

# INTERNATIONAL ANIMAL HEALTH DIVISION

International Animal Disease Monitoring Team

Qualitative Risk Assessments

[www.defra.gov.uk/animalh/diseases/monitoring/index.htm](http://www.defra.gov.uk/animalh/diseases/monitoring/index.htm)



Ref: VITT1200/AI-H5-TURKEY

Version No.:	1.1
Date:	18 October 2005

## HIGHLY PATHOGENIC AVIAN INFLUENZA (H5N1) IN WESTERN TURKEY H5 IN ROMANIA

Dr Mirzet Sabirovic  
Simon Hall  
Dr Peter Grimley  
Dr Nick Coulson  
Fred Landeg

**DISCLAIMER:** IAHD reserves the right to update this publication and make changes to the outcomes at any time if new information become available following this release. The update will be carried out without prior notice. This publication or any related updates are published at the Defra's website above. This publication and any subsequent update, if available, may be used free of charge in any format or medium provided it is used accurately and not used in a misleading context. The material must be acknowledged as crown copyright and the title of the publication specified.

**Suggested reference for this publication:**

Defra, (2005). Highly Pathogenic Avian Influenza (H5N1) in Western Turkey and H5 in Romania (Authors: Sabirovic, M., Hall, S., Grimley, P., Coulson, N., Landeg F.), International Animal Health Division, 1A Page Street, London, SW1P 4PQ, United Kingdom. Version 1.1, Released 18 October 2005, pp. 14

**©Crown copyright**

Copyright in the typographical arrangement and design rests with the Crown

## Table of Contents

<b>1</b>	<b>SUMMARY .....</b>	<b>3</b>
<b>2</b>	<b>INTRODUCTION .....</b>	<b>4</b>
<b>3</b>	<b>HAZARD IDENTIFICATION .....</b>	<b>4</b>
3.1	OUTBREAK OF H5 IN TURKEY – OFFICIAL DISEASE REPORTS.....	4
3.2	OUTBREAK OF H5 IN ROMANIA – OFFICIAL DISEASE REPORTS.....	5
3.3	OTHER RECENT REPORTS .....	5
3.3.1	<i>Hazard to be considered.....</i>	<i>5</i>
<b>4</b>	<b>RISK ASSESSMENT .....</b>	<b>5</b>
4.1	RELEASE ASSESSMENT .....	5
4.1.1	<i>Terms and definitions.....</i>	<i>5</i>
4.1.2	<i>Migrating waterbirds.....</i>	<i>6</i>
4.1.2.1	Waterbirds migration – major flyways .....	6
4.1.2.2	Identifying possible pathways .....	7
4.1.2.3	Migration of waterbirds to the UK.....	9
4.1.2.4	Commentary on migrating birds .....	10
4.1.2.5	Conclusion on migrating birds.....	10
4.1.3	<i>Legal trade.....</i>	<i>11</i>
4.1.3.1	Importations .....	11
4.1.3.2	Importation to UK of captive birds from third countries not known to be affected. ....	11
4.1.3.3	Importation to the UK of poultry and game birds through intra-community trade from EU Member States .....	12
4.1.3.4	Commercial imports of live captive birds from EU Member States	12
4.1.3.5	Pigeon racing .....	12
4.1.3.6	Imports of pet birds .....	12
4.1.3.7	Other possible pathways.....	13
4.1.3.7.1	Illegal trade .....	13
4.1.3.7.2	Movements of people. ....	13
4.1.4	<i>Conclusions on legal trade and other possible pathways.....</i>	<i>13</i>
<b>5</b>	<b>REFERENCES .....</b>	<b>14</b>

# 1 Summary

Highly pathogenic avian influenza type H5N1 has been detected in Turkey and possibly Romania. It is not certain how it was introduced to these countries although migration of wild waterbirds from Siberia has been implicated.

This is a new epidemiological development because it provides circumstantial evidence that wild birds can be capable of carrying highly pathogenic avian influenza over long distances. It is now uncertain how widespread H5N1 may be in the Black Sea region.

Known bird migration routes do not provide a strong direct link from the Black Sea to the UK, but we do not have a comprehensive knowledge of all bird migration. There are possibilities for indirect contact, for example, birds which have travelled from Siberia may contact birds destined for the UK when overwintering in Africa. Defra is working with ornithologists in the UK on this issue.

Our estimate of the likelihood of the introduction of H5N1 to the UK by migrating birds has therefore increased but remains low given the circumstantial evidence and official information that is currently available.

Legal imports from countries known to be affected have been banned. Other means of introduction are illegal imports and movement of humans. These are difficult for government to control. They continue to present a low likelihood which should be addressed by biosecurity measures and advice to the public within the UK.

There is also a possibility that intra-community trade in live birds from a premises where disease may have been introduced but remains undetected would present a low likelihood of disease introduction to the UK. H5N1 is not currently known to exist in the UK or any other EU member state. All EU Member States are understood to have effective systems for disease surveillance, notification and reporting. Currently, this risk remains negligible but could change if disease is detected within the EU.

## 2 Introduction

This qualitative risk assessment considers the likelihood of the introduction of highly pathogenic avian influenza (HPAI) to the UK following outbreaks of avian influenza (AI) serotype H5N1 in Western Turkey and H5 in Romania.

It builds on the previous qualitative risk assessment on migratory birds in Central Asia. That risk assessment concluded that there was an increased (but still low) likelihood of the introduction of H5N1 virus by migratory waterbirds from the affected region to the UK during the migratory season. However, that risk assessment indicated that the estimate should be viewed in the context of the lack of epidemiological evidence and uncertainties regarding wild birds in the breeding grounds of Russia (Defra, 2005).

## 3 Hazard identification

### 3.1 Outbreak of H5 in Turkey – Official Disease Reports



Turkey has reported an outbreak of avian influenza to the European Commission.

The outbreak occurred in an open-air turkey farm with 1800 turkeys, 1700 of which died after the first clinical signs were detected on 1 October. All remaining birds on the farm and in the village have been killed and all carcasses destroyed.

Disinfection has been applied. The farm is located in the Region of Balikesir, in the north-western part of Anatolia (see map). It is near to an area supporting large numbers of waterbirds in the Kus Lake. Laboratory tests have given positive results for highly pathogenic avian influenza H5N1 virus.

The origin of the outbreak is unknown. Turkey has taken appropriate disease control measures in the affected area. The affected flock has already been stamped out and the farm was cleaned and disinfected. There is currently no information on die-off of wild birds in the area or whether wild birds in the area may be infected (Pakdil, 2005).

The Turkish authorities have already slaughtered all poultry in the affected area to limit the spread of the disease while the EU has banned imports of birds and poultry products.

## 3.2 Outbreak of H5 in Romania – Official Disease Reports

A suspected outbreak of AI was reported in back yard poultry in the eastern part of Romania (Ceamurlia-de-Jos, Tulcea County). It is near to an area supporting large numbers of waterbirds in the Danube Delta. As a precautionary measure, the Romanian authorities have taken appropriate control measures including stamping out (Predoi, 2005).

The complete identification of the virus serotype is underway, but H5 virus has been isolated.

## 3.3 Other recent reports

A high mortality in wild waterbirds (wild ducks) has been reported in Iran (Poldasht, coast of Arras, West Azerbaijan province) (Sayari, 2005). There is currently no information on tests that may have been carried out.

There were recent media reports on suspected AI in three wild birds found dead in north-east Bulgaria. The Bulgarian authorities have informed the European Commission that the preliminary (post-mortem) examination of these birds does not suggest infection with AI. However, further laboratory tests are underway. As a precautionary measure Bulgaria has stepped up surveillance on wild birds in the area (European Commission, 2005).

### 3.3.1 Hazard to be considered

Until complete laboratory findings are available in respect of disease in Turkey and Romania, this risk assessment assumes that HPAI virus of H5N1 serotype is involved in these outbreaks and that migratory waterbirds are one potential source of infection.

## 4 Risk assessment

### 4.1 Release Assessment

#### 4.1.1 Terms and definitions

This release assessment considers the likelihood of HPAI virus introduction to the UK from the affected region including Turkey, Romania and more generally around the Black Sea. For the purpose of the release assessment (Section 4.1) the following definitions will apply:

Term	Definition
<b>HPAI</b>	<i>"HPNAI viruses have an IVPI in 6-week-old chickens greater than 1.2 or, as an alternative, cause at least 75% mortality in 4-to 8-week-old chickens infected intravenously. H5 and H7 viruses which do not have an IVPI of greater than 1.2 or cause less than 75% mortality in an intravenous lethality test should be sequenced to determine whether multiple basic amino acids are present at the cleavage site of the haemagglutinin molecule (HA0); if the amino acid motif is similar to that observed for other HPNAI isolates, the isolate being tested should be considered as HPNAI" (OIE, 2005)</i>
<b>Waterbirds</b>	<i>"Means those species of birds that are ecologically dependant on wetlands for at least part of their annual cycle..." (UNEP, 2005)</i>

For the purpose of the release assessment (Section 4.1) the following terminology will apply (OIE, 2004):

Term	Definition
<b>Likelihood</b>	Probability; the state or fact of being likely
<b>Likely</b>	Probable; such as well might happen or be true; to be reasonably expected
<b>High</b>	Extending above the normal or average level
<b>Highly</b>	In a higher degree
<b>Low</b>	Less than average; coming below the normal level
<b>Negligible</b>	Not worth considering; insignificant
<b>Remote</b>	Slight, faint
<b>Would</b>	To express probability; past of Will: expressing a wish, ability, capacity, probability or expectation

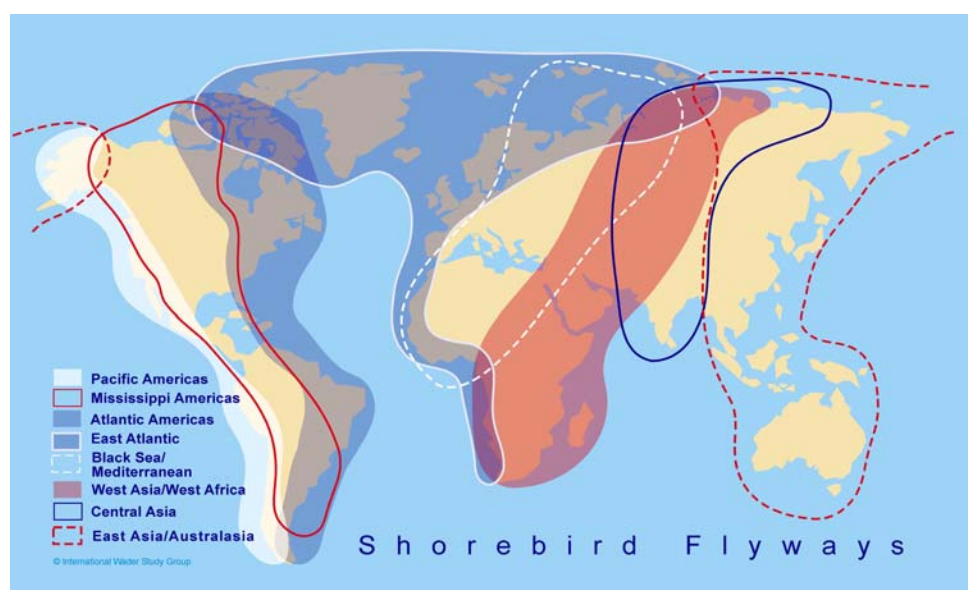
## 4.1.2 Migrating waterbirds

### 4.1.2.1 Waterbirds migration – major flyways

Wetland habitats in Siberia support large numbers of breeding waterbirds, many of which migrate in the autumn to wintering areas in Europe, Africa, India and East and South-East Asia using various routes (“flyways”) (BirdLife International, 2005, Defra, 2005).

As mentioned in our previous risk assessment (Defra, 2005), the principal flyways for migratory waders (shorebirds) of Eurasia (Hötcker and others, 1998; Stroud and others, 2004) are:

- The East Atlantic Flyway
- The Black Sea/Mediterranean flyway,
- The West Asia/West African flyway
- The Central Asia/India flyway,
- The East Asian-Australasian flyway.



(Map from: Stroud and others, 2004)

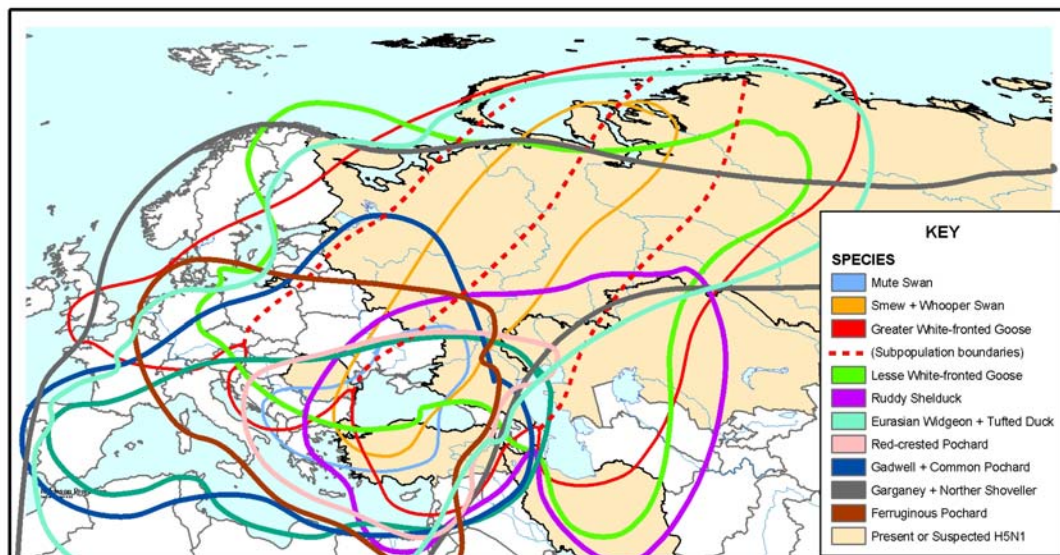
#### 4.1.2.2 Identifying possible pathways

As a starting point, a number of pathways have been considered to determine whether waterbirds from southern Russia and northern Russia are likely to migrate to the UK.

The Volga Basin and North Caspian regions are considered cross-roads for migratory waterbirds that use four major routes in Eurasia and East Europe. These two regions host the vast majority of migratory birds which are nesting in Eastern Fennoscandia, Northern-Central territories of the Russian plain, Ural and parts of western Siberia on their way to overwintering grounds in east Africa. A small proportion of these birds overwinters in south-western Asia. (Lvov and others 2001).

The following four maps outline very broad north to south migratory routes of ducks, geese and swans from southern Siberia. **NOTE:** Maps in this report were prepared by IAHD staff and are based on information sourced from Wetlands International (Scott & Rose, 1996). They do not necessarily reflect the true situation. They should be regarded as indicative rather than as a definitive reflection of migratory flyways between Siberia and Europe. The maps were produced using ESRI Data and maps CD - 2002.

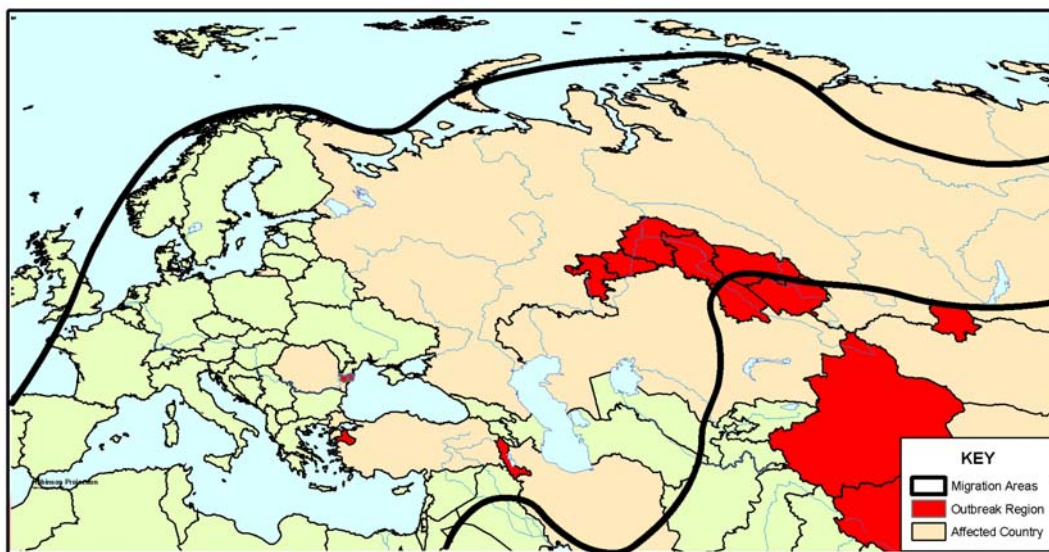
As indicated on the map below, there may be some limited mixing of the waterbird populations from four major flyways in northern Russia. However, it is uncertain at this stage whether there is any significant geographic and temporal overlap of waterbird populations in northern Russia and, hence, any mixing of waterbird populations that migrate from both European and Asian overwintering grounds to the breeding grounds in Russia. Some species of ducks appear to migrate from their breeding grounds in southern Siberia to the area around the Volga Basin and the Caspian Sea region. This map indicates the complexity of the situation and highlights difficulties in interpretation.



ArcGIS 8 Development Team  
March 2000  
Source: ESRI Data & Maps CD  
Created in ArcGIS 8 using ArcMap

**Waterfowl Migration In Europe  
and western Asia**

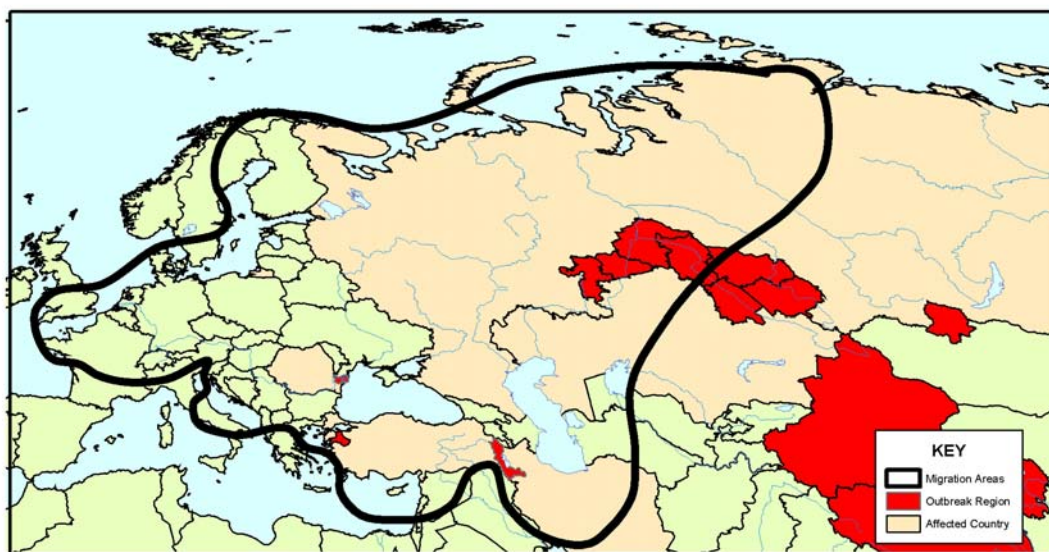




ArcGIS 8 Development Team  
 March 2000  
 Source: ESRI Data & Maps CD  
 Created in ArcGIS 8 using ArcMap

### Duck Migration In Europe and western Asia

Data from Scott & Rose (1996)  
 Map by IAHD - IADM  
 12 October 2005

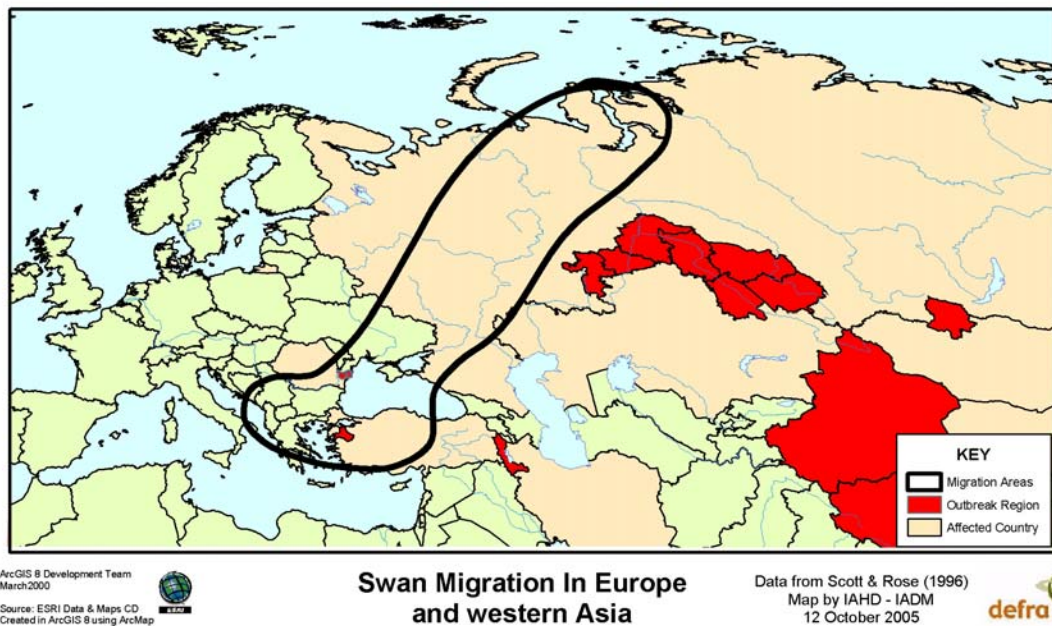


ArcGIS 8 Development Team  
 March 2000  
 Source: ESRI Data & Maps CD  
 Created in ArcGIS 8 using ArcMap

### Goose Migration In Europe and western Asia

Data from Scott & Rose (1996)  
 Map by IAHD - IADM  
 12 October 2005





#### 4.1.2.3 Migration of waterbirds to the UK

Ringed recoveries (Wernham and others, 2002) show that there may be limited movement of birds between the UK and southern Russia. The extent and regularity of such movement are uncertain. Therefore, these data should be treated as preliminary and with caution.

With regard to these limited movements, it is considered highly unlikely that some of the extreme eastern recoveries of UK birds have travelled that far in a single winter. However, it is possible that they may have paired with different mates in different breeding seasons and their wintering and breeding grounds and may have moved progressively east over a period of several years. Although the UK may play host to only a very limited proportion of these species' populations during the winter, the majority of individuals breeding in Russia are highly unlikely to reach Britain because they winter further east in Europe (for example in the Mediterranean) or in the Baltic for some species (Cromie, 2005). Nevertheless, it needs to be emphasised that detailed, comprehensive information on tracking the birds is not available.

Anatidae (ducks, geese and swans) have different migration systems (Scott and Rose 1996; Miyabayashi and Mundkur 1999). For ducks especially, flyways tend to be poorly defined. Migration occurs on a broad front, typically between a number of wetland staging areas (See also Stroud *et al.* 2005 for a recent review of migratory waterbird biogeographic populations).

Around 5 million waterbirds are present in Britain in winter. While some species are resident in the UK (i.e. birds present in winter that have bred here) many species arrive in the UK from arctic areas of North America, Greenland, Iceland, Fenno-Scandia and further east in northern Russia. Many of the waterbird species or populations wintering in the UK derive from northern (arctic or sub-arctic) areas and

are highly unlikely to act as carriers of the virus to the UK from the current outbreaks in central Asia. Further, several species of wildfowl have a marine distribution during winter, and, remaining at sea, will therefore not come in to contact with farms or domestic livestock (Cromie, 2005).

#### **4.1.2.4 Commentary on migrating birds**

On two occasions in the recent past, HPAI (H5N1) virus was isolated during outbreaks in wild migratory waterbirds reported in China in May 2005 and Mongolia in August 2005. No further outbreaks in wild migratory waterbirds in the affected areas have been reported since. The H5N1 presence has been detected in village poultry in several areas east of Urals (southern Russia). Migratory waterbirds were suspected as a potential source of infection (Defra, 2005). There are currently no official reports that H5N1 is present west of Urals (Western Russia).

Our previous risk assessment emphasised that caution is required when generalising trends that may relate to carriage of the HPAI H5N1 virus or any other HPAI virus to different regions or countries because wild migratory waterbirds use different routes (flyways). Systematic studies are therefore required to understand these routes, the species susceptibility, pathogenesis and ecology of the virus.

As it currently stands, it appears that H5N1 virus is either quickly spreading over large geographic areas by migratory waterbirds or some other ways (e.g. illegal movements), or it may have been present in many areas of the world at a very low level and escaped detection due to the absence in the past of sophisticated diagnostic tools that are available now.

The UK experienced two outbreaks of HPAI H5N1 virus in the past. The first outbreak occurred in a flock of chicken in Scotland in 1959. The second outbreak occurred in a flock of Turkeys in England in 1991. These outbreaks were limited to the affected flock only. There were no reports of the disease in humans during these outbreaks. These outbreaks were detected quickly due to sudden and high mortality associated with the introduction of the virus and effectively dealt with at the time resulting in no further spread. It is, however, not known what the potential source of the virus may have been, although the viruses in these earlier outbreaks are different to the virus currently present in Central Asia.

#### **4.1.2.5 Conclusion on migrating birds**

Given recent isolations of H5N1 virus from a very small number of dead migratory birds in China and Mongolia, the outbreak of H5N1 in western Turkey (Asian part of the country) raises concerns that the H5N1 virus may be on its way to Europe via migratory waterbirds.

Recent experience has also demonstrated that the H5N1 virus is likely to cause the death of migratory birds as a result of infection. However, limited experimental evidence suggests that the virus may be able to infect migratory ducks without causing overt clinical signs. This is yet to be proven in field conditions.

The maps in this document indicate that the major migration routes are largely north-south in autumn and south-north in the spring. Turkey and other countries in the region (Eastern Europe, south Europe) may be on the path of these migration routes.

It is uncertain whether any movements from east to west and vice versa occur and to what extent, if so. Nevertheless, the confirmed outbreaks of H5N1 in Turkey has increased the likelihood that the virus may be present in other countries in the Black Sea region including some countries in Europe.

Defra has consulted ornithological experts. This indicates that the normal flyway patterns for migrating birds would not usually include direct movement of waterbirds from Turkey to the UK. The majority of birds from Turkey and the Danube Delta will either spend the winter there or disperse southwards.

We continue to monitor developments and will re-assess the situation when required.

### **4.1.3 Legal trade**

#### **4.1.3.1 Importations**

Imports of all live birds and their products from countries affected with H5N1 have been banned. They will not be admitted through any UK Border Inspection Posts (BIPs) and the same should apply at any EU border. Therefore, direct importation to the UK of live birds and products from a third country known to be affected, or indirect importation to the UK of live birds and products from a third country known to be affected through another Member State to the UK is highly unlikely to occur.

Processed feathers and, for some countries, processed (cooked) poultry meat are exceptions to the general ban. It is unlikely that the raw material would have been contaminated and they have been heat treated to destroy any virus present.

#### **4.1.3.2 Importation to UK of captive birds from third countries not known to be affected.**

Imports of captive birds (typically for the pet trade) are normally permitted from any country which is a member of the World Organisation for Animal Health (OIE). This could include Asian or African countries where H5N1 virus has been introduced but has not yet been detected.

Captive birds must enter the EU through a BIP; they may only be admitted if they comply fully with EU import conditions. They must then go directly to an approved quarantine unit where they are isolated for 30 days and tested for haemagglutinating viruses (avian influenza and Newcastle disease).

This procedure should ensure that avian influenza is not introduced to birds in the UK but workers in the quarantine unit could be at risk so it is reasonable to suspend imports from countries believed to be affected. The health certificate also requires that AI and Newcastle disease have not been detected within 10km of the premises of origin for past 30 days prior to export

#### **4.1.3.3 Importation to the UK of poultry and game birds through intra-community trade from EU Member States**

Much trade is in high health status breeding birds or commercial poultry which should have been kept under conditions of high biosecurity. However, game birds (including ducks) could be wild caught or reared in open pens. The recent Newcastle disease outbreak in pheasants legally imported to the UK from France highlights the risk that disease may enter a holding and that birds may be traded before the disease is detected.

The official veterinary services responsible for the holding of origin certify that the birds to be consigned are free from notifiable disease. They then notify the local Animal Health Divisional Office at the point of destination in the UK so that post-import checks may be carried out. This is done using the TRACES computer system. In Great Britain, the State Veterinary Service checks a proportion of consignments based on risk.

#### **4.1.3.4 Commercial imports of live captive birds from EU Member States**

Captive birds (other than psittaciformes and poultry of any species) intended for 'exhibition, show or contest' may be traded from a registered establishment in a member state on the basis of an owner's self-certificate. These include waterbirds. It is more likely that undetected infection could be present in such birds than for farmed poultry because there is no pre-export veterinary inspection or certification.

This trade would appear to present a low likelihood of the disease being introduced into the UK while there is no evidence of H5N1 being present in other EU Member States.

#### **4.1.3.5 Pigeon racing**

The 2005 racing season has now finished. Racing takes place from April to October. Birds are released in western Europe to fly home to the UK. In the event of H5N1 being confirmed in an EU Member State restrictions would have to be considered proportionate to the risk.

#### **4.1.3.6 Imports of pet birds**

Imports of pet birds are not subject to harmonised EU rules. Great Britain requires 35 days domestic quarantine and two official veterinary inspections after arrival (but no tests) for birds from all countries.

Individual import licences are issued by local Divisional Veterinary Managers. No central record is kept of these licences.

Other Member States set their own conditions for pet bird imports. It is possible that another Member State may admit a pet bird from a high risk country (other than one which has an explicit ban) with minimal conditions. However, our licensing system

should ensure that further movement to the UK would present negligible risk provided that these rules are complied with.

#### **4.1.3.7 Other possible pathways**

##### **4.1.3.7.1 Illegal trade**

There is always the possibility of illegal imports from the affected countries. UK Customs have been alerted to the risks from avian influenza.

##### **4.1.3.7.2 Movements of people.**

Movements of people could transmit disease by transferring infected bird faeces (on footwear for example) or through themselves being infected.

Categories of people which could present a risk include:

- UK farm workers on holiday to high risk countries,
- Migrant workers from high risk countries working on UK livestock farms
- Military personnel,
- Tourists, particularly any staying in the countryside or visiting bird markets,
- Hunters, birdwatchers or anyone else who goes out of their way to contact wildlife and who may contact birds in the UK.

#### **4.1.4 Conclusions on legal trade and other possible pathways**

There is an increase in the likelihood that wild waterbirds could introduce H5N1 virus to a holding in Europe because of geographical closeness to the affected area in Turkey and possibly Romania.

With regard to legal trade, the EU has banned imports of poultry and poultry products from all countries believed to be affected by H5N1 so far, including Turkey and Romania. Procedures are in place to ensure that legal trade in birds and bird products presents negligible risk of introducing notifiable disease to the UK.

GB customs have had increasing success in intercepting illegal imports. However, smuggling can never be excluded completely.

Given the new epidemiological developments with H5N1 and uncertainties associated with its spread, the EU rules could be reviewed to ensure that all possible risk pathways have been appropriately considered.

Defra and the Department of Health are working together to ensure that the risk of human transmission to poultry is addressed adequately through biosecurity on farms and other places where poultry are kept.

## 5 References

- BirdLife International, (2005). Saving Asia's Threatened Birds: Country Summaries. Accessed 12 October 2005 ([http://www.birdlife.org/action/science/species/asia\\_strategy/countries.html](http://www.birdlife.org/action/science/species/asia_strategy/countries.html))
- Cromie, R. (2005). The Wildfowl & Wetlands Trust, Slimbridge, Glos GL2 7BT, UK./ Personal communication, 23 August 2005).
- Defra, (2005). Highly Pathogenic Avian Influenza (H5N1): Migratory waterbirds in Central Asia, An update and commentary (Authors: Sabirovic, M., Grimley, P., Hall, S., Wilesmith, J., Coulson, N.) Accessed 12 October 2005 (<http://defraweb/animalh/diseases/monitoring/pdf/ai-asia170805.pdf>).
- European Commission, (2005). Further information on avian influenza in Bulgaria. Health and Consumer Protection Directorate General, Brussels, E2 BVG (05) D/521831, Urgent Fax N.6, 12 October 2005. Received 12 October 2005.
- Hötker, H., Lebedeva, E., Tomkovich, P.S., Gromadzka, J., Davidson, N.C., Evans, J., Stroud, D.A., West, R.B. (eds.) (1998). Migration and international conservation of waders. Research and conservation on North Asian, African and European flyways. *International Wader Studies* 10. 500 pp.
- Lvov, D.K., Yamnikova, S.S., Gambaryan, A.S., Fedaykina, I.T., Matroshevich, M.N. (2001). Isolation of influenza viruses from wild birds in the Volga River Basin and in the North Caspian Region, *International Congress Series*, 1219, 251-258.
- Miyabayashi, Y. & Mundkur, T. 1999. Atlas of key sites for Anatidae in the East Asian Flyway. Wetlands International - Japan, Tokyo and Wetlands International - Asia Pacific, Kuala Lumpur. 148 pp.
- Pakdil, N. (2005). Avian Influenza in Turkey. 051010TUR - OIE Alert message. Office International des Epizooties, 12 rue de Prony, Paris, France. Email received on 10 October 2005.
- OIE, (2005). Chapter 2.7.12: Avian Influenza. Terrestrial Animal Health Code, 14<sup>th</sup> Ed., Office International des Epizooties, 12 rue de Prony, Paris, France. Accessed 12 October 2005 ([http://www.oie.int/eng/normes/mcode/en\\_chapitre\\_2.7.12.htm](http://www.oie.int/eng/normes/mcode/en_chapitre_2.7.12.htm))
- OIE, (2004). Handbook on Import Risk Analysis for Animals and Animal Products. Vol.1. Office International des Epizooties, 12 rue de Prony, Paris, France.
- Predoi, G. (2005). Avian Influenza in Romania. 051010ROM - OIE Alert message. Office International des Epizooties, Paris France. E-mail received on 10 October 2005.
- Sayari, M. (2005). High mortality observed in wild birds in Iran. 051012IRN - OIE Alert message. Office International des Epizooties, Paris, France. E-mail received 12 October 2005.
- Scott, D.A., Rose, P.M. (1996). Atlas of Anatidae populations in Africa and Western Eurasia. *Wetlands International Publication*, 41. Accessed 12 October 2005 (<http://www.wetlands.org/IWC/wpal&swa/atlas/AEAatlas.htm>)
- Stroud, D.A., Scott, D., Rose, P. (2005). Guidance on definition of waterbird biogeographical populations. Information paper for the third Meeting of Parties to the African-Eurasian Waterbirds Agreement. Accessed 31 August 2005 ([www.unep-awea.org/meetings/en/mop/mop3\\_docs/word-docs/mop3\\_12\\_guidance\\_biographical\\_population\\_waterbird.doc](http://www.unep-awea.org/meetings/en/mop/mop3_docs/word-docs/mop3_12_guidance_biographical_population_waterbird.doc))
- Stroud, D.A., Davidson, N.C., West, R., Scott, D.A., Hanstra, L., Thorup, O., Ganter, B., Delany, S. (compilers) on behalf of the International Wader Study Group (2004). Status of migratory wader populations in Africa and Western Eurasia in the 1990s. *International Wader Studies*, 15: 1-259. ([www.waderstudygroup.org](http://www.waderstudygroup.org))
- UNEP, (2005). Convention on migratory species, New Delhi, 10-13 June, 2005. Agenda Item 6.0., CMS/CAF/5, 17 March 2005. Accessed 12 October 2005 ([http://www.cms.int/bodies/meetings/regional/site\\_network/pdf/Inf\\_06\\_Proposed\\_CAF\\_ActionPlan.pdf](http://www.cms.int/bodies/meetings/regional/site_network/pdf/Inf_06_Proposed_CAF_ActionPlan.pdf))
- Wernham, C.V., Toms, M.P., Marchant, J.H., Clark, J.A., Siriwardena, G.M. & Baillie, S.R. 2002. *The Migration Atlas: Movements of the Birds of Britain and Ireland*. T. & A.D. Poyser, London, UK. 884 pp.