



NEVADA DEPARTMENT OF WILDLIFE

# Wild Bird Avian Influenza Surveillance Plan 2008-09

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## State of Nevada

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*Nevada's wild bird influenza surveillance program, initiated in 2005, continues during 2008 and 2009. The survey provides baseline information about the strains and distribution of influenza viruses in native and migratory waterfowl and a growing dataset on which to base an appropriate response to the potential emergence of highly pathogenic avian influenza (HPAI) H5N1. Our goals are to identify avian influenza viruses in wild waterfowl in Nevada and to detect HPAI strains early. The Nevada Department of Wildlife (NDOW) partners in this state-wide program with the Wildlife Services division of the United States Department of Agriculture, Animal and Plant Health Inspection Service, (USDA APHIS-WS), the United States Fish and Wildlife Service (USFWS), the Nevada Department of Agriculture (NDOA) and the United States Geological Survey (USGS). Federal funding in support of this program is received from USDA-APHIS WS and the USFWS.*

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### 2008-09

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#### *Introduction*

All known viruses that cause influenza in birds belong to the genus Influenza Virus A. This genus is comprised of a cluster of viral strains or subtypes that replicate as a continuous lineage and can genetically reassort with each other. These viruses are widely endemic in wild populations of waterfowl and many other species of birds, most subtypes (designated by their antigenic proteins H and N) being of little pathogenic significance. An Asian strain of the H5N1 subtype however, is classified as highly pathogenic (HPAI) and based on recent observations has the potential to expand its range into North America. Public concern has been heightened by extensive media coverage about this virus in Asia, its spread to Europe and Africa, and the very small number of human infections—much of it including speculation that migratory birds are a primary vector and will bring it to the North American continent. Apprehensions among government agencies and the public are based on a range of potential consequences that include sickness and mortality in wild bird populations, devastating impacts to 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 the next flu pandemic. Government agencies, particularly state and federal wildlife agencies, have been called upon to develop an early detection system to determine if and when the virus arrives here.

To provide baseline information about the strains and distribution of influenza viruses in native and migratory waterfowl and to respond to the emergence of highly pathogenic avian influenza (HPAI) H5N1, the state of Nevada's wild bird influenza survey, initiated in 2005, continues during 2008-09. The goals of the survey are to identify avian influenza viruses in wild waterfowl in Nevada and to detect HPAI strains early. The Nevada Department of Wildlife (NDOW) partners in this state-wide program with the Wildlife Services division of the United States Department of Agriculture, Animal and Plant Health Inspection Service, (USDA APHIS-WS), the United States Fish and Wildlife Service (USFWS), the Nevada Department of Agriculture (NDOA) and the United States Geological Survey (USGS). Federal funding in support of this program is received from USDA-APHIS WS and the USFWS.



## *Goals and Objectives*

The foundation for Nevada's plan is found within the principles described in the US Interagency Strategic Plan and the Pacific Flyway Strategy. The goals of this multi-agency effort are the identification of avian influenza viruses in wild migratory birds in Nevada and the early detection of HPAI H5N1 during the sampling period (1 July 2008 – 30 June 2009, corresponding to state FY '09, federal FY '08).

No reliable information on the prevalence of HPAI H5N1 in wild bird populations exists. Sampling goals are therefore based upon the following general epidemiological prediction: in order to detect one positive sample, with 95% confidence, in a defined population of >1,000 individuals, in which the virus has 1% prevalence, a minimum of 200 samples must be tested. Statistically, sampling rates should be increased with larger populations but decreased if viral prevalence was higher. Excluding morbidity/mortality investigations, the Nevada surveillance plan has a goal of 1,200 samples (see Table I).

The objective of this plan is the implementation of an appropriate surveillance strategy for avian influenza viruses in wild birds in Nevada.

## *Species*

Recommended Pacific Flyway priorities for sampling live migratory birds are based on (1) the list of primary and secondary species with the highest potential for exposure to Asian H5N1; (2) specific staging and wintering locations where high-priority species are accessible; and (3) recognition that principal winter terminus areas present opportunities to sample large population units.

Birds considered primary candidate species in the 2007 Pacific Flyway Strategy and targeted during Nevada surveillance efforts include tundra swan (TUSW) and northern pintail (NOPI). Harvest of tundra swans is restricted to limited permit hunts in Nevada, Montana and Utah. Secondary candidate species include mallard (MALL), American wigeon (AMWI), American green-winged teal (AGWT) and northern shoveler (NSHO). In Nevada, additional species to be tested include wood duck (WODU) (from opportunistic sampling during planned banding operations) and gadwall (GADW).

## *Study Area*

During the 2008-09 surveillance period, the majority of samples will be collected from two primary sites in the Lahontan Valley in western Nevada: the Carson Lake Wetlands and the Stillwater National Wildlife Refuge (SNWR). Additional samples may originate from the Mason Valley Wildlife Management Area near Yerington, NV.

With total precipitation averaging approximately 230 mm (9 inches) per year, Nevada is the most arid state in the nation. Of the precipitation that falls, only approximately 10 percent results in stream runoff and groundwater recharge; the remaining 90 percent being lost through evaporation and transpiration. Nevada's terminal lakes and wetland areas are,

therefore, extremely important resources for both resident and migratory aquatic birds in this state. Opportunities for a comprehensive and representative waterfowl surveillance program for the entire state are hampered by this geographic focus but sampling efficiency can be maximized as a result. Birds congregate in these areas allowing for efficient live bird sampling during banding operations and due to limited accessibility for waterfowl hunters, harvest check stations continue to provide an effective way to gather representative statistically valid samples for analysis. The distribution pattern of waterfowl in the state also allows for highly effective morbidity and mortality surveys to be performed by agency personnel in conjunction with, or separate from, other management activities.

### *Sample collection and analysis*

Paired cloacal and oropharyngeal swabs will be collected from live birds during annual banding operations (juvenile mallards, wood ducks); from apparently healthy ducks, swans and geese presented dead at hunter check-stations and during mandatory swan validation procedures. Sampling technique will follow the guidelines set forth in the Wildlife Services and State/Tribal Cooperator Avian Influenza Surveillance Procedure Manual, Version 3.0 (March 1, 2008) Samples will be tested at the National Wildlife Health Center in Madison, WI or the Nevada Department of Agriculture's Animal Disease and Food Safety Laboratory in Reno, NV by real-time reverse transcriptase-PCR (RRT-PCR), a technique that targets a specific region of the matrix protein (M1) gene in the influenza A virus. In cases where the M1 gene sequence is detected (i.e. positive for avian influenza A virus), confirmatory testing involving follow-up RRT-PCR for H5 and H7 hemagglutinin gene segments (indicators of pathogenic virus) will be performed at the USDA National Veterinary Services Laboratories (NVSL) in order to further classify the virus.

### *Surveillance Strategies*

#### *Sampling Live Birds*

1. Banding (summer) – SNWR and NDOW along with their volunteers annually band mallards on federal national wildlife refuges and state wildlife management areas. Field crews will obtain samples from hatch year GADW, NSHO and MALL.
2. Wood Duck Banding (winter, spring) – The University of Nevada, Reno is conducting a wood duck (WODU) population study which entails the banding of live wood ducks in Lahontan Valley in mid-winter and late spring.

#### *Sampling Hunter-Harvested Birds*

1. Mandatory Swan Validation (fall, winter) – Nevada has a limited swan hunting season; special regulations require participating hunters to validate all harvested swans with NDOW.
2. Hunter Check Stations (fall, winter) – NDOW, SNWR and APHIS-WS will establish hunter check stations at strategic locations to intercept hunters exiting wetland areas. Table I describes a preliminary sampling strategy for 2008-09.



3. Targeted Surveillance (winter) – Additional efforts utilizing lethal collection techniques to obtain samples from certain primary candidate waterfowl species may be considered if samples representing those species collected through check stations or live bird captures are deemed numerically insufficient. This approach has been utilized in the past to meet number objectives for target species (NOPI).

#### *Detection of and Response to Morbidity-Mortality Events*

Investigation of morbidity/mortality events may be the most important strategy for early detection of HPAI. Nevada has established a reporting protocol to document wildlife mortality events and a system is already in place to monitor bird mortalities attributed to West Nile Virus and Exotic Newcastle Disease. The expanded response program will prioritize epidemiologic findings consistent with HPAI H5N1 infection in wild birds: small numbers, particular species, broad distribution and clinical signs consistent with involvement of the central nervous system. In the event of a major mortality event, cooperating state agencies in Nevada will coordinate with USFWS, USDA and USGS. There are no stated numerical objectives for morbidity/mortality sample collection as these events are not predictable.

All morbidity/mortality events detected during surveillance activities will be reported directly to the NDOW Wildlife Health Specialist who in consultation with NWHC will determine which birds will be evaluated in the lab. Morbidity-Mortality surveillance will be facilitated by:

- Sample collection during suspected botulism events (summer) – SNWR and NDOW personnel annually monitor for botulism outbreaks.
- Population surveys (summer, fall, winter) – SNWR conducts monthly aerial population assessments in August, September, October, November and February. NDOW conducts operational surveys in December to observe swan peak numbers and in January for the annual Mid-Winter Inventory, a large-scale survey coordinated by the USFWS.
- Development of regular schedules for performing proactive surveillance. The details of these schedules may vary according to geographic location and season and based on waterfowl density patterns, two distinct survey periods will be considered; (1) April through September and (2) October through March. During period (1), surveillance areas will be monitored once every two weeks; during period (2), when waterfowl densities peak, monitoring will occur once a week.

### ***Sample Collection Techniques***

#### *1. Collection of morbidity/mortality samples*

- a. Primary candidates for mortality surveillance in Nevada are swans and diving ducks. Secondary emphasis placed on other duck species and other waterbirds occupying the same habitat.

- b. Proactive mortality surveillance incorporated into other bird survey or habitat work for species other than waterfowl.
  - c. Regular schedules for proactive surveillance throughout the year developed and coordinated by the NDOW Wildlife Health Specialist. Outreach program to encourage greater participation of research organizations, bird watching groups, organized volunteer groups and the general public.
  - d. Tracheal swabs or entire carcasses are the preferred diagnostic specimens. Representative carcasses collected from mortality events submitted to NWHC for diagnostic workup, sample collection and testing - coordinated by WHS and USGS Field Investigation Team representative (Western States). To avoid duplicate testing, no swabs collected from carcasses submitted to the NHWC.
2. *Collection of samples (n=700) from live or hunter-harvested migratory birds for laboratory diagnosis pursuant to Cooperative Agreement with USDA/APHIS-WS*
- a. Opportunistic collection of samples from live birds in Nevada.
  - b. Collection of samples in the fall/winter from hunter-harvested migratory birds in Nevada.
  - c. Development and maintenance of an interagency communications accord ensuring participants remain fully apprised of ongoing surveillance activities.
    - Communicate to the public ongoing surveillance activities and how these activities relate to the overall mission of ensuring public safety.
    - Coordinate preparation and distribution of informational products through the agencies' public relations outlets.
3. *Collection of samples (n=500) from live or hunter-harvested migratory birds for laboratory diagnosis pursuant to Cooperative Agreement with USDI/USFWS*
- a. Opportunistic collection of samples from live birds in Nevada.
  - b. Collection of samples in the fall/winter from hunter-harvested migratory birds in Nevada.
  - c. Development and maintenance of an interagency communications accord ensuring participants remain fully apprised of ongoing surveillance activities.
    - Communicate to the public ongoing surveillance activities and how these activities relate to the overall mission of ensuring public safety.
    - Coordinate preparation and distribution of informational products through the agencies' public relations outlets.
4. *Environmental Sampling*
- a. No environmental sampling will be performed during the 2008-09 surveillance period.



## *Analytical Capabilities and Data Management*

### *Initial Sample Testing*

1. Sample kit supplies will be provided by NVSL to APHIS-WS in Nevada.
  - a. 700 vials will be provided for distribution among field personnel and cooperators.
  - b. Additional vials will be distributed as needed.
  - c. Samples will be submitted to the NDOA-ADL:

Nevada Department of Agriculture, Animal Disease Laboratory  
350 Capitol Hill Ave.  
Reno, NV 89502-2923  
(775) 668-1182

(Primary Contact: Dr. Anette Rink)

2. Sample kit supplies will be provided by the NWHC to USFWS in Nevada.
  - a. 500 vials will be provided to SNWR for distribution among its field personnel and cooperators.
  - b. Additional vials will be distributed as needed.
  - c. Samples will be submitted to the USGS NWHC:

USGS National Wildlife Health Center  
6006 Schroeder Road  
Madison, WI 53711  
(608) 270-2400

(Primary Contact: Dr. Hon Ip)

### *Follow-up Sample Testing*

Submitted samples will be tested individually. Those samples considered positive by the NDOA ADL will be submitted to the National Veterinary Services Laboratories (NVSL) in Ames, Iowa for additional testing.

### *Data Management – USDA/APHIS/WS-NV Samples*

1. Data will be entered on the *Wildlife Avian Influenza Surveillance Data Sheet* developed by USDA-APHIS (Rev 1/11/2008 attached).
2. Data sheets will be managed as follows:
  - a. Original data sheets will be delivered to WS-Nevada where their staff will record the documented data into the database.
  - b. A copy of each data sheet will be provided to the ADL at the time of sample delivery.
  - c. An additional copy of each data sheet will be provided to the NDOW Wildlife Health Specialist ([matkinson@ndow.org](mailto:matkinson@ndow.org) or fax: 775-688-1687)

### *Data Management – USDI/USFWS-SNWR Samples*

1. Data will be entered into the HEDDS (Highly Pathogenic Avian Influenza Early Detection Data System) database available at <http://wildlifedisease.nbio.gov/ai/>.
2. Data will be managed as follows:
  - a. Datasheets will be completed in the field and will accompany submitted samples.
  - b. A copy of the datasheet (and notation of shipment's FedEx tracking number) will be delivered to the USFWS Region 1 AI Coordinator at [jenny\\_hoskins@fws.gov](mailto:jenny_hoskins@fws.gov) and an email alerting the NWHC of the arriving shipment including notation of the FedEx tracking number will be emailed to the NWHC at [aidata@usgs.gov](mailto:aidata@usgs.gov).
  - c. An additional copy of each data sheet will be provided to the NDOW Wildlife Health Specialist ([matkinson@ndow.org](mailto:matkinson@ndow.org) or fax: 775-688-1687)

### *Communications*

The potential for HPAI H<sub>5</sub>N<sub>1</sub> to become a human concern has been widely discussed. This plan recognizes the importance of communicating surveillance activities and testing results to the public through coordinated public information and outreach programs. Communications among partners within this Plan will be facilitated through a group email list comprised of these agency representatives.

#### *Public Communications Regarding Surveillance Strategies*

Public relations representatives are encouraged to utilize the content of this plan to develop materials regarding surveillance activities in Nevada. NDOW will prepare surveillance notification media materials for strategic distribution prior to the hunting season opening date and at intervals during the season. These include:



- Radio and television media spots.
- Direct mail letters to swan permit holders.
- Letters to conservation organizations for redistribution through their newsletters.
- Letters and posters to hunting clubs.
- Signage at key access points to public and private hunting areas.
- Fact Sheet on website (ongoing).
- Notation within NDOW's Waterfowl Regulations Brochure.

AGENCY	NAME	TITLE	PHONE	EMAIL
NDOW	Russ Mason	Chief, Game	(775) 688-1520	<a href="mailto:rmason@ndow.org">rmason@ndow.org</a>
	Kelly Clark	Chief, Conservation Education	(775) 688-1555	<a href="mailto:kclark@ndow.org">kclark@ndow.org</a>
	Mark Atkinson	Wildlife Health Specialist	(775) 688-1659	<a href="mailto:matkinson@ndow.org">matkinson@ndow.org</a>
	Leah Swanekamp	Wildlife Health Technician	(775) 688-1145	<a href="mailto:lswanekamp@ndow.org">lswanekamp@ndow.org</a>
	Craig Mortimore	Staff Biologist, Migratory Birds	(775) 688-1914	<a href="mailto:cmort@ndow.org">cmort@ndow.org</a>
	Kyle Neill	Biologist, Western Region	(775) 423-3171	<a href="mailto:kneill@ndow.org">kneill@ndow.org</a>
	Pat Kelly	MVWMA Manager	(775) 463-2741	<a href="mailto:pekelly@ndow.org">pekelly@ndow.org</a>

NDOA	Phil LaRussa	State Veterinarian	(775) 688-1180	<a href="mailto:plarussa@agri.state.nv.us">plarussa@agri.state.nv.us</a>
	Anette Rink	Laboratory Supervisor	(775) 688-1182	<a href="mailto:arink@agri.state.nv.us">arink@agri.state.nv.us</a>
	Ed Foster	Public Information Officer	(775) 688-1180	<a href="mailto:efoster@agri.state.nv.us">efoster@agri.state.nv.us</a>
NSHD	Martha Framsted	Public Information Officer	(775) 684-4014	<a href="mailto:mframsted@nvhd.state.nv.us">mframsted@nvhd.state.nv.us</a>
USFWS	Brad Bortner	Chief, MBHP-Region I/CNO	(503) 231-6164	<a href="mailto:brad_bortner@fws.gov">brad_bortner@fws.gov</a>
	Jenny Hoskins	MBHP-Region I – AI Coordinator	(503) 231-6164	<a href="mailto:Jenny_Hoskins@fws.gov">Jenny_Hoskins@fws.gov</a>
	Mike Goddard	Stillwater NWR	(775) 423-5128	<a href="mailto:mike_goddard@fws.gov">mike_goddard@fws.gov</a>
	Bill Henry	Stillwater NWR	(775) 423-5128	<a href="mailto:bill_henry@fws.gov">bill_henry@fws.gov</a>
	Jeff Mackay	Ruby Lake NWR	(775) 779-2237	<a href="mailto:jeff_mackey@fws.gov">jeff_mackey@fws.gov</a>
APHIS-WS	Mark Jensen	State Director, WS	(775) 851-4848	<a href="mailto:Mark.A.Jensen@aphis.usda.gov">Mark.A.Jensen@aphis.usda.gov</a>
	Zack Bowers	Wildlife Disease Biologist	(775) 851-4848	<a href="mailto:zack.l.bowers@aphis.usda.gov">zack.l.bowers@aphis.usda.gov</a>

### *Public Communications Regarding Testing Results*

Highly pathogenic H5 or H7 viruses are reportable diseases (i.e., laboratories are required to report them to state and federal authorities). Positive tests will result in immediate notification to the agency submitting the sample, the state veterinarian, the area veterinarian in charge, the state health officer and the CDC/USDA Select Agent program. The reporting of a positive finding of a bird carrying the HPAI H<sub>5</sub>N<sub>1</sub> in Nevada begins with the federal government agency making the positive determination. Protocols for state contacts are established, with accommodations for information management being a principle feature. Cooperators will not be directly contacted by the laboratories making a positive finding, rather they will be informed through their own state or federal information disbursement plans.



### *Funding*

Funding in support of this year’s Plan will again be provided by both USDA-APHIS Wildlife Services and USDI-USFWS. A financial plan to establish a cooperative agreement is currently under development and will lead to the allocation of \$70,000 (USDA-APHIS) and \$59,000 (USFWS) for the Nevada Department of Wildlife for surveillance work to be performed this fiscal year. \$11,000 of the USFWS allocation will be directed toward the SNWR to fund specific manpower and operating needs. Cooperative Agreements between agencies will be signed following distribution and approval of this Plan. A budget plan is attached as Table II.

### *Reporting*

The Nevada Department of Wildlife will be responsible for completing a report of activities and findings in June 2009. This report will be distributed to the cooperating agencies.

*Table I: State of Nevada Avian Influenza Surveillance Plan – 2008*

<b>Species</b>	<b>Sample Objective</b>
Tundra Swan (TUSW)	100
Northern Pintail (NOPI)	200 (includes 50 live)
Mallard (MALL)	500 (includes 200 live)
American Wigeon (AMWI)	75
American Green-winged Teal (AGWT)	100
Northern Shoveler (NSHO)	100
Wood Duck (WODU)	50 (live)
Gadwall (GADW)	75
<b>Total</b>	<b>1,200</b>