

Integrated Pest Management Program

LOB #293:

DISEASE-CARRYING INSECTS PROGRAM

Purpose

The Health Department's Environmental Health Program utilizes an Integrated Pest Management (IPM) approach and performs vector surveillance activities, control, outreach and education to the public about how to protect against disease carrying insects and vector-borne disease specific to mosquitoes and ticks.

Description

Disease Carrying Insects Program (DCIP)

In order to address the presence of emerging diseases, the County established a multi-agency mosquito surveillance and management committee, and the Health Department secured contract services in 2002 to carry out specialized activities in mosquito surveillance and control. The Health Department also focuses on heightening awareness of tick and tick-borne diseases. Lyme disease is a bacterial infection transmitted to man by the bite of an infected black-legged (deer) tick. Currently the program consists of three major components: surveillance, control, and outreach.

Mosquito surveillance and control activities help protect the public by identifying aquatic habitats that support the development of mosquitoes and, when indicated, treating those habitats with a larvicide. Storm drain and other larvicide treatments are carried out by a contractor. Since the 2004 mosquito surveillance activities have been performed by Health Department staff. Contracted services have been retained for the labor-intensive preemptive control activities that require a significant fleet of vehicles and specialized equipment. The County continues to proactively treat the storm water catch basins in an effort to reduce the population of *Culex* mosquitoes that transmit West Nile virus (WNV). Catch basins are treated from May through October to ensure the aggressive suppression of the WNV vector. Inspection and larviciding activities are carried out in targeted areas of the County identified as significant mosquito breeding areas.

The outreach and education component of the WNV program is aimed at increasing residents' awareness of actions that can be taken for personal protection and reduction of potential mosquito breeding areas on private property. The program produces and distributes outreach material in English, Korean, and Spanish. Outreach and education activities are conducted by Health Department staff with education and experience in the field of Environmental Health.

A countywide tax levy financially supports Fund 40080 activities and this levy is subject to change annually due to funding requirements based on the level of infestation. Since FY 2001, the Board of Supervisors-approved tax rate has been \$0.001 per \$100 assessed value and has provided support for both the Forest Pest and the Disease-Carrying Insects Programs.

Benefits

Environmental Health programs are essential to the protection, improvement, and preservation of public health. A strong surveillance program provides information about the local mosquito vector populations and testing for pathogens like West Nile virus provides information about the presence of pathogens in these populations. This information can be utilized for a variety of public health actions. Vector-borne diseases are preventable and one of the most effective ways prevent them is through the use of personal protective measures which help prevent bites. Education and outreach activities provide opportunities to relay these messages to county residents and to promote healthy behaviors that protect and improve quality of life in the community.

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Mandates

This Line of Business is not mandated.

Trends and Challenges

Mosquito vector abundance and annual West Nile virus (WNV) activity are not easily predictable and vary from year-to-year. Long- and short-term environmental conditions as well as timing and availability of susceptible reservoir populations during mosquito season can impact both mosquito and WNV activity. Rainfall can present challenges for control activities and also impacts mosquito abundance.

Chikungunya virus (CHIKV) is a mosquito-borne disease transmitted from person-to-person by the yellow fever mosquito (*Aedes aegypti*) or the Asian tiger mosquito (*Aedes albopictus*). It was first discovered during a small outbreak in east Africa in 1953, but several outbreaks have been reported since 2004 in Africa, Asia, Europe, and islands in the Indian and Pacific Oceans. An epidemic of locally transmitted CHIKV was detected in the Caribbean beginning in December 2013, and is ongoing. This is the first time this virus has been transmitted in the western hemisphere, with more than 1.625 million probable cases reported to date from the Americas. As of September 2015, the Centers for Disease Control and Prevention (CDC) has reported 294 imported cases of CHIKV this year in the U.S. from travelers returning from areas of active transmission. In CY 2015, there has been no local transmission of CHIKV in the United States. If there are locally acquired cases of CHIKV in the County, the Health Department will utilize the guidance document "Preparedness and Response for Chikungunya Virus Introduction in the Americas" published by the CDC and Pan American Health Organization (PAHO). A brochure about CHIKV is currently under development.

The Zika virus, which is transmitted by same mosquitoes that transmit CHIKV, began circulating in South and Central America in 2015. The virus was originally identified in Africa in 1947; outbreaks previously been reported in Africa, Southeast Asia, and the Pacific Islands. Locally-acquired cases have been reported from at least nine countries in Central and South America. The CDC reports that cases have been reported in returning travelers but the virus is not currently found in the United States.

The development, implementation, refinement, and evaluation of action thresholds are key components of IPM. Mosquito and WNV activity, as well as human WNV disease, provide information that can help trigger various public health actions. Quick turn-around of mosquito samples and subsequent testing for WNV and timely follow-ups on possible human cases of WNV are all important for this process.

Warmer temperatures and greater rainfall create the ideal conditions for the spread of vector-borne diseases. Research finds that as temperature and rainfall change, vectors such as ticks and mosquitoes are able to expand their territories and introduce disease risks to new regions. The chance for the introduction of vector-borne diseases and/or vectors into our area is real given the global nature of travel today. It is important to protect public health, be able to identify, adjust, and adapt to these new challenges if they should appear by maintaining surveillance and control capabilities, technical knowledge and expertise, and a strong outreach and educational component.

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Resources

Category	FY 2014 Actual	FY 2015 Actual	FY 2016 Adopted
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FUNDING			
Expenditures:			
Compensation	\$332,929	\$379,590	\$559,393
Benefits	113,309	133,797	149,478
Operating Expenses	656,455	674,004	1,328,442
Total Expenditures	\$1,102,693	\$1,187,391	\$2,037,313
Transfers Out:			
Transfer Out to General Fund	\$72,961	\$72,961	\$74,547
Total Transfers Out	\$72,961	\$72,961	\$74,547
Total Revenue	\$1,161,087	\$1,279,334	\$1,441,663
POSITIONS			
Authorized Positions/Full-Time Equivalents (FTEs)			
Positions:			
Regular	5 / 5	5 / 5	5 / 5
Total Positions	5 / 5	5 / 5	5 / 5

Metrics

Metric Indicator	FY 2013 Actual	FY 2014 Actual	FY 2015 Actual	FY 2016 Estimate	FY 2017 Estimate
Mosquito larvicide treatments of storm drains to control West Nile virus	101,013	103,661	76,377	105,000	105,000
Disease-carrying insects program cost per capita	\$1.10	\$1.02	\$1.07	\$1.79	\$1.80
Percent of targeted storm drain areas treated with mosquito larvicide within the scheduled timeframe	91%	94%	70%	100%	100%
Confirmed human cases of West Nile virus in Fairfax County, Fairfax City, and Falls Church City as reported by the Virginia Department of Health	8	3	1	1	1

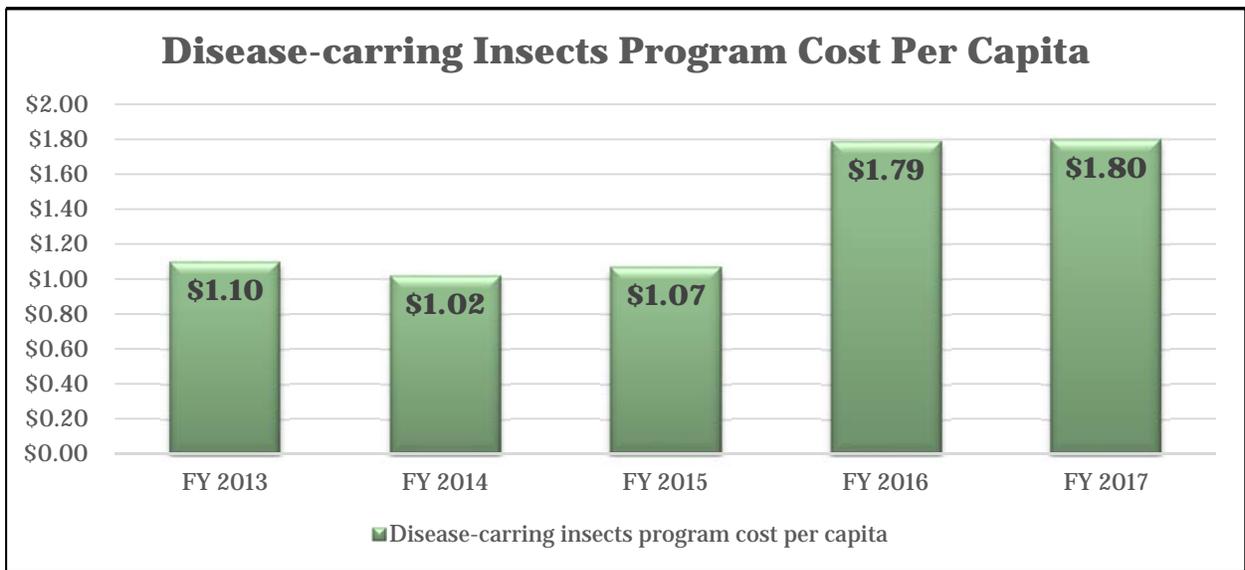
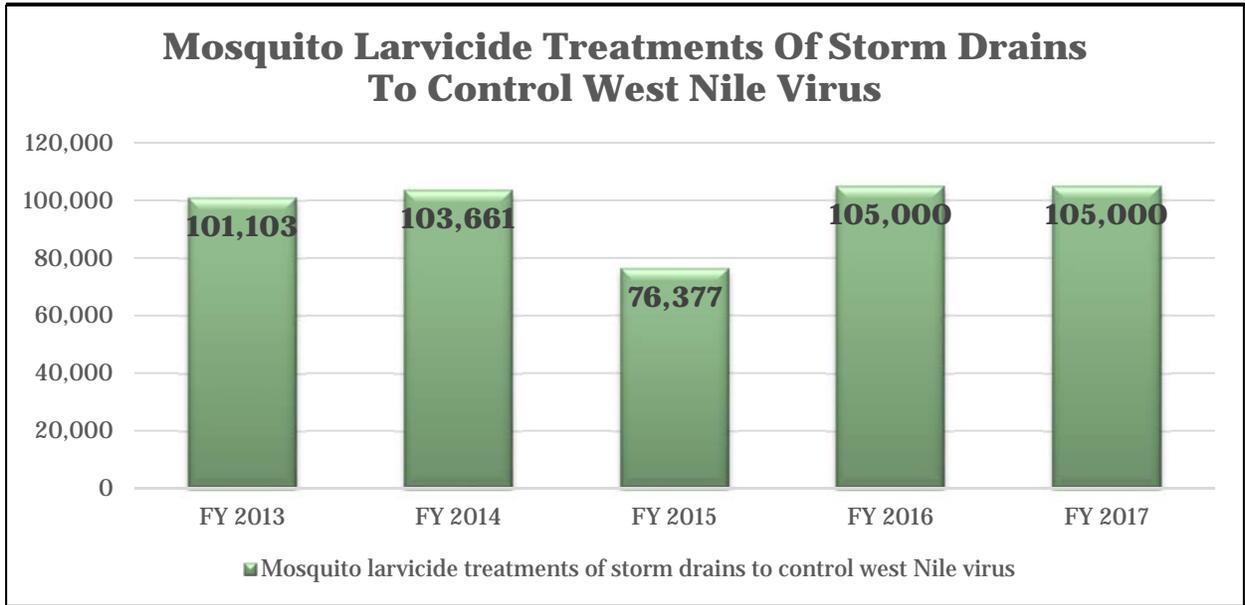
Approximately 35,000 storm drains are treated with a larvicide during three separate six-week cycles from mid-May through October, for a total of approximately 105,000 storm drain treatments. Weather conditions are the principal factors that determine the number of storm drains that will be treated, as well as the percent of storm drains treated within the scheduled timeframe, during a given year. There was a significant decrease in the number of larvicide treatments of storm drains for the control of mosquitoes that transmit West Nile Virus from FY 2014 (103,661) to FY 2015 (76,377). The new contract with the provider of mosquito control services was delayed and not awarded until late May 2015. Multiple days of rainfall in June 2015 limited the application of larvicide treatment.

Disease Carrying Insect Program (DCIP) costs are based on the number and size of treatment rounds in a given year, as well as education, outreach, and surveillance activities carried out in-house. Treatment rounds, although dependent on weather conditions, remain relatively constant throughout the years, maintaining a relatively stable program cost. The total DCIP cost per capita was \$1.07 in FY 2015. This was lower than the budget of \$1.80 per capita. The estimated cost for FY 2016 and FY 2017 provides the capacity

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for a higher cost per capita; actual spending will depend on environmental factors, insecticide treatments resulting from larval inspections and surveillance activities, outreach and education costs, and other program activities.

The continuing goal of the DCIP in FY 2016 is to hold the number of human cases of West Nile virus (WNV) as reported by the Virginia Department of Health to no more than one case, the same goal as in prior years. In FY 2015, one human case of WNV was reported.



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