

**Washington Department of Fish and Wildlife**  
**Wild Bird Avian Influenza Surveillance Report**  
**July 1<sup>st</sup> 2008 – June 30<sup>th</sup> 2009**

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**Introduction**

Avian influenza is caused by viruses that naturally occur in water-associated birds such as ducks, geese, swans, and shorebirds. Avian influenza viruses (AIV) are classified according to two types of proteins present on the surface of the virus, hemagglutinin (H), and neuraminidase (N). There are 16 known hemagglutinin proteins and 9 known neuraminidase proteins, for a total of 144 possible H/N combinations or “subtypes”. Virtually every possible H/N subtype has been found in wild birds, and AIV typically do not cause serious disease in these species.

In contrast to wild birds, domestic poultry such as chickens and turkeys can be extremely susceptible to certain strains of AIV. These strains are referred to as “highly pathogenic avian influenza” (HPAI) viruses. The HPAI designation refers only to the severity of disease caused in domestic poultry, and is not related to the potential to cause disease in humans or other species. To date, all known HPAI viruses have been of the H5 or H7 subtypes, although not all H5 and H7 viruses are HPAI viruses. Commercial poultry producers are aware of the potential threat that wild waterfowl present to domestic poultry, and for decades have taken precautions to prevent contact between domestic and wild birds.

On rare occasions, AIV can mutate or recombine with human influenza viruses and become infectious to humans. Beginning in 2005, an increasing number of human cases of influenza caused by an HPAI H5N1 subtype of an AIV were reported in southeast Asia. Prior to that time, infections with this particular virus had primarily been limited to birds. The human cases sparked worldwide concern that this virus could cause another worldwide epidemic (“pandemic”) of influenza in humans, such as those experienced in 1918, 1957, and 1968.

As a result of this concern, several wild bird surveillance programs were initiated in Washington to assess the prevalence of AIV in wild birds, and to provide an early warning to poultry producers and public health officials should the HPAI H5N1 virus of concern enter the United States via migratory birds. The purpose of this report is to summarize AIV sampling efforts and test results from wild birds collected by Washington Department of Fish and Wildlife (WDFW) between July 1<sup>st</sup> 2008 and June 30<sup>th</sup> 2009.

## Methods

The avian influenza surveillance program (US Interagency Strategic Plan - USISP) is a collaboration between the U.S. Fish and Wildlife Service (USFWS), the U.S. Department of Agriculture (USDA), Tribal nations, and state wildlife agencies to sample migratory wild birds. This plan can be found at:

[http://wdfw.wa.gov/wlm/avian\\_flu/ai\\_monitoring\\_plan.pdf](http://wdfw.wa.gov/wlm/avian_flu/ai_monitoring_plan.pdf).

The USISP delegated responsibility to the USGS for establishing a nationwide database to capture all avian influenza data from the various agencies throughout the United States. This database, known as the HPAI Early Detection Data System (HEDDS), is viewable by the public and includes data collected in Washington by WDFW, USDA, USFWS, Yakima Wildlife Resources, Quilleute Tribe Natural Resources, Washington State Department of Transportation, Olympic National Park, private citizens, and other entities. For more information about HEDDS data, please visit their website at <http://wildlifedisease.nbio.gov/ai/index.jsp>.

WDFW's samples were collected according to the USISP, as well as from birds during morbidity and mortality investigations. Oral-pharyngeal and/or cloacal swabs were collected from hunter-harvested birds, live-trapped and released birds, agency harvested birds, and birds that were either harvested or collected for routine morbidity and mortality investigations. Agency harvested birds are collected under special permits for a few reasons including: damage control, research purposes, or to meet certain disease-testing quotas. Intensive morbidity and mortality field surveys were implemented this year to improve the likelihood of discovering ailing waterfowl.

Samples were initially screened for the presence of AIV using a polymerase chain reaction (PCR) assay designed to detect the presence of a matrix protein common to all AIV. Samples that yielded positive matrix results were then screened with a PCR assay designed to detect the presence of H5 or H7 AIV. Samples that yielded positive H5 or H7 results were submitted to a second laboratory to undergo an additional confirmatory PCR test. Both labs then further characterized the viruses through a variety of techniques, to determine whether or not they were of the H5N1 subtype, and whether or not they were HPAI viruses.

## Results

WDFW collected a total of 1631 samples between July 1<sup>st</sup> 2008 and June 30<sup>th</sup> 2009 (Table 1). The number of samples collected utilizing each strategy are as follows: 841 hunter harvested (Table 2), 696 live-trapped and released (Table 3), 2 agency harvested (Table 4), and 92 morbidity/mortality (Table 5). WDFW surveillance efforts focused on 7 species of birds; however, additional samples collected through routine statewide avian mortality investigations and incidental sampling accounted for an additional 14 species.

Out of the 1631 birds, 198 (12%) samples tested positive for the presence of an AIV. Only 16 of the 198 AI positive samples were H5 or H7 subtypes, and none of them were H5N1 subtypes.

In general, dabbling ducks had the highest prevalence of AIV infection, with 3/4 species tested yielding an AIV. In descending order, these were: 157/525 (30%) mallards (*Anas platyrhynchos*), 14/155 (9%) northern pintails (*Anas acuta*), and 1/52 (2%) American green-winged teals (*Anas crecca*). Two wood ducks (*Aix sponsa*) were tested during routine mortality investigations and were found AIV negative.

Only three individual diving ducks and mergansers (2 common mergansers [*Mergus merganser*] and 1 common goldeneye [*Bucephala islandica*]) were tested during routine mortality investigations. All three birds were negative for AIV.

AIV were detected in 2/4 species of geese tested, but at relatively low prevalence. In descending order, these were: 7/205 (3%) lesser snow geese (*Chen caerulescens*) and 6/200 (3%) cackling geese (*Branta hutchinsii minima*). Two hundred black brant (*Branta bernicla*) and 1 Canada goose (*Branta canadensis moffitti*) were all negative for AIV.

Nine of 72 (12%) trumpeter swans (*Cygnus buccinator*) were infected with an AIV, while none of 3 tundra swans (*Cygnus columbianus*) and none of 3 mute swans (*Cygnus olor*) were infected.

An AIV was detected in only 1/8 species of miscellaneous birds tested. Four out of 195 (2%) dunlin (*Calidris alpina*) tested positive for an AIV during mortality investigations.

### **Summary**

AIV were detected at rates and from species that were expected based on numerous surveys done in the United States over the past several decades. Based on samples collected from wild birds in Washington and previous surveys done elsewhere, it appears that highly pathogenic AIV are rare in wild birds. Continued surveillance for AIV in wild birds is advised, with particular emphasis on sick and dead birds, to ensure timely detection of highly pathogenic H5N1 or any other highly pathogenic AIV should they enter the United States.

WDFW intends to continue surveillance into the 2009-2010 year, following the guidelines of the USISP. This plan is revised annually, in order to improve the effectiveness of the surveillance methods and to ensure optimal use of resources.

Table 1. All Bird Avian Influenza Samples Collected by WDFW, 7/1/08 - 6/30/09

Sp. Code	Common Name	Scientific Name	Total Number Tested	Total AI positive	Percent AI positive	Total H5 positive	Percent H5 positive	Total H5N1 positive	Total H7 positive	Percent H7 positive
<u>Dabbling Ducks</u>										
AGWT	American green-winged teal	<i>Anas crecca</i>	52	1	2%	0	0.0%	0	0	0.0%
MALL	mallard	<i>Anas platyrhynchos</i>	525	157	30%	13	2.5%	0	3	0.6%
NOPI	northern pintail	<i>Anas acuta</i>	155	14	9%	0	0.0%	0	0	0.0%
WODU	wood duck	<i>Aix sponsa</i>	2	0	0%	0	0.0%	0	0	0.0%
<b>Subtotal:</b>			<b>734</b>	<b>172</b>	<b>23%</b>	<b>13</b>	<b>1.8%</b>	<b>0</b>	<b>3</b>	<b>0.4%</b>
<u>Diving Ducks and Mergansers</u>										
COGO	common goldeneye	<i>Bucephala islandica</i>	1	0	0%	0	0.0%	0	0	0.0%
COME	common merganser	<i>Mergus merganser</i>	2	0	0%	0	0.0%	0	0	0.0%
<b>Subtotal:</b>			<b>3</b>	<b>0</b>	<b>0%</b>	<b>0</b>	<b>0.0%</b>	<b>0</b>	<b>0</b>	<b>0.0%</b>
<u>Geese</u>										
BLBR	black brant	<i>Branta bernicla</i>	200	0	0%	0	0.0%	0	0	0.0%
CACG	cackling goose	<i>Branta hutchinsii</i>	200	6	3%	0	0.0%	0	0	0.0%
CAGO	Canada goose	<i>Branta canadensis</i>	1	0	0%	0	0.0%	0	0	0.0%
LSGO	lesser snow goose	<i>Chen caerulescens</i>	205	7	3%	0	0.0%	0	0	0.0%
<b>Subtotal:</b>			<b>606</b>	<b>13</b>	<b>2%</b>	<b>0</b>	<b>0.0%</b>	<b>0</b>	<b>0</b>	<b>0.0%</b>
<u>Swans</u>										
MUSW	mute swan	<i>Cygnus olor</i>	3	0	0%	0	0.0%	0	0	0.0%
TRUS	trumpeter swan	<i>Cygnus buccinator</i>	72	9	12%	0	0.0%	0	0	0.0%
TUSW	tundra swan	<i>Cygnus columbianus</i>	3	0	0%	0	0.0%	0	0	0.0%
<b>Subtotal:</b>			<b>78</b>	<b>9</b>	<b>12%</b>	<b>0</b>	<b>0.0%</b>	<b>0</b>	<b>0</b>	<b>0.0%</b>
<u>Shorebirds, Misc. water-associated birds and Raptors</u>										
AMCO	american coot	<i>Fulica atra</i>	3	0	0%	0	0.0%	0	0	0.0%
BAEA	bald eagle	<i>Haliaeetus leucocephalus</i>	2	0	0%	0	0.0%	0	0	0.0%
DUNL	dunlin	<i>Calidris alpina</i>	195	4	2%	0	0.0%	0	0	0.0%
GBHE	Great blue heron	<i>Ardea herodias</i>	1	0	0%	0	0.0%	0	0	0.0%
GWGU	glaucous-winged gull	<i>Larus glaucescens</i>	1	0	0%	0	0.0%	0	0	0.0%
LESA	least sandpiper	<i>Calidris minutilla</i>	6	0	0%	0	0.0%	0	0	0.0%
PALO	pacific loon	<i>Gavia pacifica</i>	1	0	0%	0	0.0%	0	0	0.0%
ROSA*	rock sandpiper	<i>Calidris ptilocnemis</i>	1	0	0%	0	0.0%	0	0	0.0%
<b>Subtotal:</b>			<b>210</b>	<b>4</b>	<b>2%</b>	<b>0</b>	<b>0.0%</b>	<b>0</b>	<b>0</b>	<b>0.0%</b>
<b>Totals</b>			<b>1631</b>	<b>198</b>	<b>12%</b>	<b>13</b>	<b>0.8%</b>	<b>0</b>	<b>3</b>	<b>0.2%</b>

\* Listed as "purple sandpiper" in VSL database due to their lack of options

**Table 2. Hunter Harvested Bird AI Samples Collected by WDFW, 7/1/08 - 6/30/09**

Sp. Code	Common Name	Scientific Name	Total Number Tested	Total AI positive	Percent AI positive	Total H5 positive	Percent H5 positive	Total H7 positive	Percent H7 positive
<u>Dabbling Ducks</u>									
AGWT	American green-winged teal	<i>Anas crecca</i>	47	1	2%	0	0%	0	0%
MALL	mallard	<i>Anas platyrhynchos</i>	190	20	10%	3	2%	0	0%
<b>Subtotal:</b>			<b>237</b>	<b>21</b>	<b>9%</b>	<b>3</b>	<b>1%</b>	<b>0</b>	<b>0%</b>
<u>Geese</u>									
CACG	cackling goose	<i>Branta hutchinsii</i>	200	6	3%	0	0%	0	0%
LSGO	lesser snow goose	<i>Chen caerulescens</i>	204	7	3%	0	0%	0	0%
BLBR	black brant	<i>Branta bernicla</i>	200	0	0%	0	0%	0	0%
<b>Subtotal:</b>			<b>604</b>	<b>13</b>	<b>2%</b>	<b>0</b>	<b>0%</b>	<b>0</b>	<b>0%</b>
<b>Totals</b>			<b>841</b>	<b>34</b>	<b>4%</b>	<b>3</b>	<b>0.3%</b>	<b>0</b>	<b>0%</b>

**Table 3. Live Bird AI Samples Collected by WDFW, 7/1/08 - 6/30/09**

Sp. Code	Common Name	Scientific Name	Total Number Tested	Total AI positive	Percent AI positive	Total H5 positive	Percent H5 positive	Total H7 positive	Percent H7 positive
<u>Dabbling Ducks</u>									
AGWT	American green-winged teal	<i>Anas crecca</i>	5	0	0%	0	0%	0	0%
MALL	mallard	<i>Anas platyrhynchos</i>	329	137	42%	10	3%	3	1%
NOPI	northern pintail	<i>Anas acuta</i>	154	14	9%	0	0%	0	0%
<b>Subtotal:</b>			<b>488</b>	<b>151</b>	<b>31%</b>	<b>10</b>	<b>2%</b>	<b>3</b>	<b>0.6%</b>
<u>Swans</u>									
TRUS	trumpeter swan	<i>Cygnus buccinator</i>	6	0	0%	0	0%	0	0%
<b>Subtotal:</b>			<b>6</b>	<b>0</b>	<b>0%</b>	<b>0</b>	<b>0%</b>	<b>0</b>	<b>0%</b>
<u>Shorebirds</u>									
DUNL	dunlin	<i>Calidris alpina</i>	195	4	2%	0	0%	0	0%
LESA	least sandpiper	<i>Calidris minutilla</i>	6	0	0%	0	0%	0	0%
ROSA	rock sandpiper	<i>Calidris ptilocnemis</i>	1	0	0%	0	0%	0	0%
<b>Subtotal:</b>			<b>202</b>	<b>4</b>	<b>2%</b>	<b>0</b>	<b>0%</b>	<b>0</b>	<b>0%</b>
<b>Totals</b>			<b>696</b>	<b>155</b>	<b>22%</b>	<b>10</b>	<b>1%</b>	<b>3</b>	<b>0.4%</b>

**Table 4. Agency Harvested Bird AI Samples Collected by WDFW, 7/1/08 - 6/30/09**

Sp. Code	Common Name	Scientific Name	Total Number Tested	Total AI positive	Percent AI positive	Total H5 positive	Percent H5 positive	Total H7 positive	Percent H7 positive
<u>Swans</u>									
MUSW	mute swan	<i>Cygnus olor</i>	2	0	0%	0	0%	0	0%
<b>Subtotal:</b>			<b>2</b>	<b>0</b>	<b>0%</b>	<b>0</b>	<b>0%</b>	<b>0</b>	<b>0%</b>
<b>Totals</b>			<b>2</b>	<b>0</b>	<b>0%</b>	<b>0</b>	<b>0%</b>	<b>0</b>	<b>0%</b>

**Table 5. Morbidity/Mortality Bird AI Samples Collected by WDFW, 7/1/08 - 6/30/09**

Sp. Code	Common Name	Scientific Name	Total Number Tested	Total AI positive	Percent AI positive	Total H5 positive	Percent H5 positive	Total H7 positive	Percent H7 positive
<u>Dabbling Ducks</u>									
MALL	mallard	<i>Anas platyrhynchos</i>	6	0	0%	0	0%	0	0%
WODU	wood duck	<i>Aix sponsa</i>	2	0	0%	0	0%	0	0%
NOPI	northern pintail	<i>Anas acuta</i>	1	0	0%	0	0%	0	0%
<b>Subtotal:</b>			<b>9</b>	<b>0</b>	<b>0%</b>	<b>0</b>	<b>0%</b>	<b>0</b>	<b>0%</b>
<u>Diving Ducks</u>									
COGO	common goldeneye	<i>Bucephala islandica</i>	1	0	0%	0	0%	0	0%
COME	common merganser	<i>Mergus merganser</i>	2	0	0%	0	0%	0	0%
<b>Subtotal:</b>			<b>3</b>	<b>0</b>	<b>0%</b>	<b>0</b>	<b>0%</b>	<b>0</b>	<b>0%</b>
<u>Geese</u>									
LSGO	lesser snow goose	<i>Chen caerulescens</i>	1	0	0%	0	0%	0	0%
CAGO	Canada goose	<i>Branta canadensis</i>	1	0	0%	0	0%	0	0%
<b>Subtotal:</b>			<b>2</b>	<b>0</b>	<b>0%</b>	<b>0</b>	<b>0%</b>	<b>0</b>	<b>0%</b>
<u>Swans</u>									
MUSW	mute swan	<i>Cygnus olor</i>	1	0	0%	0	0%	0	0%
TRUS	trumpeter swan	<i>Cygnus buccinator</i>	66	9	14%	0	0%	0	0%
TUSW	tundra swan	<i>Cygnus columbianus</i>	3	0	0%	0	0%	0	0%
<b>Subtotal:</b>			<b>70</b>	<b>9</b>	<b>13%</b>	<b>0</b>	<b>0%</b>	<b>0</b>	<b>0%</b>
<u>Shorebirds &amp; Other species</u>									
AMCO	american coot	<i>Fulica atra</i>	3	0	0%	0	0%	0	0%
BAEA	bald eagle	<i>Haliaeetus leucocephalus</i>	2	0	0%	0	0%	0	0%
GBHE	great blue heron	<i>Ardea herodias</i>	1	0	0%	0	0%	0	0%
GWGU	glaucous-winged gull	<i>Larus glaucescens</i>	1	0	0%	0	0%	0	0%
PALO	pacific loon	<i>Gavia pacifica</i>	1	0	0%	0	0%	0	0%
<b>Subtotal:</b>			<b>8</b>	<b>0</b>	<b>0%</b>	<b>0</b>	<b>0%</b>	<b>0</b>	<b>0%</b>
<b>Totals</b>			<b>92</b>	<b>9</b>	<b>10%</b>	<b>0</b>	<b>0%</b>	<b>0</b>	<b>0%</b>