unknown
Total, NW & Central Eurrope	**297,500**	**Increasing**
Black Sea	45,000	Increasing
W & Central Asia, Caspian	250,000	Increasing
Total, Central Asia & SE Europe	**295,000**	**Increasing**

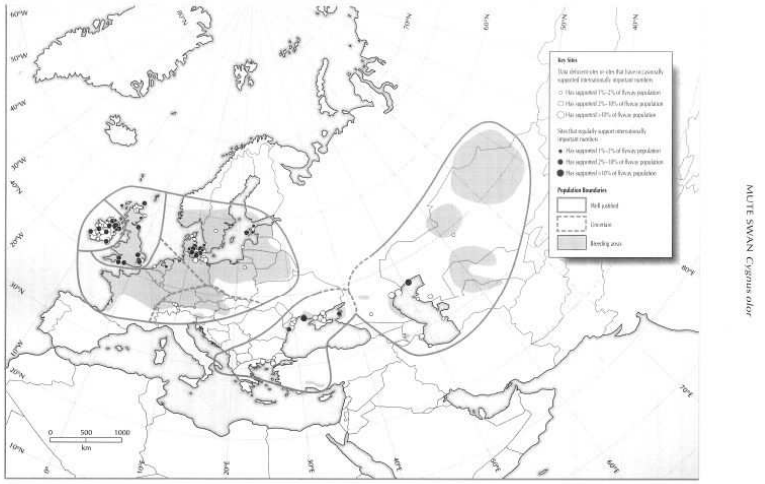
See Figure 1. Nearly all populations have been increasing for many years, although there are indications of a decrease in numbers of birds wintering around the Baltic since around 1990, which may be related to reductions in numbers breeding in Sweden and Lithuania. Recent information on the status of the Central Asia and SE Europe population is lacking, and the estimates for these populations have not been changed since 1996. Note that Figure 1. was produced in 1996 and that the general increase in numbers is likely to have affected the detailed distributions in the intervening years. For example, the number of Mute Swans wintering in Italy in normal winters increased from fewer than 500 in the early 1990s to nearly 2,500 in the early 2000s.

Most important countries and sites

The European country with the highest breeding population of Mute Swans is the UK, with an estimated 23,900 to 25,600 breeding pairs. Next most important is Russia with 15,000-20,000 pairs. The following countries (in rough order of importance) have an estimated 1,000-10,000 pairs: Germany, Ireland, Finland, Netherlands, Poland, Sweden, Denmark, Estonia, France and Lithuania. Romania has an estimated 750-1,000 pairs and all other countries are estimated to hold fewer than 1,000 pairs.

Mute Swans form some sizeable congregations during the winter months. The largest recorded by the International Waterbird Census (IWC) are on the northern Black Sea coast of Ukraine, where 14, 510 individuals were counted in the eastern Sivash in January 2000, and on the Baltic coast of Denmark where 14, 565 were counted at Lolland North-west in January 1994. Counts in the Baltic have decreased in recent years and 7,626 were counted at Lolland Northwest in January 2003. Between 1990 and 2004, 12 counts higher than 10,000 were submitted to the IWC database, of which seven came from sites in Denmark and five from sites in Ukraine. A count of 8,900 at the Meric Delta in Turkey in the cold weather of January 1999 indicates how this population migrates in response to abnormally cold winters.

The different populations of Mute Swans in Europe



Atlas of the Anatidae, Wetlands International

Movements
The north-west and central European population is largely sedentary, except in the east, where birds breeding in the Baltic region may move to the Baltic coast for the winter, and may be pushed further west by unusually cold winters. Some Polish birds move south and west into Central Europe for the winter.

The population found in Central Asia, southern and south-eastern Europe is more migratory, but again, movements are strongly influenced by the severity of winter weather. In most years, the bulk of the population breeding in the Black Sea region migrates short distances from inland breeding sites to the northern Black and Azov Sea coasts, although a small number of birds usually migrate further south to the Danube Delta, Turkey, the Balkan Peninsula and southern Italy. Birds breeding in the Caspian Sea region show a similar pattern of movement and most of the population stays close to the Caspian shore throughout the year. In hard winters, large movements of swans south to Azerbaijan and Dagestan have been recorded.

The current outbreak of HPAI H5N1 in Mute Swans in Europe
The recent outbreak of HPAI H5N1 in Mute Swans appeared more-or-less simultaneously in early February in Italy, in the southern regions of Puglia, Calabria and Sicily, in northern Greece near Thessaloniki, and in Bulgaria in the northwestern Province of Vilin and probably also Varna, on the Black Sea. The outbreak involved small numbers of birds, but was confirmed as involving H5N1on 11 February. On 12 February, Slovenia also reported a suspected case of H5N1 in a swan on the border with Austria. Reports on 15 February of an outbreak of H5N1 on the German Baltic island of Rűgen do not fit the pattern of the other recent outbreaks, and appear to involve a different population. The western Baltic, where Rűgen is situated is an important wintering area for Mute Swans and tens of thousands of birds spend the winter on the German and Danish Baltic coasts. If the outbreak spreads within this area, large numbers of birds might become infected. If infection continues into March, birds might be expected to carry the disease with them when they return to their breeding grounds in countries bordering the Baltic further to the east and north.

Previous outbreaks in S & E Europe
Outbreaks of H5N1 were reported between October and December 2005 from Russia, Romania, Croatia, Ukraine and Turkey. A majority of outbreaks in all these countries involved domestic poultry, but wild waterbirds, especially swans were also involved. At least 250 Mute Swans died of HPAI H5N1 in the Volga Delta on the north coast of the Caspian Sea in November 2005 and considerable numbers (probably hundreds, widely reported as being Whooper Swans) also died in the Danube Delta region of Romania. Small numbers of Mute Swans also died at fish ponds in Romania and Croatia in November 2005, where the use of infected poultry manure for fertilisation was suggested as being a possible cause. One of the birds in Croatia was ringed, and

had been seen a week earlier in Budapest, Huungary. This region, between Hungary and Croatia is on the border of the two European populations.

Possible causes of the current outbreak in swans in southern Europe

January 2006 was exceptionally cold throughout eastern Europe and there is little doubt that this has caused cold-weather movements of Mute Swans to the southern and western extremities of their normal wintering range in Europe. There has been growing evidence in recent weeks that wild birds are capable of transporting HPAI, and the recent outbreaks may add to the evidence that infected birds are capable of migration. This population of swans had already been infected with H5N1 earlier in the winter and it does seem likely that they have now transported the disease to the new outbreak sites.

Possible causes of the current outbreak in swans in northern Europe

The most recent outbreak of H5N1 on the German Baltic island of Rűgen does not fit this pattern. It seems possible that the birds involved may have taken an unusual migration route to the Baltic from the infected population in the Black Sea region. The distance involved is similar to the distance from the north Black Sea coast to the outbreak site in Sicily, but the direction, involving a strong northern component, is unusual and unexpected. It may be that birds were using a variation of the known migration route between central Europe and Poland. Alternatively, the inection might have come from a different, unknown source.

Future risks

- Swans are large, conspicuous birds living in open habitats, and dead birds stand a relatively high chance of being found. If other species were affected by this outbreak, the chances of finding corpses would be lower. The chances of an outbreak being undetected might be quite high for some species, especially inconspicuous ones which use densely vegetated habitats.
- Some Mute Swans associate closely with man, and the risk of infection of poultry by this species and vice versa is probably higher than for most waterbird species. The population of Mute Swans in eastern and southern Europe is usually wilder than its northern and western European counterpart, however, and this risk is likely to be higher if the disease spreads north into this population.
- Mute swans are not highly migratory, but the currently affected population will migrate back to the areas where they may have picked up the disease, and to their breeding range further east and north in Europe, mainly in Ukraine and Russia. Most infected birds would be expected to die, and the extent to which returning migrants will take the disease with them depends on the proportion of the population that can carry the disease without showing symptoms. This is currently unknown.
- It seems possible that birds from the Baltic region (Poland) may have migrated to central Europe because of the cold winter. If this is the case, the possibility exists that the two metapopulations of Mute Swans in Europe may have mixed in the past weeks, and that returning migrant swans might carry the disease into northern Europe. This is a possible explanation for the outbreak reported on Rűgen on 15 February, but the timing is perhaps earlier in the year than would be expected.
- Another possibility is that waterbirds of at least 30 species, which will migrate north and east through infected parts of southern Europe in March and April might mix with infected Mute Swans and become infected themselves. It seems possible that these infected waterbirds of other species could then migrate to nearly all parts of Europe, taking the disease with them. Unfortunately, the extent to which this mixing of species might cause onward transmission, and the species and sites that pose the greatest risk are not yet understood.