be severely affected by HPAI H5N1 **http://www.cms.int/news/PRESS/nwPR2005/pressrelease_AvianFlu_final_24_10_05.pdf**.
Separate research in the EU has identified 26 species at higher risk of both catching and spreading avian influenza **http://ec.europa.eu/environment/nature/nature_conservation/focus_wild_birds/avian_influenza/index_en.htm.** This data is now available to help land managers in Europe respond to future emergencies.

7. What science needs to explore further about the role of migratory waterbirds

We need improved international analysis of existing waterbird satellite telemetry, ringing (banding) and count data. This must synthesise information on the **routes and timing of waterbird migration**, especially of poorly known intra-African migrants, and birds using Central Asian, Asia-Pacific and Neotropical flyways. We need to strengthen bird research worldwide, especially in areas where little or no ringing and counting schemes have operated in the past. We need to publish the results of these studies and other relevant data in new flyway atlases available on the Internet. We need targeted international ringing, colour-marking and satellite telemetry programmes for waterbird species likely to be at higher risk of carrying HPAI H5N1. We need better and integrated data on **trade** in domestic poultry and other birds to build epidemiological models.We need to increase research on various aspects of the **epidemiology and ecology** of H5N1 in wild bird populations and in the environment. These aspects include:

- Prevalence of H5N1 in various wild bird populations.
- Ecology of the virus in the environment.
- Natural mortality rates in wild bird populations.
- Identification of Higher Risk Species i.e. those with high susceptibility to H5N1 and which have a relatively higher risk of spreading it.

We need research on the behaviour and ecology of those migratory and non-migratory bird **species living in close association with man**, which might act as a 'bridge' for the transmission of HPAI between waterbirds and poultry. Such research should aim to develop practical guidance on ways and means of reducing this risk.

8. What governments are encouraged to do

All countries should undertake transparent, structured, science-based **risk assessments** that make use of all available knowledge. The communication of web-links to national or other assessments via a single **clearinghouse mechanism** would be helpful. Governments can help
to strengthen HPAI field surveillance of wild birds and enhance the understanding of wild bird migration and use of important sites during migration. To this end, the further building of national capacity to develop and implement field programmes for AI surveillance and to develop waterbird monitoring would be assisted by the development of training courses and relevant capacity building, especially involving international collaboration with existing centres of expertise (such as FAO and Wetlands International). The donor community has an important ongoing role to play in funding all these activities in developing countries.
Governments are also urged to:

- Avoid unjustified and counter-productive measures such as culling of wild birds and destruction of the natural habitats on which they depend, such as wetlands;
- Avoid closing of wetland or other protected areas, except where absolutely necessitated by a continuing H5N1 outbreak. Wholesale reserve closure is of limited value in disease control and is highly detrimental to conservation;
- Communicate to the public that it continues to be entirely safe to visit wetland protected areas, in the absence of an H5N1 outbreak at the site; and
- Work with site management and veterinary authorities to ensure regular and effective site monitoring, aimed at rapid detection and reporting of any potential H5N1 outbreak.

Members of the Scientific Task Force on Avian Influenza:

Observers of the Scientific Task Force on Avian Influenza:

Imprint

International Scientific Task Force on Avian Influenza.
Visit us on http://www.aiweb.info

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Avian Influenza and Wild Birds

What is their actual role in the spread of the virus?

Sponsored by agriculture, nature and food quality

What is the International Scientific Task Force on Avian Influenza and Wild Birds?

In 2005, media and public concerns grew about the role of migratory birds as potential vectors of the Asian lineage Highly Pathogenic Avian Influenza virus subtype H5N1 (HPAI H5N1), which was then spreading from Asia towards Europe and Africa. The UNEP Convention on Migratory Species (CMS) in close cooperation with the UNEP Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA) established a Scientific Task Force on Avian Influenza and Wild Birds as a liaison mechanism between various intergovernmental and other bodies knowledgeable about the relationship between wild birds and the disease. The Task Force (TF), now 14 strong, aims to obtain the best scientific advice on the conservation impact of the spread of HPAI H5N1, including assessing the potential role of migratory birds as vectors of the virus. It has issued advice on the root causes of the spread of this disease and has promoted the development of international 'early warning' systems. The TF promotes objective information on the role of wild birds as vectors of HPAI H5N1, and tries to avoid overreaction by decision/policy makers that could be detrimental to the conservation of waterbird species and their habitats.

The Task Force comprises representatives and observers from 14 international organisations, including four UN bodies, specialist non-governmental organisations, and individual experts.

Task Force members:

1. **AEWA**, the UNEP African-Eurasian Waterbird Agreement
2. **Birdlife International**
3. **CBD**, the UNEP Convention on Biological Diversity
4. **CIC**, the International Council for Game and Wildlife Conservation
5. **CMS**, the UNEP Convention on Migratory Species of Wild Animals
6. **FAO**, the UN Food and Agriculture Organization
7. **ISDR**, the UN International Strategy for Disaster Reduction
8. **Ramsar**, the Ramsar Convention on Wetlands
9. **Wetlands International**
10. **WCS**, the Wildlife Conservation Society
11. **ZSL**, The Zoological Society of London

Task Force observers:

12. **OIE**, the World Organization for Animal Health
13. **UNEP**, the United Nations Environment Programme
14. **WHO**, the World Health Organization

Avian Influenza and Wild Birds

What is their actual role in the spread of the virus?

Are wild birds the main cause of the spread of avian influenza or are there other major factors?

How can governments and the international community respond to the emerging threat of avian influenza?

The international Scientific Task Force on Avian Influenza and Wild Birds provides some answers and recommendations.

1. Risk of misinformation and adverse policies

The spread of HPAI H5N1 is of public concern, and receives a lot of attention in the media. Yet there remains widespread misunderstanding of the issue, especially about the different ways in which the virus might be spread. Misinformation has led to wild birds being automatically blamed. This creates political pressure for ill-advised and disproportionate policies such as the culling or harassment of wild birds and the destruction of wetland habitats. Other modes of transmission, such as the trade in poultry and poultry products, the trade in cage birds and human movements may well play a far more significant role in the spread of HPAI H5N1. In some cases, these modes of transmission have been underestimated and do not receive proportionate exposure in the media. We need to present an accurate and balanced view which acknowledges that there are a number of factors whose relative importance can change, depending on the area or outbreak concerned.

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2. What are the known causes of the spread of avian influenza?

The HPAI virus subtype H5N1 infecting poultry, other domestic animals, wildlife and humans almost certainly originated from the mutation of a low or non-pathogenic virus on poultry farms in East Asia. The virus then spread rapidly within and between farms, taking advantage of local practices in the feeding, housing, slaughtering and trade of domestic ducks, chickens and geese. Lack of hygiene, overstocking and mixing of different domestic animals greatly increases the risk of spreading the infection. Movements of people (e.g. farmers, veterinarians, and even journalists and tourists) and legal and illegal trade in caged birds are factors in the spread. As a result the virus may now be endemic in poultry of East and South-East Asia. Globalization has led to extensive and intensive movements of people, poultry and materials around the world at an unprecedented pace which provides greater opportunity for the spread of the virus.

The outbreaks in Nigeria in early 2006, may have been caused by the supply of infected live poultry including day-old chicks from different sources, including East Asia and Turkey. Recent samplings of 5000 wild water birds in African wetlands support the view, since no evidence of HPAI H5N1 was found, that wild birds probably play a relatively minor role in the spread of avian influenza. This view is consistent with the fact that the northward migration of wild birds from Africa to Europe in the northern spring of 2006 did not cause any major outbreaks. Nor do wild birds seem to play a role in a country like Indonesia where HPAI H5N1 has been present for some years and where several human casualties have occurred.

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In February 2007 HPAI H5N1 was detected on a turkey farm in Suffolk, UK. It has been established that the strain of the virus found in the UK was similar to the H5N1 strain discovered on a poultry farm in Hungary, which pointed to a transmission route from poultry to poultry and not from wild birds to poultry. The outbreaks took place in a non-migratory period and at a site which was not adjacent to major wetlands, nor to areas used by significant numbers of waterbirds. So wild birds were unlikely to have played a significant role during these outbreaks.

The outbreaks in Central Europe between June and August 2007, where a number of dead wild birds infected with H5N1 were consecutively found in different parts of the Czech Republic, Germany and France were most likely linked to a H5N1 outbreak in a Czech turkey farm. Again, wild birds were unlikely to be the main factor spreading the virus since the outbreaks were observed in mostly non-migrant species and during the non-migratory period.

3. The role of wild birds

It is clear that trade in domestic poultry has been a crucial factor, even for the transmission of avian influenza over long distances and across continents. However, numerous species of wild birds, especially waterbirds, have been proven to be susceptible to infection by HPAI H5N1.

Close contact between wild birds and poultry can lead to cross-infection, from poultry to wild birds and from wild birds to poultry. The loss of wetlands around the globe may force many wild birds onto alternative sites like farm ponds and paddy fields, bringing them into direct contact with chickens, ducks, geese, and other domestic fowl. Additionally, species that live in and around poultry farms and human habitations may serve as "bridge species" that could potentially transmit the virus between poultry and wild birds.

Marbled Teal, © Taej Mundkur/Wetlands International

Analysis or genetic sequences and other indirect evidence suggest that in at least some cases wild migratory birds are likely to have contributed to further spread. The actual importance of this mechanism, however, is unclear in the present state of knowledge.

Poor planning in response to development pressures has led to the increasing loss or degradation of wild ecosystems which are the natural habitats for wild birds. The displaced wild birds increasingly seek to feed and live in areas populated by domestic poultry (and humans). This provides greater opportunities for the spread of H5N1 between wild and domestic birds, and thence to humans. This issue of "ecohealth" highlights the interplay between agriculture, animal (domestic and wildlife) health, human health, ecosystem health, and socio-cultural factors.

However, it is unlikely that wild birds play a major role in spreading avian influenza. The total number of wild birds affected has so far been small and although billions of wild birds cross continents regularly during their migrations they do not seem to have a significant impact on spreading the virus on a large scale.

4. Direct action to reduce the risk of further spread and infection

- National **veterinary services** should be upgraded to the standards of the World Organization for Animal Health (OIE).
- Early detection is essential for the control or eradication of HPAI H5N1. Hence rapid reporting of infection remains central to international and national control strategies.
- Comprehensive **surveillance programmes** are essential for better understanding the disease, monitoring its development and contributing to early warning systems (see below). They should incorporate the results of risk assessments that have identified those species likely to be at higher risk of carrying HPAI H5N1, as well as the best strategic design (including optimal selection of sampling sites) and methods of sampling these species (http://www.aiweb.info/document.aspx?DocID=187).

Bird Ringing, © Doug Harebottle/AFRING

What an Early Warning System for wild bird avian influenza should look like.

The development of global early warning systems (EWS), which incorporate the results of national and international surveillance programmes, should be a high priority, and aim for the following attributes:

Open and transparent participation of relevant parties;

Targeted active and passive surveillance and other data-gathering;

Web-based output allowing the rapid dissemination of open-access data and information deriving from surveillance systems;

Integration of surveillance results with geographical and other data to facilitate integrated responses and risk management;

Meta-data allowing full analysis and interpretation of results in order to facilitate appropriate responses (inter alia, information on type of surveillance (active or passive) and locations of sampling locations); and

Facilitation of timely and effective risk management. This implies clear warning triggers and targeted reporting.

Current early warning systems address specific aspects of AI, such as the epidemiological, human, wildlife or ecological aspects of the disease. We seek better integration of surveillance and early warning systems data generated by the different organisations working on avian influenza. A more comprehensive Early Warning System would also serve as a reliable base for risk assessments.

Interest groups, such as hunters and birdwatchers, can play a vital role in the monitoring and reporting of outbreaks, provided their members are trained to minimise risks of self-infection and spread of the disease.

©Doug Harebottle/AFRING

- Biosecurity needs to be enhanced so to reduce as much as possible the risks associated with contact between poultry and wild birds (or humans). It is clear, for example, that the strict biosecurity measures put in place by EU countries in 2006, in response to outbreaks in wild bird and poultry,were very effective in minimising the spread of AI between poultry farms.
- When the presence or threat of AI appears to warrant it, human activities causing disturbance to waterbirds and their habitats should be limited or stopped, as there is a risk of (i) the displaced birds taking the infection elsewhere (ii) the birds moving to areas where they may become infected by other sources, and (iii) inadvertent human or vehicular transport of the virus to other areas.
- For similar reasons, destruction of wetlands and culling of waterbirds should also be avoided.

5. Minimizing the role of wild birds in the spread of HPAI

- A long term solution would be to separate poultry operations and wetlands used by wild birds in order to avoid shared access and cross-contamination. Wild birds and poultry occurring in the same region should not use the same water areas and should not have direct contact with each other.
- Runoff from domestic poultry operations must not pollute wetlands used by wild birds.
- Healthy wild habitats will limit the number of waterbirds that enter agricultural areas.
- Farmers can help to reduce the risks of direct transmission of poultry and cross-infection between wild and domestic birds, for example by improving hygiene and biosecurity standards in farms and during the transportation of birds.

6. What conservation scientists are already doing

Significant efforts have already been made to try to understand the role of wild birds as vectors of HPAI H5N1, as well as the actual and potential impact of the virus on wild populations of conservation concern. Several countries have initiated or reinforced surveillance programmes aimed at determining the prevalence of the virus in wild bird populations. Existing data on movements of wild birds are being analyzed, notably for those species considered more likely to survive the infection and able to carry the virus over significant distances. These efforts have already led to some important results, but remain insufficient to produce the complete and detailed picture of the role of wild birds in the spread of the virus needed for risk assessment. Preliminary analysis has also identified about 40 globally threatened wild bird species, the populations of which could

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