

Wild Avian Surveillance Activities Plan

I. Introduction

In conjunction with their local, state and federal partners, the Virginia Department of Health (VDH) will utilize information, including West Nile virus (WNV) test results, from dead crows (American and Fish) and blue jays (*Corvidae* family) and raptors (birds of prey, i.e., hawks, falcons, eagles and owls) as part of a comprehensive WNV surveillance program to help focus response activities. This surveillance system requires individuals seeing dead crows, jays and raptors to report them to the local health department (LHD) ([Appendix 1](#)) and the LHD to collect and maintain relevant data on the birds for the LHD's use in identifying areas that need increased public information and mosquito surveillance and control activities.

II. Objective

To provide an appropriate protocol for utilizing wild birds as part of a comprehensive WNV surveillance program in Virginia so that areas of increased risk for human WNV infections can be rapidly identified and suitable control measures implemented.

III. Implementation Plan

This surveillance involves two components: a **Reporting System** for sightings of dead crows, jays and raptors to track possible increases due to WNV, and a **Testing System** of crows, jays and raptors to confirm that WNV is the cause of death. In all cases, the initial point of contact for the public should be the LHD of the county or city in which the citizen has observed the bird unless a different agency has been designated and made known to the public.

A. General - The following statements apply to all types of bird surveillance.

1. **Identification Numbers** – Every dead crow, jay or raptor that is reported, every bird that is transported or in someone's possession under the auspices of the LHD, and every tested bird should have an identification (ID) number. The ID number should be the 3-digit FIPS code of the county or city where the bird was found, the accession number assigned by the county or city, and a two digit number for the year (e.g., 810-0101-03 would be the 101st bird reported from Virginia Beach in the year 2003). Each LHD must enter individual bird information in the VDH avian database prior to shipment to the laboratory. The database will print an appropriate data sheet, which must accompany the bird. The database will also assign each jurisdiction a correct FIPS Code for its VDH ID number.
2. **Permits** -- VDGIF is the designated state agency for issuing US Fish and Wildlife Service (USFWS) salvage permits to allow LHDs to transport (or delegate transport of) and designated laboratories to possess wild birds. As subpermittees, LHDs must keep records of all birds picked up and

transported under their auspices. Any person in possession of a bird must have the ID number from the LHD that authorized the collection or transport of the bird. At the end of the year the number of each species of bird that was transported or possessed will be provided by the Office of Epidemiology to VDGIF for reporting to USFWS.

3. **Impact of Specimen Collection** - To minimize the potential impact on individual birds and populations of birds, when possible, samples for WNV surveillance will be obtained from birds that have died, rather than taking samples from live animals. It is anticipated that the only samples taken from live animals would be blood specimens for antibody testing (See III. C.). To reduce the stress on sentinel birds, if possible, blood specimens should be utilized for more than one diagnostic test, for example, other surveillance tests required for investigation of other disease agents.
4. **Laboratory Test Interpretation** - VDH and the Division of Consolidated Laboratory Services (DCLS) will develop clear guidelines for the interpretation of laboratory tests.
5. **Communication of Results** - Testing of specimens and reporting of results by laboratories will occur in a timely manner, allowing for appropriate laboratory quality control. A web-based database developed by the Office of Epidemiology will allow all parties (LHD, Office of Epidemiology, DCLS) to enter (see [Attachment 1.A](#)) and access bird data. LHDs will be able to access the data for their own district and get positive results as soon as DCLS posts it on the website. Otherwise positive reports will be telephoned, faxed or electronically sent to the Office of Epidemiology who will notify the involved LHD by telephone or electronic mail. The LHD is responsible for notifying the person who submitted the bird, local government, and other relevant organizations, such as the media.
6. **Release of Information and Confidentiality** - Rapid sharing of surveillance results with government agencies and the public is essential for development of appropriate disease prevention and control measures. However, some confidentiality should be attached to the identification of persons who submit a bird or find one on their property, or a treating veterinarian, if any. Therefore, to encourage reporting, names and street addresses of dead bird locations, treating veterinarians' names and street addresses, and names and addresses of persons submitting specimens will be kept confidential. Information that will be available to agencies and the public with respect to birds that are tested will include the town, county, and neighborhood where the specimen was collected, the species, the date of collection, and the WNV test results.

B. Reporting System - Dead Wild Birds

1. **Species** - Crows (American and Fish) and blue jays (*Corvidae* family) and raptors (birds of prey, i.e., hawks, falcons, eagles and owls) will take priority for reporting. LHDs may choose to log reports of other bird species if resources allow.
2. **Timing** - Between April 1 and September 30, citizens seeing dead crows (American and Fish) and blue jays (*Corvidae* family) and raptors (birds of prey such as hawks, falcons, eagles and owls) should report the sighting, including detailed date and location information, to the LHD.
3. **Record Keeping** - LHDs should enter all sightings of dead crows, blue jays and raptors in the Access database supplied by the Office of Epidemiology, preferably directly into the web-based system or by emailing files. Directions for the electronic submission of the data will be provided prior to the start of the testing season. All dead birds that are reported should receive a VDH ID number [see III.A.1.].
4. **Individual Sick Birds** should be referred to a wildlife rehabilitator ([Appendix 5](#)). If a crow, jay or raptor dies under the rehabilitator's care, the rehabilitator should notify the LHD so a record can be made and appropriate birds submitted for testing.
5. **Use of Dead Bird Data** - LHDs can use dead bird reporting as a substitute for bird testing, once a quota of birds testing positive has been reached for an area (See III.B.6.) LHDs should benefit from their own bird data by mapping the locations where WNV positive and dead birds are found. Mapping will show where clusters of positive or dead birds are occurring and indicate where mosquito control and surveillance operations should be enhanced. Mapping will also permit the LHD to warn residents of the increased WNV risk in identified areas.
6. **Database Maintenance** - The Office of Epidemiology will maintain the web-based database, and electronically transmit the appropriate bird data to the Centers for Disease Control and Prevention in a timely manner.

C. Testing System - Dead Wild Birds

1. **Species** - Crows (American and Fish) and blue jays (*Corvidae* family) and raptors (birds of prey, i.e., hawks, falcons, eagles and owls) will take priority for testing because of their sensitivity to mortality from WNV. However, if circumstances dictate and resources allow, LHDs may submit other bird species for testing after consultation with DCLS or the Office of Epidemiology. The LHD will decide whether to have any bird tested based on species, cause of death, freshness (died within the past 24 hours)

and bird and mosquito data that have already been accumulated (See III. B. 6.).

2. **Timing** – April 1 is the official start of bird testing and September 30 the official end; however birds can be tested at any time of year if there are indications that testing results will provide critical information for focusing response activities.
3. **ID Number and Form** - The ID number (see III.A.1.) must be with the bird or bird swab while in transport. Whoever possesses or transports a bird or bird swab for testing, will be given the ID number for the bird to verify contact was made with the health department. Every effort should be made to place the submission form created by the database in the bag with the bird or bird swab. The form should be folded and sealed into a sandwich sized, zip lock bag to protect it from damage by moisture or fluids from the bird specimen(s).
4. **Specimen Collection** - DCLS will test for WNV in wild birds using oral swabs obtained in the field and shipped to DCLS or obtained in the laboratory from whole carcasses that have been submitted. LHDs are encouraged to perform oral swabs of appropriate dead birds using kits and a protocol provided by DCLS (see [Attachment 1.A-2](#)). Collecting oral swabs from birds in the field is less onerous and more standardized, and results in stable and safer specimens to ship. To ensure that safe and effective collection procedures are utilized, swabbers should be familiar with the DCLS protocol and PowerPoint training program. Because certain safety precautions should be used in collecting swabs from dead birds, it is best to conduct this activity away from public view. Swabbing should be conducted outdoors to prevent increased risk of transmission due to concentration of the virus indoors. Only crows and jays should be swabbed in the field. Due to their size and the hazards of their beaks and claws, raptor carcasses should be submitted to DCLS in their entirety. The attached DCLS field procedure is the recommendation of the Virginia Interagency Arbovirus Task Force and is based on best available scientific knowledge and consultation with numerous experts. However, if your health department has reservations about the safety of barrier precautions an N95 respirator can be used or the entire carcass can be shipped to be swabbed by DCLS staff. Under special circumstances determined by the DCLS and the Office of Epidemiology, bird carcasses may be necropsied at DCLS.
5. **Testing** - For each specimen(s) submitted, DCLS will determine, based on the history associated with the submission whether testing for WNV is warranted. (All testing by Virginia laboratories is dependent on availability of appropriate tests and supplies.) Swab specimens will be submitted according to [Attachment 1.A-2](#) and real-time RT-PCR will be

used to detect the presence of WNV RNA. When avian necropsy is necessary brain, heart, liver, and/or kidney will be removed from each acceptable bird and real-time RT-PCR will be used to detect the presence of WNV RNA. If federal and military installations send birds to the USGS laboratory in Wisconsin or SCWDS in Georgia, the Office of Epidemiology will receive those results and share them with the appropriate LHDs.

6. **Limits on Bird Testing** - Once a critical number of WNV infected birds are found in a particular geographic area, it becomes evident that WNV poses an increased threat in that area and the information can be used to focus control strategies. Continued bird surveillance in that area will not yield much new information. Therefore, to conserve resources, specimens should no longer be submitted for testing from a geographic area after five to ten positive birds have been found in that area, depending on the size of the area, the previous year's experience and the results of mosquito surveillance. Each jurisdiction should designate multiple geographic areas based on geography, and concentrations of human population density and communicate these designations to the Office of Epidemiology.

Designated geographic areas within any county or city should use rivers or highways as division lines. In rural areas, designated geographic areas should not be less than 100 square miles in size (approximately 10 x 10 miles). If LHDs wish to have further testing performed once the limit of positive birds has been reached in a designated geographic area, DCLS can supply additional testing kits for a fee. The price of each kit will include the kit components and the price of analysis and reporting.

7. **Carcass Handling** - Birds should be handled with gloves or some other means of avoiding direct contact. If bird carcasses are being collected instead of swab samples, bird handlers should be instructed to place each dead bird in a clear (transparent) plastic bag, tie (or zip) it shut and then place in a second appropriately sized zip-lock bag and seal the bag. No more than one bird should be placed in a bag, and a copy of the bird's submission form should be folded and sealed into a sandwich sized zip-lock bag and be included in the double bag along with the bird. The double-bagged bird can then be placed in a sturdy, waterproof container (one not used for personal food or drink) with a cold pack or ice until collection of bird occurs by LHD staff, Animal Control Officers, VDGIF staff, or members of conservation or wildlife groups.

Carcasses from which oral swabs were collected should be disposed of in a landfill or incinerated.

8. **Carcass Storage and Transport** - Birds should be stored on ice or in a refrigerator and should be transported in the presence of a cold pack

(preferred) or wet ice. If carcasses are stored more than 24 hours before transporting to the laboratory, they should be frozen (-20 F preferred). Leak-proof, reusable coolers (ice chests) are recommended for purchase by local agencies for bird submissions. The shipping container should be marked with indelible ink with the county name, address, and phone number, so that the laboratory can ship reusable containers back to the local agencies after receiving the birds.

9. **Swab Transport** - Swab specimens can be delivered @ room temperature if delivery to DCLS is expected within 72 hours from time of collection, otherwise they should be stored in the refrigerator. Avoid storing swabs at temperatures exceeding 100°F (i.e. the dashboard of a car). This may decompose the sample and result in a false negative test.
10. **Labeling** - All shipping containers (whole bird or swab) must be clearly labeled on the outside “For WNV Testing” so they can be properly directed in the laboratory. Only samples submitted for WNV analysis should be present in the container. Do not combine WNV and rabies submissions. WNV specimens being shipped via the DCLS courier must be clearly marked for the Richmond laboratory.
11. **Groups of Sick or Dead Birds** - Unusual sickness or die-offs of other species of birds should be investigated, but birds that die from WNV are rarely found in groups of more than two. Groups of sick or dead wild birds are more likely to have been exposed to pesticides, poisons or some pathogen other than WNV and should be referred to VDGIF or the nearest VDACS Office of Pesticide Services (OPS) ([Appendix 4](#)) for investigation and determination of suitability for testing. When groups of dead birds are found, VGDIF (main office) should be notified since larger scale mortality may indicate a disease process in the population. If USDA Wildlife Services is called to investigate such an incident, they will communicate findings to OPS and LHS. If testing is recommended, suitable tissue obtained during necropsy at VDACS will be transported to DCLS for pesticide and/or WNV testing. In all cases, the LHD and the VDH Office of Epidemiology should be informed of the outcomes of investigations and laboratory testing.

D. Testing System - Asymptomatic Wild Birds

The VDH will work with federal, state, and local agencies to develop the most feasible sentinel bird surveillance program for each geographic area and will support the collection of serologic specimens by local or other state agencies, as resources permit. Emphasis will be placed on testing serologic specimens that have already been taken as part of routine testing rather than taking new specimens, and on using existing mechanisms for collection of wild birds. Emphasis will also be placed on establishing partnerships and training to

accomplish specimen collection. Prioritization for sampling and testing will be provided to those counties that are most epidemiologically at risk based on bird migration patterns and evidence of WNV activity from other monitoring.

1. The Virginia office of the USDA, Wildlife Services will identify options for collecting specimens for WNV testing from wild birds killed in connection with wildlife damage projects to protect agriculture, property, and human health and safety throughout the state. The bird species will likely include gulls, crows, Canada geese, feral ducks and geese, starlings, and pigeons. These could include birds removed for nuisance control from landfills and airports, or in local Canada geese roundups. Samples collected by USDA Wildlife Services will be tested by NPHL.
2. Live birds tested could also include those maintained in wild bird flocks such as those in zoos and game farms.
3. Mechanisms will need to be developed to distinguish previous from current infections. These may include testing hatch year birds that were not alive the previous year or requiring a four-fold rise in titer between two specimens taken two weeks apart.

Virginia Department of Health Office of Epidemiology West Nile Virus Avian Reporting Form

AGENCY DATA

VDH	VDH ID number	NWHS ID number	VDACS ID number
001	0001-01		
CDC ID number		DCLS ID number	NPHL ID number
Other ID number	Name	Date	phone #
Local Health Department	Address		
Health District			

BIRD DATA

Name person reporting	Phone number	Date dead bird found or seen	Any evidence of trauma
Species of bird(s)	Captive	CDC Week Number:	
	no	15	
Location of bird(s) found, Address		Latitude	
		Longitude	n/a
		GPS Datum	
City	State	County	Zip Code
Date bird(s) collected	Collector's Name	Phone (collector)	Agency (collector)
Transporter's name if different	Agency (transporter)	Phone (transporter)	
Date shipped for testing	Testing Lab:		

Additional information

Avian Oral Swab Collection: General Remarks

The Virginia Interagency Arbovirus Task Force has agreed upon a new procedure for the submission of avian specimens to the DCLS beginning in April 2003. The new field collection procedure is designed to make specimen collection safer and more standardized. In addition, field collection of specimens using oral swabs will create a more simplified transport system from the LHD's to the DCLS for testing. Swab specimens do not require refrigeration after collection or during transport resulting in a more stable and cleaner specimen.

To ensure that safe and effective collection procedures are utilized, individuals responsible for avian specimen collection should be familiar with the DCLS field collection procedure and available [PowerPoint presentation](#). The VDH and DCLS will also provide a video presentation in proper oral swab field collection techniques. Because certain safety precautions should be used in collecting swabs from dead birds, it is best to conduct this activity away from public view. Swabbing should be conducted outdoors to prevent increased risk of transmission due to concentration of the virus indoors. Only crows and jays should be swabbed in the field. Due to their size and the hazards of their beaks and talons, raptor carcasses should be submitted to DCLS in their entirety.

The DCLS field procedure ([page 2](#)) is the recommendation of the Virginia Interagency Arbovirus Task Force and is based on best available scientific knowledge and consultation with numerous experts. However, if your health department has reservations about the protocol, additional safety measures can be added such as the use of an N95 respirator, goggles, safety glasses, or a face shield, and a disposable lab coat, or the entire carcass can be shipped to be processed by DCLS staff.

Division of Consolidated Laboratory Services
Avian Oral Swab Collection for the Detection of West Nile Virus: Field Procedure

• **Kit Contents**

- 1 ml swab transport solution (STS, in an O-ring sealed tube)
- 1 individually wrapped sterile dacron swab
- 1 pair of gloves
- 1 particulate filter mask
- 1 instruction sheet
- 1 laboratory address label
- 1 sample zip lock bag

Kit Storage (prior to use)

All kit components can be stored at room temperature.

Site Selection

Swabbing should be conducted out of public view in a remote or discrete outdoor location. To prevent concentration of virus and increased risk to the individual performing the procedure, indoor swabbing should only be done under a certified Class II biosafety cabinet with proper personal protective equipment.

Swabbing Procedure

1. Once a recently dead crow or jay (raptors should be submitted to DCLS as whole carcasses) is located in the field it must be identified by species and assigned a VDH ID #. The ID number should be the 3-digit FIPS code of the county or city where the bird was found, the accession number assigned by the county or city, and a two digit number for the year (e.g., 810-0101-03 would be the 101st bird reported from Virginia Beach in the year 2003).
2. Remove the biohazard zip lock bag containing the kit components from the large zip lock bag.
3. Glove hands. Grab the bottom of the large zip lock bag with your non-dominant hand and invert the bag over that hand so that you end up with the bag inside out over the non-dominant hand. Collect the bird into the bag by picking up the tail end of the bird and moving the top part of the bag over the bird, covering the bird completely. The beak of the bird should be close to the opening of the bag.
4. If you are in a public area, seal the bag and transport the bird to an appropriate location for swabbing.
5. Remove all components from the biohazard zip lock bag. Using a permanent marker, label the STS tube with the VDH ID # assigned to the bird.
6. Glove hands and don a particulate filter mask placing the white side against your mouth and the blue side facing outward.
7. Tear open the swab packaging on the handle end of the swab leaving the dacron end covered until needed.
8. Lay the bagged bird on the ground or other flat surface and open the corner of the bag that is closest to the beak of the bird.
9. **Perform this step inside the zip lock bag:** Position the opening of the bag away from your body, grab the neck/beak of the bird with your non-dominant hand from outside the bag and position the beak open.
10. Grasp the swab handle with your dominant hand and swab the inner beak, oral cavity, and throat. Release the swab handle and leave the swab in the oral cavity.
11. Open the STS tube.
12. Remove the swab from the oral cavity and place in the STS tube, making sure that the tip is touching the bottom. Snap the applicator stick and cap the STS tube.
13. Place the STS tube containing the swab specimen in the biohazard zip lock bag.
14. Gloves, swab handle, and mask can be placed in the bag with the bird.
15. Clean hands with an alcohol-based hand sanitizer or soap and water if available.
16. The carcasses and used collection supplies should be disposed of in a dumpster / landfill or incinerated.
17. A completed submission form should be placed in the outer pouch of the biohazard zip lock bag. Transport the sample to the LHD for DCLS courier service. The swab specimen(s) may remain at room temperature following collection and during transport to the laboratory.

Please contact the DCLS Molecular Biology Laboratory at (804) 786-9023 for special instructions or technical assistance.