



West Nile virus Response Plan

Prepared by:

*Nova Scotia West Nile virus Working Group
Last Revision: June 2009*

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HIGHLIGHTS OF NOVA SCOTIA'S WEST NILE VIRUS RESPONSE PLAN

Illness due to West Nile virus (WNV) can be caused by a bite from an infected mosquito. Most infected people show very mild symptoms with no lasting effects, but the virus can cause serious illness, and can even be fatal.

To prevent illness due to West Nile virus in Nova Scotia, Nova Scotia Health Promotion and Protection, in cooperation with several other provincial departments (Department of Natural Resources, Department of Agriculture, and Department of Environment) implements the West Nile virus response plan each year. Highlights of this year's plan are below.

1. West Nile virus Working Group

The WNV Working Group was established in 2000 to follow the development of West Nile virus in other parts of North America and develop a response plan for Nova Scotia. The group consists of experts in birds, mosquitoes, animal and human health who are working together to ensure a consistent and consolidated approach to protecting Nova Scotians from West Nile virus. This group of experts is responsible for developing and implementing the West Nile virus plan and for ongoing assessment of the risk of West Nile virus to Nova Scotians.

2. West Nile virus Watch

This surveillance program is carried out throughout the summer in cooperation with the Department of Natural Resources, who collects and test dead birds (crows, jays and ravens) for the virus.

In addition, through the Department of Natural Resources and the Public Health Agency of Canada, mosquitoes may be tested for West Nile virus only if clusters of West Nile virus positive birds are again detected within the province.

Nova Scotia Health Promotion and Protection will watch closely for indication of any human cases in the province.

West Nile virus Watch is updated regularly on the Nova Scotia Health Promotion and Protection website.

3. Public Awareness and Education Campaign

The West Nile virus public education campaign is part of a larger “Enjoy the Outdoors Safely” campaign developed to make Nova Scotians aware of West Nile in addition to Lyme disease and Rabies.

The West Nile virus portion of the campaign includes a poster and brochure containing general information, a series of fact sheets providing more detailed information, and updates to the West Nile virus section of the Department of Health Promotion and Protection website. In addition, articles will be provided to community papers and newsletters on how to protect yourself from mosquito bites, and there will be continued contact with the media to update the public on the West Nile virus situation in Nova Scotia.

4. Information for Health Professionals

Physicians will be updated on WNV and Nova Scotia Provincial Blood Coordinating Program WNV initiatives via a letter and through Doctors NS website. Regular contact will continue between Nova Scotia Health Promotion and Protection and District Health Authorities, and other stakeholders to ensure that they receive all relevant information on the virus.

5. Diagnostic Testing for Human Illness

In order to ensure prompt diagnosis of West Nile virus illness in Nova Scotia, initial testing requested by physicians will be done in Nova Scotia at the QEII Health Sciences Centre, with confirmatory testing at the Public Health Agency of Canada’s National Microbiology Lab in Winnipeg if required.

6. Co-operation with Canadian Blood Services

Canadian Blood Services (CBS) successfully implemented a blood test for West Nile virus on July 1st, 2003. CBS will be immediately notified of West Nile virus activity in the province, so they can quickly assess the risk to the blood supply and take appropriate action. CBS will also immediately notify Nova Scotia Health Promotion and Protection if they detect the virus as a result of their donor-screening program. CBS is represented on the WNV Working Group.

7. Reducing Exposure to Mosquitoes

Initiatives will include avoidance, personal protection from bites, and reduction of mosquito breeding grounds such as gutters, empty containers and pool covers. Tips for the public on reducing exposure to mosquitoes will be included in information materials and posted on the website. There has been very limited West Nile virus activity in Nova Scotia to date. Decisions around mosquito reduction measures will be based on ongoing assessment of several factors including WNV activity in the province and health risks.

Nova Scotians can decrease their chances of getting WNV illness by preventing mosquito bites. This can be done by avoiding areas and times of day when mosquitoes are most active, wearing protective clothing, and using personal insect repellants.

For more information:

To learn more about West Nile virus, visit the Nova Scotia Health Promotion and Protection Website <http://www.gov.ns.ca/hpp/cdpc/wnv.asp>

For health related questions contact the nearest Public Health Services Office.

For information related to pesticides or mosquito habitat, call the Department of Environment at 1-877-9-ENVIRO.

For reporting a dead crow, jay or raven call the local office of the Department of Natural Resources during business hours, or the toll free number at 1-800-565-2224 after hours.

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CHAPTER 1: Overview of Nova Scotia's West Nile virus Response Plan

1.0 Introduction

This document details the plan for responding to WNV in Nova Scotia for the WNV season. It was developed by the West Nile virus Working Group, a multidisciplinary, departmental group that has been working together since the year 2000.

The main body of this document provides background information on the West Nile virus infection, including the epidemiology, risk assessment, etc. The main elements of the plan are outlined with the details appearing in the appendices.

This is a living document. It is revised annually but may change during the WNV season as we learn from the experiences of others in dealing with this emerging pathogen or as circumstances change in Nova Scotia.

There are many issues and challenges with respect to West Nile virus activity in Nova Scotia. They include:

- Accurate assessment of risk.
- Preventing cases and protecting the blood supply.
- Education for behaviour change so the public will protect themselves from mosquito bites.
- Decisions around pesticide use based on risk to human health.

2.0 Goal and Objectives of the Response Plan

Goal:

To reduce the risk of West Nile virus infection to humans and domestic animals in Nova Scotia.

Objectives of the Response Plan:

1. To ensure that a response team with the necessary expertise and representation from the appropriate departments is in place to plan for and respond to West Nile virus related issues in Nova Scotia.
2. To maintain a surveillance system to detect West Nile virus in Nova Scotia in mosquitoes, birds, mammals and humans.
3. To increase the knowledge of the public regarding WNV and to change behaviour towards personal protection against mosquito bites.
4. To increase knowledge of health professionals regarding WNV.
5. To protect the supply of blood products, tissues and organs from WNV, whenever possible.
6. To keep Nova Scotians informed about WNV activity in Nova Scotia.
7. To recommend mosquito control measures based on assessment of risk and the many other factors related to effectiveness of mosquito control measures including protection of the environment.

3.0 Background

Birds serve as the reservoir for West Nile virus. Mosquitoes that prefer to feed on birds transmit the virus from bird-to-bird, leading to a build-up of the virus in nature as the season progresses. Then other species of mosquitoes bite infected birds and then horses and humans with associated outbreaks of human illness. Alternate modes of transmission include receipt of blood components, organ/tissue transplant, intrauterine, breast-feeding and laboratory acquired.

3.1 Clinical Picture

Most WNV infections are mild and often clinically unapparent. The incubation period after being bitten by an infected mosquito is two to 14 days. Eighty percent (80%) of infected individuals will be asymptomatic. About 20% will develop symptoms of West Nile virus Non-Neurological Syndrome (WN Non-NS), which represents the majority of symptomatic infections. Symptoms generally last three to six days. One in 150 of those infected will develop a serious neurological illness.

WN Non-NS may be characterized by two or more of: fever, myalgia, arthralgia, headache, fatigue, lymphadenopathy, or maculopapular rash. West Nile virus Non-Neurological Syndrome is unlikely to progress to central nervous system disease. Only about 50% of cases of WN Non-NS will seek medical attention.

As noted above, one in every 150 infected people will develop West Nile virus Neurological Syndrome (WNNS). Within 24 to 48 hours of fever onset, the individual may go on to develop encephalitis, meningoencephalitis, meningitis or acute flaccid paralysis. Other clinical syndromes that were identified include ataxia and extrapyramidal signs, polyradiculitis, cranial nerve abnormalities, optic neuritis and seizures. Movement disorders associated with WNNS include tremor, myoclonus, flaccid paralysis, Parkinsonism and rhabdomyolysis (acute destruction of skeletal muscle cells).

About 50% of severe cases have continued impairment at one year while 37% are considered fully recovered. Others go on to have persistent chronic headache, memory difficulties, fatigue or persistent tremor. For those with paralysis, there is little short-term improvement.

3.2 Epidemiology

Widespread in Africa, Europe, the Middle East and India, WNV was first identified in North America in 1999 during an outbreak in New York City. Since then West Nile virus has spread westward across the United States. Since that time West Nile virus activity has now been detected in every state except Alaska and Hawaii.

West Nile virus was first identified in Canadian birds and mosquitoes in the summer of 2001.

3.3 Summary of West Nile virus Activity in Nova Scotia, 2001 – 2008

Birds:

Collecting and testing of wild birds in Nova Scotia for WNV began in 2000. The numbers of dead birds tested and the number (%) positive from 2001-2008 are presented in Table 1.

Table 1: Dead Birds Submitted for West Nile virus Testing and Results, Nova Scotia, 2001-2007.

Year	Number Tested	Number (%) Positive
2001	166	0
2002	381	4(1.05)
2003	912	17(1.87)
2004	460	0
2005	203	0
2006	139	0
2007	62	0
2008	36	0

Mosquitoes:

Nova Scotia has 27 species of mosquitoes. Thirteen of these are known to be vectors of West Nile virus. There has been some testing of mosquito pools for West Nile virus but none have been positive.

From 2003 to 2005 permanent mosquito sample sites were selected and Culex mosquitoes were tested for the presence of WNV. Catch results varied widely from location and time of year. A total of 45 mosquito pools were collected and submitted for testing. All were negative for WNV.

Mosquito surveillance has been suspended since 2006 until clusters of WNV positive birds are again detected within the province.

Mammals:

The first horses suspected of having WNV infection in Nova Scotia were detected and tested in the summer of 2003. Five horses had non-descript nervous system signs. All tested positive and had a low titer for WNV, but only four had a history of vaccination to account for the titers. The fifth horse had no history of vaccination or travel and is considered to have been infected with WNV. No WNV was detected in horses since 2003.

Humans:

There were no human cases of WNV in Canada until 2002, when cases occurred in Ontario and Quebec.

No positive blood donors were detected in Nova Scotia by Canadian Blood Services. A summary of the human surveillance results are presented in Table 2.

Table 2: West Nile virus Human Cases in Nova Scotia

Year	Travel Acquired	Nova Scotia Acquired	Total
2001	0	0	0
2002	0	0	0
2003	2	0	2
2004	0	0	0
2005	1	0	1
2006	0	0	0
2007	1	0	1
2008	1	0	1

4.0 Risk Assessment for Nova Scotia, 2008 Season

Host birds species and vector mosquitoes are present in Nova Scotia but **limited** WNV activity has been detected here. Overall, the risk is low for any one individual to get bitten by an infected mosquito and develop serious disease.

5.0 Risk Reduction

To reduce the risk of West Nile virus illness in general, a number of steps can be considered:

- Maintain a surveillance system for birds, mosquitoes, mammals and human illness in order to detect WNV activity in the area.
- Educate the public on ways to reduce mosquito exposure: avoid areas and times of day when mosquitoes are most active, wear protective clothing and use insect repellants, and inform the public that the risk is extremely low for WNV in Nova Scotia.
- Reduce habitat in urban and suburban areas with priority emphasis on *Culex* mosquitoes around the home and reduce temporary water in all areas.
- Consider mosquito control measures based on ongoing risk assessment.

It is not practical to carry out any degree of detailed planning for mosquito abatement that requires the use of pesticides at this time. It should be recognized that any intervention follows a hierarchical approach to dealing with mosquitoes: education around avoidance of bites, personal protection, larval habitat reduction, larval mosquito control and adult mosquito control.

6.0 Key Elements of West Nile virus Response Plan

The key elements of the Nova Scotia Response Plan for West Nile virus are noted below. Activities for the start of each season are outlined along with a response as WNV activity is detected (see summary in Table 3).

6.1 Nova Scotia West Nile virus Working Group

The WNV Working Group was established in 2000 to follow the development of West Nile virus in other parts of North America and develop a response plan for Nova Scotia. The group

consists of experts in birds, mosquitoes, mammals and human health who are working together to ensure a consistent and co-coordinated approach to protecting Nova Scotians from West Nile virus. This group of experts is responsible for developing and implementing this West Nile virus Response Plan and for the ongoing assessment of risk to Nova Scotians. Government departments represented on the Working Group have different roles and responsibilities (see Chapter 2 for working group members and roles and responsibilities of various partners).

Nova Scotia has also been working with the other Atlantic Provinces to share expertise and resources in this area. The Nova Scotia Working Group on West Nile virus has a representative on the National West Nile virus Human Sub-Committee co-coordinated by the Public Health Agency of Canada.

The working group will continue to meet regularly, or as deemed appropriate by the group, as the WNV season progresses to monitor all activities related to the Response Plan.

6.2 West Nile virus WATCH

West Nile virus Watch is a summary of current Nova Scotia surveillance activity and will be updated biweekly and posted on the Nova Scotia Department of Health Promotion and Protection website.

6.2.1 Dead Bird Surveillance

Dead bird surveillance will start July 2, 2009. As in other years, the general public will be asked to report dead crows, jays and ravens to the nearest Department of Natural Resources (DNR) office. DNR staff will make an assessment and determine whether the bird should be collected for testing. If they do want it, DNR staff will go out and retrieve the bird following appropriate occupational health and safety precautions. If the bird is not suitable for collection, the caller will be given instructions about the proper disposal of the bird.

It is important to note that not every bird will be collected and that the office will not respond after hours or on weekends, as this is not required. Once several birds from a location have been identified as positive for WNV, collection will cease in that area. Please refer to Chapter 3 for detailed protocol for dead bird surveillance and for occupational health and safety guidelines for handling dead birds.

Birds will be sent to the Atlantic Veterinary College (AVC) for testing. The Vectest done on oropharyngeal swabs will be the initial test. Confirmatory testing by PCR will follow this. All testing results for birds are entered into the CCWHC database and reported back to the WNV Working Group. These results will form part of the biweekly WNV Watch report that is distributed to various stakeholders and is updated on the NSHPP website, when mosquito activity begins (see Chapter 7 for details).

6.2.2 Mosquito Surveillance

Mosquito surveillance has been suspended since 2006 until clusters of WNV positive birds are again detected within the province.

6.2.3 Human Illness Surveillance

National case definitions for WNV are available in Chapter 5; Annex A. West Nile virus illness is on the list of Notifiable Diseases in Nova Scotia. Physicians and laboratories are required to notify the Medical Officer of Health of all cases of WNV illness. The Medical Officer of Health will determine if the case meets the case definition and will then initiate investigation of the case including any relation to the blood supply or to donation of tissues or organs.

Full procedure for human surveillance can be found in Chapter 6. Details on Public Health investigation and management, as well as case report forms, are in Chapter 5. Also, please refer to section 6.5 for information on laboratory diagnostics.

6.2.4 Other Mammal Surveillance

WNV is an Immediately Notifiable Disease under Section 64 (1) (m) of the federal Health of Animals Regulations. All veterinary laboratories diagnosing positive WNV samples in domestic animals must immediately notify the Disease Surveillance Unit of CFIA.

Veterinary practitioners clinically suspecting/diagnosing WNV in birds and equines are to also contact their nearest CFIA Animal Health Veterinarian for a possible farm or premises visit and subsequent inspection or investigation. WNV clinical signs can be indistinguishable from Avian Influenza (AI), Newcastle Disease (ND), Rabies or the Equine Encephalitis.

WNV may be diagnosed in other species, especially horses, at the Veterinary Diagnostic Laboratory of the Nova Scotia Department of Agriculture located in Truro. This would also serve as another indicator of increased WNV activity and risk in any area of the Province.

The Department of Agriculture will notify NS HPP (chair of the West Nile Virus Working group) if any positive reports of West Nile virus are known in mammals.

6.2.5 Surveillance Reports

A surveillance report entitled, 'WNV WATCH', will be posted on the Nova Scotia Department of Health Promotion and Protection website and updated every two weeks. It will contain the most up-to-date information on WNV activity in Nova Scotia including dead birds, mosquitoes, horses and human cases.

6.3 Public Awareness and Education Campaign

Actions taken by the general public play an important role in preventing human cases of WNV. The public will be provided with information on WNV, the types of illness it causes including symptoms, how to avoid mosquito bites and the use of personal protection measures. In addition, the public will be asked to assist with the dead bird surveillance program by reporting dead crows, jays and ravens to the Department of Natural Resources.

The general public also has a key role to play in reducing mosquito habitat around homes in urban and suburban areas. By removing sources of temporary standing water around their homes, the numbers of *Culex* mosquitoes, which are key in the amplification of virus in the bird population, will be decreased.

See Chapter 7 for the detailed Communications Plan. Information on West Nile virus is part of a comprehensive 'Enjoy the Outdoors Safely' campaign, which currently includes Lyme disease and Rabies.

The Nova Scotia Department of Health Promotion and Protection website has been updated to include easy-to-find information on West Nile virus and will have a section called 'WNV WATCH' which will provide current information on WNV activity in Nova Scotia.

The public can get information on health aspects of West Nile virus by calling Public Health Services in their area. For information on dead birds or to report a dead bird, the public can call the nearest Department of Natural Resources office, after hours at 1-800-565-2224. For information on pesticide use or on standing water issues, they can call the Department of Environment at 1-877-9- ENVIRO.

Press releases and media interviews will keep the public updated during the summer months.

6.4 Information for Health Professionals

In 2003, physicians were informed that West Nile virus illness has been added to the list of Notifiable Diseases in Nova Scotia. In addition, physicians and other health professionals were provided with information on the signs, symptoms, diagnostic tests and treatment for West Nile virus illness. This was done through letters, newsletter articles and videoconferences. Please refer to Chapter 8.

6.5 Diagnostic Testing for Human Illness

During West Nile virus season, initial testing will be done at the QEII Health Sciences Centre. The National Microbiology Laboratory will carry out confirmatory testing. The WNV diagnostic testing algorithm is available in Chapter 5, Figure 1.

6.6 Co-operation with Canadian Blood Services and Transplantation Services

Canadian Blood Services (CBS) is represented on the Nova Scotia West Nile virus Working Group. CBS will continue to screen blood donations. This will protect the blood supply by identifying donors who have West Nile viraemia and who are not yet symptomatic. These positive donors will be referred to their family physician for follow-up testing. CBS will also report these cases to the Medical Officer of Health as required for notifiable diseases. This serves as an extension to the human surveillance system for cases and will provide information on asymptomatic infections that would not normally be available.

Existing traceback and lookback procedures will apply to West Nile virus illness in the event that a case appears in a recipient of blood products or that a donor is subsequently identified to have the illness (see Chapter 5, Public Health Measures of WNV Illness).

CBS will be advised of any West Nile virus activity (birds, mosquitoes, horses, humans) in Nova Scotia so that they can ensure all necessary measures are in place to protect the blood supply. Steps will also be taken to engage the Provincial Transplant Program on the same issues.

6.7 Reducing Exposure to Mosquitoes

Reducing exposure to mosquitoes can occur following a graded hierarchal response including:

- a) Avoidance.
- b) Personal protection.
- c) Reduction of Temporary Standing Water: Homeowners will be asked to ensure that there is no temporary standing water around their homes. All landowners should address temporary standing water issues.
- d) Larviciding: While there are currently no plans in place to larvicide, the West Nile virus Working Group will assess the need for larviciding as the season progresses.

Some homeowners may choose to use a pest control such as Aquabac (Bti), which is available for domestic use. Private landowners and municipalities may also decide to use larvicides independent of any provincial recommendation that would be based on risk to human health. Private landowners' and municipalities must contact the Department of Environment to ensure they meet regulatory requirements prior to conducting any larviciding or adulticiding program.

- e) Adulticiding: Adulticiding will only be considered if there is considerable risk to human health and if there evidence of effectiveness for the circumstances involved.
- e) Mosquito Control Programs in General: Any recommendations involving larviciding and adulticiding will depend on recurring assessment of risk as the season progresses and more information becomes available. All approaches to mosquito abatement will be reviewed.

A number of factors need to be weighed:

- probability of human cases of West Nile virus
- time of the year, i.e. time in the mosquito season
- number and range of bird mortality
- relative size of the biting mosquito population
- mosquito species composition
- physiological age structure of mosquitoes
- environmental factors, i.e. time of first frost
- current and predicted weather conditions
- geographic extent of suitable mosquito habitat
- probability that abatement will work in that area
- density of human population

The process and authority for the final decision on mosquito abatement activities especially those involving pesticides, is outlined below.

The Nova Scotia West Nile virus Working Group will make a recommendation regarding mosquito abatement after discussing the circumstances with help from outside experts and the National Steering Committee as required. The recommendation will be made jointly to each Department represented on the Committee. However, the Minister of Health Promotion and Protection will play the lead role.

The Department of Natural Resources will assist Nova Scotia Health Promotion and Protection in any mosquito abatement program involving pesticide use. The Department of Environment acts as the regulator.

Before any pesticide use occurs, a hot line will be established, the public notified of the decision to use pesticides and schedules and areas of use will be broadcast.

A surveillance system for the health effects of pesticides will be put in place. A letter will be written to physicians in the area of WNV activity outlining the mosquito abatement program and providing them with fact sheets on products to be used. They will also be supplied with a reporting form for possible health effects associated with pesticides and asked to send it in to their local Public Health office.

The Regional Poison Centre will also be briefed on the situation and asked to fill in case report forms and return them to Public Health. This office will be responsible for maintaining the database of reports of adverse health effects temporarily related to pesticides.

General References

1. CDC. Fifth National Conference on West Nile virus in the United States, 2004. http://www.cdc.gov/ncidod/dvbid/westnile/conf/February_2004.htm
2. Petersen L, Marfin A. West Nile virus: A Primer for the Clinician. *Annals of Internal Medicine*. 2002; 137: 173-179.
3. CDC. Division of Vector-Borne Infectious Diseases, West Nile virus website http://www.cdc.gov/ncidod/dvbid/westnile/site_index.htm
4. Campbell G, Marfin A, Lanciotti R, Gubler D. West Nile virus. *Lancet*. 2002; 2: 519-529.
5. Public Health Agency of Canada. *Management of Patients with West Nile Virus: Guidelines for Health Care Providers*. *CCDR* 2005; 31S4: 1-10

Table 3: Response to Levels of Activity of WNV in Nova Scotia

	Start of the Season	Positive Birds Identified	Positive Mosquitoes, Horses or Birds Identified	Human cases of WNV
WNV Working Group	<ul style="list-style-type: none"> ▪ Regular meetings to implement program 	<ul style="list-style-type: none"> ▪ Regular meetings for program review and risk assessment 	<ul style="list-style-type: none"> ▪ Increased frequency of meetings and risk assessment 	<ul style="list-style-type: none"> ▪ Increased frequency of meetings and risk assessment ▪ Consider mosquito control
Surveillance	<ul style="list-style-type: none"> ▪ Dead bird surveillance ▪ Mammal surveillance ▪ Human surveillance 	<ul style="list-style-type: none"> ▪ Stop bird testing in the positive area ▪ Start mosquito surveillance 	<ul style="list-style-type: none"> ▪ Delineate area of activity 	<ul style="list-style-type: none"> ▪ Get detailed epidemiology and blood information ▪ Delineate area of activity
Public Education and Awareness	<ul style="list-style-type: none"> ▪ Media releases ▪ Brochures, presentations, etc. 	<ul style="list-style-type: none"> ▪ Media releases ▪ Personal protection messages 	<ul style="list-style-type: none"> ▪ Ads around personal protection 	<ul style="list-style-type: none"> ▪ Continue to advise the public
Information for Health Professionals	<ul style="list-style-type: none"> ▪ Newsletter articles ▪ Letter to physicians 	<ul style="list-style-type: none"> ▪ Notice to Physicians by letters – DHA’s 	<ul style="list-style-type: none"> ▪ Notice to Physicians by fax – DHA’s 	<ul style="list-style-type: none"> ▪ Letter to Physicians by fax, email letter through DoctorsNS
Diagnostic Testing for WNV	<ul style="list-style-type: none"> ▪ Ensure testing capability in Province 		<ul style="list-style-type: none"> ▪ May need to prioritize testing 	<ul style="list-style-type: none"> ▪ Prioritize testing
Co-operation with CBS	<ul style="list-style-type: none"> ▪ Review communications protocol ▪ Review lookback / traceback procedure 	<ul style="list-style-type: none"> ▪ Inform CBS 	<ul style="list-style-type: none"> ▪ Keep in close contact with CBS 	<ul style="list-style-type: none"> ▪ Keep in close contact with CBS
Protection against Mosquitoes	<ul style="list-style-type: none"> ▪ Education / Awareness: Media, posters, brochures, etc. 	<ul style="list-style-type: none"> ▪ Reassess risk ▪ Enhance public education and awareness 	<ul style="list-style-type: none"> ▪ Reassess risk ▪ Enhance public education and awareness 	<ul style="list-style-type: none"> ▪ Reassess and delineate risk ▪ Review all options and factors

CHAPTER 2: Nova Scotia West Nile virus Working Group

1.0 Contact List

2.0 Roles and Responsibilities

- 2.1 Nova Scotia Health Promotion and Protection
 - 2.2 Department of Environment
 - 2.3 Department of Natural Resources
 - 2.4 Department of Agriculture and Fisheries
 - 2.5 Canadian Food Inspection Agency
 - 2.6 First Nations Inuit Health Branch (Health Canada)
 - 2.7 QEII Health Sciences Centre
 - 2.8 Canadian Blood Services
 - 2.9 Provincial Blood Coordinating Program
 - 2.10 Canadian Co-operative Wildlife Health Centre
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**CHAPTER 2:
NOVA SCOTIA WEST NILE VIRUS WORKING GROUP**

1.0 Contact List

Affiliation	Name	Phone No.	Fax No.
Nova Scotia Health Promotion and Protection ✂	Cole, Teri	722-1319	428-3313
	Holmes, Elaine	424-1748	428-3313
	Baikie, Maureen	722-1378	428-3313
	Gould, Richard	542-6310	542-6333
	O'Toole, Gary	424-1262	428-3313
	Cutler, Jennifer	424-6834	424-4716
	Koffman, Toby	424-7558	428-3148
Department of Environment ✂	Williams, Tina	424-6550	428-3313
	Burns, Donald	424-3170	424-0503
Department of Agriculture ✂	Skinner, Brad (Alt)	667-6205	667-6214
	Hartnett, Leighann	896-2299	895-6684
Department of Natural Resources ✂	Spearman, Grant	893-6538	893-6531
	Towers, Julie	679-6139	679-6176
	Ogden, Jeff	758-7015	758-3210
Provincial Public Health Lab Network / QEII Health Sciences Centre ✂	Milton, Randy	679-6224	679-6176
	Hatchette, Todd	473-6885	473-7971
Museum of Natural History ✂	Hebda, Andrew	424-6455	424-0560
Provincial Blood Coordinating Program ✂	Hamilton, Marina	473-2121	473-2589
Canadian Blood Services 🇨🇦	McLaughlin, Natasha	474-8292	474-8262
	Kahwash, Eiad	474-8298	474-8262
Canadian Food Inspection Agency 🇨🇦	McKinley, Janet	679-5742	679-5565
	Vachon, Evelyne (Alt)	679-5303	679-5565
Regional Tissue Bank	Margueratt, Sean	473-5935	473-2170
Health Canada – First Nations Inuit Health Branch 🇨🇦	Cameron, Sandy	426-0897	426-4208
	Young, Melissa (Alt)	426-4656	426-4208
Health Canada – Pest Management Regulatory Agency 🇨🇦	Troop, Troy	679-5304	679-5565
Department of National Defence 🇨🇦	Sherman, Cathy	721-8850	721-1295
Canadian Co-operative Wildlife Health Centre / Atlantic Veterinary College (PEI)	Daoust, Pierre-Yves	566-0677	566-0851
	Jones, Darlene	628-4314	566-0851
	McBurney, Scott	566-0959	566-0851

2.0 Roles and Responsibilities

2.1 Nova Scotia Health Promotion and Protection (NSHPP)

- Conducts surveillance for illness related to West Nile virus.
- Assesses risk to the health of Nova Scotians.
- Recommends when interventions should occur based on health risk in consultation with other NS government departments, the NS WNV Working Group and Health Canada.
- Conducts surveillance for health effects of pesticides if used for mosquito abatement.
- Lead department for planning and coordination of Response Plan.
- Lead in communication.

2.2 Department of Environment

- Regulates pesticide use.
- Serves as a resource on pesticide issues.

2.3 Department of Natural Resources

- Coordinates dead bird surveillance.
- Conducts surveys of mosquito species and habitat, as required.
- Advises on interventions regarding mosquitoes.

2.4 Department of Agriculture

- Provides link to veterinarian community.
- Works with CFIA on mammal surveillance.
- Works with DNR on dead bird surveillance.
- Provides veterinary diagnostic services for domestic animals/birds with diseases of unknown origin including WNV.

2.5 Canadian Food Inspection Agency

- Deals with surveillance of mammals including horses.
- Deals with foreign reportable animal diseases.

2.6 Health Canada – First Nations Inuit Health Branch

- Provides link to First Nations communities.

2.7 Infectious Disease Department QEII Health Sciences Centre

- Provides expertise in human infectious diseases.

2.8 Provincial Public Health Lab Network

- Provides human diagnostic laboratory services for WNV.

2.9 Canadian Blood Services

- Provides expertise in regards to the safety of the blood supply.
- Provides communication links between WNV Working Group and CBS NS/PEI and CBS National.
- Updates WNV Working Group on new information regarding the safety of the blood supply.
- Works with WNV Working Group to ensure a cohesive approach to human surveillance.

2.10 Nova Scotia Provincial Blood Coordinating Program (NSPBCP)

- Provides chair and functions as secretariat for the Blood Emergency Response Team (BERT)
- Provides updates on behalf of BERT.
- Develops and maintains action plan for WNV and the blood supply available on the NSPBCP website

2.11 Canadian Co-operative Wildlife Health Centre

- Works with DNR to co-ordinate wild bird surveillance
- Tests wild birds for presence of West Nile virus
- Maintains database on results of submissions and testing
- Provides timely information to Nova Scotia lead agencies on any positive results

**CHAPTER 3:
Bird Mortality Surveillance for West Nile virus**

- 1.0 Background**
- 2.0 Specimens for Submission**
- 3.0 Specimens Unable to Submit/Collect – Public Information**
- 4.0 Handling Criteria**
- 5.0 Shipping Criteria**
 - 5.1 Wildlife Investigation Report (WIR) Information

CHAPTER 3: Bird Mortality Surveillance for West Nile virus

1.0 Background

West Nile and Avian Influenza are both viruses which may be found in wild birds. A program of passive surveillance for these viruses in the Maritime provinces will be continued at the Atlantic Veterinary College in 2009 by testing of dead birds. The major purpose is to monitor for the presence of these viruses to enable quick response for the protection of human health and poultry operations.

2.0 Specimens for Submission

West Nile virus

Corvids (crows, ravens, jays) are the primary species which are being collected. The official collection period begins July 2 and continues until the end of October. However, collections can be accepted and shipped earlier where birds become readily available.

This year, birds that have known cause of death such as power lines, oil spills or vehicles should not be collected. Collections should be made for one or more dead corvid.

The public should not be requested to bring birds to the office unless they have been given detailed instructions on the safe way to handle these birds (see below). Although transmission of the virus is primarily from mosquito bites, other direct modes of transmission are possible (e.g. handling the birds with an open sore).

3.0 Specimens Unable to Submit/Collect – Public Information

The public should be advised that we are only doing collections for events which look like a possible link to Avian Influenza or West Nile virus which is the reason for the numbers and species criteria listed above. Public who are concerned about disposal of dead birds or other wildlife, which we do not collect, can be advised that it is safe to dispose of unwanted animals on their property by burial (being aware of any water supply such as wells). They should be advised to avoid bare handed contact by wearing gloves and using an implement such as a shovel, or use the double bagging technique, and to wash their hands thoroughly afterwards.

People who have health concerns should be directed to call Public Health Services in their area. The numbers for the Regional Offices may be found at the following address
<http://www.gov.ns.ca/hpp/publichealth/content/addresses.htm>

4.0 Handling Criteria

- Avoid exposure of skin or clothing to the bird's blood or body fluids.
- Disposable rubber/latex gloves and/or double plastic bags should be worn when handling dead birds.

- Remove gloves by turning them inside out and disposing of them in a sealed plastic bag.
- Wash hands after handling dead birds.
- For more information, see WWP #2.10.6, “Carcass and Specimen Processing and Handling”.

5.0 Shipping Criteria

- Place birds in a primary, leak proof container (a sealed plastic bag – ziplocs work well).
- Place in secondary, leak proof container (a sealed plastic bag), which also contains enough absorbent material (e.g., paper towel) to absorb fluid leakage from the primary container.
- Bagged carcasses should be identified clearly with the Wildlife Investigation Report (WIR) # by using a waterproof writing instrument, on a waterproof label or tag affixed to the carcass, or on paper sealed inside a leak proof plastic bag and enclosed inside the bag containing the carcass.
- Place in a hard-sided insulated plastic picnic cooler (see below).
- Add coolant (freezer gel pack) to cooler and fill empty space with newspaper or other absorbent material.
- Tape cooler shut.
- Place Wildlife Investigation Report(s) in separate envelope outside the cooler.
- If more than one specimen is packaged in the cooler they must be bagged separately, ensuring that each specimen is clearly labeled with the WIR number.
- Label for shipping, clearly marking as “**Exempt Animal Specimen**”

Note: Carcasses should be chilled, and forwarded in a timely fashion. Freezing is not recommended unless operational constraints prevent timely shipment. If the bird(s) is frozen, a freezer pack is not necessary but wrapping the bagged specimen(s) in newspaper will help to prevent thawing.

5.1 Wildlife Investigation Report (WIR) Information

- Be certain to include all information on the WIR, including the name, civic address and telephone number of the person reporting, as well as the name of the DNR staff submitting and the new map book grid reference.
- If you are able to include a GPS reference, please ensure the information collected uses the datum WGS 84 decimal degrees (that is latitude e.g. 43.23571 and longitude e.g. 76.43870) to five decimal places.
- Birds are tested and reported on a location basis; therefore, if proper location information is not included, this creates difficulty for reporting results accurately.

6.0 Shipping Criteria

Ship carcasses by MIDLAND COURIER, **collect** to:
 Veterinary Diagnostic Laboratory
 c/o Dr. Pierre-Yves Daoust or Darlene Jones
 Atlantic Veterinary College
 University of Prince Edward Island
 550 University Avenue
 Charlottetown, PE C1A 4P3

Note on the waybill that the contents are “**Exempt Animal Specimens**”

Ship on Mondays to Thursdays inclusive, overnight delivery. Do not ship specimens on Friday. Freeze specimens that cannot be shipped to arrive overnight Monday-Friday, and ship on the next appropriate day, bearing in mind any long weekends. Phone, fax or e-mail the label (see below) with the waybill # of each shipment, the day that it is shipped. This will help to track any shipments that go astray.

Darlene Jones
Phone: 902-628-4314
Fax: 902-566-0851
e-mail: djones@upe.ca

Dr. Pierre-Yves Daoust
Phone: 902-566-0667
Fax: 902-566-0851
e-mail: daoust@upe.ca

Picnic coolers and Freezer Gel Packs:

Pick up appropriate sized coolers and gel packs locally and contact Bev Cavanagh-Pick (902-679-6093) at the Wildlife Division Office to arrange for billing/reimbursement. Note that the Atlantic Veterinary Lab will immediately courier the cooler and gel packs back to the office of origin after specimens are shipped.

Diagnostic Feedback:

Data on positive birds will be emailed to the local Area Office. The person who reported the bird will be contacted directly by the local Medical Officer of Health or public health nurse.

If information is required on the status of a particular bird(s), that information can be obtained by contacting Darlene Jones at the Atlantic Veterinary College (see above)

**CHAPTER 4:
Mosquito Surveillance for West Nile virus**

- 1.0 Objectives**
- 2.0 Progress and Achievement**
- 3.0 Methods**
- 4.0 Project Time**
- 5.0 Training**
- 6.0 Personnel**
- 7.0 Proposed Cooperators**
- 8.0 Products and Results**

CHAPTER 4: Mosquito Surveillance for West Nile virus

1.0 Objectives

1. Monitor for the presence, abundance and seasonal occurrence of the mosquito species found in Nova Scotia, in particular, vector species of WNV.
2. Test all *Culex* specimens collected to provide an earlier surveillance technique to help determine the presence of WNV in the mosquito population.
3. Following the detection of WNV activity in dead birds in the province, determine the presence and abundance of WNV in mosquito populations through viral testing.
4. Provide a written report to the Nova Scotia Department of Health Promotion and Protection on findings.

2.0 Progress and Achievement

1. An on-going literature review, searching for information on the relationship between WNV and mosquitoes.
2. Sample and rearing protocol has been completed and good knowledge of known mosquito fauna within Nova Scotia established.
3. Protocol established with National Microbiology Lab (NML) in Winnipeg to process mosquitoes for WNV testing.
4. Adult mosquito key modified for Nova Scotia mosquito species.

3.0 Methods

1. Chart data of Valley results / *Culex* spp. Occurrence.
2. "Hotspot Surveillance" involves mosquito collection in the areas of new-virus –positive bird sites.

Hotspots are areas where "clusters" of viral positive dead birds are found. If there is a positive West Nile viral infection within Nova Scotia, elevated surveillance for mosquito vector species will be initiated. Survey for vector species of the West Nile virus with positive viral infection detected.

All vector species will be pooled, placed in cold storage and sent to the NML in Winnipeg for testing. Mosquito identification and testing will be completed at the lab facilities of the Insectary and screened positive samples will then be forwarded to the NML in Winnipeg.

4.0 Project Time

Project summaries.

5.0 Training

Additional systematics training.

6.0 Personnel

Field entomologist and a summer employee to make collections in field, rearing, specimen processing, identification and storage of samples.

7.0 Proposed Cooperators

1. NS Health Promotion and Protection
2. NS Department of Natural Resources – Regional Services
3. National Microbiology Laboratory, Health Canada, Winnipeg, MB
4. Nova Scotia Museum of Natural History, Halifax, NS

8.0 Products and Results

1. Produce a mosquito species list for Nova Scotia.
2. Determine the distribution, seasonality and abundance of WNV vector mosquito populations in Nova Scotia.
3. Determine the occurrence of vector mosquito species in Nova Scotia and detect viral infection within native populations in the event of WNV activity.
4. Produce a general distribution map of mosquito species within Nova Scotia.

CHAPTER 5: Public Health Measures

1.0 West Nile virus Information

- 1.1 Case Definition
- 1.2 Causative Agent
- 1.3 Symptoms
- 1.4 Incubation
- 1.5 Source
- 1.6 Transmission
- 1.7 Communicability
- 1.8 Treatment
- 1.9 Core Messages for Prevention

2.0 Public Health Case Management and Control Measures

- 2.1 Cases
 - 2.1.1 Procedure for follow up of Probable and Confirmed West Nile virus non-Neurological Syndrome (WN Non-NS) and Suspect, Probable and Confirmed West Nile virus Neurological Syndrome (WNNS)
 - 2.1.2 Procedure for follow up of Blood Donors with Positive WNV by NAT
 - 2.1.3 Procedure for follow up of Tissue/Organ donors with Positive WNV Results
 - 2.1.4 Procedure for Nova Scotia Lookbacks for West Nile virus
 - 2.1.5 Procedure for Nova Scotia Traceback for West Nile virus
- 2.2 Exclusion
- 2.3 Education
- 2.4 Contact Tracing
- 2.5 Laboratory

Figure 1: Laboratory Testing Algorithm for WNV in Nova Scotia and Prince Edward Island

Figure 2: Nova Scotia Lookback Protocol for West Nile virus

Figure 3: Nova Scotia Traceback Protocol for West Nile virus

Annex A: National Case Definitions and Diagnostic Test Criteria

Annex B: Nova Scotia West Nile virus Human Case Report Form (for reporting to the Public Health Agency of Canada)

CHAPTER 5: Public Health Measures

1.0 WNV Information

1.1 Case Definition

- See case definitions of West Nile virus Non-Neurological Syndrome (WN Non-NS), West Nile virus Neurological Syndrome (WNNS) and West Nile virus Asymptomatic Infection in Annex A.
- See Figure 1, Laboratory Testing Algorithm for WNV in Nova Scotia and Prince Edward Island

1.2 Causative Agent

West Nile virus is an arbovirus of the family Flaviviridae, genus *Flavivirus*.

1.3 Symptoms

Most people with West Nile virus infection are asymptomatic, or have a mild illness such as fever, headache, myalgia, nausea, vomiting, and sometimes rash and lymphadenopathy. Others may have serious neurological illness with fever, headache, confusion, stiff neck, muscle weakness etc., leading to a diagnosis of encephalitis, meningitis, meningoencephalitis, and acute flaccid paralysis. There are a number of emerging neurological syndromes related to WNV.

1.4 Incubation

Usually 2 to 14 days after being bitten by an infected mosquito.

1.5 Source

Infected birds.

1.6 Transmission

Transmitted via the bite of an infected mosquito, receipt of infected blood, organs or tissues, from infected mother to baby before birth or through breast milk. There have also been reports of percutaneous transmission to laboratory workers handling infected birds.

1.7 Communicability

Not transmitted from person to person. Infected mosquitoes probably remain infected for life.

1.8 Treatment

Supportive treatment.

1.9 Core Messages for Prevention

- Reduce risk for mosquito bites through the use of protective clothing and insect repellants.
- Reduce mosquito habitats around your home.

2.0 Public Health Case Management and Control Measures

2.1. Cases

Follow up all probable and confirmed cases of WNV Non-neurological Syndrome (WN Non-NS) and all suspect, probable and confirmed cases of WNV Neurological Syndrome. Additionally, follow up of all blood donors reported by CBS to be positive for WNV by nucleic acid amplification (NAT) test, and organ or tissue donors who test positive for WNV.

When notified of a possible case (lab result or clinical picture), the DHA (District Health Authority) contacts the attending physician to determine clinical information regarding the case. If NSHPP is notified of a case, distributes information to appropriate DHA for follow up.

The DHA determines if case meets one of the case definitions and if so, follows 2.1.1.

2.1.1 Procedure for follow up of Probable and Confirmed West Nile virus non-Neurological Syndrome (WN Non-NS) and Suspect, Probable and Confirmed, West Nile virus Neurological Syndrome (WNNS)

- a) The District Health Authority (DHA) notifies NSHPP of the case once it determines the case meets the definitions. NSHPP notifies Canadian Blood Services (CBS) who will review donor files for case.
- b) Once case is notified by physician, the DHA interviews the case or proxy to determine if any receipt or donation of blood, blood products, cells, tissues or organs and history of travel, areas of work/activities, residence location, mosquito bites, pregnancy, breast-feeding and other pertinent information (as per the WNV report form).
- c) DHA provides education to case and significant others regarding WNV and prevention.
- d) DHA determines if a Lookback or Traceback is necessary and if so, notifies NSHPP (section 2.1.4 and 2.1.5).
- e) DHA documents case demographics and case information on appropriate forms and electronically and forwards to NSHPP.
- f) NSHPP completes surveillance responsibilities as per Chapter 6, section 2.2

2.1.2 Procedure for Follow up of Blood Donors with Positive WNV by NAT

- a) Canadian Blood Services (CBS) screens all blood donations for West Nile virus RNA using the nucleic acid amplification test (NAT).
- b) CBS reports all donors positive for WNV by NAT to NSHPP within 24 hour of positive test result (phone and written documentation).
- c) CBS notifies donor by phone and letter. If unable to contact donor by telephone, CBS seeks assistance from District Health Authority.
- d) CBS initiates a Lookback (going back 56 days). See Section 2.1.4
- e) NSHPP receives report from Canadian Blood Services and provides information to appropriate District Health Authority (DHA).
- f) DHA contacts the donor, one business day after CBS has notified donor. Provides education and recommends follow up testing in consultation with a physician.
- g) DHA contacts donor's physician requesting information regarding symptoms and advises physician to order West Nile virus serology.
- h) If follow up serology is positive, DHA investigates case as per section 2.1.1.
- i) DHA reports final serology to NSHPP who notifies CBS of results and if positive, completes surveillance responsibilities as per Chapter 6, section 2.2.

2.1.3 Procedure for Follow up of Tissue/Organ Donors with Positive WNV Results

- a) The Regional Tissue Bank screens all donors for West Nile virus.
- b) The Regional Tissue Bank reports all positive WNV result to NSHPP.
- c) NSHPP receives report from the Tissue Bank and provides information to appropriate District Health Authority (DHA).
- d) DHA contacts the donor and provides education and recommendations to see a physician for follow up testing. If donor is deceased consult with MOH. Note that there are confidentiality issues with respect to next of kin notification of communicable disease.
- e) DHA notifies the donor's physician requesting information regarding symptoms and possible exposure risks.
- f) If the final serology is positive, the case is investigated as per Section 2.1.1.
- g) The DHA notifies NSHPP of final serology and NSHPP completes surveillance responsibilities.

2.1.4 Procedure for Nova Scotia Lookbacks for West Nile virus

Please refer to Figure 2.

A **Lookback** is the process of identifying and contacting recipients of blood components of a donor who, on a subsequent donation or testing, is confirmed positive with the presence of an infectious agent.

If the MOH identifies that a client is positive for WNV and has donated blood products (from 56 days prior to the onset of symptoms to the present), then the Medical Officer of Health will review timeframes to determine if a Lookback is required and initiate one accordingly. Canadian Blood Services (CBS)-Halifax will initiate a Lookback based on positive results from their testing or notification from other provincial Public Health departments or physicians.

- a) The MOH phones (and follows up in writing) the Chief Medical Officer of Health (or delegate) requesting that a Lookback be initiated providing the following information:
 - Full name including all possible surnames
 - Date of birth
 - Place and date of donation in as much detail as possible (city, province, location, etc.)
 - Copy of lab report
 - Address at time of donation
- b) Chief Medical Office of Health (or delegate) provides information to Canadian Blood Services – Halifax (CBS).
- c) CBS initiates Lookback and notifies Hospital Blood Bank Director, Blood Bank section head and Chief Executive Officer of any of the components that were issued to hospitals.
- d) The hospital Blood Bank reports disposition of components and information on recipients to CBS –Halifax and NSHPP.
- e) CBS provides follow up for out of province recipients.
- f) NSHPP receives Lookback with donor and recipient list from CBS and reviews WNV data to determine status of recipients. If there is indication that the recipient died in the hospital where transfusion occurred, within 4 weeks of transfusion, the Lookback procedure is ended for this recipient.
- g) NSHPP forwards the information regarding recipient's with unknown WNV status to the appropriate DHA for notification and follow up.
- h) DHA receives information from NSHPP regarding recipients who require notification of possible exposure.

- i) DHA contacts recipient's physician by phone and follow-up letter to ascertain if WNV status is known and to request that the physician provide counseling and testing if it has not already been done. Seeks physician's cooperation in completing follow up within 15 days.
- j) DHA prepares package for recipient's physician including:
- Letter to doctor: Add client's file number from tracking form, name, address and other pertinent information.
 - Lookback investigation form including contact information.
 - Self addressed envelope for return of results.
 - Educational material as needed.
- k) DHA contacts recipient's physician 10 days after letter has been sent, to review testing results. If results are not known within 15 days, contacts physician periodically until follow-up is completed. If physician refuses, or unable to contact recipient, notifies individual of possible exposure, need for testing and education regarding WNV.
- l) DHA documents all pertinent facts on the tracking form.
- m) If recipient is deceased, and there is no evidence to indicate testing, no further follow-up is necessary, except to notify NSHPP.
- n) Upon completion of follow up, DHA dates and copies the Lookback form. Sends completed Lookback form and report containing the details of the investigation to NSHPP.
- o) NSHPP provides interim report of progress of the Lookback to CBS Halifax, as necessary.
- p) NSHPP completes tracking form as information is available.
- q) NSHPP provides CBS Halifax with investigation summary including recipient Tracking Record.
- r) CBS receives final investigation summary and determines if further Lookback investigation will be continued on prior donations based on their standard operating procedures.

2.1.5 Procedure for Nova Scotia Traceback for West Nile virus

Please refer to Figure 3

Traceback is the process of investigating a report of a transfusion-associated infection. The purpose of the investigation is to identify the associated/implicated donors and to retrieve untransfused blood components related to this donor.

If the MOH identifies a client with WNV who received blood products in the 28 days before onset of symptoms, then the MOH reviews the case and initiates a Traceback if required.

- a) DHA receives notification of positive WNV and investigation is initiated. MOH determines that a Traceback is required, because receipt of blood product was the probable route of infection.
- b) DHA investigates with client and their physician and determines accurate information regarding transfusions.
- c) DHA notifies NSHPP of Traceback information and NSHPP informs CBS.
- d) CBS initiates a Traceback after notification by NSHPP, physician or other.
- e) CBS retrieves transfusion history and identifies the associated donors and their status.
- f) CBS Medical Director determines if a Lookback is to be initiated and whether letters will be sent to donors with unknown WNV status encouraging them to be tested.
- g) CBS ensures that any blood products still available from donors under investigation are retrieved and destroyed.
- h) CBS provides NSHPP and transfusion hospital with a summary of their investigation.

2.2 Exclusion

No exclusion.

Blood and blood product donation should be deferred for 56 days:

- From date of onset of WNV symptoms for cases with no lab confirmation.
- From date of positive NAT (CBS testing for WNV)
- From date of positive WNV lab confirmation (other than CBS testing)
- From date of donation for unresolved WNV test results

2.3 Education

See section 1.9, Core Prevention Messages

2.4 Contact Tracing

Identify donors or recipients involved as per Lookback / Traceback procedures (Sections 2.1.4 and 2.1.5)

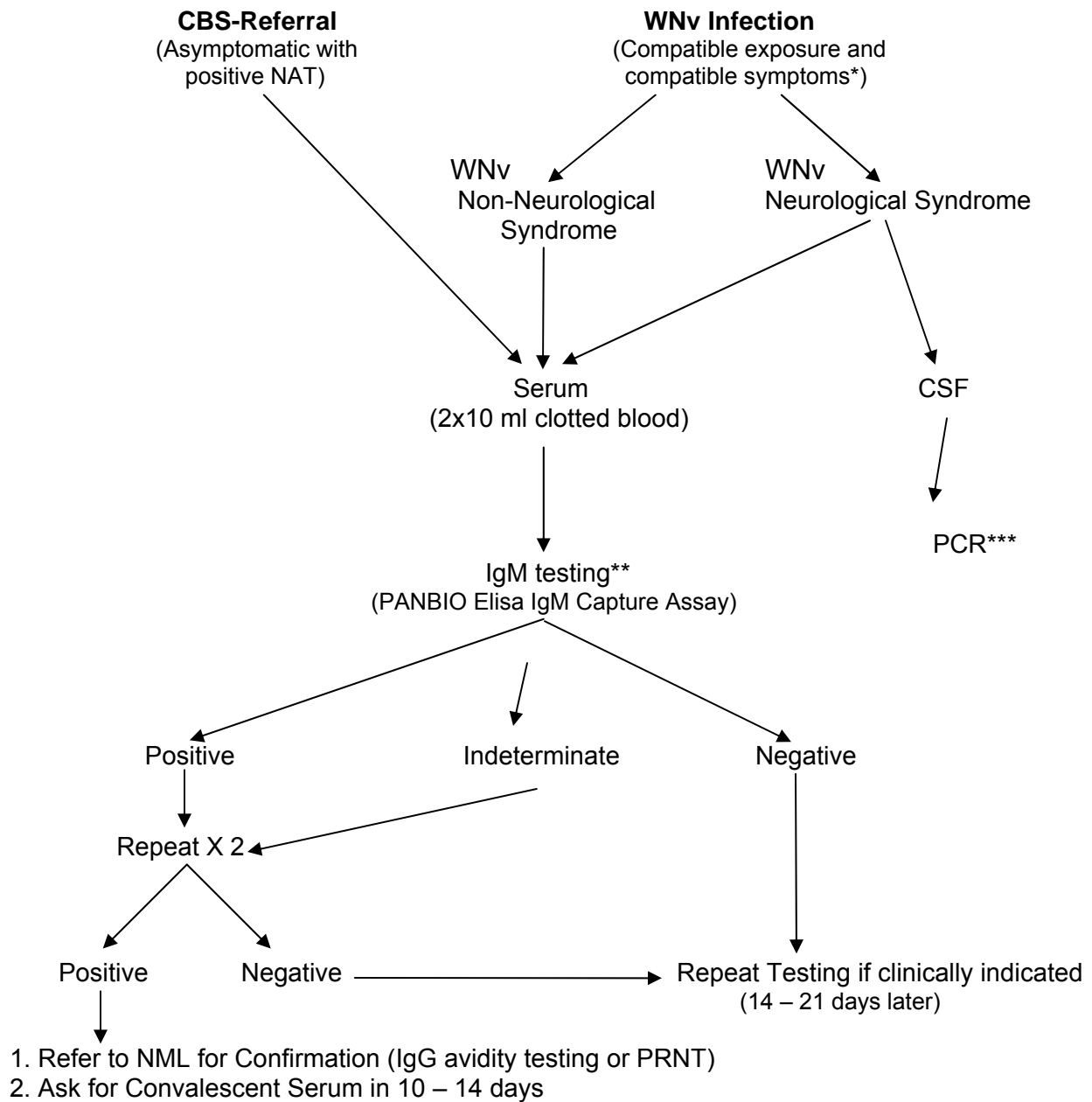
2.5 Laboratory

Provides timely laboratory diagnosis of WNV Non-Neurological Syndrome (WN Non-NS) or WNV Neurological Syndrome (WNNS) as per Figure 1, Laboratory Testing Algorithm for WNV.

Reports all WNV positive tests to MOH by telephone, fax, and electronic database (ELR).

Responds to questions from district laboratories and physicians on laboratory testing issues.

Figure 1: Laboratory Testing Algorithm for WNV in Nova Scotia and Prince Edward Island



* Patient residing in or travel to area with WNV activity in birds, mosquitoes, mammals and humans.

** Note: Current literature suggests 9% false positive results with this test. The IgM can remain positive for greater than 1 year in some people so results may not necessarily reflect recent infection.

*** Performed in house under consultation with the on call Microbiologist.

Figure 2. Nova Scotia Lookback Protocol for West Nile virus

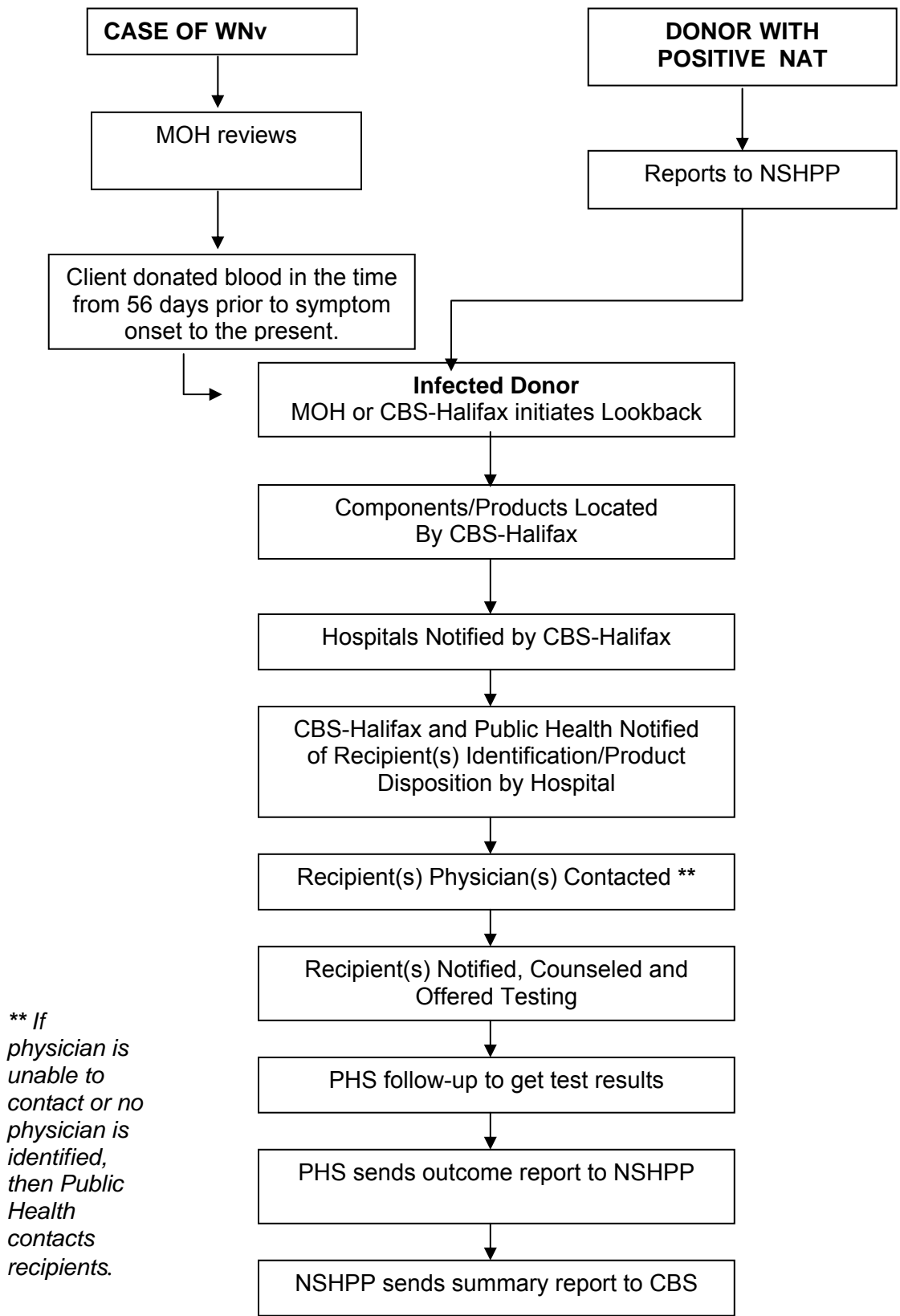
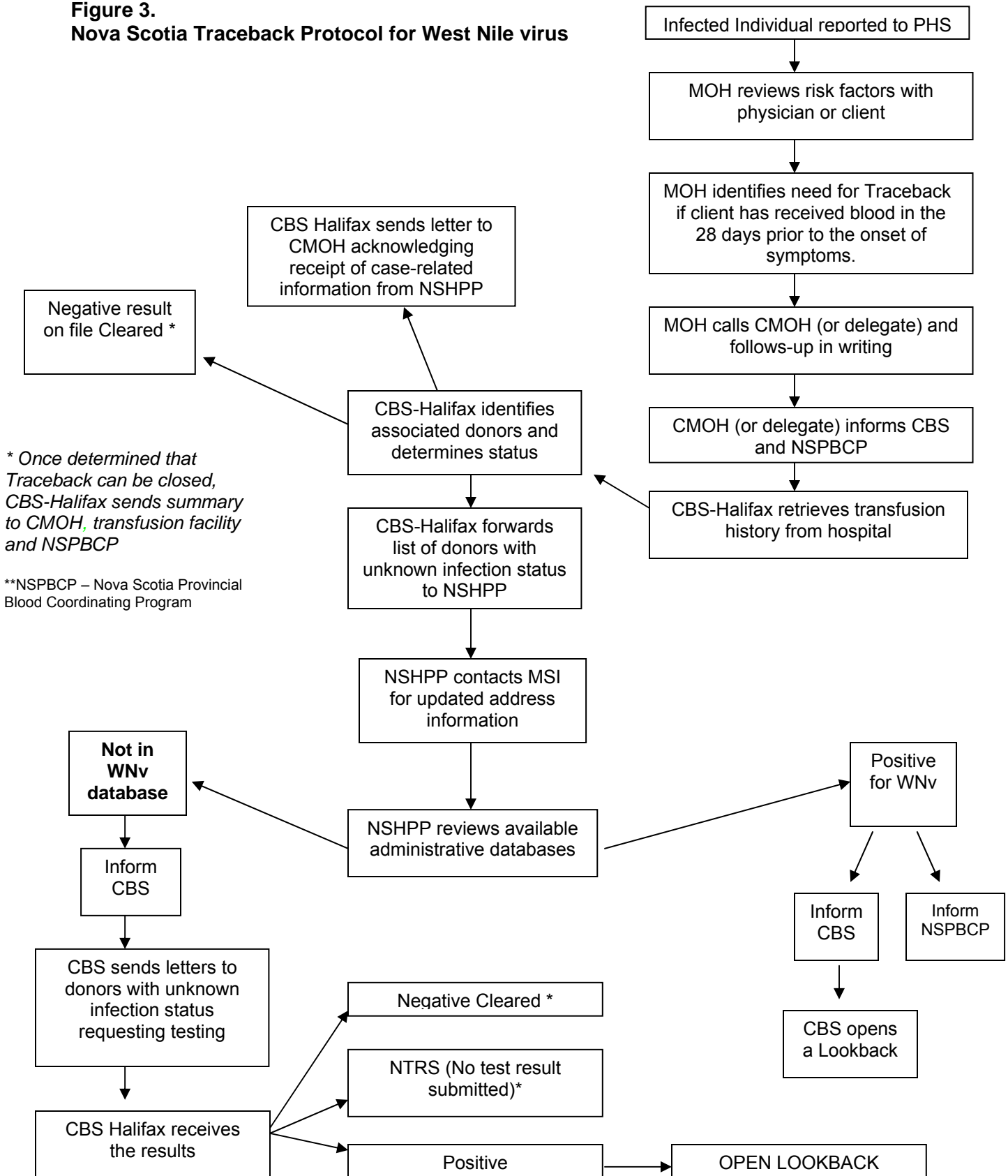


Figure 3.
Nova Scotia Traceback Protocol for West Nile virus



1.0 National Reporting

Probable and confirmed cases of disease should be notified.

2.0 Type of Surveillance

Routine case-by-case notification to the federal level

3.0 Case Classification

West Nile virus Neurological Syndrome (WNNS)¹

3.1 Confirmed case

Clinical criteria **AND** at least one of the confirmed case diagnostic test criteria

3.2 Probable case

Clinical criteria **AND** at least one of the probable case diagnostic test criteria

3.3 Suspect case

Clinical criteria **IN THE ABSENCE OF OR PENDING** diagnostic test criteria **AND IN THE ABSENCE** of any other obvious cause

Clinical Criteria:

History of exposure in an area where West Nile virus (WNV) activity is occurring²

OR

history of exposure to an alternative mode of transmission³

AND

onset of fever

AND

1 A significant feature of West Nile viral neurologic illness may be marked muscle weakness that is more frequently unilateral, but can be bilateral. WNV should be considered in the differential diagnosis of all suspected cases of acute flaccid paralysis with or without sensory deficit. WNV- associated weakness typically affects one or more limbs (sometimes affecting one limb only). Muscle weakness may be the sole presenting feature of WNV illness (in the absence of other neurologic features) or may develop in the setting of fever, altered reflexes, meningitis or encephalitis. Weakness typically develops early in the course of clinical infection. Patients should be carefully monitored for evolving weakness and in particular for acute neuromuscular respiratory failure, which is a severe manifestation associated with high morbidity and mortality. **For the purpose of WNV Neurologic Syndrome Classification, muscle weakness is characterized by severe (Polio-like), non-transient and prolonged symptoms.** Electromyography (EMG) and lumbar puncture should be performed to differentiate WNV- associated paralysis from acute demyelinating polyneuropathy (e.g., Guillain-Barré syndrome). Lymphocytic pleocytosis (an increase in WBC with a predominance of lymphocytes in the cerebrospinal fluid [CSF]) is commonly seen in acute flaccid paralysis due to WNV whereas pleocytosis is not a feature of Guillain-Barré Syndrome. Other emerging clinical syndromes, identified during 2002 included, but were not limited to the following: myelopathy, rhabdomyolysis (acute destruction of skeletal muscle cells), peripheral neuropathy; polyradiculoneuropathy; optic neuritis; and acute demyelinating encephalomyelitis (ADEM). Ophthalmologic conditions including chorioretinitis and vitritis were also reported. Facial weakness was also reported. Myocarditis, pancreatitis and fulminant hepatitis have not been identified in North America, but were reported in outbreaks of WNV in South Africa. **“Aseptic” meningitis without encephalitis or acute flaccid paralysis** occurring in August and September when WNV is circulating may be due to non-polio enteroviruses circulating at the same time. This should be considered in the differential diagnosis. [Sejvar et al., 2003a,b; Burton et al., 2004]

2 History of exposure when and where West Nile virus transmission is present, or could be present, or history of travel to an area with confirmed WNV activity in birds, horses, other mammals, sentinel chickens, mosquitoes, or humans.

3 Alternative modes of transmission, identified to date, include: laboratory-acquired; in utero; receipt of blood components; organ/tissue transplant; and, possibly via breast milk.

RECENT ONSET OF AT LEAST ONE of the following:

- encephalitis (acute signs of central or peripheral neurologic dysfunction), or
- viral meningitis (pleocytosis and signs of infection e.g., headache, nuchal rigidity), or
- acute flaccid paralysis (e.g., poliomyelitis-like syndrome or Guillain-Barré-like syndrome)⁴, or
- movement disorders (e.g., tremor, myoclonus), or
- Parkinsonism or Parkinsonian-like conditions (e.g., cogwheel rigidity, bradykinesia, postural instability), or
- Other neurological syndromes¹

West Nile virus Non-Neurological Syndrome (WN Non-NS)

3.1 Confirmed case

Clinical criteria **AND** at least one of the confirmed case diagnostic test criteria

3.2 Probable case

Clinical criteria **AND** at least one of the probable case diagnostic test criteria

3.3 Suspect case

Clinical criteria **IN THE ABSENCE OF OR PENDING** diagnostic test criteria **AND IN THE ABSENCE** of any other obvious cause

Clinical Criteria:

History of exposure in an area where WN virus (WNV) activity is occurring²

OR

history of exposure to an alternative mode of transmission³

AND

AT LEAST TWO of the following⁵:

- fever,
- myalgia⁶,
- anthralgia,
- headache,
- fatigue,
- lymphadenopathy,
- maculopapular rash

West Nile virus Asymptomatic Infection (WNAI)⁷

4 A person with WNV-associated acute flaccid paralysis may present with or without fever or mental status changes. Altered mental status could range from confusion to coma with or without additional signs of brain dysfunction (e.g. paralysis, cranial nerve palsies, sensory deficits, abnormal reflexes, generalized convulsions and abnormal movements). Acute flaccid paralysis with respiratory failure is also a problem.

5 It is possible that other clinical signs and symptoms could be identified that have not been listed and may accompany probable case or confirmed case diagnostic test criteria. For example, gastrointestinal (GI) symptoms were seen in many WNV patients in Canada and the USA in 2003 and 2004.

6 Muscle weakness may be a presenting feature of WNV illness. **For the purpose of WNV Non-Neurological Syndrome classification, muscle weakness or myalgia (muscle aches and pains) is characterized by a mild, transient, unlikely prolonged symptoms that are not associated with motor neuropathy.**

3.1 Confirmed case

Confirmed case diagnostic test criteria IN THE ABSENCE of clinical criteria

3.2 Probable case

Probable case diagnostic test criteria IN THE ABSENCE of clinical criteria

Confirmed Case Diagnostic Test Criteria:

It is currently recommended that health jurisdictions/authorities use the Confirmed Case Diagnostic Test Criteria to confirm index cases (locally acquired) in their area each year; for subsequent cases, health jurisdictions/authorities could use the Probable Case Diagnostic Test Criteria to classify cases in their area as “confirmed”, **for the purposes of surveillance**. Throughout the remainder of the transmission season health jurisdictions/authorities may wish to document PRN antibody titres to West Nile virus in a proportion of cases, to be determined by that health jurisdiction/authority, in order to rule-out the possibility of concurrent activity by other flaviviruses. [For further information on diagnostic testing algorithms for West Nile virus, see the section entitled Laboratory Specimen Diagnostic Testing Algorithm in Appendix 4 of the National Guidelines for Response to West Nile virus.]

AT LEAST ONE of the following:

- a significant (e.g. fourfold or greater) change in WN virus neutralizing antibody titres (using a PRN or other kind of neutralization assay) in paired acute and convalescent sera, or CSF¹¹

OR

- isolation of WN virus from, or demonstration of WN virus-specific genomic sequences in tissue, blood, CSF or other body fluids

OR

- demonstration of WN virus antigen in tissue

OR

- demonstration of flavivirus antibodies in a single serum or CSF sample using a WN virus IgM EIA^{8,9,10,11}, confirmed by the detection of WN virus specific antibodies using a PRN (acute or convalescent specimen)

7 This category could include asymptomatic blood donors whose blood is screened using a Nucleic Acid Amplification Test (NAT), by Blood Operators (i.e. Canadian Blood Services or Héma-Québec) and is subsequently brought to the attention of public health officials. The NAT that will be used by Blood Operators in Canada is designed to detect all viruses in the Japanese encephalitis (JE) serocomplex. The JE serocomplex includes WN virus and 9 other viruses, although from this group only WN virus and St Louis encephalitis virus are currently endemic to parts of North America. Blood Operators in Canada perform a supplementary WN virus-specific NAT following any positive donor screen test result.

OR

- a significant (e.g., fourfold or greater) change in flavivirus HI titres in paired acute and convalescent sera or demonstration of a seroconversion using a WN virus IgG EIA⁸ AND the detection of WN specific antibodies using a PRN (acute or convalescent serum sample)

Probable Case Diagnostic Test Criteria^{10, 11}

AT LEAST ONE of the following:

- detection of flavivirus antibodies in a single serum or CSF sample using a WN virus IgM EIA^{8,9,10,11} without confirmatory neutralization serology (e.g. PRN)

OR

- a significant (e.g. fourfold or greater) change in flavivirus HI titres in paired acute and convalescent sera or demonstration of a seroconversion using a WN virus IgG EIA⁸

OR

- a titre of > 1:320 in a single WN virus HI test, or an elevated titre in a WN virus IgG EIA⁸, with a confirmatory PRN result [Note: A confirmatory PRN or other kind of neutralization assay is not required in a health jurisdiction/authority where cases have already been confirmed in the current year]

OR

- demonstration of Japanese encephalitis (JE) serocomplex-specific genomic sequences in blood by NAT screening on donor blood, by Blood Operators in Canada

4.0 Laboratory Comments

8 Both CDC and commercial IgM / IgG EIAs are now available for front line serological testing. Refer to appropriate assay procedures and kit inserts for the interpretation of test results.

9 Early in infection the immune system generates antibodies that bind relatively weakly to viral antigen (low avidity). As the infection proceeds, an increasing percentage of newly generated IgG antibody displays higher binding affinity to virus antigen and thus avidity also rises (Note: avidity is usually measured based upon the ability of IgG to dissociate from antigen preparations after incubation with a solution of urea). As long as high avidity IgG is not yet detected in the serum it can be assumed that the individual was exposed to the viral agent during a recent exposure. With respect to WNV infection it has not been precisely determined when (i.e. post-exposure) high avidity antibodies reach levels in serum that can be accurately detected by serological assays (there may be significant variation depending on the individual). However, it has been shown that greater than 95% of sera collected from individuals exposed to WNV 6-8 months previously will have IgG antibodies that bind strongly to viral antigen and will give high avidity scores using both IFA and EIA testing formats. **Note: Avidity testing will not replace confirmatory neutralization testing, non-WNV flavivirus IgG antibody (e.g. dengue, SLE, etc.) may bind to the antigen preparations used in avidity assays.**

10 Note: WNV IgM antibody may persist for more than a year and the demonstration of IgM antibodies in a patient's serum, particularly in residents of endemic areas, may not be diagnostic of an acute WN viral infection.

Seroconversion (by HI, IgG EIA or PRNT assays) demonstrates a current WNV infection. Therefore, the collection of acute and convalescent sera for serologic analysis is particularly important to rule out diagnostic misinterpretation early in the WNV season (e.g. May, June) and to identify initial cases in a specific jurisdiction. However, it should be noted that seroconversions may not always be documented due to timing of acute sample collection (i.e. titres in acute sera may have already peaked). If static titres are observed in acute and convalescent paired sera, it is still possible the case may represent a recent infection. To help resolve this, the use of IgG avidity testing⁹ may be considered to distinguish between current and past infection. The presence of both IgM antibody and low avidity IgG in a patient's convalescent serum sample are consistent with current cases of viral associated illness. However test results that show the presence of IgM and high avidity IgG are indicative of exposures that have occurred in the previous season.

11 Immunocompromised individuals may not be able to mount an immune response necessary for a serological diagnosis. West Nile virus diagnostic test criteria for these individuals should be discussed with a medical microbiologist.

Sensitivity of NAT testing is approximately 50% when used on plasma / serum samples collected less than 8 days after symptoms are detected. Individuals infected with WN virus display a low level of viremia (on average several thousand genome copies) for approximately one week after symptom onset. The use of NAT testing on acute serum / plasma samples can complement IgM testing when used together to assay "early" acute specimens (Tilley et al. 2006).

5.0 Clinical Evidence

West Nile Neurological Syndrome (WNNS):

- A significant feature of West Nile viral neurologic illness may be marked muscle weakness that is more frequently unilateral, but can be bilateral. WNV should be considered in the differential diagnosis of all suspected cases of acute flaccid paralysis with or without sensory deficit. WNV- associated weakness typically affects one or more limbs (sometimes affecting one limb only). Muscle weakness may be the sole presenting feature of WNV illness (in the absence of other neurologic features) or may develop in the setting of fever, altered reflexes, meningitis or encephalitis. Weakness typically develops early in the course of clinical infection. Patients should be carefully monitored for evolving weakness and in particular for acute neuromuscular respiratory failure, which is a severe manifestation associated with high morbidity and mortality. **For the purpose of WNV Neurologic Syndrome Classification, muscle weakness is characterized by severe (Polio-like), non-transient and prolonged symptoms.** Electromyography (EMG) and lumbar puncture should be performed to differentiate WNV- associated paralysis from acute demyelinating polyneuropathy (e.g., Guillain-Barré syndrome). Lymphocytic pleocytosis (an increase in WBC with a predominance of lymphocytes in the cerebrospinal fluid [CSF]) is commonly seen in acute flaccid paralysis due to WNV whereas pleocytosis is not a feature of Guillain-Barré Syndrome. Other emerging clinical syndromes, identified during 2002 included, but were not limited to the following: myelopathy, rhabdomyolysis (acute destruction of skeletal muscle cells), peripheral neuropathy; polyradiculoneuropathy; optic neuritis; and acute demyelinating encephalomyelitis (ADEM). Ophthalmologic conditions including chorioretinitis and vitritis were also reported. Facial weakness was also reported. Myocarditis, pancreatitis and fulminant hepatitis have not been identified in North America, but were reported in outbreaks of WNV in South Africa. "Aseptic" meningitis without encephalitis or acute flaccid paralysis occurring in August and September when WNV is circulating may be due to non-polio enteroviruses circulating at the same time. This should be considered in the differential diagnosis. [Sejvar et al., 2003a,b; Burton et al., 2004]
- A person with WNV-associated acute flaccid paralysis may present with or without fever or mental status changes. Altered mental status could range from confusion to coma with or without additional signs of brain dysfunction (e.g. paralysis, cranial nerve palsies, sensory deficits, abnormal reflexes, generalized convulsions and abnormal movements). Acute flaccid paralysis with respiratory failure is also a problem.

West Nile virus Non-Neurological Syndrome (WN Non-NS):

- It is possible that other clinical signs and symptoms could be identified that have not been listed and may accompany probable case or confirmed case diagnostic test criteria. For example, gastrointestinal (GI) symptoms were seen in many WNV patients in Canada and the USA in 2003 and 2004.
- Muscle weakness may be a presenting feature of WNV illness. **For the purpose of WNV Non-Neurological Syndrome classification, muscle weakness or myalgia (muscle aches and pains) is characterized by a mild, transient, unlikely prolonged symptoms that are not associated with motor neuropathy.**

West Nile virus Asymptomatic Infection (WNAI):

- This category could include asymptomatic blood donors whose blood is screened using a Nucleic Acid Amplification Test (NAT), by Blood Operators (i.e. Canadian Blood Services or Héma-Québec) and is subsequently brought to the attention of public health officials. The NAT that will be used by Blood Operators in Canada is designed to detect all viruses in the Japanese encephalitis (JE) serocomplex. The JE serocomplex includes WN virus and 9 other viruses, although from this group only WN virus and St Louis encephalitis virus are currently endemic to parts of North America. Blood Operators in Canada perform a supplementary WN virus-specific NAT following any positive donor screen test result.

9.0 References

1. Tilley, P. et al. (2006). Nucleic Acid Test for West Nile Virus RNA in Plasma Enhances Rapid Diagnosis of Acute Infection in Symptomatic Patients. *JID*, 193, 1361-1364
2. Sejvar J et al. (2003a). Neurologic manifestations and outcome of West Nile virus infection. *JAMA*, 290, 511-515.
3. Sejvar, J. et al. (2003b). West Nile virus-associated flaccid paralysis. *Emerg Infect Dis*, 9, 788-93.
4. Burton, JM et al. (2004). Neurological manifestations of West Nile virus infection. *Can. J. Neurol. Sci.*, 31, 185-193.

Date of Last Revision/Review: September 2008

**Annex B
Human Case Report Form**

Submitting Lab Specimen # _____
Provincial Lab Specimen # _____
Provincial/Territorial Public Health Case # _____
National Microbiology Lab Specimen # _____
National Study Case # _____

Core and Minimum Data Elements to Public Health Agency of Canada

Human Case Investigation Report for West Nile virus

The designation of responsibility for completing this reporting form is at the discretion of the Provincial/Territorial health authority.

I. CORE DATA ELEMENTS

1. PROVIDID: _____ (Unique ID assigned by province)

2A. EPISODE DATE: ____/____/____ (YYYY/MM/DD)

- 2B. EPISODE DATE TYPE:**
- Date of onset of symptoms
 - Date of diagnosis
 - Date of lab test
 - Form completion date
 - Date of receipt by province/territory
 - Date of receipt by LCDC
 - Other

3. REPORTING PROVINCE: _____

- 4. SEX:**
- Male
 - Female
 - Transgendered
 - Unknown

5. AGE at EPISODE DATE: ____ . ____ (decimals are carried for children less than two years of age)

6. POSTAL CODE: ____ (first 3 characters, of the case's residential postal code at the time of EPISODE DATE)

- 7. DISEASE:**
- West Nile Virus Asymptomatic Infection (WNAI)
 - West Nile Virus Non-Neurological Syndrome (WN Non-NS)
 - West Nile Virus Neurological Syndrome (WNNS)
 - Unknown

UNIQUE CASE IDENTIFIER _____
YEAR _____

II. MINIMUM DATA ELEMENTS

SECTION A. PATIENT INFORMATION:

8. Health Unit/Health Region/Health Authority: _____

9. CASE CLASSIFICATION: (Please consult the most recent version of the National Case Definitions for explanation of these categories)

- Probable
- Confirmed
- Not WN virus case

10. If the individual is classified as WN Non-NS, did they have fever? Yes No Unknown

11. Case is related to travel outside Province/Territory Yes No Unknown

12. If the individual was a recipient or donor of blood, plasma, cells, tissue and/or organs, has Canadian Blood Services or Héma-Québec, or relevant donor organization been notified? Yes No Unknown

13. Was the individual hospitalized? Yes No Unknown

14. Symptom onset date ___/___/___ (YYYY/MM/DD) **Please try to complete.**

15. Outcome of illness: Full Recovery Not Fully Recovered
 Died Unknown
 Asymptomatic

If died, date of death ___/___/___ (YYYY/MM/DD)

Core and Minimum Data Elements to Health Canada

Mode(s) of Transmission/Potential Exposures (Please tick all that apply)	Yes	No	Unknown
16.1. Mosquito transmission	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Non-Mosquito transmission, including:			
16.2. Receipt of blood component	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.3. Receipt of Cells/Tissue/Organ transplant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.4. Patient is breast-fed infant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.5. Patient is infant infected <i>in utero</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.6. Laboratory or testing facility	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.7. Occupationally acquired infection, please specify: _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.8. Other route of transmission, please specify: _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

DRAFT TEMPLATE

Last Update: February 20, 2004

Hospital Medical Record # _____

Submitting Lab Specimen # _____

Provincial Lab Specimen # _____

Provincial/Territorial Public Health Case # _____

National Microbiology Lab Specimen # _____

National Study Case # _____

17. Please indicate the “Most Likely Mode of Transmission”. This determination should be based on ALL relevant information collected on the case-patient. Please choose only one.

- Mosquito transmission
- Receipt of blood component
- Receipt of Cells/Tissue/Organ transplant
- Patient is breast-fed infant
- Patient is infant infected *in utero*
- Laboratory or testing facility
- Occupationally acquired infection
- Other route of transmission
- Insufficient information available

Person who entered the form: _____

Date form was entered: ___/___/___ (YYYY/MM/DD)

Form Modification History, if applicable:

Form Revised June 26, 2006

CHAPTER 6:
West Nile virus Watch – Surveillance and Reporting of WNv

1.0 Introduction

2.0 Human Illness Surveillance

- 2.1 Case Definitions
- 2.2 Procedure for Reporting Human Cases
- 2.3 Forms
- 2.4 Databases

3.0 Dead Bird Surveillance

- 3.1 Procedure for Reporting Bird Testing Results
- 3.2 Procedure in Nova Scotia Health Promotion and Protection
- 3.3 Procedure in the District Health Authority

4.0 Mosquito Surveillance

- 4.1 Procedure for Reporting Mosquito Results

5.0 Mammal Surveillance

- 5.1 Procedure for Reporting WNv Positive Results in Mammals

6.0 West Nile virus Watch Reports

- 6.1 Procedure
- 6.2 Sample Format

Flow Chart 1: Dead Bird Surveillance Information Flow

CHAPTER 6: West Nile virus Watch – Surveillance and Reporting of WNV

1.0 Introduction

West Nile virus Watch is the surveillance program in place to detect and report on WNV activity in Nova Scotia. The information provided by this surveillance system will be used to inform decisions around protecting blood and organ/tissue supplies. It will also provide invaluable information for the assessment of risk to human health in the province and will inform decisions around public health measures for WNV illness, including mosquito control.

There are four components to the West Nile virus Watch surveillance system:

- Human illness surveillance
- Bird surveillance
- Mosquito surveillance
- Mammal surveillance

2.0 Human Illness Surveillance

Cases of West Nile virus are reportable to NSHPP.

2.1 Case Definitions

Please refer to Chapter 5: Public Health Measures, Annex A for the current WNV case definitions for human illness.

2.2 Procedure for Reporting Human Cases

Attending Physician:

All probable and confirmed cases of WNV Non-Neurological syndrome or suspect, probable or confirmed cases of WNV Neurological syndrome must be reported by telephone to the Medical Officer of Health (MOH) as soon as suspected in accordance with “It’s the Law – Reporting Notifiable Diseases and Conditions”.

Laboratory:

1. The laboratory will report all positive tests for WNV to the appropriate Medical Officer of Health.

Canadian Blood Services (CBS):

1. CBS will notify the donor and the donor’s physician (with consent) by telephone.
2. CBS will notify the MOH within 24-hours of positive nucleic acid amplification (NAT) test for WNV in a donor.
3. The MOH will institute public health follow-up as per Chapter 5 of this document.

Regional Tissue Bank:

1. The Transplant program will notify the MOH within 24-hours of a donor with a positive test for WNV by whatever testing method is currently in use.
2. The MOH will institute public health follow-up as per Chapter 5 of this document.

Procedure in the District Health Authority (DHA)

1. When notified of a case of WNV, public health staff will complete the WNV human case report form and enter the case into ANDS.
2. The completed WNV human case report form will be faxed to NSHPP (via confidential fax line) within 24-hours of notification.
3. Updates will be forwarded on all cases as required.

Procedure in the Nova Scotia Department of Health Promotion and Protection (NSHPP)

1. Staff at NSHPP will receive reports, update database accordingly and forward to appropriate authorities for national data collection.
2. NSHPP will include human cases in the biweekly report to be posted on the N.S. Department of Health Promotion and Protection website.
3. NSHPP will create other reports as required.
4. NSHPP (chair of the WNV Working Group) will promptly inform the WNV Working Group, if any cases of WNV are acquired in NS.

2.3 Forms

West Nile virus Human Case Report Form – See Chapter 5, Annex B

2.4 Databases

ANDS – Application for Notifiable Diseases Surveillance

3.0 Dead Bird Surveillance

Birds are tested at the Atlantic Veterinary College (AVC) in Charlottetown, PEI for WNV by the Vectest. Confirmatory testing is done using RT-PCR. See Flow Chart 1 for details on the flow of information for dead bird surveillance.

3.1 Procedure for Reporting Bird Testing Results

Negative Birds:

- Once a week, the NSHPP Surveillance officer assigned to WNV will access the Canadian Cooperative Wildlife Health Center (CCWHC) website to get updated information on dead bird testing.

Positive Birds:

- AVC will telephone all reports of positive birds immediately to the NSHPP WNv Surveillance officer and to the CDPC Coordinator if the Surveillance officer is not available.
- Positive reports will also be emailed by the AVC to designated individuals in the other Atlantic provinces. This information will be kept confidential until the responsible jurisdiction has made it publicly known.

3.2 Procedure in the Nova Scotia Department of Health Promotion and Protection

- The WNv Surveillance officer will immediately:
 - Telephone the Director of Wildlife (DNR) and the Deputy Chief Medical Officer of Health (or the Chief Medical Officer of Health), NSHPP CDPC Coordinator, NSHPP Communications advisor, as well as the MOH responsible for the region in which the positive bird was collected.
 - Email the Nova Scotia WNv Working Group.

3.3 Procedure in the District Health Authority

- The MOH or designate will inform the person who found and reported the dead bird that it has tested positive.
- The MOH will also inform authorities in the Municipality and the District Health Authority of the positive bird.
- The public will be notified of all confirmed positive birds.

4.0 Mosquito Surveillance

In the event that mosquito trapping occurs (as noted in Chapter 4, Section 3.0), the mosquitoes will be sorted by species and known vectors of WNv will be sent in pools of 50 or more to the National Microbiology Lab (NML) in Winnipeg for WNv testing (Vectest).

4.1 Procedure for Reporting Mosquito Results

Negative Results:

- All results of mosquito pools will be sent to the Field Entomologist by email and to the WNv Surveillance officer who is responsible for updating the WNv Watch.

Positive Results:

- Upon receiving positive mosquito results the Field Entomologist contacts the WNv Surveillance officer who will email the positive results to the members of the provincial WNv Working Group.
- The information will include the date and location of the collection.
- This information will be provided to the MOH in the affected district who will inform the District Health Authorities and municipality as appropriate for the first such tests in the area.

5.0 Mammal Surveillance

Either CFIA or NSDA (Veterinary Diagnostic Laboratory in Truro) may identify WNV in a mammal such as a horse. This could occur as part of routine investigations of samples submitted from animals or poultry with diseases of unknown origin. Reportable and/or Immediately Notifiable diseases detected by the lab are reported to the CFIA as appropriate.

5.1 Procedure for Reporting WNV Positive Results in Mammals

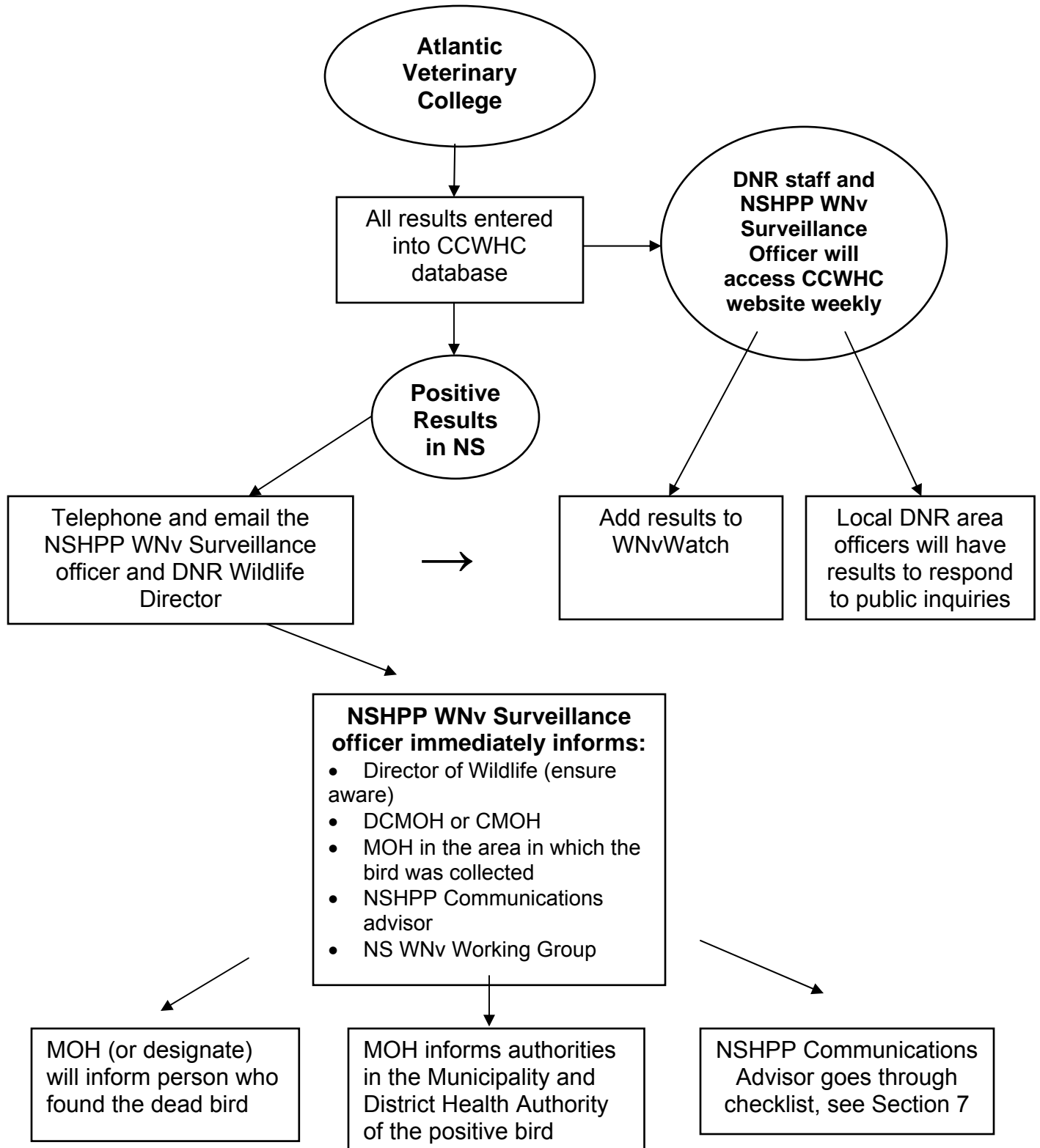
- The Provincial Veterinarian will inform the WNV Surveillance officer/CDPC Coordinator of any positive WNV mammals.
- The WNV Surveillance officer will inform the MOH in the appropriate DHA.

6.0 West Nile Virus Watch

6.1 Procedure

The WNV Surveillance officer will prepare WNV Watch report every two weeks and email it to the members of the provincial working group. It will also be posted on the N.S. Department of Health Promotion and Protection's public website.

Flow Chart 1: Dead Bird Surveillance Information Flow



CHAPTER 7: Communications Plan and Materials

1.0 Introduction

2.0 General Background

2.1 Background (Media and Public Environment)

3.0 Communications

3.1 Communication Challenges

3.2 Communication Objectives

4.0 Target Audiences

5.0 Key Messages

6.0 Action Plan

7.0 Evaluation

CHAPTER 7: Communications Plan and Materials

1.0 Introduction

This communications plan has been prepared with input from the Nova Scotia West Nile Working Group and the F/P/T West Nile virus Communications group. It will be updated as new issues emerge.

2.0 General Background

West Nile virus (WNV) was first detected in North America in and around New York City in the summer of 1999. The United States continued to have some human cases in subsequent years. Although the virus came to Canada in 2000, it did not affect people in Canada until the 2002 season.

The North American outbreak was unprecedented, and nobody could have predicted the high number of cases seen across the continent in 2002. In Canada, the majority of infected Canadians were in Ontario. However, Quebec and Alberta also had confirmed human cases. The case in Alberta was likely travel related, given that no other WNV activity was known in that province. West Nile virus activity in animals was also confirmed in Nova Scotia, Manitoba and Saskatchewan.

In 2003, Canadian Blood services (CBS) and Hema-Quebec began using a WNV test to screen donations. Nova Scotia Health Promotion and Protection worked closely with CBS to ensure that the province is notified if cases are found through blood testing, and that CBS is notified if blood donors test positive in the health care system so that any potentially infected blood can be quickly identified and pulled from the system.

In 2003, the Provincial West Nile Working Group developed a comprehensive set of guidelines to address WNV, which includes surveillance, education, prevention and response. Activities in each area will ramp-up according to the degree of risk in Nova Scotia.

2.1 Background (Media and Public Environment)

Health Canada and several provinces began the 2004 and 2005 seasons with press releases and some with technical briefings. Media coverage for both seasons was considered by most provinces to be fair and well-informed. Nova Scotia issued a news release at the start of each season. Media coverage was minimal, likely due in part to the fact that there was no West Nile virus activity detected in Nova Scotia. In 2003, Nova Scotia had the most West Nile virus activity in Atlantic Canada, with 17 confirmed WNV positive birds and two travel-related human cases. The majority of positive birds were found in the Annapolis Valley area.

3.0 Communications

3.1 Communication Challenges

- Following a season with minimal activity, a challenge for the current season is complacency among the general public.
- Coordination amongst partners is key to ensure consistent messages while respecting jurisdictional boundaries. Research indicates that the public want consistent information, from as few sources as possible.
- It is important to balance informing the public about WNV without raising unwarranted concern. However, research indicates that knowledge about WNV is high, but concern is low and as a result, people are not protecting themselves against mosquito bites. Many of those who are protecting themselves indicate that they are doing so because of the discomfort of bites more so than health concerns.
- Public opinion research in Canada and the United States indicates that the main reasons for the lack of personal prevention include the discomfort and impracticality of wearing long clothing in the summer months, and concern that DEET is not safe, that it smells bad, and that it has an uncomfortable, “sticky” consistency. It is also believed that personal protection messages too early in the season may make people more complacent during the higher risk period.
- With increasing activity each year, we may get questions about why we are not larviciding or spraying for adult mosquitoes. It is not yet clear if significant WNV activity will occur in Nova Scotia. To date there has been insufficient WNV activity to determine where mosquito control would be effective.

3.2 Communication Objectives

- To maintain public confidence in our ability to protect the health of Nova Scotians.
- To provide Nova Scotians with consistent, up-to-date and reliable information about WNV, including how to protect themselves against infection and how to reduce mosquito-breeding areas around their homes or recreational properties (e.g. cottages).
- To ensure that media have access to up-to-date information and reasonable access to spokespersons.
- To ensure that health professionals have the information that they need to recognize potential cases of WNV and report them to the appropriate authorities.

4.0 Target Audiences

Mainstream:

- General public
- West Nile virus Working Groups (Provincial, Atlantic, F/P/T Communications)

- Media
- Human health professionals (physicians, nurses, health care workers, long-term/home care staff, pharmacists)
- Internal (DOH) staff
- Other government departments/staff
- Municipalities
- Canadian Blood Services and stakeholders
- Provincial professional organizations (Doctors Nova Scotia, Pharmacy Association of Nova Scotia, NS Veterinary Medical Association)
- Stakeholders (bird and animal groups, humane societies, animal control agencies, equine associations, hunting associations, etc.)
- Tourists/outdoor recreationalists
- Outdoor workers

Potential Impact on Departments, Agencies, etc.:

- Health Promotion and Protection (including Public Health Services)
- Department of Health
- District Health Authorities
- Department of Natural Resources
- Department of Environment
- Department of Agriculture
- Department of Acadian Affairs
- Municipal Affairs
- Provincial Blood Coordinating Program
- Provincial Organ Donor Program

5.0 Key Messages

- Since 2003, we didn't have West Nile activity in the province; however, it's difficult to say what this season will be like, so Nova Scotians should take the proper precautions to protect themselves against West Nile virus.
- The most common way of contracting West Nile virus infection is through the bite of an infected mosquito.
- The virus usually appears first in birds, like crows and jays, then in mosquitoes. Horses are also particularly susceptible to West Nile Virus infection.
- Larviciding and spraying are not being considered at this time.

Phase One Messages:

- Certain types of mosquitoes are more likely to carry or pass on the virus to people. Mosquitoes lay eggs that hatch in the spring. Where they lay their eggs depends on the type of mosquito. The mosquitoes we're concerned about in this province are more likely to develop in places with small amounts of water that can warm up fairly quickly, and with organic matter like leaves for food. Examples would be old tires, saucers under flowerpots, birdbaths, the eaves on houses, litter such as chip bags, and pool covers.

- In the spring, you can help reduce the number of mosquitoes in your yard by picking up litter, getting rid of or properly storing old tires, emptying things like birdbaths and kiddie pools, cleaning out roof gutters and following the other tips available on our website.
- If you see a dead crow, jay or raven that you think may have died of West Nile virus, call your local office of Department of Natural Resources (DNR) to report the dead bird. DNR will determine whether the bird is suitable to be picked up for testing.

Phase Two Messages:

- Protect yourself from mosquito bites: Wear insect repellents that are approved by the Pest Management Regulatory Agency (PMRA). A thorough review of repellants has indicated that repellants containing DEET are effective and safe.
- Long-sleeved clothing and pants may not be practical on a hot summer day, but if the weather allows it (such as in cooler evening temperatures) light-coloured long sleeve shirts and pants, socks and hats are a great way to ward off mosquito bites.
- Limit the time you spend outdoors at dawn and dusk, when mosquitoes are most active.
- Make sure that door and window screens fit tightly and have no holes.

6.0 Action Plan

Efforts at the federal, provincial and local levels to educate the public, health care professionals and other stakeholders have been building on activities from previous years and will continue. Communications activities will be phased to coincide with surveillance, response and control levels of activity.

Messages will also be introduced in a phased approach, with habitat reduction messages in mid-June, bird collection messages in late-June, and personal protection messages beginning in mid-late July in anticipation of positive birds in mid-late August, or as needed.

Ramp-up to Mosquito Season:

June:

- Begin participation in teleconference with national communications sub-committee to discuss emerging issues. Note that teleconferences will be held every two weeks through the spring and summer.
- Begin regular meetings with the Nova Scotia West Nile Virus Working Group.
- Research and update brochure and other materials for the public, including fact sheets on: general overview of WNV; WNV symptoms & treatment; testing & diagnosis; protecting yourself / reducing the risk; transmission by blood; pregnancy & breastfeeding; animals & WNV; insect repellents.
- Develop a spokespersons list and determine whether additional media training is required.

June (continued):

- Finalize WNV materials for public.
- Modify West Nile virus Response Plan.
- Develop a community paper/newsletter article for each phase with visual.
- Finalize a news release for distribution to media, including those in rural areas.
- Update WNV web content for NSHPP website.

July:

- Distribute article(s) on West Nile virus to community papers on the topic of WNV and what residents in these communities can do to reduce their risk of being infected

April - September:

- Ongoing teleconferences with the Communications Sub-committee.
- Integration of new research findings and other information into key messages as appropriate.
- Media updates (and/or briefings) as required to announce positive birds, mosquitoes and human cases (frequency to be determined, depending on media interest and level of WNV activity in Nova Scotia).

7.0 Evaluation

On-going public environment/media monitoring to identify emerging trends and/or misinformation in the media. Adjust key messages, communications approaches where necessary.

**CHAPTER 8:
Information for Health Care Professionals**

- 1.0 Nova Scotia Health Promotion and Protection Letter to Physicians/ Health Care Providers (Doctors NS website posting).**

June 17, 2009

Dear Doctor / Health Care Provider:

With summer soon arriving, it is timely to provide a heightened awareness about illnesses in Nova Scotia that can be transmitted from animals, ticks and mosquitoes. Although there are limited cases of zoonotic illness in humans in Nova Scotia, it is important to always be aware of potential illnesses such as West Nile virus, Lyme disease, Human Granulocytic Anaplasmosis, and Rabies. Under the Health Protection Act (It's the Law); all of these illnesses are reportable to Public Health.

There have been no human cases of West Nile virus (WNV) acquired in Nova Scotia reported to date and the last detection of the virus in birds was in 2003. Nova Scotia will continue to monitor dead birds for West Nile virus in 2009.

Rabies continues to be limited in Nova Scotia and does not pose a high risk to humans except for exposures to bats since they occasionally can be infected with rabies. Rabies has infrequently been transmitted from bats to other animal species, including wildlife and domestic animals such as cats and dogs, which can then result in human exposure. A "Rabies Assessment Algorithm" for assessing animal bites or concerns about rabies exposure will be available to download at the end of June, on the Nova Scotia Health Promotion and Protection website at:

http://www.gov.ns.ca/hpp/publications/Rabies_Exposure_poster.pdf

Two tick-borne illnesses, Lyme disease (Ld) and Human Granulocytic Anaplasmosis (HGA) can pose a greater risk for people who visit, work or live in areas where Blacklegged ticks (BLT's) have become established. BLT's carrying the bacteria that causes Ld are known to be established in an area along the south shore near Lunenburg, in the Admiral Cove area of Bedford and in the Gunning cove area near Shelburne. Further surveillance of BLT's in the province continues. The surveillance case definition for Lyme disease can be found at:

<http://www.gov.ns.ca/hpp/publications/Lyme-Disease-Case-Definitions.pdf>

Included with this letter are brief highlights which provide basic and new information about WNV, Rabies and Tick borne illnesses in Nova Scotia. Additional information on these illnesses can be found on the Nova Scotia Health Promotion and Protection (NSHPP) website at:

<http://www.gov.ns.ca/hpp/cdpc/zoonotic-diseases.asp>

NSHPP has developed pamphlets to provide information to the public and health care providers about Rabies, Rabies and bats, WNV and Ld. These are available through local Public Health offices and on the NSHPP website.

The risk for acquiring an infection transmitted by animals, ticks or mosquitoes in Nova Scotia is generally low, especially if reasonable precautions are taken. People should take advantage of the summer weather to enjoy the many outdoor activities available in the province.

Yours truly,

Rob Strang, MD, MHSc, FRCP(C)



Chief Public Health Officer

Teri Cole RNB



Communicable Disease Prevention



Health Promotion and Protection

WEST NILE VIRUS

- Reporting of WNV neurological and non-neurological cases to Public Health is required by the Health Protection Act (It's the Law)
- See <http://www.phac-aspc.gc.ca/wnv-vwn/hmncasedef-eng.php#a> for the case definitions used in Nova Scotia
- No human cases of WNV acquired in Nova Scotia have been reported to date - no birds in Nova Scotia have been found to be infected with WNV since 2003
- Surveillance for WNV in crows and other corvids will continue this summer in NS
- WNV infections can be transmitted by mosquitoes and less commonly by blood components, organ/tissue transplants and possibly in utero or by breast milk
- Canadian Blood Services screens all blood donations for WNV infection and notifies Public Health of any positive tests
- Most WNV infections are asymptomatic or cause non-neurological illness
- Illnesses associated with non-neurological WNV syndrome include meningitis, meningoencephalitis, encephalitis and acute flaccid paralysis – less common associated syndromes include acute or subacute peripheral neuropathy, polyradiculopathy, parkinsonism, tremor, myoclonus, optic neuritis and acute demyelinating encephalomyelitis (ADEM)
- Mosquitoes that can carry and transmit WNV are present in many areas of the province
- Using an effective insect repellent when mosquitoes are active, especially between dusk and dawn is recommended
- Serological testing of serum and CSF for WNV is available through local hospital laboratories at QE2 hospital in Halifax