MOSQUITO-BORNE DISEASE RESPONSE PLAN

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Approved_____
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Grays Harbor County Board of Health

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Date

Adopted: April 2004 Revised: July 2007

INTRODUCTION

The response plan has three major components: communications, surveillance, and mitigation/control. Each of these components is described in detail. . The overall plan is for a "phased response," with the implementation of various interventions in response to increasing or decreasing risk to human health.

The principal goal of a phased response plan is to minimize the health impacts of mosquito-borne arboviruses in humans, as well as in domestic and zoo animals. We have a limited understanding of the ecology and epidemiology of some arboviruses such as West Nile virus in the United States. The occurrence of arboviral encephalitis is sporadic, and the prevention methods have limitations. It is reasonable to assume that prevention and control measures, no matter how intensive, cannot prevent all mosquito-borne arboviral infections in humans.

AUTHORITIES

Local health jurisdictions have the authority to take measures to control and eliminate mosquitoes in order to prevent and control the spread of disease transmitted by mosquitoes – RCW 70.05.060

Authority and responsibility for emergency response rests with the impacted jurisdiction – RCW 38.52

Counties and municipalities may undertake mosquito control measures – Titles 35 and 26 RCW

The Washington State Department of Health may undertake studies to determine the effect of mosquitoes as a health hazard – RCW 70.22

The Washington State Department of Health may provide for the control or elimination of mosquitoes if funds are available – RCW 70.22.020; 70.22.050

The Washington State Department of Health must facilitate cooperation between affected jurisdictions – RCW 70.22.030

Counties and municipalities are required to cooperate with state mosquito control plans – RCW 70.22.060

The Board of County Commissioners is authorized to declare a county emergency, allowing rapid completion of actions necessary for protection of the public health to be taken without regard to time-consuming procedures and formalities including budget law limitations and requirements of competitive bidding and publication of notice. RCW 38.52.070

The governor is authorized to declare a state of emergency – RCW 38.52; 43.06

ROLES AND RESPONSIBILITIES

Grays Harbor County Board of Health/County Commissioners

- ☑ Declare a public health emergency as deemed necessary.
- ☑ Authorize actions and expenditures deemed necessary for the protection of public health in the event of a human outbreak.

Grays Harbor County Health Officer

- ☑ Advise the Board of Health on the situation as it pertains to human health and recommend appropriate public health action.
- ☑ Issue orders as necessary for the protection of the public health with assistance from the Grays Harbor County Prosecuting Attorney's Office.
- ☑ Oversee the public health response.

Grays Harbor County Public Health and Social Services Department

- ☑ Serve as point of contact for health officer and Board of Health (Director).
- ☑ Conduct human and bird surveillance activities. Communicate new data or developments to Environmental Health.
- ☑ Map surveillance data. Provide updated maps to Environmental Health by email.
- ☑ Lead public communication and education efforts. Collaborate with Environmental Health on message development.
- ☑ Lead health care provider and other stakeholder communications. Collaborate with Environmental Health on message development.
- ☑ Facilitate diagnosis of human cases through collaboration with health care providers and the Washington State Department of Health. Report human cases to the Washington State Department of Health as required.

Grays Harbor County Department of Public Services, Environmental Health Division

- ☑ Conduct mosquito trapping and submission. Communicate data to Public Health when results received.
- ☑ Acquire and maintain contracts with local pest control services for the application of larvicides and adulticides.
- ☑ Lead implementation of mosquito control measures. Collaborate with Public Health on public and targeted information regarding mosquito control activities planned by the county.
- ☑ Communicate bird reports, mosquito complaints, or other new data received with Public Health.
- ☑ Collaborate with Public Health on communications.

Grays Harbor County Prosecuting Attorney's Office

- ☑ Provide advice and assistance in carrying out legal actions deemed necessary by the health officer to protect the public health.

Grays Harbor County Department of Emergency and Risk Management

- ☑ Activate the emergency operations center as requested by the Board of County Commissioners in support of the public health response.

Washington State Department of Health

- ☑ Coordinate statewide human, bird, and mosquito surveillance.
- ☑ Coordinate multi-jurisdiction response.

Washington State Department of Agriculture

- ☑ Coordinate statewide equine surveillance.

ALERT LEVELS AND RESPONSE

Alert Level	Definition	Surveillance Response	Education Response	Mosquito Control Response	Communications
0	**No Risk of Human Outbreak** ☑ Off season –winter ☑ Adult vectors inactive ☑ Climate unsuitable	☑ Analyze environmental surveillance results from previous season ☑ Ongoing investigation of human arboviral disease cases ☑ Review and update WNV response plan	☑ Evaluate effectiveness of educational materials and outreach from previous season and update plans ☑ Maintain partnerships with media ☑ Continue to work with local partners to educate the public and improve response	☑ Secure surveillance and control resources necessary to enable appropriate response. Obtain necessary licenses and permits ☑ Establish contracts as needed for control activities	☑ Review and update communications plans ☑ Facilitate and encourage planning among local partners
1	**Remote Risk of Human Outbreak** ☑ Spring, summer or fall ☑ No current positive surveillance findings in birds and/or mosquitoes ☑ Areas anticipating mosquito-born virus activity based on previous activity in the region	☑ Conduct mosquito surveillance and record and report results ☑ Conduct dead bird surveillance and record and report results ☑ Inventory and map surveillance findings ☑ Conduct passive equine case surveillance ☑ Ongoing surveillance and investigation of human arboviral disease cases ☑ Provide information to health care providers on recognition, diagnosis, laboratory testing, and reporting of mosquito-borne diseases	☑ Provide community outreach and public education emphasizing source reduction and bite prevention ☑ Identify high-risk populations and locations	☑ Initiate source reduction on county properties where possible	☑ Obtain new educational materials as available from DOH ☑ Report unconfirmed environmental positives to DOH ZD program ☑ Receive reports from DOH ZD program of confirmed positives
2	**Low Risk of Human Outbreak** ☑ Summer or fall ☑ Areas with limited or sporadic mosquito-borne virus activity in birds and/or mosquitoes ☑ No positive findings prior to August	☑ Continue activities Level 1 ☑ Conduct surveillance in areas of positive findings and in adjacent areas to identify possible breeding sources and mosquito species ☑ Provide information to veterinarians on local mosquito-borne virus activity and suggest increased vigilance for equine cases	☑ Continue activities in Level 1 ☑ Increase public education utilizing communication partnerships ☑ Conduct risk communication about mosquito control measures that are or may be taken, including adult mosquito control ☑ Emphasize source reduction ☑ Emphasize personal protection, particularly for persons over 50 years of age, the immunocompromised, and people with significant outdoor exposure	☑ Continue activities in Level 1 ☑ Expand source reduction and larval control, particularly in areas with positive findings in adjacent areas	☑ As in Level 1

Alert Level	Definition	Surveillance Response	Education Response	Mosquito Control Response	Communications
3	**Moderate Risk of Human Outbreak** ☑ Spring, summer or fall ☑ Areas with initial confirmation of mosquito-borne virus activity in birds before August ☑ Confirmed equine or human infections ☑ Sustained mosquito-borne virus activity in birds or mosquitoes in the absence of human infections	☑ Continue activities in Level 2 ☑ Investigate equine cases ☑ Expand mosquito and bird surveillance as necessary	☑ Continue activities in Level 2 ☑ Expand public information ☑ Emphasize personal protection and source reduction ☑ Enhance risk communication about mosquito control ☑ Engage local leaders and organizations to speak and information their communities about mosquito-borne disease	☑ Continue activities in Level 2 ☑ Consider implementing adult control if the minimum infectio rate (MIR) in vector species meets or exceeds 5/1000* ☑ Focus control efforts where surveillance indicates potential for human risk to increase	☑ As in Level 2
4	**High Risk of Human Outbreak** ☑ Spring, summer or fall ☑ Mosquito-borne virus activity at a level suggesting high risk of human infection • High dead bird densities • Sustained high mosquito infection rates • Multiple positive mosquito species • Equine or mammal cases • Human infections ☑ Areas with early season positive surveillance indicators where mosquito-borne disease epidemic activity has occurred in the past	☑ Continue activities in level 3 ☑ Stop collection of birds and focus on mosquito testing ☑ Continue to monitor and record dead bird sightings and locations ☑ Consider active surveillance for persons hospitalized with mosquito-borne infections	☑ Continue activities in Level 3 ☑ Expand community-based activities to increase attention to mosquito-borne disease transmission risk ☑ Increase visibility of public messages	☑ Continue activities in Level 3 ☑ Implement adult mosquito control targeted at areas of potential human risk if surveillance indicates the risk is likely to increase and vector mosquito species are abundant ☑ If feasible, monitor the effectiveness of spraying on target mosquito populations in adulticides are used	☑ As in Level 3 ☑ Participate in teleconferences as coordinated by DOH
5	**Outbreak in Progress** ☑ Multiple confirmed human infections ☑ Conditions favoring continued transmission to humans (i.e. persistent high infection rate in mosquitoes, continued avian mortality due to mosquito-borne viruses)	☑ Continue activities in Level 4 ☑ No bird collection ☑ Monitor and record sightings ☑ Continue mosquito surveillance	☑ Continue activities in Level 4 ☑ Emphasize urgency of personal protection ☑ Emphasize use of repellents	☑ Continue activities in Level 4 ☑ Intensify adult mosquito control program ☑ Repeat adulticide applications in high risk or human cases ☑ If outbreak is widespread, consider collaborating on control efforts with neighboring jurisdictions	☑ As in Level 4

* In general, the finding of a positive bird or mosquito pool does not by itself constitute evidence of an imminent threat to human health and warrant adulticiding. Adulticiding will be considered only after consideration of the risk to human health by taking into account multiple factors, including: documentation of the present of mosquito-borne viruses in the area; the abundance and species of the mosquito populations; the mosquito minimum infection rate (MIR); the density and proximity of human populations; the time or year and weather conditions; accessibility to the area where the mosquito vector is located; rapidity of the response as determined by the seriousness of the public health threat, and the potential impact on people and the environment.

COMMUNICATIONS

PURPOSE AND OVERVIEW

Communication activities are intended to support several outcomes:

- ☑ Increase the proportion of the general population, especially those who (1) are at high risk of neuroinvasive disease from West Nile virus or who (2) control properties that offer significant breeding areas for vector species, that
  - o Understand human risks related to West Nile virus
  - o Understand and practice appropriate personal protection against mosquito bites
  - o Understand and practice appropriate action to reduce mosquito breeding areas on their property
  - o Report dead bird sightings appropriately
  - o Understand the risks and benefits associated with mosquito control measures
- ☑ Increase the number of local elected officials who
  - o Understand the human risks related to West Nile virus
  - o Understand their role in mosquito control
  - o Understand the County's response plan
  - o Communicate with their constituents about mosquito-borne disease and the jurisdiction's planned response activities
- ☑ Increase the number of health care providers who
  - o Include WNV disease in their differential diagnosis and order appropriate testing when it is epidemiologically indicated
  - o Consult Public Health in evaluating patients who meet appropriate clinical criteria
  - o Provide accurate education about West Nile virus and personal risk reduction to their patients
- ☑ Increase the number of veterinarians who promptly diagnose and report equine cases of arboviral disease
- ☑ Provide rapid and factual information regarding West Nile virus activity in Grays Harbor County to health care providers, veterinarians, public officials, and the general public.

PLAN

Alert Level	Group	Key Message	Method(s)	Interval	Lead	Collaborator(s)
0	Cities, parks, DOT, other entities that control possible vector breeding areas	☑ Orientation to current county plan ☑ Resources and encouragement to develop plan for their jurisdiction/entity	Telephone, mail	Bi-monthly	PH	EH, BOCC
1	SWAT Team*	☑ Specific plan for upcoming season	Meetings	PRN through season	PH	EH, BOH
1	Health care providers, labs	☑ Announce the beginning public ed on WNV ☑ Describe surveillance program ☑ Contact PHL for more information	Fax	Once	PH	
1	Veterinarians	☑ Announce beginning public ed on WNV ☑ Describe surveillance program ☑ Request reporting of equine cases ☑ Providing reporting instructions ☑ Contact PHL for more information	Fax, mail	Once	PH	EH
1/2	General public	☑ Mosquitoes are starting to appear; they can cause disease ☑ Who is high risk ☑ Encourage identification and reduction of breeding areas ☑ Encourage and instruct on bite protection ☑ Public health has a plan – we are prepared ☑ Describe surveillance activities ☑ Request dead bird surveillance participation (dead crows, magpies, jays)	Newspaper, radio	Monthly	PH	EH
2/3	Health care providers	☑ Mosquitoes are starting to appear ☑ WNV clinical signs ☑ Public health activities ☑ Emphasis of personal protection and mosquito source reduction ☑ How to access PHL services ☑ How to report cases ☑ Surveillance findings	Fax, mail, website	Monthly	PH	DOH
2/3	Laboratories	☑ Reporting requirements ☑ How to access to services ☑ Surveillance findings	Fax, Website	Monthly	PH	DOH
2/3	Veterinarians	☑ Surveillance findings	Fax, Website	Monthly	PH	

*The SWAT team includes the health officer and representation from the Board of Health, Public Health, Public Services, and Environmental Health.

Alert Level	Group	Key Message	Method(s)	Interval	Lead	Collaborator(s)
		☑ Reporting requirements				
3	High risk populations --senior centers --RSVP	☑ Identification of high risk populations ☑ Bite protection ☑ Source reduction ☑ Disease symptoms ☑ Surveillance findings	Brochures, meetings, website	Bi-weekly	PH	OAAA
3	Homeowners	☑ Reduction of mosquito breeding areas	Posters, brochures in home improvement stores, home and garden shows	Check supplies bi-weekly	PH	EH, Retailers, WSU Extension
3/4	General public	☑ Risk to humans is increasing ☑ Enhance information about mosquito control ☑ Emphasize personal protection and source reduction ☑ Disease symptoms ☑ Discuss actual and possible mosquito control activities in county plan ☑ Surveillance findings	Newspaper, radio, website, postings at major retailers, golf courses, ball parks, and other outdoor public venues	Bi-weekly	PH	EH
4	Health care providers	☑ Surveillance findings ☑ Human risk high ☑ WNV clinical signs ☑ Public health activities ☑ Emphasis of personal protection and mosquito source reduction ☑ Access to PHL services ☑ Reporting requirements	Fax, mail, website	Weekly or bi-weekly	PH	DOH
4	Veterinarians	☑ Surveillance findings ☑ Reporting requirements	Fax, Website	Weekly or bi-weekly	PH	
5	General public	☑ Human risk is high ☑ Disease symptoms ☑ Bite protection ☑ Mosquito control activities ☑ Source reduction ☑ Human case counts	Newspaper, radio, website, postings at major retailers, golf courses, ball parks, and other outdoor public venues	Daily PRN	PH	EH, DOH, BOH
5	Health care providers, labs	☑ Bite protection ☑ Mosquito control activities ☑ Source reduction ☑ Human case counts	Website, newspaper, radio	Daily PRN	PH	EH, DOH, BOH
5	Veterinarians	☑ Bite protection ☑ Mosquito control activities ☑ Source reduction ☑ Human case counts	Website, newspaper, radio	Daily PRN	PH	EH, DOH, BOH

SURVEILLANCE

There are four areas of surveillance for the West Nile Virus: mosquito trapping, identification, and mapping; dead bird tracking, mapping, and testing; tracking, mapping, and investigation of equine encephalitis; and investigation and mapping of human encephalitis cases.

Data collected through these surveillance methods will be provided to the assessment coordinator, who will map the data using GIS software. The assessment coordinator will post a current map each week in the communicable disease office and will provide a weekly map to the public health manager for review with the health officer.

MOSQUITO SURVEILLANCE

Mosquito surveillance is an essential component of a comprehensive mosquito-borne disease prevention and control program. **Grays Harbor County will trap mosquito larvae and adults and submit them for identification of species and testing for the presence of West Nile virus**. There are about 50 mosquito species identified in Washington State. Of these 48 there are nine potential West Nile Virus mosquito vectors in Western Washington. Following are the results of the County's 2006 mosquito survey:

Date Collected	Location	# Collected	Species	WNV Vector
6/18/2006	Ocean City	12	*Coquilletidia perturbans*	Yes
6/19/2006	Hoquiam	20	*Ochlerotatus dorsalis*	No
6/26/2006	Westport	129	*Ochlerotatus dorsalis*	No
6/26/2006	Westport	7	*Ochlerotatus increpitus*	No
6/26/2006	Westport	2	*Culiseta morsitans*	No
6/26/2006	Westport	23	*Coquilletidia perturbans*	Yes
7/6/2006	Montesano	1	*Ochlerotatus dorsalis*	No
7/6/2006	Montesano	13	*Ochlerotatus sierrensis*	No
7/6/2006	Montesano	1	*Coquilletidia perturbans*	Yes
7/8/2006	Ocean City	10	*Coquilletidia perturbans*	Yes

The results of mosquito surveillance activities from 2003-2005 can be found in Appendix A.

Mosquito complaints will be taken by the communicable disease (Lisa Leitz) nurse in the Aberdeen office and by Kristina Hollatz in the Environmental Health office in Montesano. The following information regarding mosquito complaints will be logged: caller identity, location of mosquito problem, nature of breeding area, date of complaint, and counseling given. If complaint is not in regard to County property, callers will be referred to the appropriate jurisdiction/agency to lodge their complaint.

Reports taken in each office will be faxed to the other office by the end of the business day that the report is received.

Staff receiving reports will be responsible for monitoring the frequency of complaints and consulting with their supervisor if a substantial increase is noted. The manager will consult with colleagues and the health officer about the appropriateness of expanded surveillance in potential problem areas.

In the absence of a human outbreak refer citizens wishing to request action on their complaint as follows:

Unincorporated county or county-controlled properties:	public health
Inside city limits:	city government
Other public/private land owner	property owner

Forms for documenting mosquito surveillance activities, including mosquito complaints can be found in the attachments to this document.

MOSQUITO TRAPPING AND SUBMISSION PROCEDURES

Mosquito surveillance procedures will generally be carried out by staff of the Department of Public Services, Environmental Health Division, with support from the Public Health Department as necessary.

Larval Surveillance

1. See Appendix B in the Washington State Mosquito-borne Disease Response Plan for detailed larva collection procedures.
2. If available, use GPS to document the site of collection
3. After specimens are grown in breeders for the appropriate length of time, prepare specimens as below and ship FedEx (see sample shipping document and submission forms in the Laboratory Section, Volume 1, Notifiable Conditions Manual).
4. **Receive results. If results indicate a vector species that is infected with WNV, schedule an immediate telephone conference of the SWAT team to plan risk communications about result and implications**.

Adult Surveillance

1. Identify the habitat to be sampled. The plan for sampling for the 2006 mosquito season follows this procedure.
2. Collect the necessary supplies: EVS carbon dioxide trap, 4 "D" batteries, 4 pounds of dry ice.
3. If the capture of non-mosquito species is a significant problem, remove the light source from the trap.
4. Select a tree or other high object from which to hang the trap. Consider the possibility of vandalism or theft in choosing placement of equipment.
5. Trap at least one hour prior to dusk until one hour after dawn.
6. Return to the site the following morning to collect the trap.
7. Remove and place the contents of each mosquito pool on its own petrie dish, labeling with date and place collected. Submit using the mosquito testing form. Ship FedEx (see sample shipping document and submission forms in Attachments).
8. If available, use GPS to document the site of collection.
9. Receive results. **If results indicate a vector species that is infected with WNV, schedule an immediate telephone conference of the SWAT team to plan risk communications about result and implications.**

Surveillance Schedule 2007

Area	Specimens Collected Week Of:
Ocean Shores and Hoquiam	June 18
Westport/Grayland	June 25
Aberdeen/Junction City	July 9
Elma/Oakville	July 16
McCleary/Porter	July 23
Central Park/Montesano	July 30

Schedule may be started earlier or later, or repeated depending on mosquito and/or arboviral disease activity

BIRD SURVEILLANCE

Bird surveillance may provide early warning to allow for appropriate actions to prevent human cases and reduce impacts on livestock, pets, and wildlife. Avian morbidity/mortality surveillance appears to be the most sensitive early detection system for West Nile virus and should be a component of every arbovirus surveillance program. The surveillance system will include two components: tracking of reports of dead birds and collection of selected individual bird specimens for WNV testing.

Bird Surveillance and Avian Influenza

This year, we can also expect that reports of dead birds may be associated with concerns about avian influenza. We are not actively soliciting reports of bird deaths for avian influenza surveillance; however, for inquiries from concerned citizens who want to know if a dead bird(s) should be tested for avian influenza:

- ☑ Refer calls about domestic poultry to the Washington State Department of Agriculture (WSDA) Animal Health Program (360) 902-1878.
- ☑ Calls about wild birds:
  - o Waterfowl or other aquatic species – refer caller to the Washington Department of Fish and Wildlife (WDFW) Dead Bird Reporting Line: 1-800-606-8768.
  - o If it is a raptor, excluding owls, WDFW would like to be notified. In some cases, avian influenza and WNV testing may both be performed.
  - o If it is NOT a waterfowl, other aquatic species, or raptor
    - Three or more sick or dead birds at one time in one location of any species? Refer to the WDFW Dead Bird Reporting Line: 1-800-606-8768.
    - Fewer than three birds? If not suitable for WNV testing, the carcass may be discarded.

Instructions for Handling Dead Bird Carcasses

Although handling of infected birds is unlikely to lead to infection with WNV, H5N1 HPIA, or other pathogens, callers reporting dead birds will be instructed that the risk may be eliminated by avoiding contamination of mucous membranes, eyes, and skin by material from the bird. This can be accomplished by eliminating any direct contact with dead birds via use of the following precautions

- ☑ Wear disposable gloves when picking up any dead bird. Dispose of it directly into a plastic bag. In the absence of gloves, an inverted plastic bag technique may be used.
- ☑ If the carcass is in a wet environment, safety goggles or glasses and a surgical mask may be worn to protect mucous membranes against splashed droplets or particles.
- ☑ Double bag carcasses and place in a trash receptacle that is secured from children and animals. If submitting for testing, hold it in a cool location until pickup, but not in close contact with food.
- ☑ After handling, avoid touching the face with gloved or unwashed hands.
- ☑ Any gloves or other protective gear used should be discarded and hands should be washed with soap and water.

Tracking Reports of Dead Birds

Avian surveillance will be conducted from April 1 through October. A database will be established to record and analyze dead bird sightings with the following data; caller identification, date observed, location, species, and condition.

1. The Public Health and Social Services Department will maintain a recorded message at ext. 410 that instructs people to leave specific information regarding any dead bird sightings. The WNV response lead or his/her back-up will check this voice mail several times per day beginning April 1. To access the mailbox, open voice mail (feature 981), press “other”, and at the “log” prompt enter 4101234. This should open the mailbox and allow review of any messages in it.

2. PHSS staff will record information about sightings on a Dead Bird Surveillance Form. The bird surveillance forms will be collected and given to the assessment coordinator at the end of each day so that the sightings can be mapped.
3. Reported bird sightings will be differentiated from those that actually test positive for WNV on the map.
4. Reports of birds that appear freshly dead and are without obvious trauma will be considered for testing, especially during high mosquito season and in geographic areas where there have not already been multiple birds collected for testing. PHSS staff will notify Jeff at environmental health when a bird is selected for testing; likewise, EH staff will notify PHSS staff (Lisa or Eeva) if a bird is submitted for testing through their office.
5. An updated map will be posted weekly in the communicable disease office and reviewed to detect geographic patterns or increases in avian mortality.

Submitting Dead Birds for WNV Testing

Background: Dead birds testing positive for West Nile virus (WNV) are a sensitive indicator of viral activity in a geographical area. The *Cordivae* family of birds and raptor species (hawks) are very susceptible to the virus causing a high mortality rate. Therefore, we will evaluate reports involving these species as candidates for testing of WNV.

During past WNV outbreaks, birds testing positive for WNV were more commonly found dead. The small percentage of sick birds observed showed the following clinical signs: weakness; lethargy; tremors; inability to walk, fly, perch, or hold their wings normally against their body; and were easily approachable by humans. These signs of generalized illness are **not** unique to WNV infection. Birds positive for WNV were often in fair to poor physical condition with loss of fat and muscle mass particularly noticeable in the flight muscles (breast).

Reports of a substantial number of dead birds in the same location likely will be shown to have died from causes other than WNV. Such die-offs are frequently associated with pesticide or natural poisoning incidents. Birds associated with these die-offs are not considered suitable specimens for WNV surveillance. These bird die-offs will be reported to the Washington State Department of Fish and Wildlife (1-800-606-8768).

Selecting Candidates for Testing: Birds submitted for WNV testing, should be dead less than 48 hours with carcass intact. If the carcass has an odor, is soft and mushy, has skin discoloration, feathers or skin that easily rubs off, or has maggots present, it is too decomposed for testing. Birds which meet requirements for testing may be frozen for storage and shipping.

Testing is done at the Washington Animal Disease Diagnostic Laboratory, Pullman, WA. The laboratory will test birds weekly and submit electronic reports to Washington State Department of Health. They will notify the department immediately by telephone of any positive birds. **In order for you to obtain the results of your dead bird submissions, Washington State Department of Health will provide a link to the Avian Mortality Report in the West Nile Virus Newsletter (http://www.doh.wa.gov/ehp/ts/zoo/zdnewsletter.html).**

Questions should be directed to Jo Marie Brauner of Washington State Department of Health at 360.236.3064 or jomarie.brauner@doh.wa.gov.

Collecting and Shipping Dead Birds for West Nile Virus Testing
Please follow these instructions on how to collect and ship bird carcasses for West Nile virus testing to ensure that adequate and well-preserved specimens are received at Washington Animal Disease Diagnostic Laboratory (WADDL).

1. Collect birds preferably dead less than 48 hours. Decomposed or scavenged carcasses are unacceptable. If the carcass has an odor, is soft and mushy, has skin discoloration, feathers or skin that easily rubs off, or has maggots present, it is too decomposed for testing. Ideally, collect a combination of freshly dead birds and birds that were euthanized after their behavior was observed and recorded.
2. Use a shovel and rubber gloves when picking up sick or dead birds. If you do not have gloves, insert your hand into a double plastic bag to pick up dead birds. Immediately chill the bagged carcass in a cooler with gel packs. Whenever handling sick or dead birds wash your hands and/or use a hand sanitizer.
3. Place each bird in a plastic bag with absorbent material (paper towel, etc.), seal, then place inside a second bag and seal (more than one individually bagged bird can be placed in the second bag). Double bagging carcasses prevent cross-contamination of individual specimens and leaking from shipping containers.
4. Complete a separate copy of the **Dead Bird Reporting Form** for each bird. Place copies of the forms in a plastic bag and place inside of the shipping container **on top of the bagged birds**. If more than one carcass is submitted, please include some identification information or number to match bird with the correct form.
5. **Ship specimens in hard-sided plastic coolers only**. **To ensure all shipping containers will be returned directly to you from WADDL, please secure your return address to the interior of the cooler lid or side.**
6. Line the cooler with a plastic bag and pack the bagged carcasses in the cooler with **two gel ice packs** to keep the carcasses cold. Use additional gel packs if you ship more than one bird. Place crumpled newspaper or similar absorbent material in the cooler to fill unused space, provide insulation, and absorb any liquids. Keep gel packs in contact with carcasses. Tape cooler shut with strapping tape.
7. Ship to:
   Washington Animal Disease Diagnostic Laboratory
   Washington State University
   Bustad Hall, Room 155-N
   Pullman, WA 99164-7034
   509.335.9696
8. For questions, contact Jo Marie Brauner at 360.236.3064 or jomarie.brauner@doh.wa.gov. Ship birds Monday through Thursday by FedEx overnight service using Washington State Department of Health's account. Pre-printed forms are available for your convenience. Do not ship on Friday; the laboratory is closed on Saturday. If you cannot ship within 24 hours, freeze the birds.
9. Provide results to assessment coordinator for mapping.
10. **Receive results. If positive, schedule a conference call of the SWAT team to**
    a. **develop a risk communication strategy about the results and implications of the result**
    b. **develop a plan for investigating possible mosquito sources in the surrounding area**

EQUINE SURVEILLANCE

Horses are particularly susceptible to West Nile virus. Veterinarians in Grays Harbor County are encouraged to report equine encephalitis cases to both the LHJ and the Washington State Department of Agriculture. This information will be mapped along with mosquito and bird data.

1. Local veterinarians are asked to report suspect or confirmed cases of West Nile virus in horses.
2. If a veterinarian calls to make a report, an Equine WNV Surveillance form (see Attachments) will be completed. Notify state epidemiology at (206) 361-2914. Instruct veterinarian to report case to the Washington State Department of Agriculture State Veterinarian's Office at (360) 902-1878 or rmead@agr.wa.gov OR to the U.S. Department of Agriculture at (360) 753-9430.
3. The County's focus on birds, mosquitoes, and horses in response to West Nile virus is specifically as an indicator of potential threat to human health. The County will specifically address the impact of WNV on human health, so inquiries regarding the virus as it relates to horses or other animals will be referred to the individual's veterinarian.
4. Provide a copy of the surveillance form to the assessment coordinator for mapping.
5. **Upon receipt of a report of a confirmed equine case, schedule a conference call of the SWAT team to**
    a. **develop a risk communication strategy about the results and implications of the result**
    b. develop a plan for investigating possible mosquito sources in the surrounding area

b

HUMAN SURVEILLANCE FOR ARBOVIRAL DISEASES INCLUDING WEST NILE VIRUS

Potential Bioterrorism Agent Category B

Human case surveillance is another important component of an overall mosquito-borne disease surveillance program. It includes ensuring rapid and complete laboratory diagnosis of all suspect cases. Human surveillance data will be evaluated together with mosquito, bird, and horse surveillance information to determine the Risk Category and the efforts needed to prevent additional outbreaks of mosquito-borne disease.

To ensure detection of human outbreaks, **enhanced passive surveillance** for cases of encephalitis of unknown etiology will be implemented during the mosquito season (May through September). This passive surveillance is enhanced by general alerts to key health care personnel, such as primary care providers, infectious disease physicians, neurologists, hospital infection control personnel, and diagnostic laboratories. A high index of suspicion for arboviral encephalitis will be encouraged. Appropriate clinical specimens will be submitted from suspect human cases.

Active human surveillance will be initiated when information indicates the presence of arboviruses in mosquitoes, birds, or animals. This will include identifying physicians in appropriate specialties (e.g., infectious disease, neurology, and intensive care medicine) and hospital infection control personnel and contacting them at least weekly to inquire about patients with potential arboviral infections. Physicians will be encouraged to submit clinical specimens from suspect cases.

Reporting Requirements

Health care providers:	Notifiable to LHJ within 3 work days
Hospitals:	Notifiable to LHJ within 3 work days
Laboratories	Notifiable to LHJ within 2 work days
Local Health Jurisdictions	Notifiable to DOH Communicable Disease Epidemiology within 7 days of case investigation completion or summary information required within 21 days. **If bioterrorism is suspected, case must be immediately reported to DOH: 1-877-539-4344**

Description

A group of acute inflammatory viral diseases of short duration involving parts of the brain, spinal cord and meninges. Signs and symptoms of these diseases are similar but they vary in severity and rate of progress. Most infections are asymptomatic; mild cases often occur as febrile headache or aseptic meningitis. Severe infections are usually marked by acute onset, headache, high fever, meningeal signs, stupor, disorientation, coma, tremors, occasional convulsions (especially in infants) and spastic (but rarely flaccid) paralysis. Case-fatality rates range from 0.3% to 60%, with the rates due to Japanese (JE), Murray Valley (MV) and eastern equine encephalomyelitis (EEE) among the highest. Neurologic sequelae occur with variable frequency depending on age and infecting agent; they tend to be most severe in infants infected with JE, western equine encephalomyelitis (WEE) and EEE viruses. Mild leukocytosis is usual in these mosquito-borne diseases; leukocytes in the CSF, predominantly lymphocytes, range from 50 to 500 cu mm (SI units: 50 to 500 x 10^6/L or greater) and may be 1,000 cu/mm or greater (SI units: 1,000 x 106/L or greater) infants infected with EEE virus. The elderly are at greatest risk of encephalitis with St. Louis encephalitis (SLE) or EEE virus infection, while children under 15 years of age are at greatest risk from LaCrosse virus infection and may develop seizures.

These diseases require differentiation from the tickborne encephalitides (see below); encephalitis and nonparalytic poliomyelitis; rabies; mumps meningoencephalitis; lymphocytic choriomeningitis; aseptic meningitis due to enteroviruses, herpes encephalitis; postvaccinal or postinfection encephalitides; and bacterial, mycoplasmal, protozoal, leptospiral and mycotic meningitides or encephalitides. Venezuelan equine encephalomyelitis, Rift Valley fever and West Nile (WNV) viruses produce primarily arthropod-borne viral fever, but may sometimes cause encephalitis.

Identification is made by demonstrating specific IgM in acute-phase serum or CSF, or antibody rises between early and late specimens of serum by neutralization, CF, HI, FA, ELISA or other serologic tests. Cross reactions may occur within a virus group. Virus may occasionally be isolated by inoculation of

suckling mice or cell culture with the brain tissue of fatal cases, rarely from blood or CSF after symptoms have appeared; histopathologic changes are not specific for individual viruses.

Agent: Each disease is caused by a specific virus in one of three groups: EEE and WEE in the alphaviruses (Togaviridae, Alphavirus); JE, Kunjin, MV encephalitits, WNV, SLE and Rocio encephalitis in the flaviviruses (Flaviviridae, Flavivirus); and LaCrosse, California encephalitis, Jamestown Canyon and snowshoe hare viruses in the California group of bunyaviruses (Bunyaviridae, Bunyavirus).

Occurrence:

In Washington: In 2006, the first confirmed human WNV infections acquired within Washington State were reported. The virus has also been detected in horses and birds in Washington.

Western equine encephalitis and St. Louis encephalitis have also occurred sporadically in Washington State.

Worldwide: EEE is recognized in eastern and north central US and adjacent Canada, in scattered areas of Central and South America and in the Caribbean islands; WEE in western and central US, Canada and parts of South America; JE in western Pacific islands from Japan to the Philippines; rarely cases have occurred on Badu Island in the Torres Strait and in far North Queensland, Australia and in many areas of eastern Asia from Korea to Indonesia, China and India; Kunjin and MV encephalitis in parts of Australia and New Guinea; SLE in most of the US, in Ontario Canada and in Trinidad, Jamaica, Panama and Brazil; Rocio encephalitis in Brazil; LaCrosse encephalitis in the US from Minnesota and Texas east to New York and George; snowshoe hare encephalitis in Canada, China and Russia. Cases due to these viruses occur in temperate latitudes in summer and early fall and are commonly limited to areas and years of high temperature and many mosquitoes.

WNV was first isolated and identified in 1937 from an infected woman in the West Nile district of Uganda. Until 1999, WNV disease was found only in the Eastern Hemisphere, with wide distribution in Africa, Asia, the Middle East, and Europe. Human outbreaks occur and have been more frequent and associated with more severe neurological disease since the mid-1990s. Recent outbreaks in Romania, Israel, Russia, and the US involved thousands of cases with significant neurological disease.

Reservoir: California group viruses overwinter in Aedes eggs; the true reservoir or means of winter carryover for other viruses is unknown, possibly birds, rodents, bats, reptiles, amphibians or survival in mosquito eggs or adults, with the mechanisms probably differing for each virus.

Due to the recent introduction of WNV in the US, investigation of the ecology of the virus in the Western Hemisphere is ongoing. As of May 2005, WNV has been detected in 60 North American mosquito species and 284 bird species. Corvids (e.g. crows, magpies, jays) often succumb to the infection. Mosquitoes of the genus Culex (e.g. *Culex pipiens*, *Culex restuans*, *Culex quinquefaciatus*, *Culex tarsalis*) are among the most competent WNV vectors in the US. The virus is maintained in an enzootic cycle involving birds as reservoirs and mosquito vectors. Amplification of WNV occurs during warm weather; the peak of viral transmission to humans and horses occurs during August and September. Humans and other mammals (primarily horses) are incidentally infected, and do not function as reservoirs for mosquito infection.

Mode of Transmission: By the bite of infective mosquitoes. Although rare, WNV transmission has been demonstrated through some unusual modes: transfusion with contaminated blood products, transplantation of infected organs or tissue, from an infected woman to child during pregnancy or breastfeeding, and percutaneous injuries while working with infected animals or in a laboratory setting.

Incubation Period: Generally 5-15 days; WNV ranges from 2-15 days.

Period of Communicability: Except for rare instances involving WNV, not transmitted from person to person. Virus is not usually demonstrable in the blood or CSF after onset of symptoms. Mosquitoes remain infective for life. For all but WNV, viremia in birds usually lasts 2-5 days, but may be prolonged in bats, reptiles and amphibians, particularly if interrupted by hibernation. Horses develop active disease with EEE, WEE, WNV, and JE, but viremia is rarely present in high titer or for long periods; therefore, horses and humans are not sources of mosquito infection.

For WNV, donated blood units are routinely tested to prevent transmission by transfusion.

Susceptibility and Resistance: Susceptibility to clinical disease is usually highest in infancy and old age; inapparent or undiagnosed infection is more common at other ages. Susceptibility varies with virus, e.g., LaCrosse encephalitis is usually a disease of children, while severity of SLE and WNV increases with age. Infection results in homologous immunity.

For WNV, risk of serious infection is usually highest in persons >50 years of age and among persons with certain immunocompromising conditions. Persistence of antibodies against WNV is probably lifelong, but further research is needed to determine whether re-infection can occur.

Case Definition

Probable: a clinically compatible case occurring during a period when arboviral transmission is likely, and with the following supportive serology: 1) a single or stable (less than or equal to twofold change) but elevated titer of virus-specific serum antibodies; or 2) serum IgM antibodies detected by the antibody-capture EIA but with no available results of a confirmatory test for virus-specific IgG antibodies in the same or a later specimen

Confirmed: a clinically compatible case that is laboratory confirmed.

Because closely related arboviruses exhibit serologic cross-reactivity, positive results of a serologic test using antigens from a single arbovirus can be misleading. In some circumstances (e.g. in areas where two or more closely related arboviruses occur, or in imported arboviral disease cases), it may be epidemiologically important to attempt to pinpoint the infecting virus by conducting cross-neutralization tests using an appropriate battery of closely related viruses. This is essential, for example, in determining that antibodies detected against St. Louis encephalitis are not the result of an infection with West Nile (or dengue) virus, or vice versa, in areas where both of these viruses occur.

Clinical Criteria For Diagnosis: Arboviral infection may be asymptomatic or may result in illness of variable severity sometimes associated with central nervous system (CNS) involvement. When the CNS is affected, clinical syndromes ranging from febrile headache to aseptic meningitis to encephalitis may occur, and these are usually indistinguishable from similar syndromes caused by other viruses. Arboviral encephalitis is characterized by fever, headache, and altered mental status ranging from confusion to coma with or without additional signs of brain dysfunction (e.g. paresis or paralysis, cranial nerve palsies, sensory deficits, abnormal reflexes, generalized convulsions, and abnormal movements).

The majority of patients with WNV infections are asymptomatic; approximately 20% have mild self-limited illness, and less than 1% develop severe neurological disease. Symptoms can include fever, weakness, gastrointestinal symptoms, change in mental status, headache, myalgias, rash, lymphadenopathy, meningismus, cranial nerve palsies, paresis, flaccid paralysis, abnormal reflexes, seizures, movement disorders, and coma.

WNV infections are classified as either neuroinvasive or non-neuroinvasive. Cases meeting the following criteria are reportable to DOH:

Neuroinvasive disease requires the presence of fever and **at least one** of the following, as documented by a physician and in the absence of a more likely clinical explanation:

- Acutely altered mental status (e.g. disorientation, obtundation, stupor, or coma), or
- Other acute signs of central or peripheral neurologic dysfunction (e.g. paresis or paralysis, nerve palsies, sensory deficits, abnormal reflexes, generalized convulsions, or abnormal movements), or
- Pleocytosis (increased white blood cell concentration in cerebrospinal fluid [CSF]) associated with illness clinically compatible with meningitis (e.g. headache or stiff neck)

Non-neuroinvasive disease [1]:

- Presence of documented fever (≥38° C), as measured by the patient or clinician, and
- Absence of neuro-invasive disease, and
- Absence of a more likely clinical explanation

[1] If the patient has non-neuroinvasive disease, confirmatory testing at PHL will be based on availability.

Laboratory Criteria For Diagnosis

- Fourfold or greater change in virus-specific serum antibody titer, or
    - Isolation of virus from or demonstration of specific viral antigen or genomic sequences in tissues, blood, cerebrospinal fluid (CSF), or other body fluid, or
    - Virus-specific immunoglobulin M (IgM) antibodies demonstrated in CSF by antibody-capture enzyme immunoassay (EIA), or
    - Virus-specific IgM antibodies demonstrated in serum by antibody-capture EIA and confirmed by demonstration of virus-specific serum immunoglobulin G (IgG) in the same or a later specimen by another serologic assay (e.g. plaque reduction neutralization or hemagglutination inhibition).

Procedures

Management of Case

Materials Needed

Mosquito-borne Disease Response Plan (local and state)
Control of Communicable Diseases Manual

1. Enter intake information into PHIMS.
2. Contact diagnosing health care provider. If appropriate, fax reporting provider copies of *West Nile Virus Disease Guidelines for Clinicians – Case reporting to public health* and/or *West Nile Virus Information for Clinicians* (see Attachments).
3. Screen suspected case for testing at the PHL based on clinical presentation. If patient does not meet one of the criteria below, advise provider to accomplish laboratory testing at a commercial laboratory. . Cases meeting the following criteria are appropriate for testing at PHL:
    a. For all except WNV:
        - ☑ Any pediatric patient admitted with presumed Guillian-Barré Syndrome or acute flaccid paralysis (asymmetric paralysis) with or without fever
        - ☑ Any hospitalized patient 17 years or older with aseptic meningitis (defined as fever, headache, stiff neck, and CSF pleocytosis)

    b. For WNV:
    WNV neuroinvasive disease
        - ☑ the presence of fever and **at least one** of the following, as documented by a physician and in the absence of a more likely clinical explanation:
            - Acutely altered mental status (e.g. disorientation, obtundation, stupor, or coma), or
            - Other acute signs of central or peripheral neurologic dysfunction (e.g. paresis or paralysis, nerve palsies, sensory deficits, abnormal reflexes, generalized convulsions, or abnormal movements), or
            - Pleocytosis (increased white blood cell concentration in cerebrospinal fluid [CSF]) associated with illness clinically compatible with meningitis (e.g. headache or stiff neck)

        Non-neuroinvasive with commercial laboratory evidence of WNV infection[2]:
        - ☑ Presence of documented fever (≥38° C), as measured by the patient or clinician, and
        - ☑ Absence of a more likely clinical explanation

[2] If the patient has non-neuroinvasive disease, confirmatory testing at PHL will be based on availability.

Asymptomatic or non-neuroinvasive WNV disease with commercial laboratory evidence of WNV infection in:

- ☑ A pregnant woman
- ☑ A neonate or breastfeeding infant
- ☑ Someone who donated or received blood products in the previous month
- ☑ Someone who donated or received a tissue or organ transplant in the previous month
- ☑ Someone who has had occupational exposure to WNV (e.g. laboratory work with WNV, contact with infected animals, etc)

4. Facilitate specimen submission to PHL: each specimen should be labeled with patient's name, date of birth, county of residence, specimen type, and date of collection
   - ☑ Submit ≥1 cc of CSF or serum (separated serum, not whole blood) for enzyme immunoassay (EIA) for WNV IgM antibodies
   - ☑ Serum specimens should be obtained ≥8 days after onset of symptoms
   - ☑ A second serum specimen may be requested if the initial specimen is indeterminate or was obtained <8 days after onset
   - ☑ CSF specimens obtained <8 days after onset of symptoms are acceptable; however, if non-reactive, this does not rule or WNV infection, and a serum specimen take ≥8 days after onset will be requested
   - ☑ Specimens should be refrigerated and transported cold. Frozen CSF is acceptable. Avoid repeated freeze-thaw cycles.
   - ☑ Specimens should be submitted after approval by DOH Communicable Disease Epidemiology Section staff with a completed DOH PHL *Virus Examinations* form to the Washington State Department of Health Public Health Laboratories, 1610 NE 150th St, Shoreline, WA 98155.
5. If the patient does not meet the criteria listed in #4 above, or if PHL testing is not available for a patient with non-neuroinvasive disease, testing can be performed at a commercial reference laboratory.
6. For reports of arboviral infection from commercial laboratories
   a. Complete appropriate reporting in PHIMS.
   b. Call DOH Communicable Disease Epidemiology at (206) 361-2914 before submitting samples to PHL for testing to discuss the case and receive approval for testing.
   c. If patient meets clinical criteria, arrange for confirmatory testing at PHL. If patient does not meet clinical criteria, there is no need for additional testing
7. Contact patient or representative. Question patient regarding travel outside the county during the 15 days prior to symptom onset.
8. **Inform health officer and environmental health division (249-4413) of case immediately. If case is suspected to be due to deliberate exposure, call Grays Harbor County Dispatch (533-8765) and report to law enforcement.**
9. One suspected or confirmed human arboviral disease case may prompt significant public concern, especially if it involves local acquisition of an arboviral disease not previously found locally, or the first case of a mosquito season. **Schedule a conference call of the SWAT team to**
   a. **develop a risk communication strategy about the results and implications of the result**
   b. **develop a plan for investigating possible mosquito sources in the surrounding area**
10. No isolation measures are recommended; virus is not usually found in blood, secretion or discharges during clinical disease. Enteric precautions are appropriate until enterovirus meningoencephalitis is ruled out.
11. Refer patient to their private health care provider if questions regarding treatment are asked.

12. Provide treatment information to appropriate health care providers if requested. No specific treatment is available. Care is supportive and palliative.
13. Finalize documentation in PHIMS and transmit report to DOH.

Management of Contacts
Generally no contact investigation is indicated.

Management of Community
See Alert Levels and Response at the beginning of this plan.

MITIGATION AND CONTROL

The cornerstone of mitigation efforts will include public information that encourages people to reduce their likelihood of begin bitten by an infected mosquito and to take responsibility for reducing the areas that mosquitoes may breed on their property. In the event that more aggressive control measures become necessary for public health protection, however, the County has prepared a plan for the application of pesticides.

REDUCING THE LIKELIHOOD OF EXPOSURE

Public education will focus on reducing the likelihood of being bitten by an infected mosquito by

- ☑ Limiting outdoor exposure at times of high mosquito activity (dawn and dusk)
- ☑ Wearing pants and long sleeves when outdoors
- ☑ Using appropriate mosquito repellents when outdoors during times when mosquitoes are active.

REDUCING MOSQUITO BREEDING AREAS

Public education will focus on reducing the areas where mosquitoes breed by

- ☑ Emptying containers that hold standing water
- ☑ Using mosquito-eating fish in decorative ponds and other enclosed bodies of water where mosquitoes breed
- ☑ Changing the water in animal watering troughs at least once a week.

MOSQUITO CONTROL MEASURES – COUNTY CONTROLLED PROPERTIES

Mosquito control refers to actions taken to kill mosquitoes either in the larval stage (aquatic larvicides) or as adults (spray adulticides).

Authority to Implement Mosquito Control Measures

RCW 70.05.070 assigns broad responsibility and authority to the local health officer for the control of threats to the public health. Procedures for exercising the authority of the health officer are found in the Health Officer Authorities section of the Notifiable Conditions Manual (vol 1). Any action taken to control mosquito populations that extends beyond issuing a recommendation will be planned and carried out jointly by PHSS and EH management in consultation and collaboration with the Grays Harbor County Prosecuting Attorney's Office.

Methods

Larviciding

Larviciding is the application of materials to kill mosquito larvae in the aquatic environment. Includes the use of *Bti* (*Bacillus thuringiensis israelensis*), which kills mosquito larvae after being ingested by them. *Bti* has low levels of toxicity to humans and wildlife, and minimal effect on non-target species. For waters with high organic content, *Bacillus spharicus* may be better suited with repeat applications every 4-6 weeks. *Bti* must be ingested by the insect and is thus most effective in the first and second stage of the larvae.

When the larvae are in the pupal (non-feeding) or adult stage of metamorphosis, *Bti* is less than 60% effective and will not gain effectiveness until the next generation. At these stages, non-molecular films, which last about 10-14 days and minimally affect beneficial aquatic insects, can be used to suffocate the pupae and prevent emerging adults from attaching to the water surface. These should never be used in drinking water sources.

Landowners are required to hold a National Pollutant Discharge Elimination System (NPDES) permit to apply of larvicides into any body of water on their property which is not completely self-contained. Grays Harbor County Department of Public Services, Environmental Health Division, holds this permit (exp. 2008).

Adulticiding

Adulticiding involves spraying pesticide in the air to kill mosquitoes in the adult stage. Spraying will be done carefully only after evaluating the likelihood of virus transmission, pesticide-related illness, and the contributing factors to a human epidemic of mosquito-borne disease. **Adulticiding will always be conducted in tandem with larviciding and in the context of appropriate mosquito surveillance**.

The synthetic pyrethroids such as resmethrin, sumithrin, and permethrin, have lower acute human health and environmental risks than organophosphates, but may be associated with problems in vulnerable populations (children, the elderly, people with respiratory or immunologic compromise or chemical sensivities). Organophosphates, such as malathion and naled, are associated with higher acute poisoning rates.

Pesticide Sensitive Individuals

The Washington State Department of Health maintains a list of persons who report pesticide sensitivity to each local health jurisdiction. A current version of this list is kept by Environmental Health. This list will be consulted each time a spraying operation is planned and individuals on the list within the planned spraying area will be contacted personally and offered the opportunity to opt-out.

Public Venues

Any public venue that may be affected by spraying will be closed to the public during and for 72 hours after spraying is completed.

Public Notice

General Public
When planning application of adulticides, every household, school, hospital, and business in the planned spraying area will be notified about when the spraying will occur at least **72 hours** in advance. Notification will include information about the risks of pesticide exposure and identification of vulnerable populations. Public notice will also include how to pursue the **opt-out** opportunity.

Notification may include the use of mass media (radio, newspaper) leaflets, and/or use of the telephonic warning system.

Information about when and where spraying will occur and how to protect against pesticide exposure will be posted on the public health website and on a mosquito hotline hosted by public health with a recorded message.

Public health will be the lead agency for public notice.

Health Care
Health care providers and emergency departments will be notified of planned applications and asked to report any suspected pesticide-related illness to the Washington State Department of Health. Public health will be the lead on these communications.

Agency
Water management, environmental quality, and fish and wildlife agencies will also be notified of any planned pesticide applications. Environmental health will be the lead agency on these notifications.

Procedures

Application

The County will not directly apply larvicides or adulticides. If the County determines that mosquito control measures are necessary on County properties, a contract will be made with a permitted vendor to complete the desired application. A current list of certified applicators will be maintained by the Department of Public Services, Environmental Health Division. Environmental Health will be the agency lead on mosquito-control activities including contracting and coordinating with selected applicators.

Any contractor engaged to apply adulticides will adhere to the following guidelines:

- ☑ Use the appropriate larvicide for the larval stage and/or the least dangerous pesticides.
- ☑ Spray when mosquitoes are most active.
  Research the biology of the identified vector to find our when they are most likely to be exposed when spraying. The spray must hit the mosquito while in flight in order to be lethal.
- ☑ Strict compliance with all label and manufacturer instructions.
- ☑ Complete spraying in the most targeted manner possible from vehicle or on foot.

Resident Opt-Out

Members of the public may opt-out their residences (including a 300 foot buffer zone) from spraying. The location of residences requesting to opt-out will be provided to the contractor prior to any spraying.

- ☑ Public notification regarding planned spraying will include a telephone number and deadline for residents to notify the county of their desire to opt their property out of spraying.
- ☑ Environmental health will complete an opt-out request form for each resident. A copy will be provided to the applicator and the original will be kept on file at environmental health.
- ☑ The resident will be advised that their opt-out status will remain active for one year.

Monitoring for Pesticide-Related Illness

Refer calls reporting pesticide-related illnesses to the Washington State Department of Health at 1-888-586-9427 or 1-360- 236-3360.

MOSQUITO CONTROL MEASURES – NON-COUNTY PUBLIC LANDS

Voluntary Control

Public Health staff will offer education to cities and others as appropriate regarding the requirements/limitations of the County permit and the process for acquiring an NPDES permit and/or forming a mosquito control district if desired.

Under normal circumstances, the County may only contract for the application of larvicides. Under the conditions of the permit, the County (land-owner) is granting permission to the State Department of Health and the Department of Ecology to inspect and otherwise monitor the effects of larvicide on the property. The County cannot assure access to properties not owned or controlled by the County.

Responding to Complaints

Complaints about mosquitoes in areas controlled by municipalities or other jurisdictions will be referred to the public works or other appropriate contact in that jurisdiction's administration.

In a declared public health emergency, the County may pursue ordering and accomplishing the application of larvicides on non-county public lands through consultation with the Prosecuting Attorney's Office and seeking appropriate court action.

MOSQUITO CONTROL MEASURES - PRIVATELY OWNED PROPERTY

Voluntary Control

If private property owners and/or other land-owning entities wish to apply larvicides or adulticides, they will be referred to permitted vendors.

Responding to Complaints

Addressing mosquito complaints regarding private lands not owned by the complainant will have three action levels. These action levels will be used sequentially. There will be some cases that go no further than Action Level I.

- Action Level I: A general letter (see Appendix B) notifying the property owner that a complaint has been made will be sent. It will include specific information for measures that may be taken to control breeding areas and will request that the homeowner take appropriate measures to reduce mosquito breeding areas on their property.
- Action Level II: To be implemented only if WNV birds, horse cases, or human cases have been reported in the immediate area, and the cases are believed to have been acquired locally. A certified letter (see Appendix B) will be mailed informing the property owner that evidence exists of a mosquito problem on their property. It will include specific information for measures that may be taken to control breeding areas and will request that the homeowner take appropriate measures to reduce mosquito breeding areas on their property.
- Action Level III: An order from the health officer requiring specific actions be taken to reduce mosquito breeding areas. Issued only if a documented significant and imminent threat to human health exists. The order will be written and will include a deadline for the required actions. This level of action will always include consultation with the Prosecuting Attorney's Office.
- Action Level IV: If the Health Offer determines that a significant and imminent threat to human health exists in the form of mosquito breeding areas on the public or private property of another and the owner refuses to take measures to mitigate the problem, he may execute a legal order for specific actions, including mosquito control interventions to be taken for the protection of public health. This level of action will always include consultation with the Prosecuting Attorney's Office.

CONFIDENTIALITY

Rapid and accurate dissemination of a changing surveillance picture to health care providers and the public is an important component of this plan. It may be accomplished by using established networks of health care providers, internet sites, telephone hotlines, and press releases. However, confidentiality is important for bird and mammal testing as well as for human surveillance information. Identifying information should be protected, including:

- ☑ the human case's or animal owner's name and street address
- ☑ veterinarian's or physician's name and address
- ☑ name and address of individual or institution submitting a specimen
- ☑ in some cases, age and gender of human cases or species of bird or mammal.

Depending on the situation, specific locations involved with human or animal cases may not be released if releasing such information may compromise the privacy of individuals. Summary level information will be provided to the public.

APPENDICES

A. Historical Mosquito Surveillance Data
B. Sample Mosquito Complaint Letters

ATTACHMENTS

Communications Support Materials

- ☑ Plan development resources
- ☑ General public, basic information
- ☑ Health care, laboratories
- ☑ Veterinarians
- ☑ Mosquito Control Information

Surveillance Forms

- ☑ Mosquito
- ☑ Bird
- ☑ Equine
- ☑ Human

Legal References

- ☑ RCW 38.52 – Emergency Management
- ☑ RCW 70.05 – Local Health Departments, Boards, Officers
- ☑ RCW 70. 22 – Mosquito Control

APPENDIX A – HISTORICAL MOSQUITO SURVEILLANCE DATA

2003

Date Collected	Location	Total/Female	Species	Type	WNV Vector
8/5/03	Aberdeen	7/7	Culex pipiens	Adult	Yes
8/5/03	Aberdeen	38/38	Culex pipiens	Adult	Yes
8/1/03	Central Park	6/6	Culex pipiens	Larva	Yes
8/1/03	Central Park	3/3	Culiseta particeps	Larva	No
8/19/03	Elma	2/2	Culiseta particeps	Adult	Yes
8/21/03	Elma	1/1/	Culex pipiens	Adult	Yes
8/21/03	Elma	1/1	Culex pipiens	Adult	Yes
8/21/03	Elma	2/2	Culex tarsalis	Adult	Yes
7/22/03	Grayland	3/3	Coquilletidia pertubans	Adult	Yes
7/22/03	Grayland	5/5	Culiseta morsitans	Adult	No
7/22/03	Grayland	3/3	Ochlerotatus aboriginis	Adult	No
7/22/03	Grayland	2/2	Ochlerotatus fitchii	Adult	No
7//8/03	Hoquiam HS	1/1	Coquilletidia pertubans	Adult	Yes
7/8/03	Hoquiam HS	17/17	Ochlerotatus dorsalis	Adult	No
8/5/03	Junction City	1/1	Culiseta particeps	Adult	No
7/16/03	Montesano	5/5	Culiseta incidens	Larva	No
7/2/03	Ocean Shores	0/0		Larva	
7/8/03	Ocean Shores	4/4	Ochlerotatus dorsalis	Adult	No
9/3/03	Porter	1/1	Culex pipiens	Adult	Yes
6/30/03	Westport	15/3	Culiseta particeps	Larva	No
7/22/03	Westport	49/49	Culiseta morsitans	Adult	No
7/22/03	Westport Y	7/7	Ochlerotatus aboriginis	Adult	No
7/22/03	Westport Y	11/11	Ochlerotatus dorsalis	Adult	No
7/22/03	Westport Y	1/1	Ochlerotatus increpitus	Adult	No

2004

Date Collected	Location	Total/Female	Species	Type	WNV Vector
6/28/2004	Westport	5/5	Culiseta impatiens	Adult	No
6/28/2004	Westport	31/31	Ochlerotatus dorsalis	Adult	No
6/28/2004	Westport	4/4	Ochlerotatus fitchii	Adult	No
7/7/2004	Beacon Hill	1/1	Ochlerotatus dorsalis	Adult	No
7/7/2004	Beacon Hill	9/9	Culiseta particeps	Adult	Yes
7/7/2004	Hoquiam HS	1/1	Culex tarsalis	Adult	Yes
7/7/2004	Hoquiam HS	1/1	Coquilletidia perturbans	Adult	Yes
7/7/2004	Hoquiam HS	96/96	Ochlerotatus dorsalis	Adult	No
7/15/2004	Aberdeen	8/8	Culex pipiens	Adult	Yes
7/15/2004	Aberdeen	5/5	Coquilletidia perturbans	Adult	Yes
7/15/2004	Aberdeen	4/4	Ochlerotatus dorsalis	Adult	No
7/15/2004	Aberdeen	1/1	Ochlerotatus stictius	Adult	No
7/21/2004	Montesano	5/5	Coquilletidia pertubans	Adult	Yes
7/21/2004	Montesano	2/2	Ochlerotatus dorsalis	Adult	No
7/15/2004	Grayland	2/2	Culiseta impatiens	Adult	No
7/15/2004	Grayland	6/6	Ochlerotatus fitchii	Adult	No

2005

Date Collected	Location	Total/Female	Species	Type	WNV Vector
7/19/2005	Oakville	3/3	Culex tarsalis	Adult	Yes
7/19/2005	Oakville	2/2	Culex pipiens	Adult	Yes
7/19/2005	Oakville t	2/2	Coquilletidia pertubans	Adult	Yes
7/19/2005	Elma	2/2	Culex pipiens	Adult	Yes
7/19/2005	Elma	1/1	Culex tarsalis	Adult	Yes
7/19/2005	Elma	6/6	Coquilletidia pertubans	Adult	Yes
7/26/2005	Lake Sylvia	4/4	Coquilletidia perturbans	Adult	Yes
7/26/2005	Lake Sylvia	2/2	Culex pipiens	Adult	Yes
7/26/2005	Lake Sylvia	1/0	Ae s ierrensis	Adult	No
7/26/2005	Central Park	1/1	Culex pipiens	Adult	Yes
7/26/2005	Central Park	13/13	Coquilletidia perturbans	Adult	Yes

APPENDIX B – MOSQUITO COMPLAINT LETTER EXAMPLES PRIVATELY OWNED PROPERTY

General Mosquito Complaint Letter Example

[LETTERHEAD]

Date

Dear Property Owner:

It has been brought to our attention that there is a possible mosquito problem on your property. Having a mosquito problem on your property could be harmful to your health and the health of others. Some types of mosquitoes carry diseases like West Nile Virus and can pass them on to people when biting them. A West Nile Virus fact sheet is attached.

You can reduce your risk of getting such diseases by stopping the breeding of mosquitoes on your property. The attached flyer suggests ways that mosquito populations can be reduced. You can also protect yourself by using mosquito repellents containing DEET, making sure to follow directions, and screening the doors and windows of your home.

If you have any questions, please contact me at (360) 532-8631 ext. 2--.

Sincerely,

Certified Mosquito Complaint Letter.

[LETTERHEAD]

Date

Dear Mr./Mrs.:

It has been brought to our attention that there is a mosquito problem on your property. There have been reports of dead birds around your residence that have tested positive for West Nile Virus, and we know through trapping that mosquito species that carry West Nile Virus live in the area. Because of this, the mosquito problem on your property may present a health risk to you and others.

We recommend that your take steps to reduce the areas where mosquitoes live and breed on your property. Mosquito eggs mature in water, so get rid of tires or other containers where water can accumulate. If you have livestock, change the water in watering troughs at least weekly. If you have water that cannot be eliminated, then aquatic mosquito control is needed. Aquatic mosquito control can be as easy as putting fish in the water to eat the mosquito larva before they mature.

If you feel that more extreme measures are needed to solve your mosquito problem or you have questions, please contact me at (360) 532-8631 ext. 2--.

Sincerely,