2006 MOSQUITO ACTION PLAN (MAP)
Fire Island National Seashore

Reviewed By _____ Date 7/26/06
(Deputy Superintendent)

Approved By _____ **Date** 7/26/06
(Superintendent)

Introduction

Fire Island is a 32-mile long barrier beach approximately 1-5 miles south of Long Island. Fire Island National Seashore (FIIS) is located in the middle 26 miles of the island. The park has concurrent jurisdiction with New York State that encompasses 1,000 feet into the Atlantic Ocean and on average 4,000 feet into the Great South Bay including the islands adjacent to the bay shoreline. There are 17 communities within the boundaries of the park, 13 of which are within the West District. There are approximately 4,100 homes on Fire Island all within the park's boundary, including two incorporated villages, which have their own governing bodies. Of the 4,100 homes, approximately 350-500 of the residences are year round. Visitation on a peak season weekend day can be as high as 100,000 within the park areas and the communities combined.

Fire Island National Seashore (FIIS) has the responsibility to preserve the park's natural resources as well as to ensure protection of the health and safety of the public within its jurisdictional boundaries. Thus, it is a responsibility FIIS to monitor park mosquito populations, manage park natural processes, and assist in the protection of visitor and resident health. In 1985, based on research on mosquito dispersal, the park determined that the impact of mosquitoes in the federal wilderness area was minimal on nearby Long Island south shore communities.

In the late 1990s public, concern relating to Eastern Equine Encephalitis and West Nile Virus – both diseases related to mosquito populations – prompted the park to initiate a mosquito monitoring program. To further mitigate the possibility of a major incident and to ensure a quick and rational response should a mosquito-borne disease be found in this area, the park has developed the following Mosquito Action Plan (MAP).

FIRE ISLAND NATIONAL SEASHORE
WEST NILE VIRUS ACTION PLAN

PRE-SEASON PREPARATIONS

During this stage the park receives low to moderate visitation and mosquito activity is dormant to low. The primary goal of this stage is to prepare for the season ahead.

1. All Stage Three Incident (see below) Caches should be checked to ensure that personal protective equipment (PPE) is maintained or replaced from the previous year. Those employees that are incidental responders in the field will have access to Tyvek tick suits, head nets, gloves and insect repellant at each ranger station in the park (William Floyd Estate, Smith Point, Watch Hill, Sailors Haven, Lighthouse). These items are stored in locked, weather-resistant caches at each station. Caches will be checked and restocked as necessary. See Appendix D for equipment cache information.

2. All dead bird transport coolers (see below) should be checked to ensure that the equipment and protocols are maintained and current. Each ranger station in the park has a cooler with PPE and other items needed to collect and transport dead birds in accordance with state and federal guidelines.

3. Park employees should be informed of the preparations underway and educated about disease prevention including sanitation and personal protection. The education program in the park should be started at the first staff meeting of the New Year (just to remind everyone of what is on the way). Employees should know how the disease is transmitted, how to prevent breeding areas from forming around the workplace or at home, and how to protect themselves. All employees should also be taught to recognize the signs and symptoms of West Nile Virus (see appendix A).

4. All park areas should be checked to identify any potential artificial freshwater mosquito breeding areas. Work orders should be generated to clean up these areas. This should include evaluating park vehicle access roads (Burma Road, road to facilities, etc.). Those areas that have significant rutting that retain standing water longer then 2-3 days may need to be graded or filled. Sanitation actions should continue until October, when mosquito breeding activity ceases (see Appendix E).

5. Park Management Protocols, educational/outreach documents (mosquito brochure, web page, interpretive programs), and other brochures and handouts should be prepared and management plans finalized. Education should consist of brochures, interpretive programs, press releases or other means to inform the public.

6. Permit approvals for pesticide applications or other management interventions should be obtained and should include all possible regulated chemicals for mosquito management use. This is done in partnership with Suffolk County Vector Control. Permit applications are made to the National Park Service Integrated Pest Management coordinator for FIIS.

7. The Mosquito Action Plan (MAP) should be prepared in accordance with the Mosquito Surveillance and Management Protocol. This plan should include a protocol for handling dead birds and should be reviewed and approved by the MAP committee.
The 2006 MAP committee includes:
Jim Dunphy - Maintenance Foreman, Paula Valentine - Chief of Interpretation, and Fernando Villalba - Park Biologist.

8. Adult mosquito trapping sites and larval sampling sites should be chosen in consultation with park experts and scientists at the United States Geological Survey – Biological Research Division.

9. Arrangements should be made with Suffolk County Vector Control or other agencies for transport and testing of mosquitoes, dead birds, etc.

STAGE ONE – ACTIVE SURVEILLANCE AND EDUCATION

This stage begins in the summer when park visitation becomes moderate to high and mosquito activity is moderate to very high. The park will begin trapping mosquitoes and preparing pools of mosquitoes to be tested, in accordance with guidelines provided by the park's Mosquito Surveillance and Management Protocol. This will entail close work with Suffolk County Vector Control.

1. Education efforts by the park should be fully implemented. Interpretive programs, radio announcements and press releases should be used to educate staff and the general public. Park brochures, handouts, and other sources of information should be distributed to all the visitor centers and, where appropriate and workable, in Fire Island communities. Employees should be sufficiently knowledgeable to provide residents and visitors with accurate information (or know where they can get it). **However, it is critical that all employees realize that the Superintendent or his/her designee is the only one speaking to the media for the park.**

2. The protocol for handling dead birds should be distributed and promoted. Fire Island employees, residents and visitors should understand what to do if they find a dead bird.

3. Mosquitoes will be collected once a week from traps set out at the William Floyd Estate and from Smith Point to the Lighthouse. These mosquitoes will be transported live back to PMF, where they will be sorted into the main vector species and stored on dry ice until delivered to Suffolk County Vector Control. The number of traps and exact placement will be determined after consulting with USGS biologists and SCVC. Deadlines for delivery of mosquitoes to SCVC will be coordinated with that agency.

4. Dead birds will be collected in accordance with the park's protocol (see Appendix B).

STAGE TWO – DETECTION AND PUBLIC NOTIFICATION

This stage occurs when routine mosquito monitoring indicates a potential emergence of adult mosquitoes, or West Nile Virus or Eastern Equine Encephalitis has been detected in or within 2 miles of the park. Visitation is probably high and mosquito activity high to very high. The park will notify Suffolk County of a potential emergence. If disease is detected in or near the park, visitors will be notified, informed of the (realistic) potential for contracting disease and advised to use protection.

1. Field responders should be reminded of the resources available to them (e.g. equipment caches, etc.)

2. In the event that disease is detected, education efforts by the park should be intensified. More frequent interpretive talks, community outreach and active distribution of brochures or handouts by rangers are a few ways to do this. **Press releases should be generated** (see Appendix C).

3. In the event that disease is detected, the park will consult with the Centers for Disease Control (CDC), Suffolk County Vector Control, New York State Health Department, New York State Department of Environmental Conservation, USGS and other authorities. Together with these agencies, the park will decide on the best course of action to minimize the risk to human health, while considering the possible environmental impact of any action taken.

4. In the event that disease is detected, arrangements for pesticide use should be finalized. The park should work closely with Suffolk County Vector Control and any other involved parties to assure that, should the need arise; application of pesticides is done within the guidelines approved by NPS, CDC, EPA and DEC.

STAGE THREE – MOSQUITO MANAGEMENT

This stage will be triggered by the detection of disease in **more than one "pool" of mosquitoes** (a pool of mosquitoes is defined as a sample of 50) or by detection of disease in both mosquitoes and birds, or in increasing numbers of birds. Each incident will be dealt with on a case-by-case basis and the decision to advance to a Stage Three will ultimately be based on professional and technical judgment, in consultation with the Centers for Disease Control (CDC), Suffolk County Vector Control, New York State Health Department, New York State Department of Environmental Conservation, USGS (entomologist Dr. Howard S. Ginsberg). Mosquito management could take several forms: application of adulticide to the identification site, application of larvicide to breeding areas, and/or closing areas of the park to the public.

1. All of the actions listed above for Stage Two should be immediately implemented, if not already done.

2. The park's response will conform to the Suffolk County Unified Command (SCUC) structure and the NPS Incident Command System (ICS). Park headquarters will be the Command Center, with supply, public relations and administration functions.

3. The Superintendent/Incident Commander will close areas of the park as needed or appropriate. This may impact large areas of the park such as a marina or the William Floyd Estate, or just specific trails.

4. There should be a daily radio briefing to the staff as part of the incident command process. Public information efforts should be coordinated with the CDC and SCVC to prevent duplication of work and assure that information is consistent.

Debriefing Period:

This period will conclude a Stage Three of the MAP, after the above actions (1-4 of Stage Two and 1-4 of Stage Three) have been taken. The purpose of this period is to evaluate the effectiveness and efficiency of the overall response to the incident.

1. If Stage Three was reached, each response team leader, district ranger or other supervisor should hold discussions with his/her staff and be prepared to make a presentation to the Incident Commander and overhead no later than one pay period after the 1-4 of Stage Three have been completed. The Incident Commander and overhead team should be prepared to hold a supervisor's critique based on the above time line.

2. The superintendent will schedule an all-employee staff meeting no later than two pay periods after the Incident Commander concludes his/her critique.

3. The park management team should quickly evaluate current conditions and a return to the appropriate stage should begin immediately.

4. **If needed, the appropriate changes or additions should be made to the actions taken in Stage Three** in order to mitigate any unnecessary challenges experienced during the incident response.

POST- SEASON WRAP-UP

At this point public visitation is low and mosquito activity is low to dormant. The main purpose of this stage is to evaluate the past season and clean and store all equipment.

1. A final report will be written, detailing the results of the season's mosquito surveillance and management activities.

2. All monitoring equipment will be cleaned and put into safe storage.

APPENDIX A

QUESTIONS AND ANSWERS ON WEST NILE VIRUS/ENCEPHALITIS FOR EMPLOYEES AND VISITORS OF FIRE ISLAND NATIONAL SEASHORE

What is West Nile Encephalitis?
"Encephalitis" means an inflammation of the brain and can be caused by bacteria and viruses, including viruses transmitted by mosquitoes. West Nile Encephalitis is an infection of the brain caused by West Nile Virus (WNV), a virus commonly found in Africa, West Asia, and the Middle East. West Nile Virus is also found in southern Europe. It was found in the Western Hemisphere for the first time in 1999. It is closely related to St. Louis Encephalitis virus, also found in the United States.

How big a threat is West Nile Virus to the health and safety of NPS employees and visitors?
Since its introduction into the Western Hemisphere, West Nile Virus has proven to be most serious in the elderly and people who are already weakened by other ailments. Since 1999, when the virus first appeared in the Northeast, it has spread westward. The Centers for Disease Control reports that in 2005 WNV occurred in 42 states with 119 fatalities. There were 38 reported human cases and 4 deaths in New York State. There were 9 reported human cases in Suffolk County, NY but no fatalities. People most likely to develop serious symptoms are the elderly and those who are already ill. By using insect repellents when engaged in outside activities, the risk of contracting West Nile Virus can be greatly lowered. For maximum protection, a repellent containing 33% DEET is recommended. Follow the label directions carefully, especially when using DEET on children, for whom a lower % of DEET is recommended.

What is the basic transmission cycle for the West Nile virus?
Mosquitoes become infected when they feed on virus infected birds. After an incubation period infected mosquitoes can transmit West Nile virus to humans and or other animals. Disease symptoms do not develop in everyone that is bitten by an infected mosquito. People with compromised immune systems or elderly and physically weak or ill people are more likely to develop symptoms.

How long has West Nile virus been in the United States?
It is not known how long the virus has been in the U.S., but the Centers for Disease Control and Prevention (CDC) scientists first detected it in the eastern U.S. during the summer of 1999.

How do people get West Nile Virus?
Transmission comes through the bite of a mosquito (primarily the *Culex spp.*) that is infected with the West Nile Virus. The virus is located in the mosquito's salivary glands. The virus is not known to be transmitted by casual contact between people, but in a small number of cases it has been transmitted by blood transfusions, organ transplants, breastfeeding and even during pregnancy from mother to baby.

What are the symptoms of West Nile Virus?
Most people who are infected with WNV have no symptoms. Some experience flu-like symptoms including fever, headache, and body aches, often with skin rash and swollen lymph glands. In fewer cases, the infection may be more severe and may include headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, paralysis. Severe infection may lead to permanent neurological damage or death in the most extreme cases.

What is the treatment for West Nile Virus?
There is no specific treatment for West Nile Virus. Mild cases usually clear up on their own. In more severe cases, intensive supportive therapy is indicated including hospitalization, IV fluids and nutrition, and good nursing care. If you develop symptoms of severe WNV illness, such as unusually severe headaches or confusion, seek medical attention immediately.

Is there a vaccine against West Nile Virus?
There is no vaccine for the West Nile Virus at this time.

Can a person get West Nile Encephalitis directly from birds that might have the virus?
There is evidence that a person with a cut can get West Nile Encephalitis from handling live or dead birds that test positive for the virus. To be safe, always use gloves or double plastic bags to handle or remove dead birds.

Is a woman's pregnancy at risk if she gets West Nile encephalitis?
There is evidence that an infection caused by the West Nile virus can be transmitted to the unborn child of a pregnant woman. The Centers for Disease Control recommends that pregnant women avoid being bitten (stay away from mosquitoes and ask your doctor about the use of repellent).

Why doesn't Fire Island National Seashore spray for mosquitoes?
Fire Island National Seashore is by law required to protect the native wildlife, plants and other natural resources within its boundaries from environmental contamination. Modern insecticides, while safer for humans than their older counterparts, are often very toxic to fish and other forms of marine life.

Since 1999, Fire Island National Seashore, in cooperation with Suffolk County, and in consultation with New York State and the Centers for Disease Control, has conducted a mosquito surveillance program each summer to monitor mosquitoes on park lands for the presence of diseases that present a threat to humans, such as Eastern Equine Encephalitis and West Nile Virus. The program was designed by a leading entomologist from the University of Rhode Island.

Each week, mosquitoes are sent to Albany to be tested for disease. If mosquito-borne disease is found in the park, or within a few miles of park boundaries, the National Park Service will consult with the County, the CDC, New York State and with academic experts to decide whether or not to spray park lands to reduce the number of adult mosquitoes. Other control methods such as larviciding may also be implemented.

What role does the Centers for Disease Control and Prevention play in NPS mosquito management efforts?
The Centers for Disease Control and Prevention and other federal, state and local agencies will assist the National Park Service to determine the severity of the public health threat from mosquito-borne disease in Fire Island National Seashore, and to choose the appropriate course of action to protect the health of staff, residents and visitors.

What can park visitors or park employees do to prevent becoming infected with the West Nile virus?
No control method will eliminate *all* mosquitoes. For the individual, the very best form of protection is personal protection. Avoid areas with mosquitoes, but if you must be outside, wear protective clothing and use repellent.

- Long-sleeved shirts, long pants, a hat, and gloves can provide increased protection from mosquitoes. For extra protection, clothing can also be treated with an insecticide such as permethrin.
- The use of an insect repellent on exposed skin will reduce your chances of being bitten by mosquitoes. A repellent with 20% to 30% DEET (N,N-diethyl-meta-toluamide) as the active ingredient works the best.
- The combination of permethrin-treated clothing and a DEET-based repellent on exposed skin will provide for maximum personal protection.
- The use of a head net and mesh jacket can also provide added protection and needed ventilation on warm days.

Where can I get more information on West Nile Virus and other mosquito borne diseases?
Check on the web at http://www.cdc.gov/ncidod/dvbid/westnile/index.htm or call your local public health office.

2006 PROTOCOL FOR COLLECTING DEAD BIRDS ON FIRE ISLAND NATIONAL SEASHORE

The Start Date for Dead Bird collection and the Dead Bird Hot Line in 2006 will be June 5th

The National Park Service, Fire Island National Seashore (NPS-FIIS) will work with the New York State Department of Environmental Conservation (DEC), Suffolk County Health Department and Suffolk County Vector Control (SCVC) to collect and transport bird carcasses. This will be done in accordance with guidelines developed by the U.S. Fish and Wildlife Service, the Centers for Disease Control, New York State and the Suffolk County Health Department.

For viral testing, the DEC definition of an acceptable bird carcass for collection and transportation is:

- The bird is a **crow**, a **raven**, a **blue jay**, a **raptor** (osprey, eagle, hawk, vulture, or falcon) or a **robin*.**
- The collector believes it **died within the past 18-24 hours** (the carcass is fresh, not bloated, infested or decayed).
- The collector believes **it did not die of routine natural causes or due to an accident**.

* Although not listed as a DEC-defined "acceptable bird carcass," recent research suggests that **robins** may also be a primary reservoir of WNV. Therefore, if found dead it should also be reported, treated and handled similar to the birds indicated above.

EVERY EFFORT SHOULD BE MADE TO COLLECT AND TRANSPORT CARCASSES TO THE PATCHOGUE MAINTENANCE FACILITY WITHIN A FEW HOURS SO THAT THE 24-HOUR PERIOD IS NOT PASSED.

List of dead-bird drop off locations on Fire Island National Seashore:

Lighthouse Annex (checkpoint)
Talisman
Sailors Haven
Watch Hill
Wilderness Visitor Center (Smith Point)

Rules for reporting, handling and transporting dead birds:

1. Safety first and foremost – **DO NOT TOUCH THE CARCASS WITH YOUR BARE HANDS!**

2. IF A RESIDENT OR VISITOR FOUND THE BIRD THEY SHOULD **CALL THE SUFFOLK COUNTY DEAD BIRD HOTLINE IMMEDIATELY TO REPORT IT: (631) 853-8405, 9:00 AM to 4:30PM. The resident or visitor should then try contacting a FIIS field staff member.** Staff should explain to visitors and residents that Suffolk County needs to assign a number to the specimen and to record time and date and

a few details about the bird. The person who found the bird would know these details best. The time and location (as specific as possible) should be recorded.

3. Staff should contact Mosquito Monitoring Program coordinator, the Park Biologist (radio call # 410, office # 4769). If a negative contact is made, the same effort should be made to contact the Chief of Natural Resource Management (radio call # 400, office # 4760) or the Wildlife Biologist (radio call # 450, office # 4768) in this order. Calling HQ at 631-289-4810 will be the last resort. The first staff contacted will become the Point of Contact (POC) between FIIS and SCHD.

4. If the SCHD has not been notified of the dead bird, the POC should first call the Suffolk County Dead Bird Hotline (above). The logistics of getting the dead bird into the possession of SCHD personnel should be worked out. SCHD will be expecting to pick up the bird from the mosquito lab at PMF-B (166 West Ave.). The first resort should be to have a FIIS field staff transport the bird in a Park vessel. However, if this is not feasible, the bird can be transported over in a ferry. In this case, the POC should meet the ferry at the terminal for pick-up and transport to the mosquito lab. The POC should then escort the SCHD personnel into the lab for pick up.

5. Whenever possible, carcass collection and handling should be done by those staff on the FIIS Dead Bird Collection List (see list below).

6. Collecting equipment will be found in the dead bird collection-and-transport coolers located at all ranger stations or visitor centers (Lighthouse Annex, Sailors Haven, Watch Hill, Smith Point –Wilderness Visitor Center, William Floyd Estate) and at Talisman. In the coolers will be large plastic bags, rubber gloves and specimen tags. THE TAGS ARE TO BE COMPLETED BY THE CARCASS COLLECTOR.

7. Collectors should wear rubber gloves (found in cooler).

8. The carcass is collected by inverting a plastic zip-locking bag (found in cooler), grasping the bird, then pull the bird into the bag.

9. Once the bag with the bird is sealed, place it inside another plastic zip-locking bag with a tag containing the following information:

   - Where the bird was found
   - Date and time the bird was found
   - Collector's name
   - Best estimate of what species it is (e.g. *Cyanocitta cristata*) and the common name (e.g. Blue Jay).

10. Place the bagged carcass in the dead bird transportation cooler with two or three blue ice packs (found in ranger/visitor station freezer). **DO NOT FREEZE THE BIRD.**

11. Remove the rubber gloves by turning one inside out, holding it with the other glove then turning that one inside out also. PLACE THE GLOVES IN THE COOLER.

12. Close the cooler securely and transport to the Patchogue Maintenance Facility (PMF) as quickly as possible by whatever means is available. At PMF B there will be a large light gray dry ice cooler in the mosquito lab (in the corridor between the shop and the lunchroom). The cooler will be marked "DEAD BIRDS IN HERE." and is situated on a refrigerator in the back of the lab. Place two or three blue ice packs, found in the freezer compartment of this refrigerator, into this cooler until dry ice can be obtained. Place the bird in the cooler and close securely. The bird will be transported to SCVC with the next shipment of mosquitoes. The park has arranged with SCVC to keep dead birds on dry ice until delivered (dry ice will preserve the integrity of the virus, if any is present, but regular freezing will not).

13. Remove the used gloves from the transportation cooler and discard them into the box marked "USED LATEX GLOVES." There will be a supply of fresh rubber gloves and plastic bags marked "for dead birds" by PMF dead bird cooler. **Replace the plastic bag and rubber gloves you used** with clean ones. **Return the dead bird cooler to the ranger station/visitor center it came from and make sure the blue ice packs go back into the freezer at the ranger station/visitor center**.

Below is a list of personnel recommended and authorized to remove dead birds for viral testing from the park:

<u>Park Staff on Dead Bird Collection List (in alphabetical order):</u>

Michael Bilecki	Jay Lippert
Paul Czachor	Irene Rosen
Steve Czarniecki	Ralph Tramontano
Jim Dunphy	Paula Valentine
Bernie Felix	Wayne Valentine
Steve Henderson	Fernando Villalba
Joe Heinrich	

FIRE ISLAND

National Seashore
New York

National Park Service
U.S. Department of the Interior

If you find a dead bird on Fire Island. . .

. . . and you think it died of illness within the last 18-24 hours, call:

Suffolk County Health Department
West Nile Virus Hotline
631-853-8405
Monday through Friday
9:00 a.m. - 4:30 p.m.

For further information on the park's mosquito and avian flu monitoring program, call:

631-687-4769 or 687-4760

NYS Department of Environmental Conservation

SUFFOLK COUNTY SEAL NEW YORK

FIRE ISLAND NATIONAL SEASHORE

Fire Island National Seashore - 120 Laurel St. - Patchogue, NY 11772 - 631-289-4810 - www.nps.gov/fiis

APPENDIX C

DRAFT PRESS RELEASE

Date

West Nile Virus Found on Fire Island

Fire Island National Seashore Superintendent Michael Reynolds announced today that West Nile Virus-infected mosquitoes/birds have been found on Fire Island. The bird was found by _____ at _____. The mosquitoes were from a trap set by_____ (Suffolk County/the park as part of its weekly monitoring program). Testing was done by _____ (currently NY State Department of Health, Arthropod-Borne Disease Program, Albany).

The National Park Service will be working closely with the Centers for Disease Control (CDC), the New York State Department of Environmental Conservation (DEC), Suffolk County Vector Control, and local Fire Island and Long Island municipalities to determine the best course of action to protect residents, visitors and employees of the Seashore. Actions to protect the public may include control methods such as larviciding or spraying. The public will be notified 24 hours in advance of any spray event.

The park is also conducting continued surveillance to monitor the severity and extent of West Nile Virus in the Seashore.

Residents, visitors and staff are advised to avoid mosquito-infested areas. If contact with mosquitoes is unavoidable, it is advisable to wear protective clothing and use an effective insect repellent, such as one containing at least 30% DEET. People most at risk of becoming ill from West Nile Virus are those over 50 years of age or whose health is impaired. Such people are advised to stay away from areas with mosquitoes.

For general information on West Nile Virus, please contact your local health department. Information can also be obtained from the CDC, New York State or Suffolk County WNV web sites, or one of the park visitor centers. If you have information or questions for the park, please contact our headquarters at (631) 289-4810.

APPENDIX D

CHECK LIST FOR MAP EQUIPMENT CACHES

Each ranger station at Fire Island National Seashore has Stage Three Personal Protective Equipment (PPE) stored in a clearly labeled black box. Each station also has a cooler for transporting dead birds. Boxes and coolers should be kept in an area with other protective equipment. **They should be inspected periodically by District Rangers** and the black PPE boxes should be kept locked. The key should be clearly marked and in an obvious, easily accessible location (such as a key box). Caches will be available to all staff involved in implementing MAP protocols. Caches are available at:

West District Ranger Station - Full cache (Jay Lippert)
Sailors Haven Ranger Station/Shop - Full cache (Jay Lippert)
Talisman Shop - Half cache (Jay Lippert)
Watch Hill Ranger Station/Shop- Full cache (Paul Czachor)
Wilderness Visitor Center- Half cache (Paul Czachor)
William Floyd Estate- Half cache (Steve Czarniecki)
Patchogue Maintenance Facility- Full cache (Fernando Villalba)

The following is the list of items in a full cache:

Stage Three PPE Black Box:

- 8 hoop style head nets
- 8 net style bug jackets
- 12 pr. leather gloves (3M, 6L, 3 XL; half cache: 2M, 3L, 2XL)
- 12 paper suits
- repellant (7 cans):
  - 3 - DEET 15% (2 for half cache)
  - 2 - DEET free
  - 2 - Permethrin
- 4 “After Bite” pens
- one copy of the Mosquito Action Plan

Dead Bird Coolers:

- 12 large plastic bags
- six pairs of rubber gloves
- 6 - 12 bird carcass identification tags
- three blue plastic ice packs (to be placed in site area freezer from June 1 through September 15)

Additional PPE equipment is stored at PMF B in the Resource Management storage room, second floor.

APPENDIX E

REDUCTION OF ARTIFICIAL FRESHWATER MOSQUITO BREEDING HABITAT ON PARK LANDS

As stated in the Mosquito Surveillance and Management Protocol, Fire Island National Seashore will conduct a sanitation program to remove or reduce artificial larval habitat for the West Nile Virus vector, *Culex spp.* Such habitat is characterized by the presence of stagnant, dirty, fresh water. Fresh water that is present and undisturbed for 4 days or more and that contains a moderate to large quantity of organic matter (decaying vegetation; animal droppings; garbage of any kind; pollution or runoff from gardens, livestock holding pens, or other sources) is prime habitat for *Culex*. Following are suggestions from state and federal agencies in NY, NJ and elsewhere for where to look for *Culex* larval habitat and mechanical remedies to reduce the attractiveness of these areas to mosquitoes.

Underground Septic Tanks

Mosquitoes can enter through covers that don't fit properly, through cracks in the ground, or through vent pipes, and produce offspring in large numbers. Covers should be altered so that they fit adequately, cracks should be filled, and all vents should be covered with screening, preferably aluminum, to prevent the entry of females ready to lay eggs.

Crawl Spaces under Buildings

Garbage bags, tin cans or other open containers may collect water. Refuse may attract vermin whose droppings will make the area even more enticing to *Culex*. Trash or garbage of any kind should be removed.

Containment Areas for Livestock

Pens should be examined for permanent or semi-permanent puddles, or low, outlying areas of standing water that receive runoff. Steps should be taken to reduce the amount of runoff and fill in the puddles. Disposal of animal wastes should be done in an area with drainage sufficient to prevent the accumulation of rainwater.

Garbage Dumps

Areas should be examined for the presence of standing fresh water (in cans or can covers, trash bags, old buckets, under or beside storage sheds). Containers should be overturned or adequately covered and puddles filled in.

Gas Tanks

Area should be examined for the presence of refuse, standing fresh water or containers able to collect standing water. Refuse should be removed, puddles filled, and containers covered or overturned.

Clogged Ditches or Drains

Remove source of clog and check routinely.

Garbage Cans, Recycle Bins and Other Containers

Holes should be punched in the bottoms (not the sides) of plastic garbage or recycling bins to prevent them from holding water. All areas with significant human impact should be examined for forgotten or discarded containers (flower pots, tin cans, buckets, etc.) that may fill with fresh water and provide breeding habitat. Containers should be discarded, covered or overturned.

Tire ruts on roads

Tire ruts can prove to be significant breeding ground for freshwater mosquitoes. The ruts should be filled and the road graded to improve drainage.

Note: **If potential breeding sites are found that are not easy to remedy by the means outlined above, the location and a brief description of the area should be given to the park biologist in charge of mosquito management. If it is determined that an artificial breeding site can not be feasibly removed, larviciding at this site should be considered, in the consultation with the regional IPM coordinator and USGS entomologist from the University of Rhode Island, Howard S. Ginsberg.**