

## PROGRAM ACTIVITY REPORT (PAR)



## Mosquito Collection Activities

A number of mosquito-borne diseases exist in the United States that can threaten human and domestic animal health. Many of these diseases, such as Eastern equine encephalitis virus, are native, but others have been introduced, including West Nile virus. The recent resurgence in West Nile virus cases in regions of the United States during 2012, along with the recent discovery of mosquito-borne Chikungunya virus in the Western Hemisphere, underscore the importance of understanding the mosquito vectors involved in these complex transmission cycles. These diseases require knowledge of all three players -- vector, host, and pathogen - - in order to better understand when and where outbreaks could occur.

In an effort to gain insight into mosquito populations and their origins across a wide geographic area, disease biologists with the NWDP recently assisted scientists at the Agricultural Research Service (ARS) in mosquito collection activities. The two mosquito species targeted for collection were *Culex tarsalis* and *Aedes vexans*. Both species are known disease vectors and



A CDC light trap used for insect collections.



*Culex tarsalis*, photo courtesy of the CDC.

*C. tarsalis* is often considered the most important mosquito vector in the United States because of its role in the

transmission of numerous pathogens. Disease biologists collected mosquitoes using a variety of methods, including light trap collection over multiple trap nights. Adult mosquitoes were sorted and identified to species, or they were sent to ARS for identification.

Genetic analyses and preliminary phylogenetic trees conducted by ARS on mosquito pools collected to-date have revealed that there are discrete *C. tarsalis* populations. Future work will attempt to detail the genetic structure that exists within these populations. This ongoing effort is unprecedented in the geographic range it covers and the resulting data are revealing the population structure of medically important mosquito species. These insights are helping to inform current disease risk and will also provide information on future disease risks that may arise in association with changing climates. Data on mosquito sources and migration may also be useful for mosquito control planning efforts. For

more information, contact Sarah Bevins, [Sarah.N.Bevins@aphis.usda.gov](mailto:Sarah.N.Bevins@aphis.usda.gov).

The original artwork on this page was created by the National Wildlife Disease Program's Erika Kampe and Sarah Goff