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HPAI H5N1 in a Whooper Swan (*Cygnus cygnus*)

in Scotland

Preliminary risk assessment for Great Britain

Working document

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1 Summary

A dead swan, found on the coast in Cellardyke, Fife, Scotland on 29th March 2006 tested positive for HPAI H5N1 virus. The swan, tentatively identified as a Mute Swan (*Cygnus olor*) at the time of collection, has now been identified by genetic fingerprinting as a Whooper Swan (*Cygnus cygnus*). While Mute Swans in the UK are largely sedentary, Whooper Swans are migratory and arrive in Scotland and North and East England from Iceland and Northern Europe. Therefore, we have reviewed our previous risk assessment of 7th April 2006, which was informed by the tentative identification of the swan as a Mute Swan, to take this new information into account.

We are still in a very dynamic and uncertain situation. There have been widespread and sporadic detections of HPAI H5N1 in dead wild birds in many locations across Europe over the past few months and further developments are likely.

Our previous risk assessments have concluded that there is an increased likelihood that the virus may be introduced to Great Britain. Apart from the single finding in the dead Whooper Swan washed up in the harbour in Fife, Scotland, on-going intensified surveillance across Great Britain has not identified any other positive live or dead wild bird. There is also no evidence that the virus is present in domestic poultry in Great Britain.

At the time of writing we do not consider that the new evidence on the species of dead swan significantly alters the outcome of our previous risk assessment. Our previous risk assessment concluded that the event in Fife, Scotland indicated that the level of risk had increased to the point that warranted housing of birds for a limited period of time within a specified region (established as the Wild Bird Risk Area – WBRA) outside the established surveillance zone was recommended. Measures have been introduced accordingly.

The intensified surveillance in the WBRA is directed at the early detection of any spread to other birds in the area where the positive case was found. The results to date are negative. Wild bird surveillance across Great Britain will continue in order to identify any disease outside this area, not only in swans but also in other susceptible wild bird species.

This risk assessment concludes that field studies (notably systematic surveillance of wild birds including those in the vicinity where the virus has been detected) should continue to ascertain whether the virus is present in Great Britain and to what extent swans and other susceptible species may play a role in the maintenance of the virus in nature and its potential transmission over greater geographic areas. This situation again emphasises the need for continuing comprehensive and careful observations of identified wild bird sites including the areas where Whooper swans may have been in Great Britain recently, collection of samples from susceptible live and dead wild birds, and field investigations in the currently identified areas (WBRA).

Future developments and the results of the continued intensified surveillance for AI viruses in Great Britain will be kept under constant review.

2 Disease Report in a Whooper Swan (*Cygnus cygnus*)

A dead swan was found on the 29th March 2006 on a slipway on the coast at Cellardyke, Fife, Scotland. The swan was tentatively identified as a Mute Swan (*Cygnus olor*), but there was uncertainty about this identification because of the state of decomposition of the bird's body. HPAI H5 was confirmed on 5 April 2006 in tissue samples using RT-PCR. HPAI H5N1 virus was confirmed on 6 April 2006 using virus isolation. DNA fingerprinting confirmed that the swan was a Whooper Swan (*Cygnus cygnus*) on 11th April 2006.

In accordance with a recent EU decision (European Commission, 2006), the Scottish Executive put in place on 6th April a Protection Zone (PZ) of 3km radius and a Surveillance Zone (SZ) of 10km. A Wild Bird Risk Area (WBRA) was also established within which free-range poultry is housed and extensive surveillance of dead wild birds is being carried out.

Genetic analyses on 11th April 2006 of the H5N1 HPAI virus isolated from the Whooper Swan indicate that it is very similar to the virus isolates obtained from swans from the Island of Ruegen, Germany and in Poland and the virus isolate from a Buzzard (*Buteo buteo*) in Denmark.

2.1 Situation assessment

As our risk assessments have previously indicated, the introduction of the virus to Great Britain would not be unexpected given our knowledge of migratory patterns of birds moving to the UK from the currently affected areas in western Europe.

Confirmation that a swan was a Whooper, rather than a Mute, provided new information which has required us to review our previous risk assessment of 7th April 2006, which was carried out on the tentative identification as a Mute Swan.

The Mute Swan is considered to be sedentary in the UK. Whooper Swans (*Cygnus cygnus*) are migratory. According to Robinson and others (2004) there are four breeding populations of Whooper Swan (*Cygnus cygnus*) in the Western Palearctic and Asia:

- a) The Iceland population which winters in Iceland, the UK and Ireland
- b) The Northwest Europe population which winters primarily in Denmark, Schleswig-Holstein and Mecklenburg (Germany), and the Netherlands
- c) A third population occurs in western Siberia, the Black Sea and eastern Mediterranean
- d) A fourth population in the Central Siberia/East Asia region (sometimes considered as two distinct populations).

The degree to which there may be exchange between these populations, and the flyways they use, are uncertain.

The vast majority of Whooper Swans that have been recorded in Ireland and the UK originate from Iceland (Robinson and others, 2004). Most of these birds winter in Ireland, England and Scotland while small numbers have been encountered in

mainland European countries bordering the southern North Sea. A few pairs that winter in the UK may breed in Scotland. This breeding population is usually less than five pairs.

The mid-winter census in the UK, Ireland and Iceland indicates that there were 20,900 swans in the Icelandic population in January 2000. Preliminary results from the January 2005 census suggest an increase in population size (WWT, unpublished data).

Some 200 Finnish breeding Whooper Swans may visit Great Britain while some 600 Icelandic Whooper Swans winter in continental Europe (Robinson and others, 2004).

Departure of Icelandic birds from Britain and Ireland to their breeding grounds commences during March and most birds have left for Iceland by early April. They may take between 12 hours and 4 days to complete the 800-1200km flight, usually at low altitudes over the sea (Robinson and others, 2004).

The dead swan was not ringed. Therefore it is not possible to say with confidence where it may have originated from and whether, for example, it was en-route to its breeding area in Iceland after wintering in the Baltic or western mainland Europe or from an area within the UK.

Molecular genetic studies of the virus isolated from the Whooper Swan in Scotland suggest that this isolate groups very closely with those viruses that have been detected in wild swans in Germany and Poland and a buzzard in Denmark.

Therefore, one possible option is that the infected swan may have originated from the affected region in the Baltic Sea where detections of the virus have been reported this year.

“During January 2006, cooler than average temperatures were observed in the Iberian Peninsula, Algeria, Alaska, Eastern Europe, and most of Asia with some anomalies exceeding -5°C. Temperatures were more than 3°C above average across Canada, the U.S., Scandinavia and the majority of China” (NCDC, 2006). Cold weather continued in the Baltic region in February and March. Whooper Swans on the continent are known to exhibit cold-weather movements and this may have resulted in movement to Great Britain. Whooper swans have tested positive for HPAI H5N1 virus in the Ruegen island outbreak.

No HPAI H5N1 virus was detected in any of the samples tested in any wild bird collected so far in Great Britain except the most recent detection in a Whooper Swan in Fife, Scotland. This could suggest that the virus is either not present in Great Britain or may be present only at a very low level that escapes detection. As a part of our wild bird surveillance initiated in autumn last year more than 4,500 samples have been collected from live and dead wild birds across Great Britain. Of these, approximately 600 Whooper Swans have been tested for the presence of the virus with negative results. Wild bird surveillance continues in Great Britain. In addition, there have been no reports of the detection of the virus in domestic poultry either by targeted surveillance or investigation of suspected cases of avian influenza in domestic poultry which include backyard poultry.

Whooper Swans are known to have a broad distribution in the UK. Nevertheless, they appear to have a high degree of winter site fidelity although they can be locally highly mobile, congregating during the night and dispersing 10 to 15km to forage

during the day. They mainly forage on arable and agriculturally-improved pasture (Robinson and others, 2004). Whooper Swans typically share habitat with a range of other wildfowl species.

So far, intensive investigation in specified areas (WBRA) in Scotland has not detected the presence of the virus. This area covers the Loch Leven, considered to be the main site for Whooper Swans in the area. Robinson and others (2004) consider that Whooper Swan numbers peak at this loch at the end of winter. Their feeding grounds are in the surrounding farmland areas. Long-term monitoring has recorded up to 150 Whooper Swans at this site. They share habitat with some 500 Mute Swans and thousands of other wildfowl (Collier and others, 2005).

3 Conclusions

We are still in a very dynamic and uncertain situation. There have been widespread and sporadic detections of HPAI H5N1 in dead wild birds in many locations across Europe over the past few months and further developments are likely.

Many uncertainties still remain with regard to the geographic distribution of the virus in Asia, Europe, Africa and beyond and further developments are likely. Our previous risk assessments have considered that the virus may be introduced to Great Britain at some point in the future.

Apart from the single finding in a dead Whooper Swan washed up in the harbour in Fife, Scotland, on-going intensified surveillance across Great Britain has not identified any other positive live or dead wild bird. There is also no evidence that the virus is present in domestic poultry in Great Britain.

At the time of writing we do not consider that the new evidence on the species of dead swan significantly alters the outcome of our previous risk assessment. Our previous risk assessment concluded that the finding of an infected dead swan in Fife, Scotland, indicated that the level of risk had increased to the point that warrants the housing of birds for a limited period of time within a specified region outside the established surveillance zone. These measures have been introduced accordingly.

The intensified surveillance in the WBRA is directed to early detection of spread to other birds in the area local to where the positive case was found and results to date are negative. Wild birds surveillance across Great Britain will continue in order to identify any disease outside this area, not only in swans but also in other susceptible wild bird species.

This risk assessment concludes that field studies (notably systematic surveillance of wild birds including in the vicinity where the virus has been detected) should continue to ascertain whether the virus is present in Great Britain and to what extent swans and other susceptible species may play a role in the maintenance of the virus in nature and its potential transmission over greater geographic areas. This situation again emphasises the need for continuing comprehensive and careful observations of identified wild bird sites, collection of samples from susceptible live and dead wild birds including in areas where Whooper swans may have been in Great Britain recently, collection of samples from susceptible live and dead wild birds, and field investigations in the currently identified areas (WBRA).

Future developments and the results of the continued intensified surveillance for AI viruses in Great Britain will be kept under constant review.

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