
WEST NILE VIRUS

SUMMARY REPORT, 2004



January, 2005

ACKNOWLEDGEMENTS

The Leeds, Grenville and Lanark District Health Unit authored this report.

Considerable input into other aspects of this report was provided by:

- Dr. Charles Gardner, Medical Officer of Health
- Henry Garcia, Director of Health Protection
- Jane Futcher, Director of Clinical Services
- Kim McCann, WNV Coordinator and Public Health Inspector
- Teresa Clow, Public Health Inspector
- Anne Taylor Barnett, Epidemiologist
- Bonnie Erwin, Public Health Nurse, Clinical Services Department
- Joan Goodfellow, Assistant to the Director of Health Protection
- West Nile Virus Stakeholders Advisory Committee Members

TABLE OF CONTENTS

Introduction.....	4
Public Education and Community Outreach.....	5
West Nile virus Stakeholders Advisory Committee.....	7
Dead Bird Surveillance.....	8
Mosquito Surveillance.....	9
Mosquito Control.....	10
Human Case Surveillance.....	12
Risk Assessment and Conclusion.....	13

LIST OF TABLES

Table 1	Human Cases in Ontario.....	4
Table 2	Media Outlets Carrying WNV Information, 2003 and 2004.....	5
Table 3	Summary of Telephone Calls Received by Health Unit.....	6
Table 4	WNV Stakeholders Committee Perceptions Regarding Committee Responsibilities.....	7
Table 5	Total Number of Corvids Submitted Including Test Results.....	8
Table 6	Total Number of WNV Positive Corvids in Ontario.....	9
Table 7	Adult Mosquitoes Trapped.....	9
Table 8	Leeds, Grenville and Lanark Counties.....	10
Table 9	Municipal Source Reduction Activities, 2003 and 2004	11
Table 10	Common Symptoms of West Nile virus.....	13

Introduction

West Nile virus (WNV) is a mosquito-borne virus that first made its appearance in the Western Hemisphere (New York City) in 1999. Since then it has spread to numerous states and provinces in the United States and Canada.

In 2004, a total number of 14 human cases were identified in Ontario and 29 cases have been identified in Canada. There were no deaths anywhere in Canada in 2004. This year, once again, most of the human cases were located in Ontario and most specifically they occurred in the southern region of the province; however, one human case was found in the City of Ottawa. It is believed that the patient did not acquire the virus locally. Table 1 indicates where human cases were located in Ontario throughout the 2004 season.

Table 1

Human Cases in Ontario

Health Unit	Human Cases	
	2003	2004
Brant	2	0
Chatham Kent	1	1
Elgin- St. Thomas	0	1
Haliburton-Kawartha-Pine Ridge	1	0
Hamilton-Wentworth	4	0
Kingston	1	0
Middlesex-London	1	0
Niagara	5	1
Ottawa	4	1
Peel	10	0
Peterborough	1	0
Renfrew	1	0
Simcoe	1	0
Toronto	44	6
Waterloo	1	0
Windsor-Essex	10	3
York Region	2	1
Ontario Total	89	14

In order to prevent the occurrence of WNV in humans within Leeds, Grenville and Lanark, the Health Unit has continued to implement our WNV Prevention and Control Plan in 2004. The plan, described in this report under separate headings, consists of several prevention and control strategies, including:

- Public education and community outreach
- Mosquito surveillance
- Mosquito control
- Human case surveillance

In order to improve the West Nile Virus Prevention and Control program for the future, a comprehensive evaluation plan was completed in 2003 for each component of the WNV Prevention and Control Plan. This report acts as a supplement to the 2003 WNV evaluation. The purpose of this report is to present the results of the program evaluation for the year 2004 and to complete a risk assessment to determine what level of active pest controls are required to prevent human exposure to West Nile virus in our Health Unit's geographical area.

Public Education and Community Outreach

Public education and community outreach is designed to increase knowledge about WNV and to educate the public on measures to prevent human illness. Public education measures conducted by the Health Unit included providing information on mosquito breeding site reduction and personal protection strategies, through the media and public presentations.

Table 2 indicates where public messaging was advertised locally in 2003 and 2004. In 2004 the Ministry of Health and Long-term Care focused the public messaging in weekly media outlets, radio and television. The Health Unit therefore chose to advertise in media outlets that were not targeted by the Ministry of Health and Long-Term Care.

Table 2

Media Outlets Carrying WNV Information, 2003 and 2004

Newspapers		Magazines		Radio Stations	
2003	2004	2003	2004	2003	2004
Brockville Recorder & Times Boating Pool and Garden	Brockville Recorder & Times Boating Pool and Garden	Parent and Child Guide	Parent and Child Guide	CFJR	CFJR
Cottage Golf	Cottage Golf	Country Senior	Country Senior	Country 92	Country 92
Riverfest	Riverfest			CJET	CJET
Record News/EMC	Record News/EMC				

Newspapers		Magazines		Radio Stations	
2003	2004	2003	2004	2003	2004
Athens Mural	Athens Mural				
Westport Review Mirror	Westport Review Mirror				

The total cost to deliver the public messages in 2004 was \$7,369.99 while in 2003 a total of \$18,288.91 was spent; it is worth noting that our funds were not increased in 2004 as recommended in the 2003 WNV evaluation report due to budgetary constraints. Another factor in contributing to the lower cost of advertising in 2004 as opposed to 2003 is the lack of need for advertising pesticide use notices in local newspapers, as larviciding was not done in 2004.

Messages given to the public regarding West Nile virus appear to have been clearly communicated and widely distributed throughout the Leeds, Grenville and Lanark area. The table below demonstrates the comparison between the number and nature of complaints and general inquires received in 2004 to 2003. The numbers of complaints were less in 2004 than received in 2003. We still received approximately the same number of general inquires about WNV.

Table 3

Summary of Telephone Calls Received by Health Unit

Complaint Stated or Request for Information by Public	Total Number of Telephone Calls Received	
	2003	2004
Standing Water	21	Referred to municipalities 2 (Health Unit)
Request for Larvicide on Private Property	3	1
Environmental Concern re: Larviciding	1	N/A
Illegal dump sites/garbage related complaints	4	0
Chemical Sensitivities	5	N/A
Mosquito Testing	1	1
General Larvicide location request	13	N/A
General Inquires about West Nile virus i.e. signs and symptoms of the virus in humans and animals, type of animals that carry the virus.	*>98	*>91

During the West Nile Virus Stakeholders Advisory Committee meeting held October 28, 2004 the municipalities were verbally surveyed to see if the number of complaints regarding West Nile virus were numerous. All municipalities present (United Counties of Leeds and Grenville, County of Lanark, Gananoque and Smiths Falls) indicated that they received a low number of complaints regarding West Nile virus. The Cataraqui Region Conservation Authority also indicated that they too received very few complaints and concerns regarding West Nile virus control. Ministry of Environment also indicated that they had very few inquires this year regarding larviciding and illegal tire/dump piles that contribute to the breeding of vector mosquitoes (mosquito responsible for spreading WNV).

West Nile Virus Stakeholders Advisory Committee

On October 28, 2004 the members of the West Nile Virus Stakeholders Advisory Committee completed an evaluation survey to determine the value of the Committee. Out of the 35 members that were invited to the October 28, 2004 meeting 12 (34%) were in attendance (All Stakeholder Sectors including governmental, environmental, and funding municipalities were represented). Of the 12 in attendance 100% completed the survey.

Of those members in attendance, 92% had attended the April meeting. When asked whether they felt the committee had fulfilled its responsibilities as outlined in the Terms of Reference, everyone indicated "yes". The proportion of respondents who replied "yes" to each statement is outlined in Table 4. Table 4 also indicates that the vast majority of respondents felt the responsibilities as outlined in the Terms of Reference were appropriate for the Committee. The majority of respondents (100%) felt that they had sufficient input into the development of the West Nile Virus Prevention and Control Plan.

Table 4

**WNV Stakeholders Committee Perceptions
Regarding Committee Responsibilities**

Terms of Reference Statements	Responsibility Met		Responsibility Appropriate	
	2003	2004	2003	2004
	n=17	n=12	n=17	N=12
Provide a forum to discuss and share information on West Nile virus and its controls.	100%	100%	100%	100%
Provide current and critical information to agencies/sectors being represented at the Committee on various discussions pertaining to control strategies.	88%	100%	100%	100%
Provide advice on the best available information and research on any proposed control measures for WNV.	94%	100%	94%	83%
Discuss, review and comment on critical activities in the management of WNV.	76%	100%	94%	100%
Discuss ways and means of stakeholder activity in providing control measures.	-	100%	-	100%
Ensure appropriate and effective public communication.	88%	100%	94%	100%

Dead Bird Surveillance

Dead bird surveillance is an important tool in trying to predict the presence of WNV within a particular area. High activity of WNV within the corvid population can indicate areas where WNV could be a concern within the human population. In the Leeds, Grenville and Lanark area, thirty-six birds of the corvid family (crows and blue jays) were submitted to the Canadian Cooperative Wildlife Health Centre (CCWHC) laboratory for testing. Of the total number of corvids submitted to the Laboratory, one tested positive for the virus in 2004. The single crow that tested positive for WNV was found in the Township of Rideau Lakes about 5 kilometers south west of Westport during the month of July. The presence of the positive dead bird located within our Health Unit area indicates that the virus was present once again in 2004. Table 5 indicates the total number of birds submitted from our Health Unit in the past few years and the number of birds locally that were found positive with WNV.

Table 5

Total Number of Corvids Submitted Including Test Results

Year	Total Number Submitted	Negative	Positive
2002	16	11	5
2003	43	39	4
2004	36	35	1

Table 6 demonstrates the total number of WNV positive birds found in Ontario over the past few years. Once again birds tested are of the Corvid species.

Table 6

Total Number of WNV Positive Corvids in Ontario

Year	Total Number
2001	101
2002	281
2003	285
2004	250

Mosquito Surveillance

The goal of the mosquito surveillance program is to monitor the abundance, species and location of mosquitoes within the Leeds, Grenville and Lanark area. The ultimate goal of the surveillance program is to detect the presence of WNV within the local mosquito population. In the Leeds, Grenville and Lanark District Health Unit area a total of 88,447 mosquitoes were trapped. Of those, 79,842 (90.27%) mosquitoes were non-vector mosquitoes (mosquitoes that are not associated with transmitting the virus to humans or animals), 7851(8.88%) were bridge vectors (mosquitoes that have the ability to transmit the virus but are not natural carriers of the virus) and 754 (.85%) were vector mosquitoes (mosquitoes that are known carriers of the virus). All mosquitoes tested were negative for the virus. Table 7 shows a comparison between the numbers of mosquitoes trapped in 2004 versus 2003. Please keep in mind that in 2003 five traps were set up within our region on a bi-weekly basis. In 2004 our program expanded to 9 regular traps set up throughout our area and our trapping program ran on a weekly basis. The other aspect to keep in mind for increase in mosquitoes caught was the wet climatic conditions we experienced in 2004 as opposed to 2003.

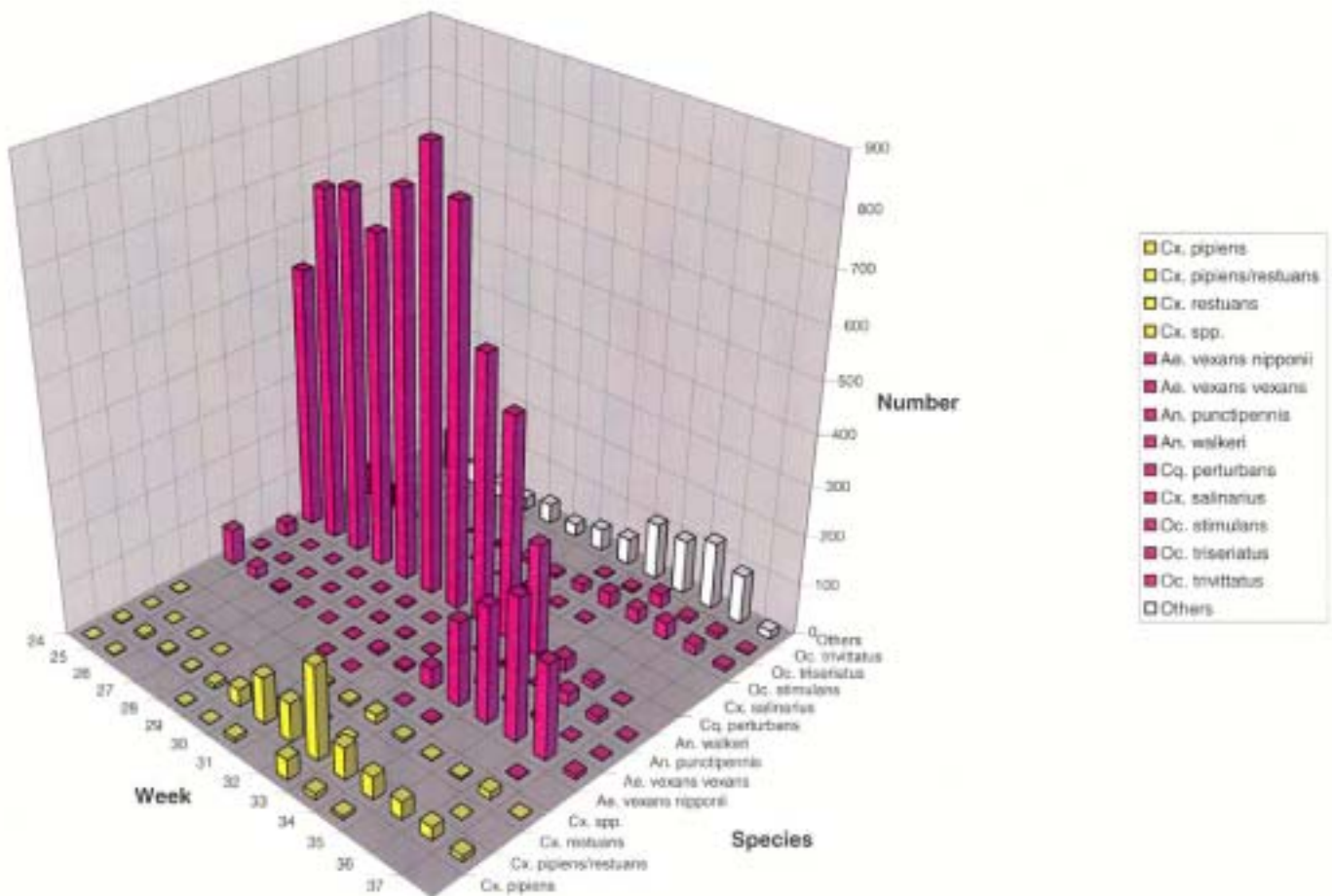
Table 7

Adult Mosquitoes Trapped

Mosquitoes	2003	Percentage	2004	Percentage
Vector	348	3	754	.85
Bridge Vector	1,786	15	7,851	8.88
Non Vector	9632	82	79,842	90.27
Total	11,766	100	88,447	100

Table 8

Leeds, Grenville and Lanark Counties Mosquito Species Summary



Mosquito Control

The goal of controlling the mosquito population within the Leeds, Grenville and Lanark areas is to reduce and prevent human cases of WNV. An integrated mosquito management approach was not fully carried out in 2004 to reduce potential WNV mosquito vectors. A risk assessment completed in the 2003 indicated that the risk of contracting WNV in the Leeds, Grenville and Lanark geographical area was low, making the use of active mosquito control measures unnecessary in our area. Integrated Pest Management makes use of a range of mosquito control strategies including larviciding of catch basins and certain low lying areas and physical removal of stagnant water (source reduction). Controlling the areas where mosquitoes (vector and bridge vectors) have to breed ultimately reduces the populations of mosquitoes that could potentially cause human illness from WNV. A media campaign carried out in 2004 stressed the importance of reducing standing water within our communities. The municipalities were also encouraged to physically reduce breeding sites (source reduction) within their municipalities.

A survey was conducted both in 2003 and 2004 to determine the actions that municipalities took to remove standing water on municipal property. The results of the survey are listed in the table below. As shown in Table 9, some of the source reduction activities were reported to be carried out on a regular basis, not related to the threat of WNV by the majority of respondents, namely the cleaning and flushing of catch basins and the cleaning up of garbage on municipal property. The completion of the other source reduction activities varied more between respondents.

Table 9:

Municipal Source Reduction Activities, 2003 and 2004

Source Reduction Activities	Carried out previous to the threat of WNV		Carried out or emphasized due to the threat of WNV		Activity not carried out	
	2003	2004	2003	2004	2003	2004
Cleaning/flushing catch basins (prior to larvicide being applied).	10 (55.6%)	6 (50.0%)	-	-	-	4 (33.0%)
Garbage/litter cleaned up on municipal property.	16 (88.9%)	11 (91.6%)	-	-	-	-

Source Reduction Activities	Carried out previous to the threat of WNV		Carried out or emphasized due to the threat of WNV		Activity not carried out	
	2003	2004	2003	2004	2003	2004
Containers covered i.e. dumpster to prevent water from collecting.	7 (43.8%)	8 (73.0%)	7 (43.8%)	1 (8.3%)	-	2 (16.0%)
Re-grading of all or some ditches to prevent water from ponding for more than 7 days.	6 (35.3%)	7 (58.3%)	8 (47.1%)	5 (41.6%)	-	1 (8.3%)
Tire piles located on municipal property (including municipal dump sites) stored in a manner to prevent water from ponding for more than 7 days.	-	5 (45.0%)	7 (46.7%)	3 (25.0%)	-	2 (16.6%)
Play structures that contain devices that could hold water fixed to prevent standing water i.e. holes drilled in tire swings, tire ladders.	5 (38.5%)	3 (2)	5 (38.5%)	3 (25.0%)	-	6 (50.0%)
Low lying areas that hold water for more than 7 days located on municipal property (including municipal dump sites) re-graded to prevent water from standing.	-	6 (50.0%)	7 (41.2%)	5 (41.6%)	7 (41.2%)	2 (16.6%)

Source Reduction Activities	Carried out previous to the threat of WNV		Carried out or emphasized due to the threat of WNV		Activity not carried out	
	2003	2004	2003	2004	2003	2004
Removed debris from flat roofs that could hold water for more than 7 days.	6 (46.2%)	7 (58.3%)	-	1 (8.3%)	5 (38.5%)	4 (33.3%)

- Number of responses too small to report

Human Case Surveillance

The goal of the human case surveillance is to quickly detect human illness caused by West Nile virus. Results of all blood samples submitted by local physicians to the Public Health Laboratory were negative for WNV. There were no human cases of WNV diagnosed in Leeds, Grenville and Lanark in 2003 or 2004.

Human Surveillance Forms are an important communication tool to inform the Health Unit of suspect cases of WNV related illnesses. Physician compliance with properly completing the human surveillance forms in 2004 appears to have improved since 2003. In 2004, all forms submitted by physicians appeared to be filled out correctly. This is an improvement from 2003 where only 75% of forms filled out by physicians were filled out correctly. This indicates to the Health Unit that our communication with physicians has improved since 2003. This also fulfills the recommendation given in the 2003 WNV evaluation to consult with local physicians to develop strategies to enhance the accurate and timely reporting of WNV related illnesses to the Health Unit.

The Health Unit has knowledge of 22 blood samples in 2003 and 13 blood samples in 2004 from residents of the Leeds, Grenville and Lanark area that were submitted to the Public Health lab for WNV analysis. This is known through the receipt of the Human Surveillance Form that physicians submitted. However, the number of blood samples submitted to the lab for analysis may be higher if a Human Surveillance Form was not completed and submitted to the Health Unit by the physician. Unfortunately, the lab is not able to provide the Health Unit with the number of samples submitted, and therefore, physician compliance in completing the form cannot be determined.

Results of all blood samples submitted to the Public Health Laboratories were negative for WNV in both 2003 and 2004. The Human Surveillance forms indicated the major and minor signs and symptoms of the people who had blood tests. The following table indicates the number of common symptoms identified from the human surveillance form in 2003 and 2004.

Table 10

Patients Tested for WNV

Common Symptoms/ Conditions Investigated for WNV	Number of identified symptoms	
	2003	2004
Fever	20	10
Muscle Weakness	10	10
Meningitis	1	1
Total number of blood samples submitted	22	13

Analysis of the human surveillance forms shows that many of the patients that had blood sent off for WNV testing primarily exhibited minor symptoms.

Risk Assessment and Conclusion

Regulation 199/03 gives the power to the Medical Officer of Health to decide when and where active mosquito control (use of pesticides) is needed within the respective Health Units of Ontario.

The determination of where and when to use active mosquito control requires a local risk assessment by Dr. Gardner, Medical Officer of Health. The assessment must include careful examination of the following trigger factors:

1. Evidence of birds dying from infections caused by WNV and/or a large number of bird deaths in a localized area.
2. Evidence of mosquitoes infected with WNV and/or a high percentage of Culex species as determined by adult mosquito trapping activities.
3. Evidence of at least one human case assessed to have acquired the virus locally.

To determine the level of risk to Public Health from the mosquito borne virus, we must weigh the evidence based on the most current available local WNV activity surveillance data. Other control measures such as the mosquito breeding site source reduction must be considered as well when weighing the expected benefits and risks of pesticide use.

From the surveillance data that has been analyzed in this report it is evident that the risk of humans contracting the virus from our local mosquito population is low. Our area once again in 2004 did not present with the trigger factors required to indicate that human cases are imminent in our local area.

Therefore it is the judgment of Dr. Gardner, Medical Officer of Health that active pest controls will not be used in 2005 to Control the spread of West Nile virus within the Leeds, Grenville and Lanark District Health Unit geographical area.

In conclusion, the Health Unit deems it necessary to continue all aspects of the West Nile virus surveillance program, including public education and community outreach activities, and municipal mosquito control activities i.e. cleaning catch basins, cleaning eave troughs on public buildings etc. There is documented evidence that supports that the Culex species of mosquitoes over-winter with the virus thus allowing the virus to reoccur year after year.

KMC:TC:jg