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A JOINT PROJECT
BETWEEN

USDA APHIS
WILDLIFE SERVICES

AND

INDIANA DNR
DIVISION OF FISH AND
WILDLIFE

Indiana Wildlife Disease News



Volume 1, Issue 1

January 2006

Special points of interest:

- Special Issue on Avian Influenza
- Understanding bird migration and how it could relate to the spread of AI
- A brief history of AI in the United States
- An update on wildlife disease in Indiana and surrounding states
- The purpose of Indiana Wildlife Disease News

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Avian Influenza : What it is and how it spreads

Because of media attention surrounding human deaths caused by the Avian Influenza (AI) outbreak in Asia, much of the public's attention has been on this particular wildlife disease. This issue of Indiana Wildlife Disease News will focus on what is currently known about AI so that biologist, animal and human health officials, and others have information that can be shared with cooperators and the public.

AI is a virus that causes disease in various types of birds, thus the common name "bird flu." AI viruses can infect chickens, turkeys, pheasants, quail, ducks, geese and guinea fowl as well as a wide variety of other birds, including migratory waterfowl.

AI viruses are classified by a combination of two groups of proteins found on the surface of the virus: hemagglutinin proteins (H), of which there are 16 (H1-H16), and neuraminidase pro-

teins (N), of which there are 9 (N1-N9). AI strains also are divided into two groups based on the pathogenicity of the virus--the ability of the virus to produce disease.

Low Pathogenicity Avian Influenza (LPAI): Most AI strains are classified as low pathogenicity and cause few clinical signs in infected birds. LPAI generally does not pose a significant health threat to humans. However, LPAI is monitored because two strains of LPAI—the H5 and H7 strains—can mutate into highly pathogenic forms.

High Pathogenicity Avian Influenza (HPAI): This is a more pathogenic type of avian influenza that is frequently fatal to birds and easily transmissible between susceptible species. The strain that is currently of concern in Southeast Asia and Europe is the HPAI H5N1 virus.

AI is primarily spread by direct contact between healthy and infected birds through respiratory secretions and feces. The disease also can be spread through indirect contact if healthy birds are exposed to contaminated equipment or materials.

The HPAI H5N1 virus can be spread from birds to people as a result of extensive direct contact with infected birds. Broad concerns about public health relate to the potential for the virus to mutate, or change into a form that could spread from person to person. The U.S. Department of Health and Human Services is aggressively working to ensure public health is protected. More information about the joint efforts of the federal government is available at www.pandemicflu.gov.

Source USDA

Avian Influenza Surveillance in Migratory Birds

Since 1998, U.S. Department of Agriculture (USDA) scientists, in cooperation with the U.S. Department of the Interior (DOI), have monitored wild migratory birds for AI viruses. The agencies have tested more than 12,000 birds in the Alaska flyway, and since 2000, tested more than 3,000 birds in the Atlantic flyway.

The U.S. Geological Survey

(USGS), U.S. Fish and Wildlife Services (USFWS), and State of Alaska biologists have been sampling migratory birds for H5N1 in the Pacific Flyway for the past several months.

The USGS, USFWS, and USDA are planning a coordinated and more comprehensive surveillance and detection program for 2006, which will include all of the major migratory flyways.

This program will serve to provide an early warning to the agriculture, public health, and wildlife communities should migratory birds be found to carry this particular virus. Details on sampling in Indiana will be in future issues of Wildlife Disease News as they become available.

Source USDA, USDO

Migratory Flyways

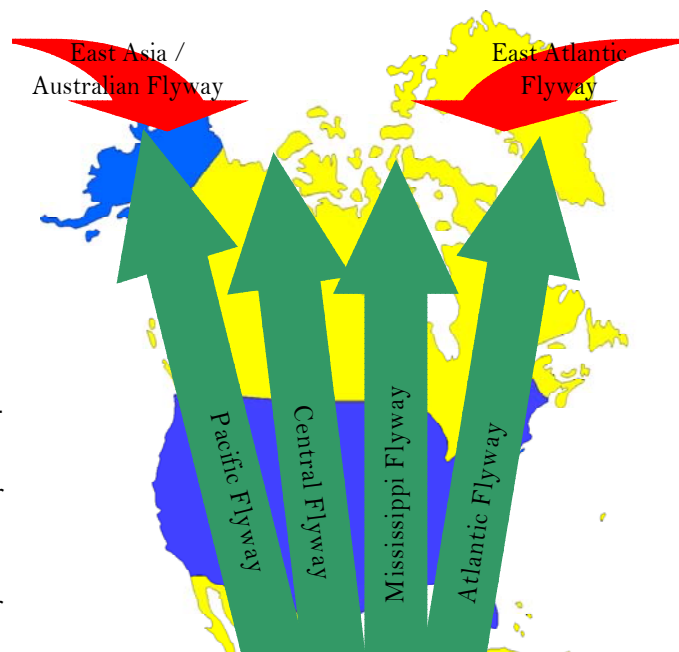
To understand the potential for High Pathogenic Avian Influenza (HPAI) to spread into the United States through migratory birds, it is important to understand the concept of migratory bird flyways. Flyways are broad corridors that birds use for north to south migrations. These are not precise routes taken by birds, but rather a generalization of the concept of north-south migration that is useful for wildlife management purposes. Globally, there are 8 recognized flyways for wading birds (the East Atlantic, Black Sea/Mediterranean, East Africa/West Asia, Central Asia, East Asia, Australian, Pacific Americas, Mississippi Americas (consisting of both the Mississippi and Central waterfowl flyways), and Atlantic Americas flyways.

The four North American flyways (Pacific, Central, Mississippi, and Atlantic) are administrative units, comprised of states and Canadian provinces, used to manage migratory birds. Indiana is part of the Mississippi Flyway. The flyways were intended to reflect migratory patterns of birds. However, there is a great deal of mixing between flyways. A good example of "flyway crossing" is the tundra swan: Adults that breed in Alaska (Pacific flyway) may winter on Chesapeake Bay (Atlantic flyway). Many other species also cross flyways to lesser degrees.

Migration is seasonal movement, occurring in fall (southward) and spring (northward), so it often follows weather

patterns. Timing is highly variable among species and between years: blue-winged teal may be moving southward through Indiana in late August and early September, while mallards and Canada geese may not migrate until most of the water on the breeding grounds is ice-bound. These flights often occur just in front of fall cold fronts.

Migration provides an opportunity for birds that winter on separate continents to mix during the breeding season. Ducks and geese that breed in Alaska winter in both North America and Asia; geese that breed in Greenland winter in both North America and Europe. The co-occurrence of Asian and North American ducks in Alaska has encouraged sampling for the H5N1 strain of avian influenza there, as well as among wintering birds on the Gulf Coast, where many of these birds winter. So far, there is little evidence that H5N1 is being spread by migration of infected birds. The initial



Flyways of migratory waterfowl in North America and 2 intersecting flyways of migratory shorebirds. (USDA)

effort to detect HPAI in wild birds by state and federal wildlife agencies will be divided into two phases. The initial phase will address early detection activities in Alaska, and in particular, coastal areas that have the most potential for contact among Asian and North American birds. The second phase will address subsequent HPAI detection activities in the four major North American flyways.

Article by A. Phelps, IDNR



Photo: USDA

Incidents of Low Pathogenic Avian Influenza (LPAI) are commonly detected in domestic poultry flocks. Typically, LPAI does not pose a serious threat to human health.

History of Avian Influenza in the United States

There is no evidence that High Pathogenic Avian Influenza (HPAI) currently exists in the United States based on extensive and regular testing of U.S. poultry flocks. Historically, there have been three HPAI outbreaks in poultry in this country--in 1924, 1983 and 2004. No significant human illness resulted from these outbreaks.

The 1924 H7 HPAI outbreak was detected in and eradicated in East Coast live bird markets.

The 1983-84 H5N2 HPAI bird outbreak

resulted in the destruction of approximately 17 million chickens, turkeys, and guinea fowl in the northeastern United States to contain and eradicate the disease.

In 2004, USDA confirmed an H5N2 HPAI outbreak in chickens in the southern United States. The disease was quickly eradicated thanks to close coordination and cooperation between USDA, state, local, and industry leaders. Because of the quick response, the disease was limited to one flock.

Source: USDA

Dead Birds : A Common Winter Occurrence

During the winter, dead birds can be found throughout Indiana for a number of reasons. Dead birds are also often visible because larger numbers of people enjoy feeding birds at backyard feeders, but between 20 and 45% of feeder sites can experience at least some winter bird mortality.

A common reason for bird die-offs is a sudden change in the weather. Late fall through early winter in Indiana can be characterized by sudden, significant changes in the weather. One day can be sunny and in the high 50's, and the next can be cold, snowy, and windy. These sudden changes can stress wildlife, possibly leading to death. Long period of persistent sub-freezing weather can also stress birds. Typically, birds that frequent feeders that are filled on a regular basis will not die of hypothermia because they are able to generate enough internal heat. But if feeders are refilled infrequently, birds may not be able to generate enough heat or may utilize all of their fat reserves in heat production.

Another reason for winter deaths among birds is disease transmission. Because of the lack of food, birds will often congregate

around areas with abundant food (e.g., bird feeders, dairies, etc.). This close contact can lead to increase disease transmission. Salmonellosis has been reported as a primary cause of mortality associated with a disease at bird feeders. Other diseases found in dead birds around feeders include trichomoniasis, Mycoplasmal conjunctivitis (see related story), aspergillosis, avian pox, and avian mange. However, only a low percentage of dead birds ever receive a professional diagnosis. Cleaning bird feeders on a regular basis (e.g., every couple of days) can reduce the likelihood of disease transmission.

Legal pest control of starlings, pigeons, and house sparrows (all invasive bird species in the U.S.) can result in dead or dying birds observed by the general public. These exotic species are often controlled at industrial and agricultural sites during the winter. However, the birds



Photo: USDA

do not always die at the treatment site. A number of dead or dying birds could be seen by the public up to 15 miles away from the treatment site.

Predators can also learn that an easy meal can be found at bird feeders and

other places where birds congregate. Some birds that are found at feeding stations may be the result of a predator kill, such as a feral house cat.

Unless there is a large number of dead birds, there is no agency or organization in Indiana that will respond to dead birds found by bird feeders. USDA Wildlife Services does have a toll-free hotline (1-800-893-4116) where dead birds can be reported. The hotline technicians will record the information and give out basic facts about wildlife diseases associated with dead birds at feeders. The information will be monitored to determine if there are any significant die-offs in a given area.

Article by J.N. Caudell, USDA

Mycoplasma conjunctivitis

Mycoplasma conjunctivitis simply means "an inflammation of the mucous membrane of the eyelid caused by one of the Mycoplasma bacteria." In 1994, around the Washington D.C. area, house finches were observed with eye infections. It was determined that the cause was *Mycoplasma gallisepticum* (MG). This non-zoonotic pathogen more commonly affects poultry and was not formerly associated with songbirds.

The disease spread rapidly and reached Indiana the following year. MG primarily affects the house finch and American goldfinch, but other species have shown signs of the illness. The prominent field signs are puffy or swollen eyes, crusty appearing eyelids and fluid drainage from the eyes in some birds. Infected birds

will often rub their eyes on branches or feeders, and may show signs of impaired vision.

Poor vision makes affected birds more vulnerable to predation and interferes with normal feeding, probably resulting in increased mortality. In one study, captive house finches with MG infections lost 20-25% of their body weight. While not necessarily fatal, such weight loss can decrease the likelihood that the bird will survive other stresses. Some birds have shown clinical signs over long periods, while in others symptoms have disappeared.

Bird feeders are a primary source of infection. Birds will leave bacteria on hard surfaces, feed, and make contact with other birds. Routine cleaning and

disinfection of feeders is recommended, particularly if infected birds are observed nearby. A weekly application of a ten percent bleach solution to feeders and other frequently used artificial surfaces will reduce the chances for disease transmission. If infected birds are observed, another option is to cease feeding for a few weeks to avoid bringing the birds into a common contact point.

If birds other than house finches are observed showing signs of conjunctivitis, you should report it to the nearest Indiana Division of Fish and Wildlife office, the Wildlife Conflicts Information Hotline (1-800-893-4116), or contact one of the newsletter editors.

Article by D. Zimmerman, IDNR

Avian Influenza and Migratory Birds

Recently, the United State Geological Survey (USGS) National Wildlife Health Center (NWHC) in Madison, Wisconsin, published a series of Frequently asked questions about Avian Influenza (AI; http://www.nwhc.usgs.gov/research/avian_influenza/FAQ_avian_influenza.html; last accessed on 1-21-06). We have printed the section pertaining to migratory birds. For a complete version of the text, please visit the NWHC web site (www.nwhc.gov).

What kinds of wild birds primarily carry avian influenza?

Most avian influenza viruses have been isolated from wild waterfowl (ducks, geese, and swans) and shorebirds (wading birds), gulls, and terns. With rare exception, the thousands of flu isolates found in wild birds have been low pathogenic avian influenza and have rarely caused signs of illness. The occurrence of avian influenza in wild ducks in North America reaches its height in late summer and early fall. At other times of the year, infection rates are usually less than 1 percent. In shorebirds, infection rates are highest during the spring migration, although in comparison with waterfowl, their infection rates are much lower.

Has High Pathogenic AI (HPAI) H5N1 affected migratory birds differently than other avian influenza viruses in the past?

Yes. In May 2005, HPAI H5N1 was detected for the first time in wild birds in Qinghai, China, where bar-headed geese (*Anser indicus*) died. This marked the first time since 1961 in which large numbers of wild birds have died from avian influenza. In this May 2005 outbreak in China, researchers estimate that 5 to 10 percent of the world's population of bar-headed geese may have perished.

Most of the wild birds confirmed as having HPAI H5N1 have been sick, dying, or dead, although there are some reports of apparently healthy wild birds infected with HPAI H5N1.

Are migratory birds carrying the virus from one country to another?

The role of migratory birds in the transfer of the Asian H5N1 strain is not clear.

Wild birds have been suggested, but to date they have not been confirmed to be the source of new outbreaks. The pattern and timing of several outbreaks have not coincided with periods of major migratory movements or migratory routes. However, there are also reports of wild bird mortality that are associated with outbreaks of HPAI H5N1 in poultry. It is not known if wild birds were the source of the virus or acquired the virus from poultry; although, once infected they could be a potential source of infection for domestic poultry that are not isolated from wild birds.

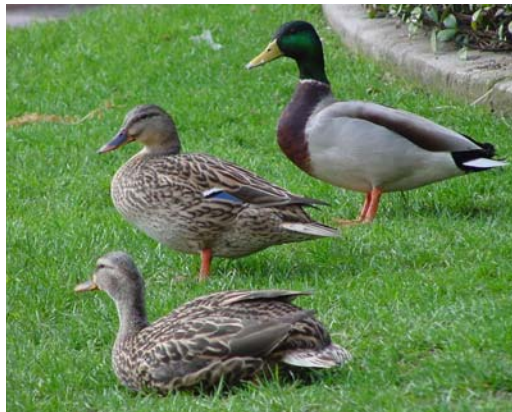


Photo: USDA

Can humans catch avian influenza from wild birds?

There are no documented cases of human H5N1 disease resulting from contact with wild birds. The only documented cases of transmission to humans are from poultry; these cases include both highly pathogenic and low pathogenic strains of avian influenza. At the present time, close contact with infected domestic poultry has been the primary way that people have become infected with the HPAI H5N1 virus.

What are the potential routes for a pathogenic strain of avian (or human) influenza to arrive in North America?

Bird migration is only one possible route of introduction of HPAI H5N1 into North America. Illegal smuggling of birds and poultry products, travel by infected people or people traveling with virus-contaminated articles are more direct, and possibly more likely, means of introducing the new strain of HPAI H5N1 virus into the United States.

Migratory birds usually travel the same

routes in their annual migrations. In the Northern Hemisphere, birds begin moving south during August and September of each year. North American migratory birds that over-winter in Asia may come into contact with potentially infected domestic or wild birds during the winter months. In spring, migratory birds will migrate north to their breeding grounds in eastern Russia, Alaska, and Canada. Migratory birds infected with the HPAI H5N1 returning from Asia can potentially interact with other North American wild birds as they co-mingle on the breeding grounds.

What can we do to protect ourselves?

As a general rule, people should observe wildlife, including wild birds, from a distance. This protects people from possible exposure to diseases and minimizes disturbance to the animal. Avoid touching wildlife. If there is contact with wildlife, do not rub eyes, eat, drink, or smoke. Thoroughly wash your hands with soap and water. Do not pick up diseased or dead wildlife. Contact your state, tribal, or federal natural resource agency if you find a sick or dead animal. For other protection advice unrelated to wildlife, please go to www.flupandemic.gov.

Should hunters be concerned about avian influenza?

There are no documented cases of wild birds directly transmitting avian influenza to people. There is currently no indication that waterfowl or other wild birds hunted in the United States carry HPAI H5N1. While experts believe the risk to hunters is currently low, scientists cannot guarantee that there is no risk. It is always wise to practice good hygiene when handling or cleaning any wild game.

Source: USDOJ - NWHC



Midwest Wildlife Disease Update

Indiana : The final report from Purdue Animal Disease Diagnostic Lab (ADDL) showed that

there were no detectable chronic wasting disease (CWD) prions in any of the submitted 2005 hunter-harvested samples that were testable. A total of 1256 samples from 68 of the state's 92 counties (sample numbers ranged from 1 - 105 per county), 38 samples were not usable and 1218 samples had no detectable levels of prions.

In mid-December, 20 wild Mallards and 34 wild Canada Geese died at a tertiary treatment pond in northeastern Indiana (Auburn). A Purdue ADDL report indicated the birds died of: 1) visceral gout, 2) enteric salmonellosis, and 3) colibacillosis/colisepticemia. Further inquiry has

led to the conclusion that the waterfowl picked up salmonella, probably while feeding. This led to severe diarrhea, dehydration, renal failure and the build up of urates in the body causing death.

There were 22 human cases of West Nile virus recorded in 10 counties during 2005. In addition, 46 birds tested positive from 28 different counties. St. Joseph County accounted for 27 of those birds.

Illinois : CWD was detected in 16 additional deer (2,500 sampled) in Illinois through sampling of hunter harvested deer during the 2005-06 season. The majority of positives came from the four core counties, but two positives were in a new county to the southwest. Since 2002, there have been 112 positive cases of CWD in Illinois.

Michigan : Eastern Equine Encephalitis (EEE) has been discovered in 8 free-ranging white-tailed deer in Kent County, Michigan. The Michigan Department of Natural Resources (MDNR) Wildlife Disease Laboratory is conducting a serological survey to better understand the situation. In November, the MDNR began collecting samples from deer in coordination with the hunter-harvested deer tuberculosis and CWD surveillance. The target number of samples is 50 from Kent County, 50 samples from a 5-county area where EEE typically shows up in horses, and 50 samples from a 5-county area where EEE is not endemic.

FYI- In the past year, New York, West Virginia, and Kansas had their first instance of free-ranging deer that tested positive for CWD.

Column by D. Zimmerman, IDNR

We Want YOU!

This newsletter is being produced through cooperation between the Indiana Department of Natural Resources and the U.S. Department of Agriculture Wildlife Services. We would like to have stories, updates, or other information

that would be useful for our readers throughout Indiana.

If your agency or organization would like to contribute to a one-time article, a limited series of articles, basic data, case

studies, a reoccurring article, or would like to contribute to a particular topic (i.e., an agencies involvement in bird flu, rabies, etc.), please contact on of the editors.

Animal Surveillance and Emergency Response Teams (ASERTs)

The Indiana State Board of Animal Health (BOAH) has launched a new program to train 60 private veterinarians in animal-related emergency response and disease surveillance. The program, known as ASERTs (Animal Surveillance and Emergency Response Teams), brings federal homeland security dollars to Indiana communities in a new way to protect human and animal health.

Each team has been tasked to work locally, within the region, to be involved with planning and readiness for animal-related emergencies. ASERTs serve as a resource to local emergency planners



and may be called upon to respond during animal health emergencies in support of BOAH efforts to detect, contain, and control diseases.

The mission of this program is to increase the capacity of Indiana and its veterinary community to address homeland security issues. This program will result in teams of veterinarians who are

prepared to rapidly and effectively manage animal health emergencies. Agriculture and food are part of our nations critical infrastructure. Agriculture and food are vulnerable to inten-

tional and accidental introduction of agents with the capability of widespread damage to the national's people, animals, economies. Moreover, 75% of new and emerging diseases in man are estimated to result from spillover of disease agents from wild and domestic animal populations. In addition, the majority of agents identified by the Centers for Disease Control and Prevention as potential bioweapons are zoonotic diseases. The creation of ASERTs will be a valuable resource to Indiana for protecting its agricultural resources from both accidental and intentional disease outbreaks. For more information on ASERTs, please contact Dr. Marianne Ash at BOAH (mash@boah.in.gov).

Indiana Wildlife Disease News

A joint project between:

Indiana DNR
Division of Fish and Wildlife

and

USDA APHIS Wildlife Services
National Wildlife Disease Surveillance and Emergency Response Program

to provide information on wildlife diseases in Indiana and surrounding states.

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The Indiana Wildlife Disease News is only published in electronic format. To add or remove you name from the mailing list, please send an e-mail to jcaudell@aphis.usda.gov

Submissions or Participation

If you would like to submit a wildlife disease related article, ideas, comments, or other information, please contact one of the editors.

We welcome individuals or agency representatives to act as reviewers or to provide assistance in the production of this newsletter. To assist, please contact one of the editors.

Providing information on wildlife diseases in Indiana and surrounding states



Indiana Department of Natural Resources Division of Fish and Wildlife

The mission of the Division of Fish and Wildlife is to professionally manage Indiana's fish and wildlife for present and future generations, balancing ecological, recreational, and economic benefits. Professional management is essential to the long term welfare of fish and wildlife resources, and providing for human health and safety. Communication between agency professionals and educating the public are important aspects of professional management.

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USDA APHIS Wildlife Services NATIONAL WILDLIFE DISEASE SURVEILLANCE AND EMERGENCY RESPONSE PROGRAM

The mission of the National Wildlife Disease Surveillance and Emergency Response Program is to provide Federal leadership in managing wildlife disease threats to agriculture, human health and safety, and natural resources by assisting Federal, State, Tribal, and Local governments, private industry, and citizens with management of zoonotic and other wildlife diseases of concern.

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Purpose and Content of Indiana Wildlife Disease News

The purpose of the Indiana Wildlife Disease News is to provide a source of current information for and to facilitate communication among decision makers, stakeholders, and agencies involved with the management of wildlife diseases.

The Newsletter will be published quarterly by USDA Wildlife Services and the Indiana Department of Natural Resources.

Each quarter, the Newsletter will focus on a disease or wildlife species of current or near-future interest.

The Newsletter will also consist of a set of reoccurring articles that will add continuity



CWD sample collection in Indiana on opening day of the 2005 shotgun season.

to the newsletter. Some of these may include:

- Agency focus—we explore the mission of agencies in Indiana and how they tie into a wildlife disease outbreak.
- Individual Spotlight—an

individual in the state is chosen who will have an important role in a disease outbreak.

- Midwest Wildlife Disease Update—we focus on diseases that have affected Indiana and the surrounding states and try to provide updates on the resolution of the incident.
- Scientific Update—we spotlight recent discoveries or research in the area of wildlife diseases.

If you have suggestions for additional topics, or would like to contribute to the Indiana Wildlife Disease News, please contact one of the newsletter editors.