North Carolina Emergency Management Agency
Federal Emergency Management Agency Region IV
Mosquito Abatement Fact Sheet

Please review the following guidelines for reimbursement of mosquito abatement costs you may incur as a result of a disaster. The North Carolina Emergency Management Agency (NCEMA) and the Federal Emergency Management Agency (FEMA) are providing this information early in an effort to maximize applicant opportunities for federal reimbursement of eligible mosquito abatement activities following a Presidential Declaration. Take the necessary actions to prevent a health and safety threat as soon as possible, but know the rules for reimbursement.

1. **The Public Assistance Program and Policy Guide (FP 104-009-2/January 2016, page 70)** states:

   a. Mosquito Abatement measures may be eligible for PA Program assistance in the disaster area as emergency protective measures when there is a serious health hazard. FEMA may provide reimbursement for such costs at the written request of the State or local public health officials. Verification of the threat by medical facilities within the affected area is required.

   b. FEMA may reimburse short-term abatement costs that are in excess of usual costs. The eligible costs are calculated by comparing the disaster-related costs to the most recent three non-disaster years of expenses for the same period.

2. **Eligibility Requirements**

   You must be an Eligible Applicant as defined in the Public Assistance Program Policy Guide (page 9) and have the legal responsibility (page 20) to perform mosquito abatement. http://www.fema.gov/public-assistance-policy-and-guidance. The FEMA mosquito abatement guidance may be found in Appendix G.

3. **Procedure and Documentation Requirements**

   a. **Before spraying**, collect trap data or landing rates (for adulticide use) or dip data (for larvicide use) to verify the hazard.

   b. **Before spraying**, contact FEMA EHP Point of Contact (#5 below) to identify spray exclusions areas due to the presence of endangered or threatened or critical habitat.

   c. Obtain a letter from the county health department indicating the presence of a serious health threat or a mosquito nuisance that is severely hampering the recovery effort.

   d. Follow manufacturer's label on EPA-approved chemicals for mosquito abatement by certified employees. The pesticide also must be registered in NC by the NC Department of Agriculture & Consumer Services (NCDA&CS). Provide documentation of the chemical, application method and concentration used.

   e. For aerial spraying, check with NCDA&CS Pesticide section to make sure the plane and pilot are in compliance with rules and regulations of the NC Pesticide Law.

   f. Provide spray or larvicide area maps detailing the zones affected/treated.

   g. Provide date(s) of application.

4. **Do not delay**

   a. Start collecting data as soon as a potential threat is identified to establish a baseline trap, landing rate, or dip count. Data is only valid for a period of two weeks.

   b. Counties or communities that do not have a mosquito abatement program may request technical assistance with surveillance and personal protective measures from the North Carolina Division of Public Health by viewing http://epi.publichealth.nc.gov/cd/diseases/arbo.html or contact Carl Williams at 919-733-0391 or carl.williams@dhhs.nc.gov.

5. **Point of Contact**

   For more information, please contact FEMA-R4EHP@fema.dhs.gov and cc Chelsea Klein at Chelsea.Klein@fema.dhs.gov

Updated 10/04/2016

Mosquito Landing Rate Instructions

North Carolina Department of Health and Human Services
Revised 10-14-16

The Landing Rate Count (LRC) is a measurement of the density of adult nuisance mosquitoes landing on a person over a short period of time (i.e., 1 minute).

It is used as a simple method determining if, when, and where adult mosquito control efforts (e.g., backpack spraying, Truck ULV, Aerial ULV) should occur, and as a measure of effectiveness after the treatments have occurred. The counts are best used to complement trapping and identifying mosquitoes to species (e.g., CDC light traps, NJ light traps, BG traps) but can be used on their own during emergency situations such as hurricanes.

Methods of conducting LRCs vary from place to place, but for the purpose of reporting LRC data in North Carolina to FEMA, please use the following method for the counting and information reporting. If you use a different method, please note the differences on the paperwork.

RECOMMENDED LRC METHOD:

1. Walk into the harborage site where you intend to count (i.e., shrubby area where mosquitoes normally hide)

2. Disturb the vegetation as you are walking in, and just before starting

3. Wait a minute or two before starting counting in order to allow mosquitoes to sense your presence

4. Stand, keep still, and keep your arms out away from your body (This minimizes the effect of repellent if there is any on your arms, and does not stir up air around your legs)

5. Count all mosquitoes landing on the front of your legs from your ankles to your belt – easy to see and count

6. Count for a <1 to 5 minute period.
    a. Use 5 minutes if mosquito numbers are low (i.e., 1- 5 per minute)
    b. Use 1 minute if mosquito numbers are high (i.e., 5 to 50+ per minute)
    c. If the counts are very high (100 or more landings per minute), you can stop at 20 or 30 seconds, then multiple the count to get the # per minute.

7. After leaving, record the:
    a. COUNTY
    b. LOCATION OF COUNT (address or name on a map)
    c. DATE
    d. TIME
    e. # OF MINUTES (or SECONDS) used to count
    f. # OF LANDINGS PER MINUTE.
    g. WEATHER CONDITIONS (e.g., Cloudy, Sunny, Raining, Foggy, Dawn, Dusk, Dark)
    h. NOTES (Other factors that may affect the counts, such as use of repellents)

COUNTING NOTES:

- DO NOT report "100+" An actual number (e.g, estimate of of 120, 150, or 200) is needed to calculate averages. If needed, shorten the time period counting to 20 or 30 seconds to get a better estimate.
- To the extent possible, the Counter should only count the mosquito once
- Do not slap at the mosquitoes – this will stir them up and make counting harder
- If work is conducted after sunset, the light source should have a red filter. Red light is less repelling than white light.

TIMING:

Do LRCs at these intervals:

1. **Prior to a storm** (when possible) to measure "normal" mosquito population densities at that time of year
2. **Immediately after a storm** (when possible) to measure populations before the storm-generated mosquitoes have emerged from the water
3. **After mosquitoes emerge from floodwater** (REQUIRED) starting approximately one week after the storm, to measure adult populations caused by the storm
4. **Before each spray event** (REQUIRED) to document exceptional mosquito biting pressure
5. **After each spray event** (OPTIONAL) to measure how effective the spray effort was in reducing adult mosquito populations, and as a Pre-count for future sprays, if needed.

COUNTERS:

- The people doing the counting can by any staff or volunteers recruited by the County or municipality
- Road crews, Maintenance crews, Police/Fireman, Parks Crews, Disaster Relief crews or anyone else already outside can be recruited as long as they can perform and report the information correctly.

CLOTHING AND REPELLENTS:

- Long sleeves, long pants, lightweight gloves, and a mosquito headnet are encouraged to minimize chances of being bitten
- Wear solid color clothing whenever possible. Mosquitoes are more easily seen on solid vs. patterned background clothes.
- It is best to use no repellents until after counting is completed. If use of repellents is unavoidable, limit it to exposed skin, and definitely not on pants.
- No permethrin-impregnated clothing should be worn during the counts
- If there is known transmission of mosquito diseases in your area at the time of LRC collection, use a CDC-recommended repellent as directed.

TIME OF DAY and WEATHER:

- Counts in the early morning or just before sundown are best because the highest mosquito activity occurs then, and it's light enough to count. Counts between 10am and 3pm are likely to be lower than normal. If mid-day is the only time available to count, please note it in the paperwork.

- A convenient time to do LRCs is ideally at the start of the work shift because the Counter can put mosquito repellent on immediately after finishing counts. However, any time of day or night is acceptable. Be sure to note the time of day in the paperwork.
- LRCs are recommended when wind speeds are > 5 MPH at the collecting site, if possible.
- Record any unusual circumstances such as high winds, rain, fog, cloudy day, or anything else that might increase or decrease biting, etc.

LOCATIONS:

- Choose as many LRC stations as possible, but at least 4-5 for every proposed spray area is recommended (e.g., If there are 3 proposed spray blocks in the County, then at least 12-15 counts should be done each day)
- Collections should be conducted in areas where there are mosquito resting sites (e.g, shrubby vegetation) and not be conducted in open areas (e.g., parking lots, open fields)
- Places with landmarks or street addresses are recommended for easy locating on maps by State or FEMA personnel (e.g., near parks, intersections, bridges, ballfields, ends of roads, schools, or other areas easily seen on aerial maps)

HOW TO REPORT LOCATIONS:

- The LOCATION of counts must include either:
    - A computer file (e.g., Google Earth KML file, or ArcView SHP files) OR
    - A List of GPS points (lat. and long.) and a name of each location, OR
    - A scanned or faxed paper map showing the LOCATIONS and their names along with the paperwork
- Assistance with mapping the LRC locations prior to submission to FEMA is available from Michael Doyle, State Public Health Entomologist, at Michael.doyle@dhhs.nc.gov
- When requesting FEMA reimbursement, report the information by email to your County EOC.

Your County's Vector Control/Public Health Dept.
Address
Phone

October __, 2016

Michael Sprayberry
Director
North Carolina Division of Emergency Management
1636 Gold Star Drive
4236 Mail Service Center
Raleigh, NC 27607-3371

Dear Mr. Sprayberry:

Since the flood event that caused so much devastation in North Carolina, there has been a rapid and significant increase in the mosquito population in _____ County.

An increase in mosquito populations could have an adverse impact on public health, safety and quality of life by significantly hampering or delaying recovery and reconstruction efforts. There will also be concerns regarding increases in the populations of certain mosquitoes that could pose a risk for transmission of diseases such as Eastern Equine Encephalitis and West Nile Virus.

A large population of biting mosquitoes can pose an immediate threat to public health even when evidence of vector-borne diseases is not present or significant in the disaster affected area. Of particular concern are the following:

1. An extraordinary or unusual number of biting mosquitoes that can seriously impede response efforts. Workers that are required to work out-of-doors (i.e., debris removal operations, protection of damaged structures, restoration of power and telephone service, etc.) can often be significantly hampered in their work.
2. Housing may be compromised due to extended power outages (i.e., windows and doors are opened), which could increase the general public's exposure to mosquitoes. This could in turn result in secondary infections, especially among those with weakened immune systems such as the elderly, the very young, or the sick.

No prior seasons compare to what is occurring in _____ County at this time. Please see the following data comparing October of 2012 – 2015to the current October 2016:

- Over the past 3 years, requests to spray for mosquitoes in our county averages _____. So far this month we have already received well over _____ requests.
- The average rainfall received at (nearby weather station, airport, etc.) for October is ____".Since October 1, we have received _____" of rain.
- The highest number of female mosquitoes captured in a (type of) trap on a single night in October was in 201_ at ___. Since October 1, our highest single trap in one night is ___.This does not provide a good representation of the presence of *Psorophora* species overall since they are not as attracted to the light traps.
- We (do or do not) track landing rate counts (LRC), Our landing rate counts before the mosquito hatch-off from the flooding was _____ , whereas our tests now indicate they are at least ____ per minute.
- We (do or do not) identify mosquito species using type of traps, which show _____species of mosquitos.
- Local hospitals/clinics have reported an increased rate of _____(reports of allergic reactions to severe biting, secondary skin infections from biting, other mosquito-related health issues)

- The County EOC office reports severe/increased/moderate difficulty in performing response and clean-up efforts due to the high density of mosquitoes which emerged after Hurricane Matthew.

- Lastly, the cost for pesticide usage (larvicides & adulticides) for the past 3 year average is $_____ compared to the pesticide use so far this month which is approximately $_____. These costs (do/do not) include labor costs required to disperse the products, if it does not, please include total labors here.
  Include cost information from pre-2011 if you last sprayed then **Use typical spray costs for October if that is more relevant to your County – Or mention costs for a neighboring County which sprays regularly to give FEMA a sense of what is normal for the area**

The above information provides evidence of _____ (higher levels of disease carrying mosquitos, increased risk of infection to emergency workers and/or the general public, safety of clean up workers, risk of secondary bite infections or allergic reactions from severe bite numbers).

In order to abate the threat to public health posed by the increased mosquito population _____ County, which covers approximately _____ acres, will use _____ (aerial, ground spraying, etc) method to eliminate the threat to public safety posed by the increased mosquito population. We estimate this to cost will be approximately $_____ based on _____ preliminary estimate of acreage to be sprayed. The product(s) we plan to use are _____ or _____(adulticide name) using Truck ULV, and _____ or _____ (adulticide name) using Aerial ULV.

Sincerely,

Your Name
Your Title