

6/9/06

Surveillance for Early Detection of Highly Pathogenic Avian Influenza  
Asian H5N1 in Wild Birds:  
**2006-07 Washington Sampling Plan**

Avian influenza is widely endemic in wild populations of waterfowl and many other species of birds. The emergence and spread of a Highly Pathogenic Avian Influenza (HPAI) H5N1 subtype in Asia over the past few years (hereafter called Asian H5N1) has elevated concerns about potential expansion of this virus to North America.

Apprehensions among government agencies and the public are based on a range of possibilities that include sickness and mortality in wild bird populations, introduction of a disease that could devastate the poultry industry, and potential mutation of the virus into a form that could be highly infectious and pathogenic to humans—possibly the source of a flu pandemic. Currently, public concern has been heightened by extensive media coverage about this virus in Asia, its spread to Europe, and the small number of human infections—much of it includes speculation that migratory birds are a primary vector and will bring it to North America. Thus, government agencies, particularly state and federal wildlife agencies, are being called upon to develop an early detection system to determine if and when the virus arrives in North America.

Some clarifications of terms and the current situation are warranted because the terminology of avian influenza is often confusing, and it is important that a shared understanding of this disease is accurate. For purposes of this plan, here are some key points and assumptions as of June 2006:

- Migratory aquatic birds are the natural reservoir for many of the 144 subtypes of avian influenza, named for their protein components hemagglutinin (H) and neuraminidase (N). Most avian influenza types are not very pathogenic, but the H5 and H7 types seem to be more pathogenic to domestic poultry.
- The terms “highly pathogenic” (HPAI) and “low pathogenic” (LPAI) refer specifically to pathogenicity to domestic poultry—testing for HPAI is documented by mortality rates in dosed poultry.
- Some avian influenza varieties may mutate into forms that become pathogenic to specific taxa (e.g., birds, swine, humans). The currently prominent Asian H5N1 virus is highly pathogenic to some birds, particularly domestic poultry, but is not easily transmitted to people. This is primarily a bird disease that has infected a small number of people who have been heavily exposed to infected poultry or raw poultry parts.
- The Asian H5N1 strain has not been detected in North America. Low pathogenic H5N1 and a wide variety of other AI types have been documented in poultry and wild waterbirds.
- The degree to which migratory birds may be agents in the spread of Asian H5N1 is poorly documented. In nearly all cases of expansion in Eurasia, movements of poultry and poultry products are suspected as the primary vehicle. Mortalities of

wild birds have been associated with contact or shared use of habitats with domestic birds.

- Currently, there is inadequate information about the virulence of Asian H5N1 in wild bird species, its persistence in wild populations, and the degree to which it can spread from bird to bird during seasonal and annual cycles. Fecal and respiratory contamination is assumed to be the primary mode of transmission, and viruses can remain viable for extensive periods in cold, fresh water.
- The onset of a major human influenza pandemic could result if some form of AI—Asian H5N1 or any other type—adapted into a form that was infectious and virulent among humans. It is not a given that Asian H5N1 is the mostly likely threat for a global pandemic.

## **GOAL AND OBJECTIVE**

The overall goal of this state-level effort is to detect Asian H5N1 in wild birds if it occurs in Washington during July 2006 through June 2007. This goal, and the goals of the national strategy and the Pacific Flyway strategy, is focused on early detection of Asian H5N1 in wild migratory waterfowl and shorebirds—not its prevalence over time, its rate of movement, or the ecology of the disease. This document is intended as a step-down approach from the draft U.S. Interagency Strategic Plan (Interagency HPAI Early Detection Working Group [IAEDWG ] 2006) and the Pacific Flyway strategic plan (Pacific Flyway Council 2006), as part of the National Early Detection System for Asian H5N1.

The objective of this document is to provide an implementation plan for sampling wild bird species for Asian H5N1 in Washington State, including sampling priorities, focus periods, and target locations. Planning for these surveillance efforts for Asian H5N1 has involved extensive cooperation among federal, state, and local agencies, including U.S. Department of Agriculture APHIS/Wildlife Services (USDA), U.S. Fish and Wildlife Service (USFWS), and the Washington Interagency Avian Influenza Coordination Committee.

## **APPROACH**

### **Species Prioritization**

During development of the U.S. strategic plan, wildlife agencies in Alaska collaborated with the U.S. Geological Survey, National Wildlife Health Center (NWHC) and others to establish relative priorities among migratory bird species in terms of the relative probability that they could be exposed to Asian H5N1 (IAEDWG 2006). The Pacific Flyway Council subsequently developed a preliminary list of surveillance candidates that reflects both “primary” species that could come directly from breeding grounds in Asia, as well as “secondary” species that would likely intermingle with Asian migrants and speculatively could be subject to secondary transmission. Monitoring abundant “secondary” species, such as juvenile mallards, may be useful if Asian H5N1 is not detected in Alaska but makes its way through the surveillance network via migrants to Washington. This plan’s sampling strategies are focused on primary and secondary

species occurring in Washington (see Table 1), considering national and Pacific Flyway strategic plan priorities.

Table 1. Primary and secondary candidate waterfowl and shorebird species for Asian H5N1 surveillance in Washington.

Primary Candidates	Secondary Candidates
Lesser Snow Goose (Wrangel Is.)	Cackling Goose
Pacific Brant	Mallard
Northern Pintail	American Wigeon
Western Sandpiper	American Green-winged Teal
Dunlin	Northern Shoveler
Red Knot	Trumpeter Swan
Ruddy Turnstone	Sea Duck (Long-tailed, Harlequin, Black Scoter)
Tundra Swan	

### Sampling Intensity

Currently, there is no reliable information on the prevalence of Asian H5N1 in wild bird populations—anywhere. The national and Pacific Flyway plans suggest that a minimum of 200 samples would be required to detect one positive Asian H5N1 sample in a defined population with >1,000 individuals (probability 95%) if the virus had a prevalence of only 1%. Statistically, sampling rates need to be higher with larger populations, but could be lower if the prevalence of H5N1 was greater. This hypothetical approach assumes that the population of interest is homogenous and entirely accessible for sampling, that H5N1 is uniformly distributed within that population, and that representative sampling can be done in a random or otherwise unbiased manner, which is not the expected case in wild migratory waterfowl. Because of these factors, sampling intensity will be increased over the 200 bird minimum for large populations of wild birds occurring in Washington (e.g. shorebirds – several hundred thousand during migration) that can be sampled efficiently with available resources.

### Funding

Federal funding for 2006-07 surveillance activities has been allocated to federal agencies in Washington, and a portion will be passed through to state agencies. In March 2006, USDA presented a plan to distribute \$1.06 million to the Pacific Flyway States for testing of wild birds for Asian H5N1. The plan included a ranking system that rated states for funding prioritization using criteria such as migratory bird relative abundance, sampling efficacy based upon that abundance and resource capabilities of the state agencies. The eleven Pacific Flyway States were ranked Level 1 (highest priority/ highest funding), Level 2 or Level 3. Washington was ranked as a level 1 State, and WDFW will receive \$140,000 from USDA to collect and ship 1000 samples from live birds and hunter-killed waterfowl, and 500 fecal samples. These funds must be spent within 12 months of signing a cooperative USDA/WDFW agreement. In addition, USDA is receiving direct funding to collect 1500 samples from live and hunter-killed birds, and 1000 fecal samples. USDA direct non-contract expenditures must occur by the end of 2006. USDA will also fund WSDA for

collection of samples from game farms and wildlife rehabilitators.

USFWS will provide \$285,000 for Washington State sampling activities related to Asian H5N1, including USFWS National Wildlife Refuge (NWR) and other agency activities. This funding will allow WDFW to expand collection to other species and locations, and develop an extensive surveillance and sampling network for mortality events. Distribution of USFWS funds will follow priorities outlined in this plan. Funding for USFWS NWR activities has been allocated at \$15,000. USFWS/WDFW will provide \$25,000 in funding for the University of Washington's Coastal Observation and Seabird Survey Team (COASST) to survey and sample bird mortalities along Washington marine shorelines.

### **General Sampling Methods**

Several methods will be employed to monitor for Asian H5N1 presence in Washington's wild migratory waterfowl and shorebirds. This plan is intended to provide efficient surveillance with an array of methods designed in the context of regional, flyway, national efforts, and available funding. If Asian H5N1 is carried to North America from migratory birds moving through Alaska, it is likely to move south with about 150,000 swans, 1 million geese, and 12 million ducks that leave Alaska beginning in August (>60% oriented toward the Pacific Flyway), or with hundreds of thousands of autumn migrant shorebirds that begin arriving in Washington between July and October. Many of these birds pass through and/or winter in Washington. The challenge, given existing budgetary constraints, will be to mount a detection network in Washington of sufficient coverage to detect birds potentially infected with Asian H5N1, including a relatively small number of Asian migrants, secondarily infected birds, and locally produced birds that may acquire the virus. Additional details on sampling methods are provided in a later section, sampling strategies for the detection of Asian H5N1 in Washington wild birds (also see summary in Appendix A).

### Detection and Monitoring of Morbidity-Mortality Events

An enhanced surveillance and reporting network for detecting wildlife mortality events will be developed by the Washington Interagency Avian Influenza Coordination Committee, considering the existing reporting system to monitor bird mortalities from West Nile Virus. An expanded program to investigate mortalities will be implemented to integrate with this network, along with other reports of avian mortalities. In the event of a major event, Washington cooperators will work with U.S. Fish and Wildlife Service, U.S. Department of Agriculture, the USGS National Wildlife Health Center, and state animal health authorities.

### Sampling Live Birds - Waterfowl

In Washington, banding programs can provide access to large numbers of waterfowl. Sampling during ongoing and new banding operations will focus on Asian or Alaska connections—including capture of dabbling ducks from August to October prior to hunting seasons, and from February through March after hunting seasons have closed. Following the strategies described in the Pacific Flyway strategic plan, live bird sampling

in Washington will focus on mallards and pintails, but secondary species that meet the prioritization criteria (wigeon, green-winged teal, shoveler, sea ducks) will be sampled on an opportunistic basis. Samples from live birds will be cloacal swabs. Birds captured during testing for Asian H5N1 will be banded to document recaptures and distribution during the 2006-07 season.

Birds that breed and molt in Washington in 2006 will not likely have the potential for contact with Asian H5N1 unless or until they mingle with Asian/Alaska migrants. Locally produced birds can act as wild sentinel birds to detect the arrival of Asian H5N1 after migrants from Alaska have arrived. This is based on findings that: (1) mallards and pintails are known reservoirs of low pathogenic viruses with higher prevalence rates than some other species; (2) juvenile ducks have the highest prevalence of LPAI among North American surveys; and (3) the rate of virus shedding is high during late summer and early migration staging. Sampling of local mallards will occur during late summer banding, after migrants from Alaska are known to occur in the area.

#### Sampling Live Birds - Shorebirds

As a group, the shorebirds represent an important potential source of information regarding the early detection of Asian H5N1 in Washington. Samples (cloacal swabs) from shorebirds, primarily western sandpiper and dunlin, will be collected between mid-July through mid-November. Additionally, sampling of other species that meet the prioritization criteria (red knot, ruddy turnstone) may occur on an opportunistic basis. Birds captured during testing for Asian H5N1 will be banded to document recaptures.

#### Sampling Hunter-Harvested Waterfowl

Hunters in Washington currently harvest about 400,000 ducks and 30,000 geese. This presents an opportunity to access and sample a large number of harvested birds in 2006 and beyond, primarily on public hunting areas with existing check stations. In some cases, to meet species/area sampling goals, additional check stations or hunter contact sites will be established with enhanced staffing and support.

The harvest sampling regime is designed to test both migrant waterfowl from the north, as well as sample local mallards that may be taken in the early part of seasons. Wrangel Island snow goose, brant, cackling geese, swans, mallard, and wigeon will be the primary species of focus, but other species that meet the prioritization criteria (pintail, green-winged teal, and shoveler) will be sampled on an opportunistic basis. Samples from hunter-killed birds will be cloacal swabs. Following the end of waterfowl seasons, directed collection under existing federal scientific collection permits will only be used if required sample sizes have not been achieved using the above methods.

#### Fecal Sampling

Fecal samples will be taken in areas of waterfowl concentrations that are not sampled extensively through live or hunter-killed bird sampling. Samples will be taken via swabs of fecal material in fields. The USDA National Wildlife Research Center is establishing analytical capacity for fecal samples and water.

## **Staffing**

USDA has assigned 20 staff to this effort through December 2006. Existing WDFW permanent staff and temporary staff will be assigned to this project to meet sampling goals and develop the mortality response network. Additional needs for assistance will be filled by other WDFW permanent staff, who will be able to charge time and expenses to the project when collecting samples.

## **Methodologies and Training**

Basic protocols for taking and handling avian influenza samples have been developed in cooperation with NWHC, USDA, and other cooperators. The national strategic plan includes procedures and protocols for taking tracheal and cloacal swabs, collecting carcasses, collecting fecal samples, and shipping to laboratories (IAEDWG 2006). Sampling kits - including vials with media, coolers, and initial shipping containers - will be provided by the funding agencies. USDA kits will include sampling swabs and USFWS kits will not. Some shipping containers will need to be purchased for smaller shipments. In general, samples cannot be held longer than 72 hours and can only be shipped on Mondays, Tuesdays, and Wednesdays. Field staff collecting samples will be required to wear personal protective equipment (PPE) as required by USFWS. All Washington State personnel involved in collecting samples will be required to adhere to collection protocols.

Given that there will be a substantial investment of resources to implement Asian H5N1 surveillance in the Pacific Flyway, and that quality control of sample collection is vital, there is an immediate need for training and collaborative planning among cooperators. The NWHC and USDA have developed training materials and are working on web-based distance-delivery tools. In addition, training sessions for cooperators will be arranged in summer 2006 to cover sample collection protocols. All Washington State personnel involved in collecting samples will be required to complete these training regimes.

## **Analytical Capabilities and Data Management**

Swab samples that will be analyzed with USDA funds and Washington Department of Agriculture funds will be sent to one of the following labs:

### Eastern Washington

Washington Animal Disease Diagnostic Lab

Bustad Hall Room 155-N

Pullman, WA 99164-7034

Primary Contact:

Dr. Terry McElwain

509/335-9696

### Western Washington

Avian Health and Food Safety Laboratory

7613 Pioneer Way E.

Puyallup, WA 98371-4919  
Primary Contact:  
Dr. A. S. Dhillon  
253-445-4537

Swab samples and carcasses that will be analyzed with USFWS funds will be sent to the USGS National Wildlife Health Research Center in Madison, Wisconsin:

USGS National Wildlife Health Center  
6006 Schroeder Road  
Madison, WI 53711  
Primary Contact:  
Dr. Leslie Dierauf  
608-270-2400

All fecal samples will be analyzed at the USDA-NWRC laboratory in Fort Collins:

USDA/APHIS/WS  
National Wildlife Research Center  
4101 LaPorte Avenue  
Fort Collins, CO 80521-2154  
Primary Contact:  
Dr. Robert G. McLean  
(970) 266-6122

All samples and results will be contributed to an integrated database. USDA and USDI are currently working on a web-based database and archive system through the USGS National Biological Information Infrastructure - Wildlife Disease Information Node (WDIN). Washington cooperators will use this system to integrate reporting of sampling and testing data.

### **Coordination and Communication**

Given the high level of public and agency concern, and the level of media coverage about the disease, Washington cooperators will collaborate and coordinate their public information products and outreach programs through the Washington Interagency Avian Influenza Coordination Committee. Highly pathogenic H5 or H7 viruses are reportable diseases (i.e., laboratories are required to report them). Positive tests will result in immediate notification to the agency submitting the sample, the state veterinarian, the area veterinarian in charge, the chief state public health official, and the CDC/USDA Select Agent program. Because of the importance and public impacts of a confirmation of Asian H5N1 by the NVSL, notification will go first to top federal and state officials (e.g., Secretaries of Agriculture and Interior, Governors, Directors, etc.). A Steering Committee consisting of USGS, USFWS, USDA-APHIS, IAFWA, HHS, the National Flyway Council, and Alaska has been formed to facilitate communication and coordination among state and federal agencies for contingency planning and other

preparations for the appearance of highly pathogenic H5N1 avian influenza virus in wild birds in North America.

It is anticipated that strategies outlined in this plan will change significantly if a positive test for H5, H5N1, or Asian H5N1 is received. Resources will necessarily be redirected to assist in interagency response to a positive test. In the case of a positive test for HPAI H5N1 in any location of the Pacific Flyway, a working group comprised of membership of the Pacific Flyway Study Committee, Pacific Flyway Non-Game Technical Committee, USFWS, USDA, USGS and state animal health veterinarians will convene immediately to formulate recommendations for specific state redirection of established surveillance. These recommendations will be forwarded immediately to the National Steering Committee.



**SAMPLING STRATEGIES FOR THE DETECTION OF ASIAN H5N1 IN  
WASHINGTON WILD BIRDS**  
(also see **Summary in Appendix A**)

**1. Morbidity and Mortality Events**

According to the national strategic plan, “The systematic investigation of morbidity and mortality events in wild birds to determine if the highly pathogenic H5N1 avian influenza subtype of avian influenza (AI) is playing 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.” WDFW will employ the 4 methods listed below for implementing the Morbidity and Mortality Investigation sampling strategy of this plan. It is anticipated that up to 800 samples may be collected through response to morbidity and events.

**a. Continue routine mortality event investigations throughout the state**

**Background:** Each year, several hundred sick and dead migratory birds are recovered in Washington, affected by a variety of infectious and non-infectious conditions. Common causes of bird mortalities include infectious diseases (salmonellosis, avian cholera, pox), poisoning (lead, pesticides, natural toxins), and trauma (window strikes, powerline and vehicle collisions, gunshot). In addition, large-scale mortalities of some species, particularly seabirds, occur every year caused by starvation or by drowning in fishing nets. WDFW routinely investigates reports of dead wild birds. Typically, dead bird reports are made to the WDFW wildlife veterinarian by WDFW field staff, other agencies, or members of the public.

As more people become aware of avian influenza and concerned about sick and dead birds they may encounter, it is expected that the number of reports WDFW receives will greatly increase. In order to prevent WDFW’s existing mortality investigation system from becoming overwhelmed, it will be necessary to work with cooperating local, state, and federal agencies to improve reporting systems and to enhance field response capabilities for mortality investigations.

**Methods:** The Washington Interagency Avian Influenza Coordination Committee is currently developing an enhanced reporting network to assist investigation of wild bird mortalities. The committee is currently proposing to expand the current West Nile Virus reporting system and route reports (calls and emails) to WDFW or WSDA for birds other than corvids that are reported to local health agencies in Washington. WDFW and WSDA are developing criteria for county agencies to use in routing reports, which will include a contract for the Washington Emergency Management Department for 24/7 agency reporting. In addition, the committee will establish a 1-800 number for implementation in the event of a positive test for Asian H5N1 in North America. It is anticipated that WDFW will continue to receive direct reports from other sources, including other agencies (e.g. USDA and USFWS refuges).

In general, WDFW will be the primary contact for dead bird reports (except for corvids) and will make the determination as to whether a field investigation is needed. An interagency mortality investigation network will be created, with each member assigned responsibility for a given geographical area. If a field investigation is needed, the appropriate member of the mortality investigation network will be notified of the need to respond. Existing WDFW permanent staff and temporary staff will be assigned to participate in the mortality response network. Additional needs for assistance will be filled by other WDFW permanent staff, who will be able to charge time and expenses to the project when collecting samples. In addition, USDA will have field staff available to assist with mortality investigations throughout the state, and USFWS and National Park Service will investigate mortalities on their lands. A phone tree will be developed for each geographical area, in case the primary member of the network in that area is unavailable.

When reports are received, information about the mortality event will be collected including: the location, species, number of birds, sex and age classes, clinical signs, duration of the event, population(s) at risk, and any pertinent environmental factors. USDA and USDI are currently working on a web-based database and archive system through the USGS National Biological Information Infrastructure - Wildlife Disease Information Node (WDIN). Washington cooperators will use this system to integrate reporting of mortality incidents.

Further investigation is deemed warranted only when obvious causes of death (such as trauma) cannot be ruled out, at least 3-5 dead birds of any species are found in one place at the same time, and suitable carcasses are available for diagnostic evaluation. If these criteria are met, and HPAI Asian H5N1 cannot be ruled out as a cause of death, project funding will be used to submit a representative sample of carcasses to either the USGS National Wildlife Health Center in Madison, WI or the WSU Washington Animal Disease Diagnostic Laboratory in Pullman, WA for evaluation.

The involvement of multiple agencies will require close coordination and data sharing. Training sessions will be held throughout the state to ensure that all cooperators follow consistent protocols with respect to response criteria, sample collection, shipping, and information management.

**Responsibility:** WDFW, WSDA, USDA, USFWS (on refuges), other federal agencies, tribes.

**b. Target single sick and dead aquatic birds and raptors for avian influenza testing**

**Background:** As of April 2006, of the 24 countries where dead wild birds, not domestic poultry, were the first indication that the HPAI Asian H5N1 virus had arrived, in the majority of cases (13/24), it was detected in a single dead wild bird, not as a result of a multiple bird die-off. Therefore, depending on the conditions

surrounding the mortality, a report of a single dead aquatic or raptor species may trigger a response for sample collection by a member of the mortality investigation network.

The University of Washington's Coastal Observation and Seabird Survey Team (COASST) has an ongoing program using volunteers to survey and document bird mortalities along Washington marine shorelines. In 2005, this team found 200 fresh carcasses representing nearly 40 aquatic species of birds. The COASST program, therefore, is a valuable source of samples for the Morbidity and Mortality Investigation sampling strategy of Washington's avian influenza surveillance plan.

**Methods:** In general, for single birds, only tracheal and cloacal swabs will be collected from fresh specimens to rule out the presence of HPAI Asian H5N1. Carcasses from single dead birds will not be submitted for full laboratory evaluation. WDFW will provide some funding for the COASST program to recover and ship samples from freshly-dead birds for avian influenza testing.

**Responsibility:** WDFW, USDA, USFWS (on refuges), other federal agencies, tribes, COASST.

c. **Implement avian influenza testing of sick and dead trumpeter swans recovered in the NW Washington**

**Background:** Swans have been one of the primary species groups affected by Asian H5N1 in Asia and Europe. Trumpeter swans offer a potentially efficient sampling opportunity due to annual collection of sick and dead trumpeter swans in the north Puget Sound area. Each year since 1999, several hundred trumpeter swans have died in this area due to ingestion of lead shot, and these birds have been regularly collected to reduce secondary poisoning of other species.

**Methods:** Collection of sick and dead swans will continue in 2006-07 through WDFW. It is anticipated that up to 200 usable samples can be collected in 2006-07 if current mortality levels continue. These samples will be collected when mortalities typically occur in December and January.

**Responsibility:** WDFW

d. **Coordinate with the Washington State Department of Agriculture (WSDA) to obtain samples from licensed wildlife rehabilitation centers**

**Background:** Hundreds of sick and injured birds are presented to Washington wildlife rehabilitation centers each year. Rehabilitation centers, therefore, can serve as a valuable source of samples from sick and dead birds. WSDA would like to fund testing of selected birds at wildlife rehabilitation centers.

**Methods:** WDFW is currently consulting with WSDA and veterinarians in the wildlife rehabilitation community on selection criteria for testing and on developing a plan for sharing test data.

**Responsibility:** WSDA (Wildlife rehabilitator contacts)

## 2. Live and Hunter Killed Birds

### a. Primary Species

#### Lesser Snow Goose (*Chen caerulescens caerulescens*)

**Background:** Lesser snow geese from Wrangel Island, Russia, could come into contact with the Asian H5N1 because they breed and migrate through parts of northeast Asia. The entire breeding population of Wrangel Island migrates through Alaska and over 60% winters in Washington. The current Washington-BC population of Wrangel Island snow geese is estimated at 80,000.

**Methods:** We propose to sample Wrangel Island snow geese by targeting principal fall and winter use areas in north Puget Sound, including the Skagit Wildlife Area and surrounding private lands in Skagit, Snohomish, and Island counties. A total of 500 samples will be collected, due to the direct link of this population to Asian breeding areas. We propose a sample design targeting 200 hunter-killed birds during November-January. Samples would be collected using a combination of methods, focusing on hunter field checks, mandatory enforcement check stations, and directed collections. Part of the samples may also be provided as a result of increased mortality surveillance of wintering flocks. In addition, we propose to take 300 fecal samples from fields near Port Susan and Skagit Bays; 150 in February, and 150 in March.

**Responsibility:** WDFW

#### Pacific Brant (*Branta bernicla*)

**Background:** Brant that breed and winter in northeastern Asia have both direct and indirect links with Washington. Several thousand black brant breed and molt along the arctic coast of Russia and Wrangel Island. The highest probability of Asian H5N1 transmission from these brant to other brant is at Izembek Lagoon, Alaska, in the fall. Izembek Lagoon and adjacent embayments support virtually the entire population of brant during fall, including brant that migrate through or winter in Washington.

**Methods:** We propose to sample brant from hunter-killed birds. A total of 200 samples from hunter-killed brant will be taken during the January brant season in Padilla, Samish, and Fidalgo Bays in Skagit County. Samples will be collected in

Skagit County (e.g. Swinomish channel, Samish Bay) through hunter field checks and possibly directed collections.

**Responsibility:** WDFW

### **Northern Pintail (*Anas acuta*)**

**Background:** Northern pintail is a common duck in western Washington during migration and wintering periods. The combination of band recovery and satellite telemetry data indicates that birds wintering in Asia are found in Alaska in summer, possibly mixing with birds that winter in Washington. Satellite telemetry data demonstrate that pintails marked in California regularly move through Washington and cross the Bering Straits to Asia during the summer months (Miller et al. 2005). For these reasons, pintail is listed as a priority duck species proposed for sampling in 2006-07.

**Methods:** We propose to sample pintails by targeting known fall and spring staging areas in western Washington, as well as principal fall and winter harvest areas. Sampling areas will include north Puget Sound and coastal estuaries, including the Skagit Wildlife Area, Lake Terrell Wildlife Area, and state/private lands in Grays Harbor and Willapa Bay. We propose a sample design targeting 400 birds, 200 from each region. In the north Puget Sound region, 1/3 of the samples will be taken during each of 3 periods – pre-season, within the hunting season, and post-season. In the south Sound, 150 birds will be taken during the pre-season period and 50 during the hunting season.

Pre-season sampling will begin in late August and September using baited live traps or rocket nets, and will target mostly adult males, with fewer females and hatch year birds. Using this capture approach, there will be substantial opportunity to sample other dabbling ducks such as mallards and green-winged teal. Samples will also be obtained from hunter-shot pintails at existing mandatory check stations and/or field checks. Hunter-killed pintail samples will be evenly distributed among months of the hunting season. Sampling intensity of hunter-killed birds will increase if adequate samples are not obtained from live trapping. Spring pintails will be sampled through capture of live birds and directed collecting.

**Responsibility:** WDFW (North Sound); USDA (South Sound and Coast)

### **Shorebird Species**

**Background:** Shorebirds using Washington habitats for migration and wintering are a high priority group for sampling because of their interaction in Alaska with other shorebirds from Asia. For example, during August and September on the Yukon-Kuskokwim Delta in western Alaska, dunlin wintering in south and east

Asia (*Calidris alpina arctica*) where the Asian H5N1 virus is prevalent, mix with dunlin bound for Washington (*Calidris alpina pacifica*) and form huge aggregations, numbering in the tens of thousands. Similar interactions can be seen for the other primary shorebird surveillance candidate species in the Pacific Flyway strategic plan, including western sandpiper (*Calidris mauri*), red knot (*Calidris canutus*), and ruddy turnstone (*Arenaria interpres*). Shorebird use of inland waterways and estuaries further increases the likelihood that birds could come into contact with virus infected poultry and waterfowl.

**Methods:** We propose to capture and sample a total of 800 shorebirds, including 700 using mist nets at high tide roosts on outer coastal beaches adjacent to Grays Harbor and Willapa Bay. Samples of priority species (dunlin and western sandpiper) will be collected between mid-July and mid-November. We anticipate collecting 200 samples from western sandpipers in July (adults), and 200 in August (primarily juveniles). About 300 samples from Dunlins will be collected, 100 when large flocks begin arriving from Alaska in mid- to late-October, and 200 in mid-November. Sampling of other species that meet the prioritization criteria (red knot, ruddy turnstone) may be conducted on an opportunistic basis. Another 100 dunlin will be sampled in the south Sound using mist nets.

**Responsibility:** WDFW (Coast); USDA (S. Sound)

### **Tundra Swan (*Cynus columbianus*)**

**Background:** A segment of the breeding population of tundra swans is believed to breed in eastern Asia and winter in North America, and could potentially carry Asian H5N1 from Asia to Washington. Swans have been one of the primary species groups affected by Asian H5N1 in Asia and Eastern Europe, and tundra swans have been identified as a high priority species in the Pacific Flyway.

**Methods:** A total of 300 fecal samples from tundra swans will be collected from fields along the lower Columbia River from Bonneville Dam to the mouth of the river. Approximately 150 will be collected in each month during November and December.

**Responsibility:** USDA

## **b. Secondary Species**

### **Cackling Goose (*Branta hutchinsii minima*)**

**Background:** Cackling geese that winter in southwest Washington mingle with brant and other species, potentially including Asian migrants, on the breeding grounds and fall staging areas. Approximately 150,000 cackling geese breed on the Yukon-Kuskokwim Delta (YKD) in western Alaska. The YKD is a primary

stopover area for migratory birds arriving from Asia (e.g. Wrangel Island snow geese), and has a direct link to Washington migration and wintering areas.

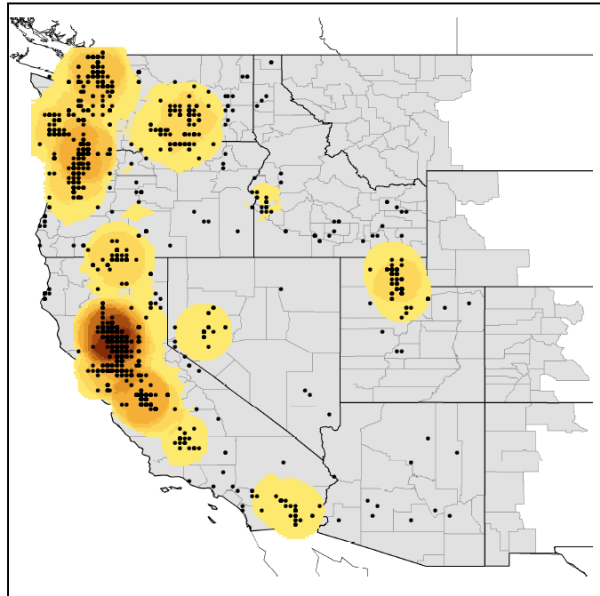
**Methods:** Based on past data, most cackling geese in southwest Washington occur in Clark and Cowlitz counties. Because cackling geese arrive in this area before the hunting season begins in November, we plan to take 200 fecal samples from fields near the Columbia River in the vicinity of Woodland and Vancouver during October. A total of 200 samples will also be taken from cackling geese at hunter check stations in southwest Washington. The hunting season for cackling geese begins in November and runs through March 10 in this area, and samples will be distributed throughout the season. Part of the samples may also be provided as a result of increased mortality surveillance of wintering flocks.

**Responsibility:** WDFW

### Secondary Dabbling Duck Species

**Background:** In order to determine opportunities to sample priority duck species during the hunting season, the Pacific Flyway Study Committee conducted an analysis on the distribution of band recoveries of Alaska-banded ducks (see Figure 1) and relative magnitude of duck harvest in Pacific Flyway states.

Figure 1. Recoveries of ducks banded in Alaska (Mikal Moore, pers. comm.)



Based on this analysis, sampling of hunter-killed mallard and wigeon in western Washington was identified as a secondary priority. As part of sampling for hunter-killed mallard and wigeon, it is likely that pintail, green-winged teal, and shoveler will be collected on an opportunistic basis. Pre-season sampling of

mallards was also identified as identified as a secondary priority in the Pacific Flyway plan.

**Methods:** We propose to sample a total of 1,800 secondary dabbling species, including 800 mallards, 600 wigeon/shoveler/green-winged teal. Samples will be collected from live-trapping and hunter-killed birds.

Mallard: A total of 200 mallards will be sampled before and after the hunting season in western Washington, in conjunction with the live-sampling strategy for pintail outlined above. Another 300 mallards will be sampled using bait traps in eastern Washington before and after the hunting season. Due to susceptibility of juvenile mallards to avian influenza, priority will be given to sampling this age class during pre-season trapping. Hunter-killed mallards in north Puget Sound (100), south Puget Sound and coastal areas (100), and eastern Washington (100) will provide additional samples. Hunter-killed duck samples will be evenly distributed among months of the hunting season.

Wigeon, Shoveler, and Green-winged Teal: Wigeon (200) and green-winged teal will be sampled primarily from hunter-killed birds during field checks in south Puget Sound and coastal areas. A total of 200 shovelers will also be sampled at the Ridgefield NWR check station. Hunter-killed duck samples will be evenly distributed among months of the hunting season.

**Responsibility:** WDFW (North Puget Sound), USDA (South Sound and Coast), USFWS (Ridgefield NWR)

### **Sea Ducks**

**Background:** Several sea duck species were identified as potential candidates in the national strategic plan, including long-tailed duck, harlequin, common goldeneye, and black scoter. A large proportion of the Alaskan breeding long-tailed ducks winter along the East coast of Asia. Long-tailed ducks marked with satellite transmitters at a single breeding location on the Yukon Delta, Alaska wintered from British Columbia to the Chukotka Peninsula. It is likely that in Alaska, some of the Asian-wintering population mixes with long-tailed ducks wintering in Washington. It is also possible that there is some mixing of long-tailed ducks with other sea ducks in Puget Sound marine areas.

**Methods:** All sea duck hunters in western Washington are required to obtain a harvest report, and there are several guides specializing in sea duck hunting in Puget Sound. These contacts offer an efficient method to obtain a composite sample of 200 hunter-killed sea ducks, including 100 in November and 100 in December.

**Responsibility:** USDA (S. Sound/Olympic Peninsula)

### **Trumpeter Swan (*Cygnus buccinator*)**



**Background:** Trumpeter swans using the Chehalis River valley near Elma offer an efficient opportunity to collect fecal samples, and these birds frequently use the same wetland areas as primary and other secondary species. For these reasons, we have included trumpeter swans on the list of secondary species for fecal sampling in Washington.

**Methods:** A total of 300 fecal samples will be collected in fields of the Chehalis River valley near Elma prior to January.

**Responsibility:** USDA

## REFERENCES

- Interagency Asian H5N1 Early Detection Working Group. 2006. An early detection system for Asian H5N1 highly pathogenic avian influenza in wild migratory birds: U.S. Interagency Strategic Plan. Unpubl. Final Rept. Report to the Department of Homeland Security, Policy Coordinating Committee for Pandemic Influenza Preparedness. <http://www.usda.gov/documents/wildbirdstrategicplanpdf.pdf>
- Pacific Flyway Council. 2006. Surveillance for early detection of highly pathogenic avian influenza H5N1 in wild migratory birds: a strategy for the Pacific Flyway. Pacific Flyway Council. [c/o USFWS], Portland, OR. Unpubl. rept. 13pp.+ appendices. [http://pacificflyway.gov/Documents/AIS\\_plan](http://pacificflyway.gov/Documents/AIS_plan).

Appendix A: 2006-07 Planned avian influenza surveillance sampling in Washington State

Method	Location	Method	Responsibility	Snow	Brant	Pintail	Shorebird	Tundra	Cackler	Mallard	Wig.	Teal	Shov.	Trump.	Seaduck	1 <sup>0</sup> ,2 <sup>0</sup> ,3 <sup>0</sup> *
Live Bird / Collection Sampling																
	N. Puget Sound	Bait traps / rocket nets	WDFW			150				100						
	Coastal Beaches	Mist nets	WDFW				700									
	Coast/S. Sound/OP	Bait traps / rocket nets	WS			150	100			100						
	N. Col. Basin	Bait traps	WDFW							150						
	S. Col. / Yakima B.	Bait Traps	WS							150						
	Total					300	800			500						
Hunter-killed Bird Sampling																
	N. Puget Sound	Field checks / stations	WDFW	200	200	50				100						
	Coast/S. Sound/OP	Field checks	WS			50				100	200	200			200	
	L. Col. R	Check stations	WDFW						200							
	L. Col. R	Check stations	WS										200			
	N. Col. Basin	Field checks	WDFW							50						
	S. Col. / Yakima B.	Field checks	WS							50						
	Total			200	200	100			200	300	200	200	200		200	
Mortality / Morbidity Events																
	Statewide	Field collection	WDFW													up to 500
	Whatcom Co.	Swan mortality project	WDFW											200		
	Statewide	Rehabilitator contacts	WDA													up to 300
	Total													200		
Total for Bird Sampling				200	200	400	800		200	800	200	200	200	200	200	up to 800
Environmental Samples																
	N. Puget Sound	Field sampling	WDFW	300												
	Coast/S. Sound/OP	Field sampling	WS												300	
	L. Col. R	Field sampling	WDFW						200							
	L. Col. R	Field sampling	WS					300								
	Urban/suburban	Field sampling	WS													400
Total for Environmental Sampling				300				300	200					300		400
Grand Total				500	200	400	800	300	400	800	200	200	200	500	600	up to 1200

\*Primary, secondary, tertiary species: tertiary=species interacting with migrant primary and secondary species