

# ARBOVIRUS TASK FORCE

## FINAL REPORT

November 1, 2007



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### Glossary of Terms

<i>Entity</i>	<i>Acronym</i>
Arboviral Illness Task Force	AITF
Arbovirus Task Force	ATF
Department of Environmental Services	DES
Department of Health and Human Services	DHHS
Department of Agriculture, Markets, and Food	DAMF
Department of Resources and Economic Development	DRED
Eastern Equine Encephalitis	EEE
Fish and Game Department	F&G
Mosquito Control District	MCD
Natural Resources Conservation Service	NRCS
University of New Hampshire	UNH
West Nile virus	WNV

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## Introduction

### Objectives

This final report accomplishes several objectives; namely to:

- Provide a summary of major arboviral control activities that occurred within the state since the issuance of the Arboviral Task Force (ATF) Interim Report.
- Ensure that all of the duties assigned to the Task Force under Chapter 284, Laws of 2006 have been addressed.
- Describe the current policy that controls the application of insect control pesticides on lands and wetlands owned by the Fish and Game Department.
- Clarify the process by which the Department of Agriculture, Markets, and Food issues pesticide application permits.
- Provide a final list of Findings.
- Provide a final list of Recommendations, including action on the 9 remaining proposed recommendations and review and update of the interim recommendations.

### Duties Assigned

In order to successfully complete this final report of the Arbovirus Task Force as required by Chapter 284, Laws of 2006, each of the duties assigned by the Legislature must be met and a final report issued no later than November 1, 2007. The duties assigned to the Task Force are as follows:

- I. Determine the coordination of and planning for mosquito control efforts, including a method to enable communities throughout the state to form mosquito control districts, or to be able to join together informally to file joint applications to engage in larvicide or adulticide spraying.
- II. Determine who should have certain mosquito control responsibilities according to expertise throughout the state.
- III. Review and, if necessary, streamline state governmental processes required to implement mosquito control programs.
- IV. Plan and coordinate public education and outreach regarding mosquito-borne illness.
- V. Apply for funding from private and public sources for the purposes of responding to arbovirus threats.
- VI. Determine a method to enable communities to order the removal of standing water hazards on private property and to levy fines on the property owner if necessary.
- VII. Establish a mechanism to work with landowners for determining when a pond, marsh land, or wetland on private property is found to be creating a standing water hazard and a method to permit local communities to receive assistance from the fish and game department and the department of environmental services to determine if the standing water hazard can be removed.

VIII. Establish procedures for determining what, if any, mosquito control efforts will be undertaken in state parks.

IX. Establish a mechanism to protect certified organic farms from being treated with products that would void their certification.

### Approach

In order to approach the above tasks in an organized manner, the Task Force initially formed 4 subgroups that were tasked with studying in detail one or more of the duties as assigned above and reporting back on recommended positions for the full Task Force to consider.

Following the above strategy, the Task Force identified 29 potential recommendations to improve arbovirus management in the state. At its meeting of October 2006, the ATF voted to act on 20 of these recommendations. These preliminary recommendations, along with Task Force findings, were released in an Interim Report dated November 1, 2006. Due to lack of time, nine recommendations were not acted upon prior to the November 1, 2006 deadline. Further discussions on these remaining recommendations were deferred to the second year of the Arboviral Task Force, and are addressed in this Final Report.

### Clarification of pesticide application process

One conclusion reached by the Arboviral Task Force is that significant public uncertainty remains regarding the current process of deciding when insect control pesticides may be applied to state-owned lands. In an effort to clarify this process, this final report contains the steps that are followed in reaching a decision to apply pesticides to Fish and Game lands. The report recommends a process for developing mosquito control policy on lands owned by other state agencies. The report also presents the process by which the Department of Agriculture issues permits for pesticide application.

### Policy for the control of mosquitoes on wildlife refuges reviewed

A citizen's advocacy group, Mothers Against EEE, brought to the attention of the Arboviral Task Force a recently published draft policy for the management of mosquitoes on federal wildlife refuges operated by the US Fish and Wildlife Service. Given the relevance of this draft policy to the work of the Task Force, this document was reviewed in detail and a summary is included in this final report.

### Science Subcommittee established

As the Arboviral Task Force renewed its work in September of 2007, there was a general consensus that the underpinnings of any arboviral management policy needed to be based on the best available science. Given the continuing evolution of arboviral disease, the Task Force decided to create a Science Subcommittee to review the current state of arbovirus science and report back to the full Task Force with its recommendations. The work of the Science Subcommittee and its findings and recommendations are reported elsewhere in this report.

## Arboviral Control Activities Update

The following bullets summarize significant arboviral prevention/control actions or activities that occurred between November 1, 2006 and November 1, 2007.

- **Funding:** Through the Mosquito Control Fund, established by statute in 2006, NH DHHS provided \$89,432 during 2006 to towns and cities as 25% reimbursement for mosquito control activities. During 2007, NH DHHS anticipates awarding approximately \$240,000 as reimbursement for mosquito control activities.
- **Legislation:**
  - Amendment to RSA 141-C:24 to clarify that a mosquito control district established under RSA 430:13 may apply for monies from the Mosquito Control Fund.
  - Repeal of RSA 430:46, I(e) to ensure all mosquito control and abatement activities are regulated by existing permit requirements.
  - Prior to emergency rules expiring, DHHS promulgated rules He-P 308 (Financial Assistance to Partially Fund Towns or Cities for Mosquito Control Activities); effective 1/13/07.
- **State and Local Plan Development and Review:** Of the 20 recommendations accepted by the Arboviral Task Force in its interim report, State agencies completed or actively addressed 17 of the recommendations.
- State agencies were involved in numerous interagency and local meetings, correspondence, presentations, and press releases. Partners and/or recipients of the materials included the Departments of Education, DHHS, DES, F&G, DAMF, DRED, local health officers, local elected officials, health care providers, private veterinary practitioners, school nurses and administrators, summer camp directors, visitors to State Welcome Centers, parks within DRED management, the NH Farm Bureau, and the general public. See Appendix A for a listing of arboviral educational materials available from NH DHHS.
- An interagency group was established to draft a policy addressing emergency aerial pesticide application for mosquito control.
- NH Fish and Game Commission adopted a new policy to address insect control on department-owned properties.
- DRED completed a mosquito control plan for property under the control of DRED. It is pending review by the Attorney General's office and will be further reviewed by the working group in arboviral policy on state owned lands discussed below.
- **Surveillance:** Regional arboviral surveillance for EEE and WNV remained robust with over 10,000 mosquito pools, 160 humans, 30 birds, and 8 non-human mammals tested during 2007. There was also an increase in the number of towns locally funding surveillance and control activities.
- **Response to EEE/WNV activity:** Following the detection of arboviral activity, NH DHHS and DAMF were actively engaged in interagency and local correspondence, local surveillance needs, and assistance with local prevention and response.
- Governor Lynch asked Senator Hassan to lead a group of state agencies in preparing a coordinated arboviral policy for state-owned lands. The Governor has asked that this policy be completed by January 15, 2008, in order to have a plan in place prior to spring arboviral-related activities.

## Science Subcommittee

As described in the Introduction Section above, the Science Subcommittee was formed by the ATF to recommend the goals and scope of further scientific review on all vector-borne diseases to help the state develop sound policy for prevention and response. The following individuals comprised the subcommittee:

- Steve Crawford, DVM, New Hampshire State Veterinarian
- Joe Moore, VMD, NH Veterinary Diagnostic Laboratory
- Jason Stull, VMD, MPVM, Department of Health and Human Services
- Jim Oehler, Fish and Game Department
- Timothy Drew, Department of Environmental Services
- John Burger, University of New Hampshire
- Kyle Lombard, Department of Resources & Economic Development
- Michael Morrison, President, Municipal Pest Management Services, Inc.
- Robert Goodrich, Community Member

### Research Methods

The Science Subcommittee was formed at the October 4, 2007 meeting of the ATF and was charged with developing a list of questions regarding EEE/WNV ecology, vector surveillance, and control that require further exploration. The subcommittee was further charged with developing recommendations for compiling answers to those questions. The list of questions and recommendations are included in this final report to the legislature.

Because of the short timeframe, members of the subcommittee were asked to individually draft a list of questions that, based on their knowledge and experience, would help to better inform public policy regarding EEE/WNV control and prevention and would be appropriate for a science committee to address. Those questions were condensed to a list of twelve by eliminating questions that were outside the scope of the subcommittee, eliminating those that were readily answerable given currently available information, and combining others.

In order to further define the Subcommittee's questions, presentations were requested by Dr. Jason Stull (NH DHHS), Mike Morrison (a local mosquito contractor) and Dr. Richard Pollack (Laboratory of Public Health Entomology, Harvard School of Public Health). Topics addressed during these presentations included existing state and local roles and approach to arboviral surveillance in NH, approach to modeling arboviral disease risk, the efficacy of vector control strategies, and non-target impacts of *Bacillus thuringiensis israelensis* (*Bti*) larvicide. See Appendix B for the Organizational Meeting Notes for the October 18, 2007 Subcommittee meeting for the details of these presentations.

### Recommendations of the Science Subcommittee

Following these presentations, the list of questions was reviewed by Subcommittee members and was unanimously approved at the Subcommittee's October 25, 2007 meeting. Based on this assessment, the Science Subcommittee recommends the following:



## Review of existing science

The Science Subcommittee recommends that the Arboviral Illness Task Force (AITF) compile existing information on WNV/EEE with respect to disease ecology, methods and utility of disease surveillance, important mosquito vectors, and disease control and prevention strategies. Compiling this information will be helpful in further evaluating and informing the state and local response to arboviral diseases and relevant public policies. The NH Arboviral Illness Task Force (AITF) was established in 2000 to provide expertise in helping to minimize the risk to NH citizens of being exposed to and infected with mosquito-borne diseases. Since 2005, the Commissioner of NH DHHS has annually convened this Task Force to develop and improve a statewide coordinated strategy to reduce the risk of EEE and WNV in NH. See Appendix C for a more detailed description of the AITF.

The Science Subcommittee further recommends that in the process of compiling their information, the AITF should pay special attention to the following questions posed by the Science Subcommittee. Currently, these topics are either poorly understood or there are relevant differences in opinions among experts. The Science Subcommittee believes the answers to these questions could have significant ramifications on how state and local officials address EEE/WNV disease prevention and control in New Hampshire. In addition, the Subcommittee recommends that topics for which sufficient information is not currently available, be targeted through future research endeavors.

## Surveillance

- 1) How can we best structure arboviral surveillance in NH to ensure the most effective use of limited resources, while gaining advanced warning for the region and magnitude of activity (e.g. only concentrate on specific mosquito species, investigate other trapping locations or methods, etc)?
- 2) How can we best integrate the known imperfections of EEE/WNV surveillance with regional control and prevention programs? How do we impress upon towns/cities the concept of regional risk? How do we do this while ensuring IPM (Integrated Pest Management) strategies?
- 3) What trigger points (criteria) should be used to determine when larval and/or adult mosquito control is indicated on local and state-owned land?

## Disease Risk

- 4) What is the level of risk reduction attained from the various control and prevention strategies (e.g., adulticiding, larviciding, personal protection, outreach and education, wetland management, etc.)?
- 5) Is it possible to develop a EEE/WNV disease risk model to better predict where disease occurrence may be more prevalent? Factors to include in developing a risk model include current and future potential weather patterns, wetland types, abundance, and distribution, past disease occurrence, mosquito abundance and species distribution, and current and future land uses. Such a risk model would aid in targeting regional control and prevention activities and be useful in evaluating possible effects of weather and environmental changes.

6) What level of disease risk is an appropriate goal for which to strive and what criteria should be used to determine that goal?

#### Vector Ecology

7) Have humans altered upland and wetland ecosystems to favor mosquitoes and if so, are there means to restore those ecosystems to reduce mosquito populations?

8) Is the amplification cycle of EEE/WNV viruses in New Hampshire unique in terms of mosquito species that are involved, timing of infection, etc. and are there weak points in the amplification cycle or in the spatial patterns of mosquitoes that could be exploited to more effectively and efficiently reduce mosquito populations?

#### Vector Control – Efficacy

9) How much existing mosquito breeding habitat is being treated and how much would need to be treated to reduce the risk of arboviruses? Are there locations (e.g., hard-to-reach swamps) in which treatment could dramatically reduce disease risk?

10) What is the effectiveness of larviciding and adulticiding in reducing mosquito populations given New Hampshire's forested condition, dispersed human population, fragmented land ownership patterns, challenging mosquito population dynamics and habitat ecology?

#### Vector Control – Nontarget Impacts

11) What are the short and long term impacts of using adulticides and/or larvicides (including Bti) repeatedly in lentic wetland environments over successive years? Factors to consider include direct mortalities of non-target organisms and food web effects on both invertebrates and vertebrates in both fresh and saltwater wetland systems. What is the potential for the development of pesticide resistance to these mosquito control products for both target and nontarget species?

#### Vector Control – Nonchemical Options

12) What techniques are appropriate for wetland management that would lead to a reduction in mosquito populations and enhance or at least not degrade the public and natural resource values of those wetland systems?

## **Review of USFWS Draft Policy for Mosquito Management**

At the request of the Mothers Against EEE and in an effort to address the need for the development of a State-owned land mosquito control policy, the ATF reviewed the “Draft Mosquito and Mosquito-borne Disease Management Policy Pursuant to the National Wildlife Refuge System Improvement Act of 1997”, developed by Department of the Interior, Fish and Wildlife Service (Appendix D). Several ATF members also discussed the policy with Michael Higgins, U.S. Fish and Wildlife Service representative.

This draft policy is aimed at managers of refuges on units of the National Wildlife Refuge System with the purpose of providing direction and procedures for making determinations regarding if and how to manage mosquito populations on lands administered within the Refuge System. Overall, the ATF found the draft policy to be a useful comprehensive list of components that should be incorporated into a mosquito control plan for state-owned lands, including education, surveillance, and threshold-driven prevention and control activities. The ATF noted the critical importance of a required, written, approved mosquito control plan for all lands in which a Public Health Threat has been declared.

The ATF found that many of the mosquito control plan requirements and actions as discussed in the draft policy are currently recommendations in existing NH State Plan guidelines, such as the DHHS State of New Hampshire Arboviral Illness Surveillance, Prevention and Response Plan. Furthermore, the well-defined, location-specific, quantitative thresholds discussed in the draft policy, although excellent in theory, are rarely implementable as the association between these variables and human disease risk is often poorly understood. The ATF finds this draft policy to be a useful tool toward the development of a State-owned land mosquito control policy, but as a stand-alone policy will not adequately address NH’s arboviral public health risks.

# Summary of Department of Agriculture Pesticide Application Permit Process

## Overview of regulatory process

In New Hampshire, Mosquito-control programs involving pesticides might require that the applicator possess a Special Permit issued by the New Hampshire Department of Agriculture, Markets and Food, Division of Pesticide Control (the Division). The need for, and nature of any such permit will depend on the manner and location of any proposed mosquito-control program. Pesticide applications to water (larviciding), aerial applications of pesticides (larviciding and/or adulticiding), and applications made along rights-of-way (adulticiding) require a Special Permit. Applications to private properties (that don't involve treatment of water) may, in general, be done without such permit. The authority for and procedures governing the issuance of such permits lie in RSA 430:28-50, and the Administrative Rules of the Pesticide Control Board, CHAPTERS Pes 100 – 1100. The exact process will vary, depending on the proposed activities and the circumstances surrounding them. Such things as lead times, which agencies must review applications, and notification requirements vary for different situations. Whether or not the applications are being made under a public health threat or emergency will also bear on the procedures and time lines. With the above in mind, following is a summary of the steps and procedures involved in the procurement of such permits.

## Apply for the permit

This *must* be done on a form provided by the Division. In the case of mosquito control programs by municipalities, the application may be submitted by the municipality itself, or by a commercial pesticide applicator on behalf of such municipality. If the municipality submits the application, it shall state in the application which licensed pesticide applicator(s) will do the work. An original and 4 copies are generally required. The body of the application must include a list of the pesticides to be used, copies of their complete labels, and detailed maps of the proposed treatment sites, among other information. New in 2007 is a requirement that the applicant log on to a Natural Heritage Bureau datacheck website (<http://www2.des.state.nh.us/OneStop/>) to determine if endangered species might be put at risk by the proposed application. If no such risk is perceived, a letter is generated stating so and that must be included in the permit application. If risk is recognized, the applicant must submit \$25.00 for a more complete assessment of potential risks, and the documentation stemming from this must be included in the application package. Lead time for submitting applications will depend on the type of program. Aerial applications require a 120-day lead time (Pes 506.02(c)); larviciding (applications to surface waters) by governmental agencies (which includes municipalities) require a 30-day lead time (Pes 604.01(b)(2), otherwise a 90 day lead time is required – Pes 602.01(e)); adulticiding only (if to right of way) requires a 60-day lead time (Pes 505.05(b)(2)). In the event of a declared public health emergency, all lead-time requirements are nullified.

With regard to aerial applications, there is also a requirement that applicants, at the time they submit the application to the Division, provide public notice of the pending application to town officials (in the towns where treatment will occur), cooperative extension, and landowners within 1320 feet of the treatment area. They shall also publish such notice in a newspaper of general circulation in the area(s) to be treated. These notices shall offer persons 15 days within which to submit written comments to the Division. In the event of an aerial application to residential areas,

a public hearing *shall* be scheduled prior to approval of any special permit. The details regarding such an application and hearing are specified in Pes 506.04. In the event of a declared public health emergency, such notice and hearing requirements are waived.

Permit applications are reviewed by Division and other agencies.

On receipt by the Division, applications are reviewed for completeness, and then copies are forwarded to other agencies for their review. Aerial applications have the longest list of reviewers, which are: DRED; DAMF, Division of Plant Industry; DES; F&G; and DHHS, Office of Management, Bureau of Health-Risk Assessment (Pes 506.01(a)) At the very least (if not aerial) applications are reviewed by DES, DRED, F&G, and the Division. Once all reviews are received (30 days is the normal turn-around time for reviews – although this is not a rule requirement), the Division completes its review - folding in all of the reviews by the other agencies - and writes and issues the permit. The permit will state conditions under which the pesticide applications are to be made. These conditions have the weight of rule and are enforceable by the Division. In the event of public health emergencies, the agencies target a 12-hour turn-around time, and the permits are issued immediately thereafter. Should numerous permit applications be received at the same time under emergency conditions, this turn-around time will likely be longer than 12 hours.

Applicator conducts notification.

This varies with type of application, but generally includes newspaper notices, notices to beekeepers, municipalities, etc. These notices are not made until the permit is issued, will include a list of the pesticides to be applied, anticipated treatment dates (or program start date), locations to be sprayed, and a statement that persons may request their property not be sprayed. Such requests must be honored, and a list of such persons must be maintained by the applicant. In the event of a public health emergency, an abbreviated notification process under Pes 505.06(p-r), which requires a 12-hour lead-time, shall be followed.

Applicator conducts program.

Applications shall be made as per the conditions of the special permit and all applicable rules and regulations. Permits generally require the applicator provide the Division 48-hour advanced notice (by telephone) of intent to commence spray activities. In the event of applications to state-owned lands, conditions shall be specified in the permit as to when this will be allowed. Applicators, via permit conditions, are also required to submit to the Division a record of spray activities conducted under a permit, a summary of survey data, and an assessment of the effectiveness of the program.

## NH Fish and Game Department Insect Control Policy

On March 28, 2007, NH Fish and Game Dept. adopted a new policy to address insect control on department-owned properties (Appendix E). The following summarizes the basic elements of this policy, but both the Fish and Game Department and the ATF agree that further amendments of the policy may be necessary.

### Mosquito Surveillance

Mosquito surveillance can occur on Fish & Game properties using methods approved by the NH Department of Health & Human Services. No prior approval to perform mosquito trapping is required, however, the F&G Dept. should be contacted with the trap location and intended duration of use. At the conclusion of the WNV/EEE season, a summary of surveillance activities and disease positive results (if any) should be forwarded to the F&G Dept.

### Larviciding

The F&G Dept. will allow the larvicide methoprene in artificial water receptacles such as old tires, barrels, and manmade water catch basins at any time. Methoprene is not allowed in natural wetlands and waterbodies.

Two biological larvacides, *Bacillus thuringiensis israelensis* (Bti) or *Bacillus sphaericus*, may be used on natural wetlands when:

1. A wetland is located in a buffer surrounding the location where disease-positive mosquitoes were trapped in any of the preceding three years or the current year. The buffer corresponds to the maximum flight range of the mosquito species that tested positive for either EEE or WNV (generally 1/4 - 5 miles depending on the species); OR
2. A wetland is located within a 5-mile buffer surrounding the location of a disease-positive human, horse, or other mammal.

### Adulticiding

Adulticides may be used in situations where the area proposed for treatment is contained within the location of a Public Health Threat as declared by the Commissioner of NH Health and Human Services and the area is near a location of high public use (e.g., school, sports complex, etc.).

### How to Get Approval for Treatment

Municipalities wishing to control mosquitoes on Fish & Game property must obtain a pesticide permit from the Division of Pesticide Control. Thereafter, the town or city should contact the F&G Dept. requesting permission to treat Department properties. Their request should be accompanied by a map showing the location of wetlands on Fish & Game properties to be treated, the types of pesticides to be used, the location of high public use areas (e.g., schools, ball parks, etc.) if adulticides are to be used, and a description of surrounding properties to be treated.

## Findings

As described in the Introduction, the Arboviral Task Force reviewed the findings presented in the Interim Report. After this review, the following represents the final Findings of the Task Force.

1. The Task Force finds that statutory authority exists under RSA 147:1 and RSA 47:12 for the adoption of standing water hazard control ordinances for towns and cities respectively.
2. The Task Force finds that there is some existing statutory authority that allows the Departments of Environmental Services and Fish & Game to advise communities and landowners as to the impact of ameliorating standing water hazards. Because of the statutory duties and expertise of these two agencies, their input is appropriately focused in the potential environmental impacts of removing standing water hazards.
3. The Task Force finds that there are also other organizations that can help communities evaluate potential standing water hazards, such as the UNH Cooperative Extension Service, the Natural Resources Conservation Service, and Conservation Districts, and encourages communities and landowners to take advantage of these resources.
4. The Task Force finds that neither the Department of Environmental Services nor the Fish & Game Department have requested that the ATF support additional statutory authority or funding to provide these services. (However, the Fish and Game Department did note that if staff were to be assigned to this effort without additional funding, other program areas would be negatively impacted.)
5. While recognizing that organic farmers in compliance with Section 205.672 will not lose certification due to a federal or state emergency pest or disease treatment program, the Task Force finds that the loss of marketable organic produce would nonetheless have a financial impact on such farmers.
6. The Task Force finds that RSA 53-A:3 provides the authority for two or more public agencies in the state to enter into an agreement for joint or cooperative action that would presumably include the filing of joint applications for larviciding and adulticiding.
7. The Task Force finds that while the state has made many efforts to reduce the risk of arboviral illness there remains an ongoing need to ensure that these activities are well coordinated, well communicated, and transparent to the public.
8. The Task Force finds that while a mechanism for regular communication and sharing of expertise between agencies and government bodies, both state and local, is not in place at this time, the work of the Task Force demonstrates the statewide and local benefits of ongoing dialogue.
9. The Task Force finds that without a mechanism to support ongoing communication and sharing of expertise, the issue of arboviral illnesses will continue to be an emotional and contentious one on the local level.
10. The Task Force finds that while the duties of the All Health Hazards Regions (AHHRs) established for the purpose of overseeing the development of regional public health emergency

plans are relevant to the control of arboviral illness, more formal assignment of duties would require either that these Regions be recognized in law and or that existing contracts be amended.

11. The Task Force finds that overall educational efforts and materials delivered in NH are consistent with those provided by other states in the region. The materials available for the public and other state agencies are, for the most part, adequate.

12. The Task Force finds that there is a continuing need to provide arboviral information to appropriate municipal officials so that prevention methods are followed and town-based mosquito surveillance and prevention programs are financed as needed.

13. The Task Force finds that mosquito surveillance is a valuable educational tool. Mosquito surveillance not only allows for a rapid detection of mosquito-borne diseases, it promotes continued awareness as test results become available throughout the season. Mosquito-borne diseases such as EEE and WNV draw public attention at times when human and/or non-human mammal cases are detected. When there are not such cases for long periods of time, it is possible that communities may choose not to finance mosquito surveillance during these perceived “lower risk” periods. ATF members are concerned about identifying mechanisms to maintain the interest and attention of the public/municipalities while these diseases go through periods of low incidence.

14. The Task Force finds that sustainable, long-term mosquito surveillance is an important component in local education and outreach efforts.

15. The Task Force finds that it is paramount that communities and individual citizens receive timely and appropriate educational messages to assist in making personal and community-based decisions regarding arboviral disease surveillance, prevention, and control. It is particularly important that schools communicate this knowledge at both the beginning and end of the school year, as the risk of contracting arboviral illness is greatest in the summer and fall.

16. The Task Force finds that policy makers, researchers, and educators would benefit from a comprehensive overview of our current knowledge base on locally important mosquito-borne diseases (i.e., EEE and WNV).



## Recommendations

This is the updated and final list of the recommendations that have been accepted by the Arboviral Task Force. Recommendations are grouped by subject area as set forth by Chapter 285.4, Laws of 2006, but are numbered consecutively in order to avoid ambiguity.

**284:7,I.** Determine the coordination of and planning for mosquito control efforts, including a method to enable communities throughout the state to form mosquito control districts, or to be able to join together informally to file joint applications to engage in larvicide or adulticide spraying.

1. **The Task Force recommends** a coordinated effort by state agencies and institutions to assist Mosquito Control Districts (MCDs) in developing local expertise in mosquito surveillance, control, and prevention. One means of developing this expertise may be through the Regional Planning Commissions (RPCs). Established under RSA 36:45-53, RPCs enable municipalities and counties to join together to, among other duties, facilitate the wise and efficient expenditure of public funds. RPC members have access to a number of planning and advisory services. RPCs should be consulted about the appropriateness of their involvement in these activities.

2. **The Task Force recommends** the organization of mosquito control efforts through adequately funded pre-existing regional entities that may include RPCs or All Health Hazards Regions (AHHRs).

3. **The Task Force recommends** the reactivation of the State Committee for Mosquito Control established under RSA 430:10. The duties of the reactivated committee should be to provide oversight and coordination of interagency efforts with regard to mosquito prevention and control. Further, the Task Force recognizes that this reactivation may require legislative efforts to revise the membership and duties so that they reflect current best practices and the importance of public health.

**284:7,II.** Determine who should have certain mosquito control responsibilities according to expertise throughout the state.

4. **The Task Force recommends** that, over the long term, the state should consider taking responsibility through an existing state agency for mosquito trapping and development of entomology expertise as necessary to better identify risks for arbovirus diseases and to target those risks accordingly.

5. **The Task Force recommends** that the DHHS investigate sources of revenue to fund effective, long-term mosquito surveillance.

6. **The Task Force recommends** that the Arboviral Illness Task Force (AITF), established in 2000 by the Department of Health and Human Services, review the current knowledge and address future needs of EEE and WNV ecology, disease, prevention, and control in New Hampshire so that accurate and timely information can be used to guide personal, local, and State responses to these diseases. This review should encompass the subject areas recommended by the ATF Science Subcommittee as set forth in this Final Report, and may require that the AITF

meet more than annually. Health protection measures should continue while the scientific review is in process.

7. **The Task Force recommends** that the N.H. Local Government Center and N.H. Association of Counties should be made aware of the issue of mosquito-related standing water hazards so as to direct inquiries from its members to appropriate state agencies.

8. **The Task Force recommends** that RSA 141-C:25 be amended so that municipalities will be eligible for reimbursement for mosquito control activities that occur prior to a Public Health Threat declaration under RSA 141-C:25,III.(a).

**284:7,III.** Review and, if necessary, streamline state governmental processes required to implement mosquito control programs.

9. **The Task Force recommends** adding a specific reference in the pesticide control rules and/or in RSA 430 so that decision makers can consider both the public health risks and benefits of potential pesticide applications along with other criteria when evaluating a pesticide application request.

10. **The Task Force recommends** the Division of Pesticide Control consider the adoption of a tiered permitting process that simplifies the annual renewal of Special Permits for mosquito control.

**284:7,IV.** Plan and coordinate public education and outreach regarding mosquito-borne illness.

11. **The Task Force recommends** that the current arboviral disease education practices at the local and state levels continue, but with certain revisions of, and additions to, educational materials and approaches to better encourage local communities to become better prepared for detecting and responding to arboviral threats. An example of an appropriate addition would include the adoption of the “7Ds” as cited on the Mothers Against EEE website (<http://momsagainsteee.com/>). An example of additional educational outreach would be to engage groups such as the New Hampshire Hospital Association and the NH Medical Society.

12. **The Task Force recommends** training community members (i.e., local veterinarians, physicians, Health Officers) to present information to local decision makers regarding the appropriate response to the threat of arboviral illnesses.

13. **The Task Force recommends** that educational approaches at the local level should be tailored depending on need – what works in one town may not work well in another.

14. **The Task Force recommends** the creation of a website where the public could go for a comprehensive source of information regarding arboviral illnesses. Currently, the DHHS website serves this purpose. Links to related topics such as the status of pesticide application permits would help local residents track mosquito control efforts in their communities.

15. **The Task Force recommends** that the DAMF post the status of pesticide application permits on its web site.

16. **The Task Force recommends** making sure that local education efforts begin in November prior to town meeting time in order to facilitate informed budgetary decisions.

17. **The Task Force recommends** maintaining mosquito surveillance during those years in which the risk of human infection is perceived to be low as surveillance provides early warning, awareness, and educational benefits.

18. **The Task Force recommends** the development of educational components with a personal touch (e.g. how these diseases have touched or changed the lives of NH residents and animal owners). The intent of this personalized education is to encourage individuals to act to reduce risks and that their efforts will be based objective information.

19. **The Task Force recommends** that the existing local public education efforts continue as a means of controlling standing water hazards.

**284:7,V.** Apply for funding from private and public sources for the purposes of responding to arbovirus threats.

20. **The Task Force recommends** that the application for funding from private and public sources should fall to state or local agencies acting within their legal scope of authority for arbovirus control.

**284:7,VI.** Determine a method to enable communities to order the removal of standing water hazards on private property and to levy fines on the property owner if necessary.

21. **The Task Force recommends** that ordinances adopted by municipalities that provide for fines for standing water hazards occurring in artificial containers (e.g., used tires, recycling containers, bird baths) should apply only during such times as the Commissioner of DHHS has determined a public health threat pursuant to RSA 141-C:25, III(a) and in situations in which evidence exists of mosquito larvae on the property in question.

**284:7,VII.** Establish a mechanism to work with landowners for determining when a pond, marsh land, or wetland on private property is found to be creating a standing water hazard and a method to permit local communities to receive assistance from the fish and game department and the department of environmental services to determine if the standing water hazard can be removed.

22. **The Task Force recommends** that communities and landowners work with organizations such as the UNH Cooperative Extension Service and the Natural Resources Conservation Service, and conservation districts for assistance in the evaluation of potential standing water hazards. Further, the Task Force recommends that readers refer to the policy letters received from the Fish and Game Department and the Department of Environmental Services that are attached to the ATF Interim report dated November 1, 2006.

**284:7,VIII.** Establish procedures for determining what, if any, mosquito control efforts will be undertaken in state parks.

23. **The Task Force recommends** that, consistent with the Governor's request dated October 24, 2007, the Department of Resources and Economic Development (DRED) develop with the NH Department of Fish and Game, Health and Human Services, Agriculture, and Environmental Services, a coordinated plan for determining when to initiate mosquito control activities on its state owned land, including the state park system, and the Task Force further supports the Governor's request that a coordinated plan be developed for determining when to initiate mosquito control activities on all state owned land.

**284:7,IX.** Establish a mechanism to protect certified organic farms from being treated with products that would void their certification.

24. **The Task Force recommends** that when aerial spraying is the method of choice in responding to an emergency, certified organic farms should be identified, buffer zones established, and global positioning or other technology should be used to establish “no-spray” zones. Spray these areas only as a last response after other means of control are exhausted.

25. **The Task Force recommends** that any such treatment program should be conducted in a manner to minimize the effect on certified organic farms, including using the minimum amount of product required, limited use of USDA National Organic Program prohibited materials in areas surrounding organic farms, providing a sufficient buffer distance to prevent drift from occurring onto organic farms, and favoring the use of pest control materials that would not be considered prohibited under the rules for organic farming, such as certain biologically derived pesticides.

26. **The Task Force recommends** education and outreach to organic farmers and organic farmer’s organizations regarding scientifically documented natural means of mosquito control.

27. **The Task Force recommends** that the Pesticide Control Division make ongoing efforts to notify certified organic farmers if spraying is scheduled to occur on their property.

## Conclusions

Over the course of the last two years, the Arboviral Task Force has worked hard to ensure that New Hampshire improves its response to arboviral illness. The Task Force believes that the state has made progress in its efforts to educate the general public, policy makers who share responsibility for the prevention and response to these diseases, as well as local officials who have prevention and response roles as well. There is also better coordination between and among the state agencies with shared prevention and response responsibilities.

That being said, each and every member of the Task Force understands the full impact of this disease when it strikes, and believes that the state must continue to improve its efforts to avoid any additional cases. It is also possible that other mosquito-borne illnesses will be detected in our state as population increases, mosquito vectors and habitats modify or evolve, and diagnostic tools improve. Lessons learned from responding to EEE and WNV will be useful as we respond to other mosquito-borne public health threats. We note in particular that such public health threats do not confine themselves to political borders, and that the state should continue to work with regional entities to determine ways in which we can develop effective, efficient, and targeted methods to protect citizens of our state and region from mosquito-borne disease.

## APPENDIX A

### Arboviral Educational Materials Currently Available From New Hampshire Department of Health and Human Services (NH DHHS)

(Additional resources are available from other State agencies)

Educational materials available from the NH DHHS website or by contacting the NH DHHS Arboviral Coordinator\*

#### 1. Fact Sheets

- Eastern Equine Encephalitis Fact Sheet
- West Nile virus Fact Sheet

#### 2. Frequently Asked Questions (FAQs)

##### People

- West Nile virus and Eastern Equine Encephalitis Infection and Breast Feeding
- West Nile virus and Eastern Equine Encephalitis and Hunters
- School, Day Camps, Day Care Centers and West Nile virus and Eastern Equine Encephalitis

##### Animals

- Arboviruses and Birds: West Nile virus and Eastern Equine Encephalitis
- Dead Bird Handling Instructions
- West Nile virus and Eastern Equine Encephalitis in Dogs and Cats
- West Nile virus and Eastern Equine Encephalitis in Horses

##### Mosquito Control

- West Nile virus and Eastern Equine Encephalitis and Mosquitoes in New Hampshire
- Reducing the Risk of Infection from Mosquitoes Around Your Home and Community
- Control of Adult Mosquitoes to Reduce Transmission of West Nile virus and Eastern Equine Encephalitis
- Pyrethroid Insecticides for Mosquito Control
- Larvicides
- Vectobac (*Bacillus thuringiensis israelensis*)

#### 3. Posters and InfoCards

- Insect-borne Disease in New Hampshire – Don't Let Them Bug You
- Prevent Diseases Caused by Mosquito Bites
- Protect Yourself Against West Nile virus and Other Mosquito-borne Diseases
- Preventing Mosquito and Tick Bites

#### 4. PowerPoint for Cable Access Stations

- Protect Yourself Against Eastern Equine Encephalitis and West Nile virus

5. Professional resources

Letter to NH veterinarians regarding Eastern Equine Encephalitis and WNV  
Letter to health care providers regarding Eastern Equine Encephalitis and WNV  
Information Regarding Human and Animal Arboviral Testing

6. Local Plan Development and Response

Arboviral Illness Surveillance, Prevention, and Response Plan  
Arboviral Plan Supplement

\*NH DHHS website: <http://www.dhhs.state.nh.us>; NH DHHS Arboviral Coordinator can be reached at 603-271-4496

## APPENDIX B

Task Force to Facilitate A Coordinated Local, Regional, and State Response to Arboviruses in  
New Hampshire  
Chapter Law – 284:5  
Year 2006

### SCIENCE SUBCOMMITTEE

#### *Organizational Meeting Notes*

October 18, 2007

**Members Present:** James Oehler, Jason Stull, Kyle Lombard, Mike Morrison, Robert Goodrich, and Joe Moore for Steve Crawford.

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The Subcommittee began compiling information on some of the questions it posed regarding EEE/WNV prevention and control. Jason Stull from DHHS explained DHHS' role in surveillance, while Mike Morrison explained a contractor's role. Dr. Richard Pollack from the Laboratory of Public Health Entomology, Harvard School of Public Health provided his perspective on a number of topics including disease risk modeling, efficacy of mosquito control techniques, and impacts of Bti, among others. More detailed notes on these topics follow.

#### Surveillance

##### DHHS Role

Main surveillance roles include developing/implementing protocols for sample collection and submission, performing sample testing, disseminating results to inter and extra-agency partners, assessing local surveillance efforts and supplement when indicated, monitoring efforts and results for trends, and convening the Arboviral Illness Task Force to review and obtain comments on the above. Further information is provided below:

DHHS' role includes developing protocols for collecting and testing adult mosquitoes from light traps and other types of adult mosquito traps. These protocols include outlining what mosquito species should be tested. Currently testing begins June 1 and ends when mosquito control contractors are no longer seeing high mosquito numbers (usually around mid-October). DHHS concentrates on testing *Culiseta melanura* and *Cs. morsitans* early in the season (i.e., June 1 – July 1). After July 1, DHHS accepts additional species including bridge vectors. Jason also explained the reporting that is triggered by positive tests. Notices of disease positive mosquitoes are sent to the local animal control officer who then reports the information to town officials. Notices are also sent to Arboviral Task Force members, and others. The State veterinarian has similar responsibilities when animals test positive for WNV or EEE.

DHHS does not provide guidance on the recommended number of traps/town, trap placement, or other such standards. DHHS has a limited budget to supplement town-sponsored surveillance with state-sponsored efforts. For example, state-sponsored trapping may be employed if EEE is detected in one town and trapping efforts are low or non-existent in surrounding towns. Historically, emergency trapping is usually done over a two-week period following a positive disease result. DHHS contracts emergency trapping with mosquito control contractors.

DHHS also tracks mosquito population levels and trap effort on a regional basis as one indicator of disease risk. DHHS uses contractor data to do this.

#### Contractor Role

Mike explained that towns contract with mosquito control contractors like himself to do both surveillance and control of mosquitoes. A number of different traps can be used to collect adult mosquitoes for disease testing. Among them are light traps, resting box traps, and gravid (aka “stinky”) traps. Gravid traps are best for surveilling mosquito species associated with WNV. Resting box traps are very good for surveilling *Cs. melanura*, one of the primary species associated with amplifying EEE virus in nature. Light traps are effective for surveilling a wide range of species.

Light traps are typically deployed at eye level. However since *Cs. melanura* feeds primarily on birds, there is some thought to trying to deploy them at tree canopy level where birds roost. However, there are obvious logistical barriers with trying to do this.

Traps are typically checked once per week and usually 2-3 traps are deployed in each town. Trapped adults are transported to DHHS’ lab for disease testing as soon after collection as possible. Specimens have to be kept cold through transport and testing.

#### Risk Modeling

Dr. Pollack explained that it is possible to develop a risk model, but any model will not be good for pinpointing potential disease locations. Models have obvious limitations. It is often difficult to populate risk models with useful data. Data is often lacking. Therefore, educated guesses are often incorporated. Risk models can be useful for testing questions like, “What would happen if we reduced the population of mosquito species x?” The impact of weather (e.g., rain fall and hydrologic factors) is important to address in such models.

#### Vector Control Efficacy

Dr. Pollack explained that *Cs. melanura* is the primary player in enzootic transmission. It primarily feeds on birds, but approximately 20% of blood meals are known to come from mammals. Some traditional methods of mosquito larvae and adult control are not effective with controlling *Cs. melanura* because the species occurs in out of the way places. Mike has found them occurring primarily in crypts under sphagnum mounds in hemlock stands. If larvicides can be applied to those crypts *Cs. melanura* can be controlled but it is a labor-intensive undertaking. Given that controlling *Cs. melanura* is difficult, it may prove reasonable to also target bridge vectors.

The epidemic (bridge) vectors for EEE likely depend on location and ecology. According to Dr. Pollack, in this area they are *Aedes vexans*, *A. canadensis*, and *Coquillettidia perturbans*. *A. vexans* occurs primarily in river floodplains that occasionally get inundated with water. If inundation lasts long enough, millions of adults can hatch. If water recedes fast enough and soil dries up again, millions of larvae will be stranded and will not develop into adults. Mosquito control agents have 1-3 days after inundation to deliver Bti before adults begin hatching. In Massachusetts, helicopters or fixed winged aircraft are commonly used to deploy Bti in such situations.

*Cq. perturbans* is another species that has been implicated as a major player in EEE transmission. *Cq. perturbans* occurs in freshwater cattails stands. Dr. Pollack doesn’t believe it is as important as some of his colleagues in other states. This species is difficult to control. Best control can be had from draining breeding sites.



Dr. Pollack addressed the question of triggers for larviciding and spraying in Massachusetts. He categorized some as nuisance triggers and others as more objective, such as mosquito abundance, virus activity, weather, and human population density. In areas of increased human population density, triggers may be different than those in which the human density is lower. He also suggested that mosquito control activities might result in reduction of 1-12 cases per year, although the origin of those figures is unclear.

Mike mentioned that less than 1% of mosquito breeding sites are treated in any town. Dr. Pollack explained that if treatment is targeted at correct habitats at correct times then treatment can be effective at reducing larvae of target species. Does that result in fewer adults? That is unsure.

#### Impacts of Bti

Dr. Pollack chaired a committee for MA Department of Public Health to look at this issue. Bti directly impacts mosquitoes, nonbiting midges, and black flies. He believes any collateral damage is minimal and insignificant. You may have to be careful in certain types of vernal pools under certain conditions, but for most other wetlands systems there should be little concern. Dr. Pollack questions some of the sampling techniques of the few long-term studies reviewed in Boisvert and Boisvert that indicate potential for nontarget impacts.

He went on to state that there are few specific predators of mosquitoes. Anything that feeds on mosquitoes are generalist predators that can move to other prey species if mosquitoes are limiting. We may be perturbing wetland systems through human landuse, but many of those perturbations are resulting in more mosquitoes.

The goal of control programs is not to prevent every human case of EEE (of course that would be ideal), but rather to reduce peak transmission risk and thus numerous human cases. Can't eliminate EEE or prevent the odd case of EEE. A long-term, sustained program is critical to success.

He made it clear that there are a number of different opinions on all of these issues and offered his assistance in further discussing any of them in the future. He also felt that NH should develop a EEE/WNV control plan and clearly "define our goal" before we proceed with developing a plan for reaching that goal. Dr. Pollack felt that an on-site visit of the NH endemic area would allow better assessment of current or planned surveillance/control.

## **APPENDIX C**

### **Description of the Arbovirus Illness Task Force**

The New Hampshire Arboviral Illness Task Force (AITF) was established in 2000 to provide expertise in helping to minimize the risk to NH citizens of being exposed to and infected with mosquito-borne diseases. Membership of the AITF includes representatives of State Agencies (DRED, DAMF, F&G Dept, DES, DHHS, Dept of Education), local public health entities, University of New Hampshire (entomologists, Veterinary Diagnostic Laboratory personnel, Cooperative Extension coordinators), mosquito contractors, and relevant organizations (NH Audubon Society, NH Veterinary Medical Association, USDA). Since 2005, the Commissioner of New Hampshire Department of Health and Human Services has annually convened this Task Force to develop and improve a statewide coordinated strategy to reduce the risk of Eastern Equine Encephalitis (EEE) virus and West Nile virus (WNV) in NH. Information provided from ATF and AITF meetings, as well as Department and federal program analyses is used to guide NH DHHS' annual arboviral-related activities and development of a State Arboviral, Illness Surveillance, Prevention and Response Plan.

## **APPENDIX D**

**DEPARTMENT OF THE INTERIOR, Fish and Wildlife Service [1018-AT72]  
Draft Mosquito and Mosquito-Borne Disease Management Policy Pursuant to the  
National Wildlife Refuge System Improvement Act of 1997 (as published in the Federal  
Register / Vol. 72, No. 198 / Monday, October 15, 2007 / Notices)**

Permit No.	Applicant	Receipt of application FEDERAL REGISTER notice	Permit issuance date
156814 .....	David L. Duncan .....	72 FR 39830; July 20, 2007 .....	September 5, 2007.
152774 .....	Eric K. Schnelle .....	72 FR 33242; June 15, 2007 .....	July 26, 2007.
152402 .....	Gary D. Young .....	72 FR 31090; June 5, 2007 .....	August 23, 2007.
154555 .....	Herbert Rudolf .....	72 FR 31601; June 7, 2007 .....	September 5, 2007.
154496 .....	Scott A. Huebner .....	72 FR 33242; June 15, 2007 .....	August 9, 2007.
156806 .....	Donald Thompson .....	72 FR 37795; July 11, 2007 .....	September 5, 2007.
155649 .....	Elizabeth C. Harris .....	72 FR 39829; July 20, 2007 .....	September 6, 2007.
690038 .....	U.S. Geological Survey .....	72 FR 25328; May 4, 2007 .....	August 30, 2007.
071799 .....	Jennifer Miksis-Olds .....	72 FR 39829; July 20, 2007 .....	August 30, 2007.
156394 .....	Raymond Cuppy .....	72 FR 37039; July 6, 2007 .....	September 5, 2007.

Dated: September 21, 2007.  
**Lisa J. Lierheimer,**  
*Senior Permit Biologist, Branch of Permits,  
 Division of Management Authority.*  
 [FR Doc. E7-20233 Filed 10-12-07; 8:45 am]  
**BILLING CODE 4310-55-P**

**DEPARTMENT OF THE INTERIOR**

**Fish and Wildlife Service**

**Issuance of Permits**

**AGENCY:** Fish and Wildlife Service, Interior.

**ACTION:** Notice of issuance of permits for marine mammals.

**SUMMARY:** The following permits were issued.

**ADDRESSES:** Documents and other information submitted with these applications are available for review, subject to the requirements of the Privacy Act and Freedom of Information Act, by any party who submits a written request for a copy of such documents to: U.S. Fish and Wildlife Service, Division of Management Authority, 4401 North

Fairfax Drive, Room 700, Arlington, Virginia 22203; fax 703/358-2281.

**FOR FURTHER INFORMATION CONTACT:** Division of Management Authority, telephone 703/358-2104.

**SUPPLEMENTARY INFORMATION:** Notice is hereby given that on the dates below, as authorized by the provisions of the Marine Mammal Protection Act of 1972, as amended (16 U.S.C. 1361 *et seq.*), the Fish and Wildlife Service issued the requested permits subject to certain conditions set forth therein.

**Marine Mammals**

Permit No.	Applicant	Receipt of application FEDERAL REGISTER notice	Permit issuance date
153572 .....	Gregory L. Pope .....	72 FR 31601; June 7, 2007 .....	August 9, 2007.
155528 .....	Michael G. West .....	72 FR 37795; July 11, 2007 .....	September 19, 2007.
156520 .....	Christopher Ring .....	72 FR 39829; July 20, 2007 .....	September 25, 2007.
157475 .....	Philip E. Carlin .....	72 FR 39829; July 20, 2007 .....	September 19, 2007.

Dated: September 28, 2007.  
**Lisa J. Lierheimer,**  
*Senior Permit Biologist, Branch of Permits,  
 Division of Management Authority.*  
 [FR Doc. E7-20236 Filed 10-12-07; 8:45 am]  
**BILLING CODE 4310-55-P**

**DEPARTMENT OF THE INTERIOR**

**Fish and Wildlife Service**

[1018-AT72]

**Draft Mosquito and Mosquito-Borne Disease Management Policy Pursuant to the National Wildlife Refuge System Improvement Act of 1997**

**AGENCY:** Fish and Wildlife Service, Department of the Interior.

**ACTION:** Notice.

**SUMMARY:** We propose to establish policy that refuge managers will follow concerning mosquito and mosquito-borne disease management on units of the National Wildlife Refuge System. The National Wildlife Refuge System Administration Act (Administration Act), as amended by the National Wildlife Refuge System Improvement Act of 1997 (Improvement Act),

provides the Refuge System mission. That mission is to “administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.” In addition, each refuge “shall be managed to fulfill the mission of the System, as well as the specific purposes for which that refuge was established.” We cannot fulfill this mission unless we provide consistent direction to refuge managers and manage the Refuge System as a national system. Therefore, we are developing policies to provide refuge managers clear direction and procedures for making determinations regarding wildlife conservation and public uses of the Refuge System and individual refuges. This draft policy describes the process we will follow to determine if and how to manage mosquito populations on lands administered within the Refuge System. We propose to incorporate this policy as part 601, chapter 7 of the Fish and Wildlife Service Manual.

This draft policy states that “we will allow populations of native mosquito species to function unimpeded unless they cause a human and/or wildlife health threat.” While we recognize mosquitoes are a natural component of most wetland ecosystems, we also recognize they may represent a threat to human and/or wildlife health. We may allow management of mosquito populations on Refuge System lands when those populations pose a threat to the health and safety of the public or a wildlife population. This draft policy outlines the procedures refuge managers will follow in planning and implementing mosquito and mosquito-borne disease management within the Refuge System.

**DATES:** Comments must be received by November 29, 2007.

**ADDRESSES:** You may submit comments on this draft policy by mail to Michael Higgins, Biologist, National Wildlife Refuge System, U.S. Fish and Wildlife Service, 4401 North Fairfax Drive, Room 670, Arlington, Virginia 22203; by fax to 703-358-2248; or by e-mail to [refugesystempolicycomments@fws.gov](mailto:refugesystempolicycomments@fws.gov).

## **APPENDIX E**

### **NEW HAMPSHIRE FISH & GAME DEPARTMENT RESOURCE MANAGEMENT AND PROTECTION POLICY INSECT CONTROL ON DEPARTMENT-OWNED PROPERTIES**

WHEREAS, the legal responsibility of the New Hampshire Fish and Game Department is to “preserve, protect, and propagate the fish and wildlife resources of the state” pursuant to RSA 206:9 and RSA 206:10;

WHEREAS, the Department currently owns or hold conservation easements on several hundred thousand acres in New Hampshire which contain thousands of acres of tidal and non-tidal wetlands, vernal pools, upland forest and other critical habitats and natural communities;

WHEREAS, these habitats and natural communities provide habitat for insects including mosquitoes that may harbor diseases such as West Nile virus (WNV) or Eastern Equine Encephalitis virus (EEE), which can be transmitted to humans;

WHEREAS, both wetland and upland habitats on these lands produce numerous species of insects that are part of the food web and, therefore, are critical for the survival of fish and wildlife, some of which are rare;

WHEREAS, all other state departments and agencies, to the extent possible, consistent with their authority and responsibilities, shall assist and cooperate with the executive director of the Department to conserve endangered or threatened species as set forth in RSA 212-A:9;

WHEREAS, Department lands are open to the public for recreational, educational and scientific activities, and the Department endeavors to provide a safe and attractive environment within the limits of its mission, and it is the responsibility of the public to possess the necessary knowledge, skill and equipment necessary for a safe visit to Department properties;

WHEREAS, the Department cooperates with the Department of Health and Human Services to promote education and personal protection as the most effective means to reduce the risk of contracting diseases such as EEE or WNV through local signage and internet education;

WHEREAS, Department lands are equally owned and shared by all citizens of New Hampshire, and this diverse citizenry has an equal opportunity to have its broad range of goals accounted for within the responsibilities of the Department;

THEREFORE BE IT RESOLVED, that the Department will consider the use of chemical and biological agents for the control of insect populations including mosquitoes on Department-owned lands in accordance with the following provisions. These provisions may be altered if a Public Health Emergency is issued pursuant to RSA 21-P:35.

#### **Section A. Provisions Specific to Mosquito Control**

1) The Department considers mosquito surveillance to be an important tool for tracking changes in pathogen occurrence and planning control activities. As such, the Department will encourage mosquito surveillance on their lands by state/local public health authorities or vector control agencies. Monitoring will occur using methods approved by the Department of Health and

Human Services. The goal of mosquito monitoring is to detect relative changes in population sizes that can indicate an increased risk to human, wildlife, or domestic animal health as well as to collect adult mosquitoes for testing of pathogen presence.

2) Methoprene or similar insect growth regulator may be used to control mosquitoes in artificial water receptacles such as old tires, barrels, and manmade water catch basins identified on Department-owned lands;

3) The Department will allow the use of biological control agents (specifically *Bacillus thuringiensis israelensis* or *Bacillus sphaericus*) in natural wetlands and waterbodies on land it administers as long as those wetlands and waterbodies:

a. Contained disease-positive carrying mosquitoes in any of the preceding three years or the current year;

b. Are located in a buffer surrounding the location where disease-positive mosquitoes were trapped in any of the preceding three years or the current year; the buffer corresponding to the maximum flight range of the mosquito species (Table 1) that tested positive for either disease;

c. Are located in a buffer surrounding the location of a disease-positive mammal; the buffer corresponding to the maximum flight range of mosquito species that can potentially transmit either disease to mammals.

4) The Department will approve the application of adult mosquito pesticides on lands it administers in cases where a public health threat is declared by the Commissioner of the New Hampshire Department of Health and Human Services and the area proposed for treatment is identified as a source of either disease near an area of high public use (e.g., school, sports complex, etc.);

5) A municipality or mosquito control district will submit a detailed map of Department-owned lands they wish to treat during the Division of Pesticide Control's pesticide application process. The map will comply with the following criteria:

a. Be provided at a scale and with enough detail to locate wetlands proposed for treatment in the field.

b. Include mapped locations of potential mosquito breeding wetlands on adjacent lands along with an indication of whether those wetlands will be treated. If treatment will not occur, the applicant should explain why.

c. Applicants will also submit a description of the types of pesticides proposed for use, application rates, and timing of applications on Department-owned lands.

6) The municipality or mosquito control district implementing treatment on Department-owned land will contact a representative of the Department prior to treatment with enough time to visit the site and to coordinate the appropriate signage and possible access closures to prevent unintended human exposures to insecticides and their residues.

7) The Department will not use agency resources to initiate or implement chemical or biological control of adult or juvenile mosquitoes on lands that it administers for the purpose of nuisance control or to reduce natural populations;

8) If surveillance does occur on Department-owned lands, the municipality's or mosquito control district's Public Health Officer should contact the Department whenever mosquito traps are deployed and/or a positive result is attained on Department land. The PHO should also provide a summary of surveillance activities and positive results (if any) after the WNV/EEE season.

9) The Department will encourage the investigation of the feasibility and appropriateness of other options to manage mosquito populations in both fresh and saltwater wetlands in the long term. These may include, but not be limited to, water-level manipulation that disrupts mosquito life cycles, including timing and rate of flood-up and drawdown of managed wetlands; vegetation management to discourage egg laying by mosquitoes; and restoring natural hydrological regimes in ditched salt marshes.

Adopted March 28, 2007

Table 1. Flight ranges of known pathogen carrying mosquito species in New Hampshire\*

<b>Mosquito Species</b>	<b>Flight Range</b>	<b>Bird or Mammal Biter</b>
<i>Aedes canadensis</i>	0-1/4 mile	Birds & Mammals
<i>Aedes cinereus</i>	1/4-1/2 mile	Mammals
<i>Aedes triseriatus</i>	1/2-1 mile	Mammals
<i>Aedes vexans</i>	1-5 miles	Mammals
<i>Coquillettidia perturbans</i>	1 to 5 miles	Mammals
<i>Culex pipiens</i>	1/4-1/2 mile	Birds & Mammals
<i>Culiseta morsitans</i>	1-5 miles	Birds
<i>Culiseta melanura</i>	1/2-1 miles	Birds
<i>Psorophora ferox</i>	1-2 miles	Mammals

\* Compiled by Rachel Stevens, NH Fish & Game Department, with input from UNH Dept of Zoology and review by NH Dept. of Health & Human Services.