

Surveillance Plan for the Early Detection of H5N1 Highly Pathogenic Avian Influenza Virus in Migratory Birds in the United States: Surveillance Year 2009



General Information Publication 92

*Cover photo by Prescott Weldon,
Alaska Department of Fish and Game*

Surveillance Plan for the Early Detection of H5N1 Highly Pathogenic Avian Influenza Virus in Migratory Birds in the United States: Surveillance Year 2009

Edited by Christopher J. Brand

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**U.S. Department of the Interior
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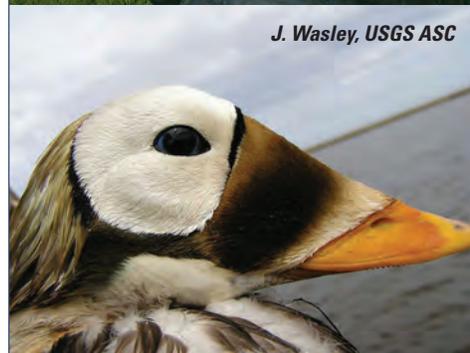
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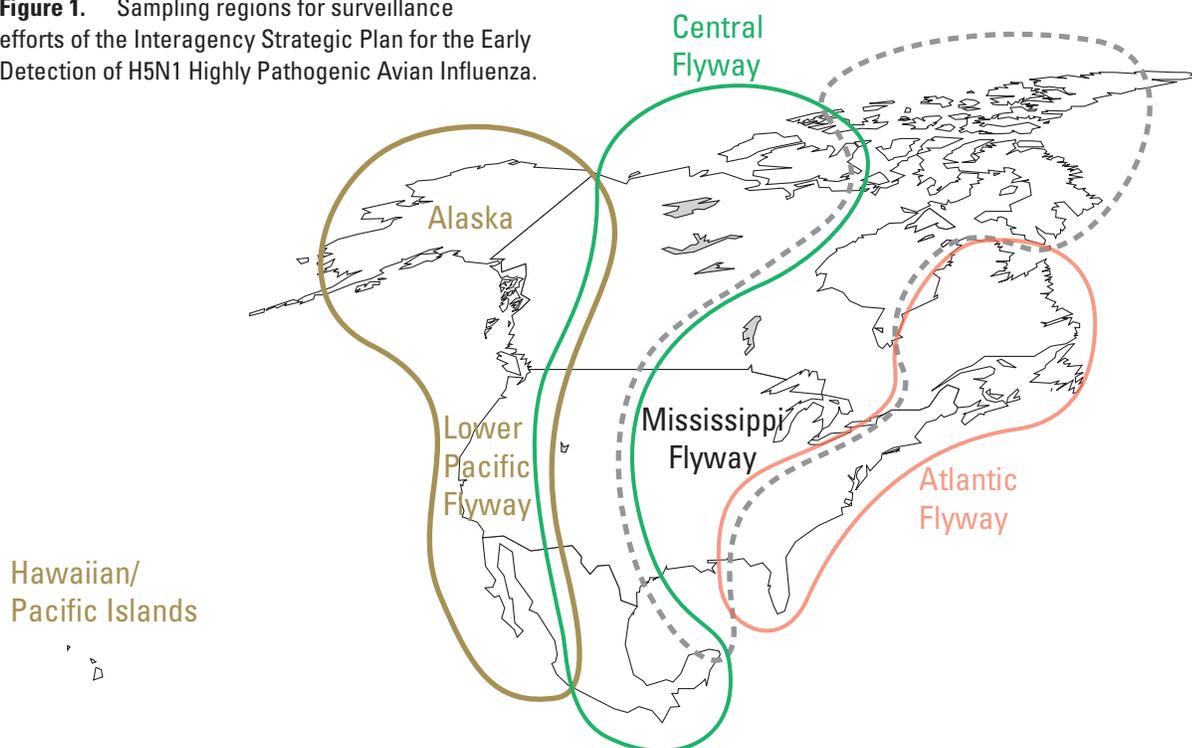
Surveillance Plan for the Early Detection of H5N1 Highly Pathogenic Avian Influenza Virus in Migratory Birds in the United States: Surveillance Year 2009

Edited by Christopher J. Brand

Executive Summary

This Surveillance Plan (Plan) describes plans for conducting surveillance of wild birds in the United States and its Territories and Freely-Associated States to provide for early detection of the introduction of the H5N1 Highly Pathogenic Avian Influenza (HPAI) subtype of the influenza A virus by migratory birds during the 2009 surveillance year, spanning the period of April 1, 2009 – March 31, 2010. The Plan represents a continuation of surveillance efforts begun in 2006 under the Interagency Strategic Plan for the Early Detection of H5N1 Highly Pathogenic Avian Influenza in Wild Migratory Birds (U.S. Department of Agriculture and U.S. Department of the Interior, 2006). The Plan sets forth sampling plans by: region, target species or species groups to be sampled, locations of sampling, sample sizes, and sampling approaches and methods. This Plan will be reviewed annually and modified as appropriate for subsequent surveillance years based on evaluation of information from previous years of surveillance, changing patterns and threats of H5N1 HPAI, and changes in funding availability for avian influenza surveillance. Specific sampling strategies will be developed accordingly within each of six regions, defined here as Alaska, Hawaiian/Pacific Islands, Lower Pacific Flyway (Washington, Oregon, California, Idaho, Nevada, Arizona), Central Flyway, Mississippi Flyway, and Atlantic Flyway (fig. 1).

Figure 1. Sampling regions for surveillance efforts of the Interagency Strategic Plan for the Early Detection of H5N1 Highly Pathogenic Avian Influenza.



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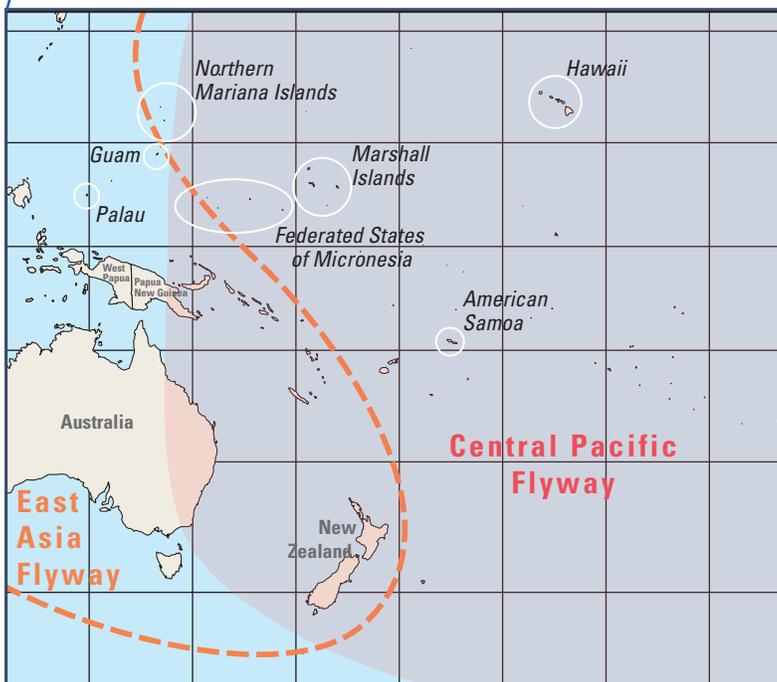
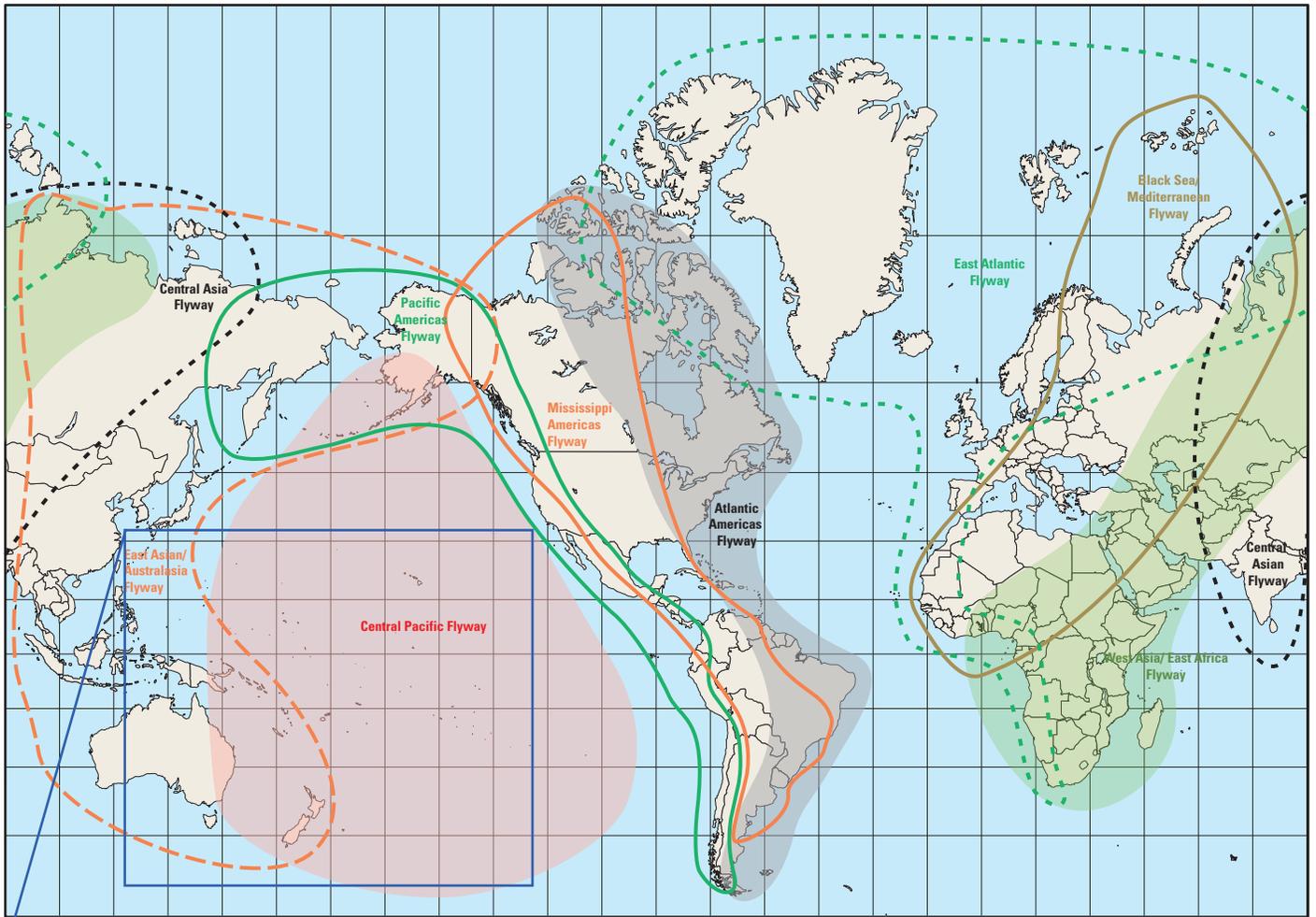


Figure 2. Generalized international migratory bird flyways (above) and U.S. Territories and Freely-Associated States (inset below).

*Northern pintail flock / Gary Kramer, USFWS (above)
Bar-tailed godwits / Robert E. Gill, USGS ASC*

Surveillance Plan History

In fall 2005, the U.S. Geological Survey (USGS), U.S. Fish and Wildlife Service, U.S. Department of Agriculture, and other partners began planning for surveillance of H5N1 HPAI in migratory birds in the United States under the Interagency Strategic Plan for the Early Detection of H5N1 Highly Pathogenic Avian Influenza in Wild Birds (U.S. Department of Agriculture and U.S. Department of the Interior, 2006). The first official surveillance year began in April 2006; subsequent annual surveillance years spanned April 1 to March 31 of each year, coinciding with approximate times of early return of spring migrants from wintering grounds to their summer ranges, through breeding, nesting, molting, and fall migration, and their duration on wintering areas. Migratory birds have now been surveyed during 3 surveillance years: 2006 surveillance year (April 1, 2006 – March 31, 2007), 2007 surveillance year (April 1, 2007 – March 31, 2008) and 2008 surveillance year (April 1, 2008 – March 31, 2009).

According to the Interagency Strategic Plan, surveillance efforts by Department of Interior took three approaches: 1) sampling of birds during avian mortality events, 2) sampling of hunter-killed birds for sport and subsistence hunting, and 3) sampling of live-captured healthy birds. During

the first year, Department of the Interior surveillance efforts during mortality events were nationwide, while the latter two approaches focused on Alaska, the Lower Pacific Flyway, and the Hawaiian Islands and U.S. Territories and Freely-Associated States in the Pacific (hereafter, the Hawaiian/Pacific Islands). At the time, these regions were assessed at highest risk for introduction of H5N1 HPAI by migratory birds because of their: 1) proximity to ongoing outbreaks at that time in Asia, 2) the intermixing of migratory birds from Asia and North America during breeding and summer periods in the arctic, and 3) the trans-Bering Sea migration of some species of birds between Asia and North America and between Asia and the Hawaiian/Pacific Islands (fig. 2).

The Interagency Strategic Plan called for expansion of surveillance coverage to other regions of the United States during the second and subsequent surveillance years. This approach was taken by Department of Interior agencies under the Interagency Strategic Plan; however, additional surveillance activities by the U.S. Department of Agriculture, and state resource agencies that conduct work for it under contract, included all 50 states beginning in the first year of surveillance.



Emperor geese / J. Wasley, USGS Alaska Science Center

During the first surveillance year, the Department of Interior and State and Territorial agencies in Alaska and the Hawaiian/Pacific Islands determined a prioritized set of migratory bird species to be sampled, as well as geographic locations and the timing of sampling. Priority was based on those factors that represented the highest risk for introducing or maintaining H5N1 HPAI. The Lower Pacific Flyway did the same type of assessment in coordination with member state resource agencies. This approach was reviewed and modified during the second and third surveillance years based on results of the earlier surveillance years and current knowledge of H5N1 HPAI in wild birds in other areas of the world. During the second surveillance year, sampling in the Central Flyway began; and in the third year, the Mississippi and Atlantic Flyways were added. Sampling approaches for live-sampled healthy birds and hunter-killed birds in these latter three flyways were determined by the corresponding U.S. Fish and Wildlife Service wildlife disease specialist in the Central Region or by flyway biologists for the Mississippi and Atlantic Flyways.

During the 2006, 2007, and 2008 surveillance years, 26,995, 20,223, and 27,092 birds, respectively, were tested for avian influenza—specifically H5N1 HPAI—at the USGS National Wildlife Health Center (NWHC). To date, HPAI H5N1 has not been detected in any birds. Infected birds have been found with low pathogenic avian influenza (LPAI) viruses at varying rates.

Surveillance Plan Objectives

The primary objective of this Plan is to provide for the early detection of H5N1 HPAI if it is introduced by migratory birds to the United States or U.S. Territories and Freely-Associated States, as stated in the initial charge of the Interagency Strategic Plan.

A secondary objective of the Plan is to provide for the detection of H5 and H7 subtypes of avian influenza viruses in wild birds. The detection of these hemagglutinin subtypes is of specific interest to the agriculture industry because of their potential to both infect commercial poultry flocks and mutate from low pathogenic to high pathogenic viruses in poultry flocks.

Detecting wild bird infection by any of the circulating LPAI viruses is a tertiary objective. Long-term and comprehensive evaluation of the temporal, geographic, and species trends of wild bird infection by these viruses can provide insight into the modes and mechanisms of the spread of influenza viruses in general, which may have application in understanding the potential role of wild birds in the spread of HPAI viruses.

Surveillance Plan Approach and Methods for 2009

The general approaches and methods for surveillance in this Plan remain largely unchanged from the initial Interagency Strategic Plan, and some modifications have been made each surveillance year from 2006 to 2008, based on information learned from previous surveillance years, recent research results, and changes in patterns of H5N1 HPAI worldwide, as well as resulting changes in the threat of introduction. This plan continues the risk-based approach to migratory bird surveillance by focusing on geographic areas; timing; and species composition, behavior, migration, and susceptibility characteristics that enhance the likelihood of detecting H5N1 HPAI if it is introduced to the United States by migratory birds. At the same time, the Plan provides nationwide monitoring of mortality events in wild birds to detect H5N1 HPAI regardless of its mode of introduction.

Surveillance Year

The 2009 surveillance year is from April 1, 2009, to March 31, 2010. This period coincides with the general annual cycle of migratory birds from their spring migration from wintering grounds, through nesting and molting periods, fall migration, and subsequent arrival and duration on wintering grounds.

Regions

To develop sampling strategies for this Plan, the United States is divided into six regions as follows: 1) Hawaiian and Pacific Islands, 2) Alaska, 3) Lower Pacific Flyway (in the lower 48 states), 4) Central Flyway, 5) Mississippi Flyway, and 6) Atlantic Flyway (fig. 1).

Methods of Sampling and Testing

Migratory birds will be sampled according to three strategies identified in the Interagency Strategic Plan: 1) Sick or dead birds from mortality events, 2) Live-capture of apparently healthy birds, 3) Sport and subsistence hunter-killed birds.

1) Mortality Investigations

The systematic investigation of morbidity and mortality events in wild birds to determine if H5N1 HPAI plays a role in causing illness and death offers the highest and earliest probability of detecting the virus if it is introduced by migratory birds into the United States. State natural resource agencies and Federal refuges and parks, primarily within the Department of the Interior's U.S. Fish and Wildlife Service National Wildlife Refuge System and the National Park Service, are

the principal authorities in a position to detect and respond to mortality events involving wild birds. Morbidity and mortality events involving wildlife are often detected by, or reported to, these agencies. Investigation of wild bird mortality events is a nationwide activity under this Plan, including all states, as well as Territories and Freely-Associated States.

Specific steps necessary to orchestrate the early detection of H5N1 HPAI through investigations of mortality events of wild birds include:

- State, federal, and tribal resource personnel will continue to increase vigilance and coordinate routine and systematic monitoring of wild bird populations for morbidity and mortality. Die-offs are investigated around the country and are treated with equally high priority. Despite efforts at coordination with partners, not all mortality events are reported to the NWHC.
 - A uniform protocol for reporting mortality events and instructions for the safe handling and shipment of specimens is available. Training of field and response personnel will be provided as requested. Mortality events are reported through appropriate channels within each state, federal, or tribal agency to the NWHC.
 - Field personnel or teams designated by respective wildlife and land management agencies will respond to mortality events by conducting mortality investigations to determine the onset, course, duration, distribution, species, and other environmental conditions associated with mortality events. As a part of the hands-on
- training, the NWHC provides assistance in developing guidelines and contingency planning for response. In certain circumstances, NWHC personnel will travel to the site of a disease outbreak to conduct intensive field investigations or assist other agencies.
 - Necropsy, histology, and laboratory (parasitology, microbiology, virology, chemistry) investigations will be utilized to determine a diagnosis of the disease-causing agents (pathogens) associated with the event. Virus isolation in chicken eggs, hemagglutination inhibition tests, and molecular testing specifically for H5N1 will be performed to detect the presence of H5N1 avian influenza virus in wild bird specimens.
 - Reporting of results back to the agency that submitted the samples is done as early as possible and includes results from U.S. Department of Agriculture-confirmed tests for HPAI. All reporting for avian influenza viruses is done in accordance with the established reporting scheme developed by the U.S. Department of Agriculture and the Department of the Interior. Any pathogen that is not avian influenza but that is a reportable disease requires notification of the U.S. Department of Agriculture's Area Veterinarian in Charge as well as the state veterinarian of the host state that submitted the samples. For all other pathogens and diagnostic results, NWHC contacts submitters directly and follows with a written report of findings.



*Hon S. Ip, USGS
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2) and 3) Live-Captured and Hunter-Killed Birds

These two strategies incorporate sampling of apparently healthy, wild birds to detect the presence of H5N1 HPAI virus. These efforts will select bird species in North America that represent the highest risk of being exposed to, or infected with, H5N1 HPAI due to their migratory movement patterns, habitat use, and behavior. This approach includes birds that migrate directly between North America or the Hawaiian/Pacific Islands and other continents where outbreaks have been reported or birds that may be in contact with species from these areas.

During the first surveillance year (2006), only samples taken by swabbing the cloacae were obtained and tested for avian influenza. Based on more recent experimental data (Brown and others 2006, 2008; Hall, J.S., U.S. Geological Survey, written commun., 2008; Keawcharoen and others 2007), birds shed H5N1 HPAI more frequently, for longer duration, and in higher concentration from the oropharynx

than the cloaca. Therefore, H5N1 HPAI is more likely to be detected from an oropharyngeal swab than a cloacal swab. In surveillance years 2007 and 2008, the swabbing protocol was thus revised to include a cloacal swab and an oropharyngeal swab combined in a single tube of Viral Transport Medium. The field-combined sample was used for Department of the Interior and U.S. Department of Agriculture surveillance nationwide with the exception of birds collected in Alaska. In Alaska, separate cloacal and oropharyngeal swabs were taken from each bird and each was placed in a separate vial containing Viral Transport Medium. These vials were then shipped in liquid nitrogen vapor shippers to the NWHC, where media from the tube with the cloacal swab was tested. The remaining sample from the cloacal swab tube was then combined with media from the oropharyngeal swab in the laboratory and the “lab-combined” sample was likewise tested. This variance was done for samples from Alaska because: 1) during the first year of the surveillance program, only cloacal swabs were tested; continuing to test cloacal swabs from Alaska provided uniform



Heather Wilson, U.S. Fish and Wildlife Service

sampling methods for between-year comparison of data; and 2) logistics in remote areas of Alaska made it more efficient to combine the media in the laboratory than in the field, as was being done in the other surveillance states. For surveillance year 2009 in Alaska, cloacal swabs and oropharyngeal swabs will be likewise collected and shipped to the NWHC. The NWHC will test the cloacal and the oropharyngeal swabs separately.

For the 2009 surveillance year, all surveillance samples shipped to the NWHC will be analyzed by matrix real-time reverse transcriptase polymerase chain reaction assay (rRT-PCR) and H5 and H7-specific rRT-PCR as identified in the Interagency Strategic Plan. Virus isolation will be performed on all of the positive samples and on a randomly-selected 30 percent of the negative samples within each batch of samples submitted, or on 30 percent of specific subsets submitted from Alaska as identified by the USGS Alaska Science Center (ASC). Virus isolation attempts on negative samples are used to estimate a rate of false-negative samples by rRT-PCR.



Karen N. Wolf



Ryan Bradley

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Selection of Bird Species/Species Groups and Locations to be Sampled

Selection of species and species groups and locations for sampling by strategies 2 and 3 is made at the regional level to enhance the likelihood of detecting H5N1 HPAI as early as possible. Priority is given to the species or populations most likely to have been exposed in Eurasia, or those that most likely associate directly or indirectly (by sharing breeding grounds or habitat) with birds from Eurasia that have been exposed to, or are infected with, H5N1 HPAI. Other factors that influence species and location selection include: the known role of a species in circulating avian influenza viruses in general (including LPAI viruses), results from previous years of avian influenza surveillance (such as species prevalence and patterns of LPAI infection), and efficiency of collecting sufficient sample sizes (see below).

Species or species groups, for example the shorebirds group, and specific locations for sampling were determined by region prior to the surveillance year in coordination among the USGS NWHC, USGS ASC, U.S. Fish and Wildlife Service, and other partners as appropriate. For surveillance year 2009 (April 1, 2009 – March 31, 2010), the targeted species or species groups and general locations are discussed below and in tables 1 and 2.

Sampling of Birds in Alaska

Major changes in the surveillance year 2009 sampling scheme included removal of all passerine birds, glaucous gull (*Larus hyperboreus*), and lesser sandhill crane (*Grus canadensis canadensis*) from species to be sampled and reduction in the number sampled and sampling locations for black brant (*Branta orientalis*) and common eider (*Somateria mollissima*). The total number of sampling locations in Alaska was reduced from 31 to about 25 (table 1).



Long-tailed ducks ready for banding / J. Reed, USGS Alaska Science Center



Rock sandpiper adult / Robert E. Gill, USGS Alaska Science Center



Bar-tailed godwit / Steve Maslowski, U.S. Fish and Wildlife Service



Black brant family / J. Wasley, USGS Alaska Science Center

Table 1. Locations of sample collection, species and species groups to be sampled, number of birds in each species or group targeted for sample collection, and sample collection method in Alaska and the Northwest Territories, Canada, during surveillance year 2009.

[NWR, National Wildlife Refuge; ~, approximately]

Location	Species or species group ^{1 h}	Number of birds	Collection method
NWR Becharof	Pacific golden plover	40	Live
NWR Becharof	Tundra swan	100	Live
Arctic NWR	Buff-breasted sandpiper, Dunlin, Long-billed dowitcher, Pectoral sandpiper, Ruddy turnstone	100 (total)	Live
Barrow	Dunlin	100	Live
	Long-billed dowitcher	30	Live
	Pectoral sandpiper	130	Live
Izembek NWR	Steller's eider	200	Live
Izembek NWR	Various	300	Fall hunting
Izembek NWR	Tundra swan	30	Live
Koyukuk/Innoko NWRs	Northern pintail	200	Live
Minto Flats	Northern pintail	200	Live
	American green-winged teal	200	Live
National Petroleum Reserve, Alaska	Buff-breasted sandpiper	50	Live
	Dunlin	25	Live
	Long-billed dowitcher	5	Live
	Pectoral sandpiper	40	Live
Northwest Alaska	Tundra swan	200	Live
Northwest Territories (Canada)	Long-tailed duck	200	Live
North Slope	Lesser snow goose	200	Live
Nelson	Steller's eider	200	Live
Interior and Arctic Coastal Plain	Greater white-fronted goose	400	Live
Seward Peninsula	Various	1,500	Subsistence
Yukon Delta NWR	Emperor goose	200	Live
Yukon Delta NWR	Black brant	50	Live
	Common eider	20	Live
	Emperor goose	50	Live
	Spectacled eider	50	Live
Yukon Delta NWR	Tundra swan	100	Live
Yukon Delta NWR	American green-winged teal	200	Live
	Northern pintail	200	Live
Yukon Delta NWR	Dunlin, Rock sandpiper, Stilt sandpiper	500–750	Live
Yukon Flats NWR	Northern pintail	200	Live
Yukon Kuskowim Delta	Various	3000	Subsistence
Three locations	Dabbling ducks	~400	Fall hunting
Total		~10,000	

¹ Pacific golden plover (*Pluvialis fulva*), Tundra swan (*Cygnus columbianus*), Buff-breasted sandpiper (*Tryngites subruficollis*), Dunlin (*Calidris alpina*), Long-billed dowitcher (*Limnodromus scolopaceus*), Pectoral sandpiper (*Calidris melanotos*), Ruddy turnstone (*Arenaria interpres*), Steller's eider (*Polysticta stelleri*), Northern pintail (*Anas acuta*), American green-winged teal (*Anas carolinensis*), Long-tailed duck (*Clangula hyemalis*), Lesser snow goose (*Anser caerulescens caerulescens*), Greater white-fronted goose (*Anser albifrons*), Emperor goose (*Chen canagica*), Black brant (*Branta orientalis*), Common eider (*Somateria mollissima*), Spectacled eider (*Somateria fischeri*), Rock sandpiper (*Calidris ptilocnemis*), Stilt sandpiper (*Calidris himantopus*), Dabbling ducks (*Anas* spp.)

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Changes in the sampling scheme for the Lower Pacific Flyway include: 1) use of regularly scheduled waterfowl trapping operations, rather than live-trapping exclusively for avian influenza sampling, and 2) shifting some live-bird sampling to sampling of hunter-harvested birds. In addition, dabbling ducks (*Anas* spp.) will be considered as one sampling unit, rather than as individual species, when multiple dabbling species occupy and are collected in the same sampling area (table 2).

Sampling of Birds in the Hawaiian/Pacific Islands

During surveillance year 2009, collection and sampling of live-captured birds will be eliminated on Hawaii and American Samoa. Collection and sampling of live-captured birds in Palau, Guam, and the Commonwealth of the Northern Mariana Islands will continue because of their close proximity to epicenters of

H5N1 HPAI activity in Indonesia and Vietnam and their close links to migratory birds of Southeast Asia. A total of 1,700 birds will be sampled, comprised of shorebirds and terns (Charadriiformes), wading birds (Ciconiiformes), doves and pigeons (Columbiformes), and Passeriformes.

Sampling of Birds in the Central Flyway

The Central Flyway program focuses primarily on morbidity and mortality surveillance and live bird samples submitted from a few select projects. Fewer than 1,000 live bird samples will be collected in this flyway and submitted to the NWHC. These samples will be collected primarily from dabbling ducks and a few shorebird species. Morbidity and mortality surveillance will cover approximately 60 percent of available habitat within project boundaries.

Table 2. Locations of sample collection, species and species groups to be sampled, and number of birds in each species or group targeted for sample collection in the Lower Pacific Flyway during surveillance year 2009.

State	County or area	Species or species group ¹	Number of birds
Washington	Clark County	Cackling goose	200
Washington	Grant County	Mallard	200
Oregon	Multnomah and Columbia Counties (Sauvie Island area)	Canada goose	200
Oregon	Harney and Lake Counties	Dabbling ducks	200
Oregon	Klamath County	Snow goose	200
Utah	Salt Lake and Davis Counties	Dabbling ducks	200
Nevada	Churchill County	Dabbling ducks	200
Idaho	Bear Lake County	Dabbling ducks	200
Idaho	Canyon County	Dabbling ducks	200
California	Kern County	Northern pintail	200
California	Butte County	Dabbling ducks	200
California	Colusa County	Dabbling ducks	200
California	Fresno County	Dabbling ducks	200
California	Central Valley area	Greater white-fronted goose	200
California	San Luis Obispo County	Black brant	200
California	Humboldt County	Black brant	200
California	Imperial County	Dabbling ducks	200
California	Stanislaus County	Cackling goose	200
Total			4,200

¹ Cackling goose (*Branta hutchinsii*), Mallard (*Anas platyrhynchos*), Canada goose (*Branta canadensis*), Dabbling ducks, (*Anas* spp.), Snow geese (*Chen caerulescens*), Northern pintail (*Anas acuta*), Greater white-fronted goose (*Anser albifrons*), Black brant (*Branta orientalis*)



*Photos by Heather Wilson,
U.S. Fish and Wildlife Service*



Sampling of Birds in the Mississippi Flyway

Sampling within the Mississippi Flyway will be conducted both by refuge and state wildlife agency staff. Collections will focus on live bird capture within the Anseriformes and Charadriiformes orders—primarily dabbling ducks (*Anas* spp.) and geese; and pectoral and least sandpipers (*Calidris melanotos* and *Calidris minutilla*). Wood duck (*Aix sponsa*) and Canada goose (*Branta canadensis*) collections will be reduced from prior years. Hunter-killed bird collections will also be reduced within this flyway. Morbidity and mortality surveillance will be conducted at as many of the participating sites as possible. Swab samples within this flyway will be limited to fewer than 3,000.

Sampling of Birds in the Atlantic Flyway

Sampling within the Atlantic Flyway will be conducted both by refuges and state wildlife agencies. Collections will focus on live bird capture within the Anseriformes (dabbling ducks, geese, and swans) and Charadriiformes (shorebirds, gulls, and auks) orders. Wood duck sampling and hunter-killed collections will be reduced from prior years but not completely eliminated. Canada goose and mallard collections will be limited in those states where the U.S. Department of Agriculture continues surveillance. Morbidity and mortality surveillance is being conducted at as many of the participating sites as possible. Swab samples within this flyway will be limited to fewer than 3,000.

Sample Sizes

For sampling of live-captured and hunter-killed birds, a sample size of 200 was selected for each target species or species group at a specific location during the time period sampled. This sample size is based on statistics that would enable detection, with a 95 percent confidence, if 1.5 percent or more of the population-at-risk was infected with H5N1 HPAI. This measure was determined at the outset of the surveillance program before widespread surveillance for H5N1 HPAI in wild birds was conducted in affected areas of the world. The figure reflects a “realistic” prevalence based on expectations of other LPAI viruses circulating in waterfowl populations from previous studies at that time.

Surveillance results (Ip and others, 2008; Dusek and others, 2009) confirm that this is still a reasonable figure for circulating LPAI viruses in the United States during most periods of time. With few exceptions (Saad and others, 2007; Feare, 2007; Chen and others, 2006), recent live-bird surveillance results from H5N1 HPAI-affected areas of the world have almost exclusively been negative for this specific virus unless in association with ongoing HPAI mortality. Although surveillance approaches and sample sizes differ widely around the world, these results suggest that either 1) the HPAI H5N1 virus is not maintained in migratory birds in general unless there is ongoing mortality or spillover from poultry outbreaks, or 2) its prevalence in migratory birds is considerably lower than 1.5 percent.

Karen Bollinger, U.S. Fish and Wildlife Service



For planning the surveillance for the introduction of H5N1 HPAI into the United States, we assume that, in the absence of large-scale mortality, this virus would need to be maintained in certain species of migratory bird populations at levels similar to LPAI in order for it to be perpetuated. If periodic mortality from HPAI in migratory birds was at a large enough scale to perpetuate virus transmission, we would likewise expect an increase in virus prevalence in live-captured or hunter-killed birds associated with such mortality events. Thus the target number of samples (200) for each sampling unit is still a reasonable number for live-captured and hunter-killed birds given current information about H5N1 HPAI.

Data Management and Reporting

A national database for use by all agencies, organizations, and policy makers has been created to support the Inter-agency Strategic Plan and this subsequent Surveillance Plan. This includes a robust, secure data-management infrastructure and a variety of integrating and reporting components. This system, the HPAI Early Detection Data System (HEDDS; <http://wildlifedisease.nbii.gov/ai>) contains data from samples submitted by many agencies and organizations. It communicates the status of surveillance efforts to the public and has specific display, mapping and data analysis tools for collabora-

tors. The system has been developed, and is maintained by, the National Biological Information Infrastructure Wildlife Disease Information Node, and it is supported by many agencies and institutions.

Cooperators and Partners in Surveillance

The Surveillance Plan includes a wide variety of partners for both field collection of samples and confirmation of laboratory results. The primary partners include the following:

- U.S. Department of the Interior
- U.S. Fish and Wildlife Service
- USGS National Wildlife Health Center, Alaska Science Center and Western Ecological Research Center; other Centers as appropriate
- Numerous state natural resource agencies
- U.S. Department of Agriculture
 - Wildlife Services
 - National Veterinary Services Laboratory

Heather Wilson, U.S. Fish and Wildlife Service



Interagency Steering Committee of the Interagency Surveillance Plan

An Interagency Steering Committee, consisting of one representative each from the USGS, the U.S. Fish and Wildlife Service, the U.S. Department of Agriculture Animal and Plant Health Inspection Service, the Association of Fish and Wildlife Agencies, and the U.S. Department of Health and Human Services has been formed to coordinate wild bird avian influenza surveillance in the United States. Specific roles of this Committee include:

- Facilitate communication between state and federal agencies, and organizations involved in avian influenza surveillance in wild birds.
- Coordinate implementation and data analysis of AI surveillance programs nationally.
- Provide periodic summaries of avian influenza surveillance in wild birds in the United States.
- Provide periodic recommendations for avian influenza surveillance in wild birds based on previous sampling efforts and changes in virus epidemiology.
- Facilitate communication and coordination among state and federal agencies for contingency planning and other preparations for the appearance of H5N1 HPAI in wild birds in North America.

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