

2009 Annual Report

Garfield County Cooperative Mosquito Control Program

Garfield County



October 2009

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On The Cover:

“Rain, rain and more rain” - The summer of 2009 will be remembered as one of the wettest on record, and with heavy rain comes heavy mosquito populations.

A cool and very wet June...June was the wettest month of the summer with a total of 4.86 inches reported at DIA. Much higher numbers were reported in other localized areas. This was the second wettest June since record keeping began in 1872. The normal June precipitation in June for Denver is 1.45 inches.

Fortunately cool temperatures slow larval mosquito development and aid in control efforts. The average temperature of 64.4 degrees was 3.2 degrees below normal for the month. This was the first June since 2003 with no 90 degree days. This fact, along with higher than normal Culex mosquito populations led to speculation that 2009 had the potential for an outbreak of West Nile virus which fortunately did not develop.

Besides being cool and wet; June was an active weather month as well with nearly double the normal number of days with thunderstorms (18 vs. 10 normally). 15 days with measurable precipitation; normal is 9 days and 6 days with dense fog, normal is less than one. Additionally, the normal percent sunshine for June is 70 percent; June 2009 was 51%

Colorado Mosquito Control, Inc.

GARFIELD COUNTY COOPERATIVE MOSQUITO CONTROL PROGRAM GARFIELD COUNTY ANNUAL REPORT 2009

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THE GARFIELD COUNTY COOPERATIVE MOSQUITO MANAGEMENT PROGRAM MISSION STATEMENT

The Garfield County Mosquito Management Program completed its 6th year of cost effective Integrated Mosquito Management operations in 2009. Many communities across Colorado recognize the need to control mosquito annoyance and the risk of mosquito-borne disease associated with flood irrigation practices, urban development, and snow melt runoff. Integrated mosquito management operations that utilize environmentally-sensitive controls and new technologies can greatly enhance the outdoor experience without negatively impacting the environment.

The primary objective of the Garfield County Cooperative Mosquito Management Program is to employ trained field technicians to suppress populations of larval mosquitoes in aquatic habitats. CMC technicians utilize bacterial larvacides that reduce mosquito populations without harming non-target organisms. Additionally, monitoring of adult mosquito populations is an essential component of an Integrated Mosquito Management (IMM) program. Surveillance trapping performed in Garfield County Cooperative provides data used to assess West Nile Virus Infection Rates, as well as the need for adult mosquito control measures. Data driven response with mosquito adulticide ULV technology can reduce the threat of disease transmission and annoyance associated with mosquitoes, while reducing the necessity for large amounts of products to be applied.

CMC OBJECTIVES

The Garfield County Mosquito Management Program, operated by CMC, has developed into one of the foremost environmentally sensitive and technologically advanced integrated mosquito management programs in the United States. Additionally, CMC has fostered cooperative efforts for mosquito control and epizootic response between surrounding municipalities and Homeowners Associations, The Centers for Disease Control (CDC) Vector-Borne Disease unit in Fort Collins, The Colorado Division of Wildlife, local County Open Space Departments, The Colorado Department of Health and Environment (CDPHE), and Colorado State University (CSU) to respond to West Nile Virus risk. Data obtained from CMC is utilized by these entities when evaluating the disease risks associated with spikes in mosquito abundance. This public-private data-sharing partnership in the interest of public health is unrivaled elsewhere in the country.

CONTRACTOR COMMITMENT

Colorado Mosquito Control, Inc. (CMC) is a large-scale contractor specializing in complete integrated mosquito control services. CMC utilizes an aggressive preemptive Integrated Pest Management (IPM) approach to controlling mosquito populations within contracted areas. CMC was established in 1986, is the largest private company specializing in mosquito control in Colorado, and is the only company in Colorado offering complete IPM mosquito control services.

CMC currently has programs across the state of Colorado including: Homeowners Associations, Incorporated Towns, Cities and Counties, and Indian Reservations. Geographically, CMC reaches from the Ute Mountain Ute Reservation in the southwest corner of the state to Fort Morgan in northeastern Colorado. CMC has programs in several mountain areas including the Gunnison Valley, the I-70 corridor through Garfield County, and parts of the upper Colorado River valley.

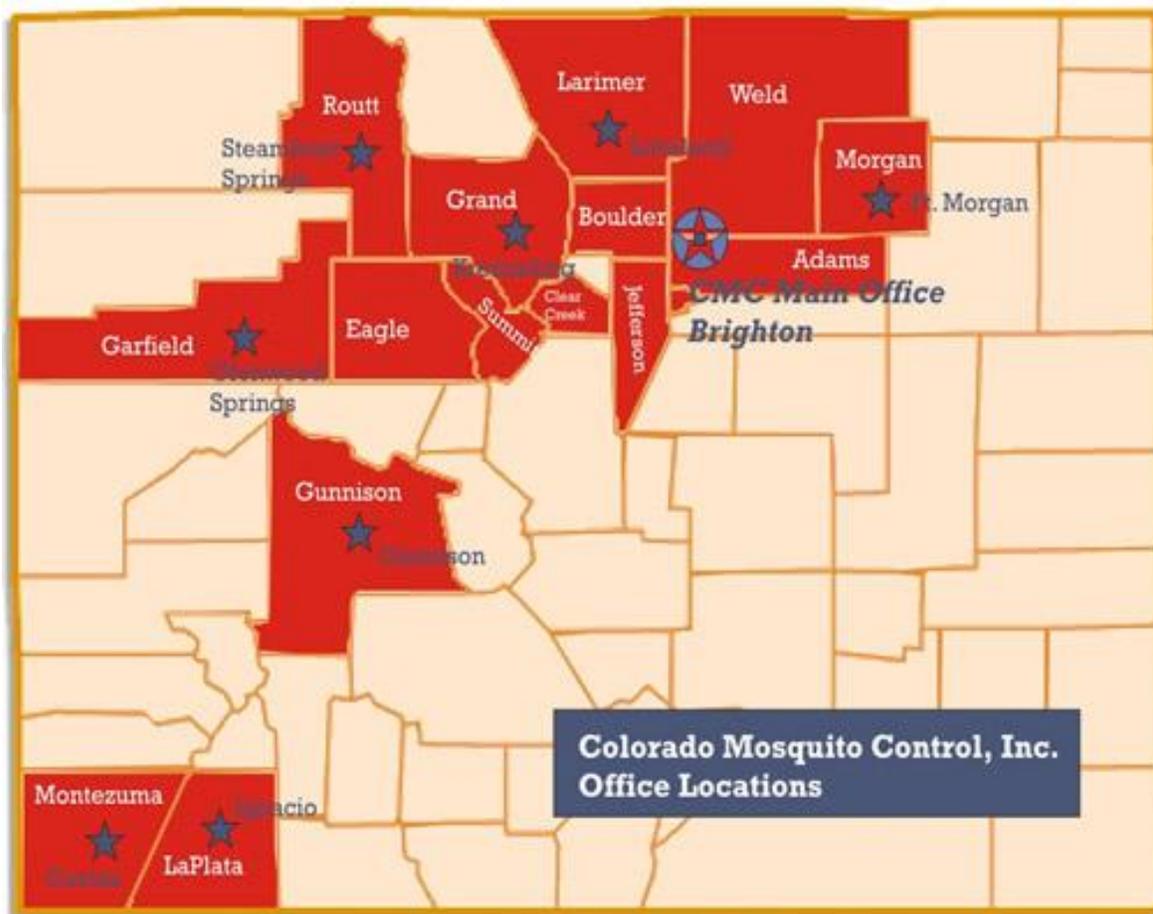
With 8 years of experience monitoring West Nile Virus in Colorado, it is clear that limiting exposure to mosquito bites is the best way to reduce the risk of disease. A well-developed mosquito management operation is only part of the picture, and CMC also emphasizes the need for personal action and protection through our educational outreach programs. *Culex tarsalis*, our primary WNV vector in the state, is more abundant today than in the past, due to current land use practices. CMC is committed to providing top quality service, via education outreach and data driven management, in an effort to minimize West Nile Virus risk and reduce mosquito annoyance in the communities where we operate and also live.

Colorado Mosquito Control, Inc. as the contractor for the Garfield County Cooperative Mosquito Control Program uses demonstrated scientific integrated pest management (IPM) methods of survey, inspection, diagnosis, biological/biochemical controls, natural enemies and limited low-toxicity pesticide applications to professionally accomplish desired control results. All of the methods and materials used have been sanctioned and registered by the U.S. EPA, Centers for Disease Control, the Colorado Department of Agriculture and the American Mosquito Control Association.

Cooperating Entities

As one of many Colorado communities dealing with West Nile Virus (WNV) on an annual basis, our understanding of WNV has grown significantly since its arrival in the area during 2002. Our residents, native and migratory birds, and local vector mosquitoes face the annual risk of becoming infected with this disease that is now considered to be endemic - West Nile Virus is here to stay. However, the severity of the disease varies from season to season, in large part due to the variable weather patterns across Colorado, including the western slope.

CMC operates in many cities and counties throughout Colorado. In doing so, we are on the frontline when developing best management practices specifically tailored to the conditions found in these Colorado communities. The experience obtained by CMC, municipal officials, county health departments and operational divisions monitoring West Nile Virus have laid the foundation for emergency response plans. This knowledge base, derived through cooperative data sharing, has put in place the tools needed to manage potential future mosquito-borne disease outbreaks.



2009 SEASON PERSPECTIVE

At CMC we have come to expect each Colorado summer to present a unique set of temperature, precipitation, irrigation, and human interactions that combine to create new and different challenges in both mosquito control and mosquito-borne disease proliferation and control; 2009 was certainly typical in that respect.

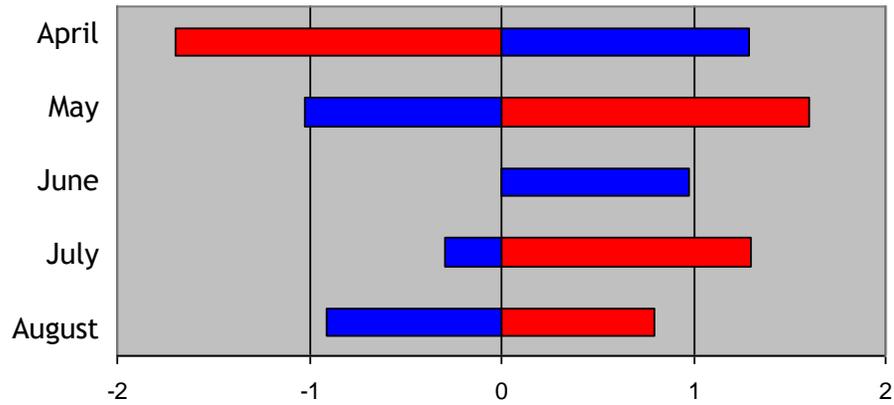
The 2009 mosquito season can be described as a “roller coaster” ride, with striking highs and dramatic lows in both temperatures and precipitation, all having profound effects on mosquito populations (See Chart 2009 Garfield County Climate Data). According to the NOAA website, April was cooler and wetter than normal with temperatures being 1.7 degrees below normal while receiving 1.29 inches of precipitation above normal. May was almost the polar opposite of April with temperatures 1.6 degrees above normal and precipitation 1.02 inches below normal. With June came more precipitation along with normal temperatures producing mostly floodwater mosquitoes. In July the rains subsided and temperatures were above normal helping to reduce the number and area of wet larval sites producing mosquitoes. August was similar to July with below average precipitation and above average temperatures.

The vast majority of the mosquitoes with which we must contend are associated with newly applied floodwater via rain or irrigation (*Aedes/Ochlerotatus*) or older standing stagnant water (*Culex*). Thus mosquito population trends are almost always dependent on either heavy rains (over 0.5in) or the agricultural flooding of fields for irrigation. In 2009, Garfield County did receive heavy rains throughout the month of June with rainfalls over 0.5 inches triggering large hatches of floodwater *Aedes*. Also, flood irrigation did occur on a regular basis in areas that resulted in several recognizable broods of floodwater mosquitoes and after-the-fact *Culex* standing water mosquitoes. Understanding and recognizing patterns of agricultural irrigation is still one of CMC’s primary goals. Significant strides have been made, but there is still more to do.

As stated above, July and August saw hot conditions with below average rainfall during the month. This had two noticeable effects on the mosquito populations. One was that the production of floodwater *Aedes* mosquitoes was decreased with exception of those areas susceptible to flood irrigation practices. Secondly, many stagnant water sites became producers of *Culex* mosquitoes. These *Culex* mosquitoes of course are the primary vectors of WNV and other mosquito-borne diseases in Colorado. Larval floodwater mosquitoes were declining throughout late August into mid-September as *Culex* mosquito populations were increasing especially in the western part of the coverage area. Early September saw a return to more normal conditions with scattered afternoon thunderstorms and only small localized mosquito problems. The season came to a close on September 14th as daytime temperatures dipped into the 60’s and 70’s with nighttime temperatures dropping into the 40’s and 50’s throughout most of the county.

2009 Garfield County Area Climate Data

Departures From Normal



	August	July	June	May	April
■ Precipitation (inches)	-0.91	-0.29	0.98	-1.02	1.29
■ Temperatures (degrees F)	0.8	1.3	0	1.6	-1.7

2009 Colorado Mosquito Control, Inc.

West Nile Virus 2009

Background

West Nile Virus was first identified in Uganda in 1937. Since that time, activity has been documented throughout Africa, Europe, West and Central Asia, and areas of the Middle East. The virus made its first appearance to North America in 1999 when it was documented in New York City. WNV comes from a family of viruses known as Flaviviridae and is closely related to other encephalitis-causing viruses that can have severe effects on both humans and animals, including Western Equine Encephalitis and St. Louis encephalitis in our region.

WNV has a wide range of symptoms which can range from mild flu-like symptoms to death. Of humans affected, nearly 80% will show no symptoms at all. The majority of people who do show symptoms will usually suffer from high fevers, muscle soreness, and overall fatigue. However, approximately 1% of people will develop much more severe symptoms including meningitis (inflammation of the linings surrounding the brain and spinal cord), encephalitis (inflammation of the brain), or very rarely poliomyelitis, which can cause paralysis in parts of the body.

Since the introduction of WNV to the United States in New York City in 1999, the virus has made a complete westward expansion to the West Coast. Starting in the Northeastern parts of the United States, the virus steadily spread through the South, the Midwest, the Rocky Mountain region, and more recently the Western States. Although many states have shown decreased case counts since epidemic years, the Colorado Front Range presents the ideal combination of abundant habitat and weather conditions during some years for *Culex tarsalis* mosquitoes to amplify West Nile Virus.

Colorado Perspective

Cases of WNV have been seen throughout a large portion of the country. States with the most reported WNV cases thus far in 2009 include California, Mississippi, Texas, Arizona, and Colorado which leads the country in human WNV cases. Some of the reported numbers represent a rebound in activity from previous years.

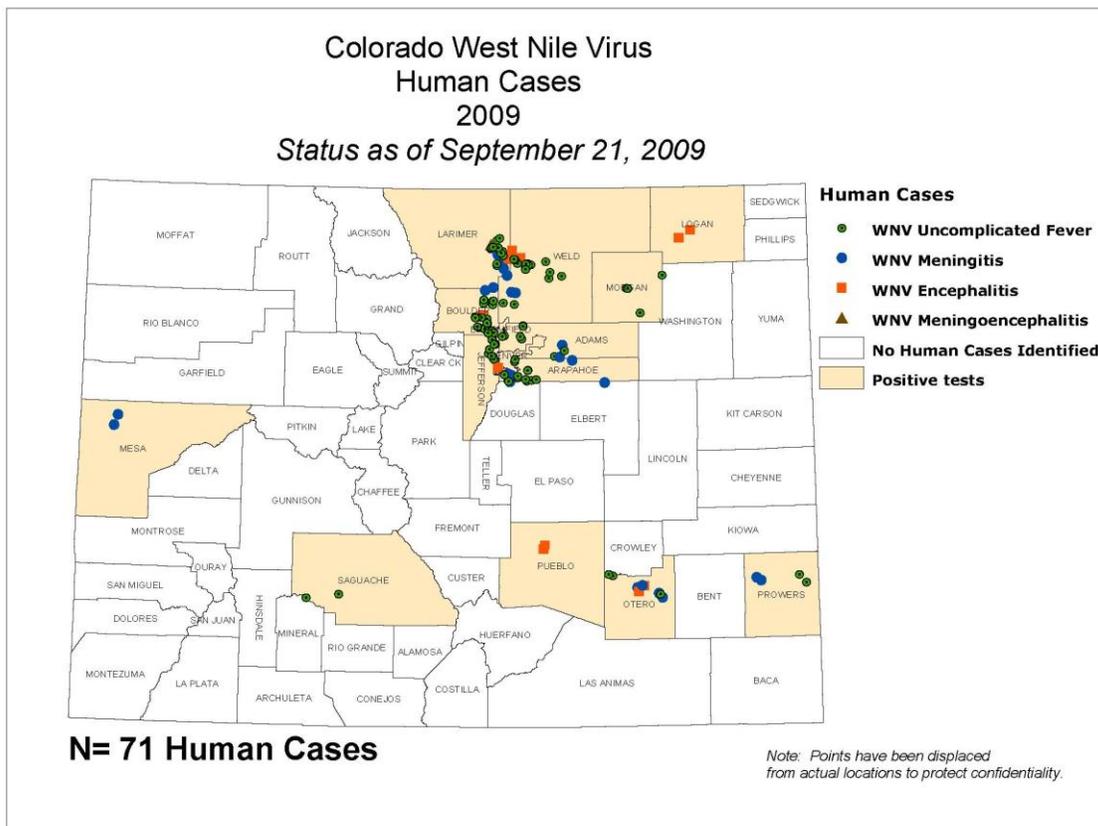
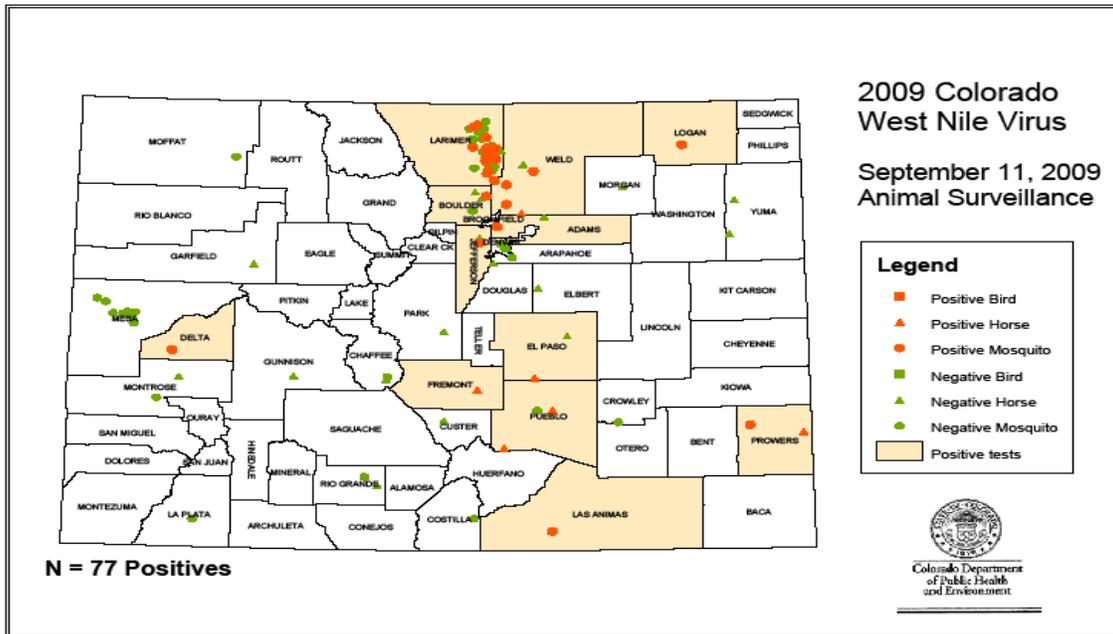
In Colorado, activity has been mostly clustered along the Front Range particularly in Northern Colorado. So far this year there have been no confirmed cases of WNV in Garfield/Pitkin Counties. The first human case in Colorado was reported to the CDC on June 30th. Human activity has consisted mainly of West Nile Fever. A number of neuroinvasive cases consisting of both meningitis and encephalitis have been seen as well. Human cases appeared to have a relatively slow start, but through mid August and early September the number of cases began to steadily increase. Most cases have been observed in adults between the ages of 35 and 65. The state has reported a total of 71 human cases and one death thus far for the 2009 season.

Human West Nile Virus Infections: Colorado, 2009

Updated September 20, 2009

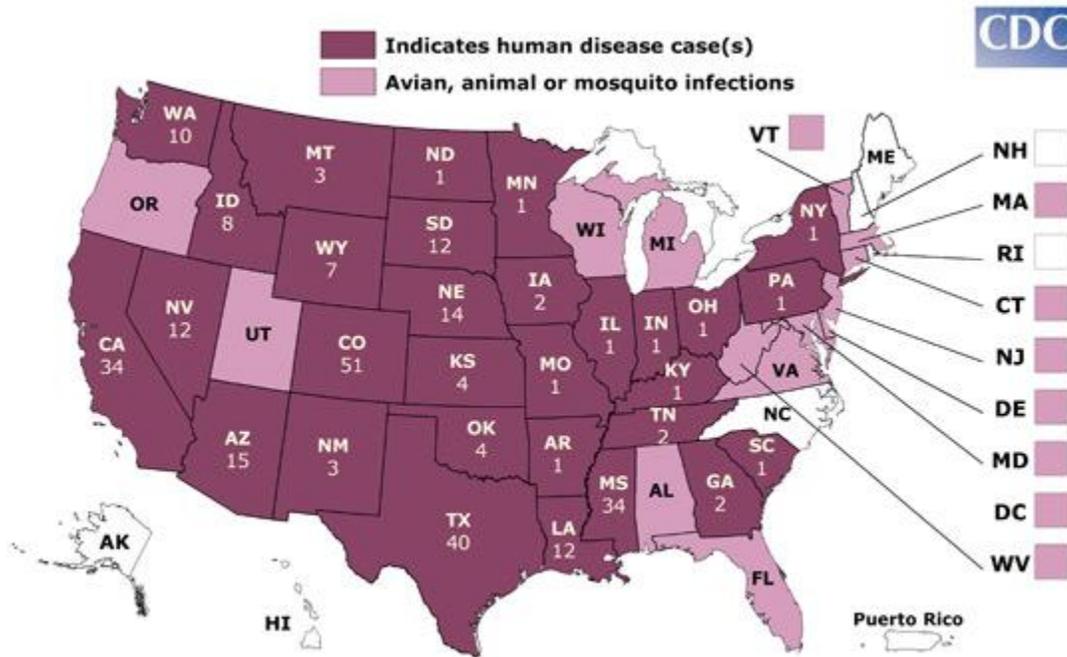
County of Residence	New cases	Clinical diagnosis			Total cases	Total deaths
		Fever	Meningitis	Encephalitis		
Adams	2	4	1	.	5	1
Arapahoe	1	6	3	.	9	.
Boulder	2	10	.	1	11	.
Broomfield	.	1	.	.	1	.
Denver	1	1	.	.	1	.
Jefferson	1	6	.	1	7	.
Larimer	1	8	4	2	14	.
Logan	.	.	.	1	1	.
Mesa	1	.	1	.	1	.
Morgan	2	2	.	.	2	.
Otero	1	3	2	1	6	.
Prowers	1	1	1	.	2	.
Pueblo	1	.	.	1	1	.
Weld	3	7	1	2	10	.
COLORADO	15	49	13	9	71	1

Counties not listed have no verified human cases of WNV



2009 West Nile Virus Activity in the United States

(Reported to CDC as of September 15, 2009)



Source: (<http://www.cdc.gov/ncidod/dybid/westnile/Mapsactivity/surv&control09Maps.htm>)

Larval Mosquito Control Activities

Since over 95% of CMC's operations are targeted toward larval mosquito control, approximately that same percentage is applied in infrastructure to facilitate those operations. CMC's warehouse, material handling equipment, supply chain, data input, vehicle fleet, and application equipment are all designed to support our management services that emphasizes larval control.

Every technician is assigned a CMC-owned fleet vehicle, fully equipped with necessary larval surveillance tools, larval control applicators, and biological larvicide products. Each vehicle contains informational brochures about mosquito repellents, recommended methods for reducing backyard mosquitoes, and the "Fight the Bite" campaign literature for residential distribution. Technicians also have on hand reference sheets about larvicide control products and mission objectives for contracted communities used in public education programs. Every vehicle contains Material Safety Data Sheets (MSDS) in accordance with Colorado Department of Agriculture requirements.

CMC management spends the winter months editing field notes and property ownership information, as well as historical inspection records for use in establishing inspection priority during the upcoming season. Early activities each season also involve review and revision of GIS maps from the previous season. Old sites often need updating, and new sites are constantly added to the inspection program in response to new construction and development.

Hiring of seasonal technicians began in February. CMC received an abundance of qualified applicants this season, many of whom had experience in aquatic sampling or an understanding of biological sciences. This aided in improving the quality of public education and outreach that CMC was able to provide.

CMC field technicians began ground inspections for new sites and inspection of existing sites in early April within contracted areas. CMC's Annual Field Technician Classroom Training Day took place on May 18, with over 80 new and returning field technicians in attendance. Daily field training by CMC management and veteran employees was performed during the week of May 19, and routine field inspections were in full swing from May 25 through August 28. The final day for larval inspections was September 14, largely due to cool daily temperatures during this time, causing natural mortality in adult mosquitoes.

The 2009 Garfield County Mosquito Management staff consisted of 8 Full-time Equivalent employees (FTE). The larval coverage area includes approximately 50 square miles of private and public lands, where permission is granted, within city limits of Garfield County Cooperative. To date 487 larval mosquito habitats are included in the regular inspection and larviciding program for the Garfield County Mosquito Management Program.

LARVAL MOSQUITO CONTROL OPERATIONS

Practical experience and scientific research have shown that the most effective way to control mosquito populations is through an aggressive Integrated Pest Management (IPM) approach. IPM aims at using a variety of concepts, tools, and products to reduce a pest population to tolerable levels. Translating these ideas to mosquito control, CMC has found the most environmentally and economically-sound approach is through targeting the aquatic larval stage of the mosquito. Targeting this stage prevents the emergence of the adult mosquito and thus, reduces disease transmission and nuisance.

Larval mosquito control can be achieved in several ways, including biological, biochemical, chemical, and mechanical means. Although there are a variety of methods for reducing larval populations, some options may have greater consequences than benefit. Mechanical or habitat modification is a technique which may be used, but the area to be modified and the extent to which the work will affect the surrounding area must be carefully assessed. Permanent ecological damage may occur if extensive habitat change has taken place. True biological controls may also have non-target affects that outweigh the benefits of their control capacity. The biological control agent, if not carefully selected and evaluated, may cause an imbalance in the natural ecological community, as well as threaten population levels of other organisms. This was the case with the introduced mosquito fish, no longer widely utilized in Colorado as they readily preyed upon young amphibians and other fish species in addition to controlling mosquitoes.

CMC's favored method of larval mosquito control is through bacterial bio-rational products. The main product used by CMC is a variety of bacteria (*Bacillus thuringiensis var. israeliensis*). *Bti*, as it is known, has become the cornerstone of most mosquito control programs throughout the world. Almost all Mosquito Abatement Districts have incorporated *Bti* applications into their management practices, given the specificity of these products on larval mosquitoes causing almost no mortality among other non-target organisms. The benefits of applications using *Bti* include its efficacy and lack of environmental impacts, as well as its cost efficiency. When used properly, successful mosquito control without impact to aquatic invertebrates, birds, mammals, fish, amphibians, reptiles, or humans can be achieved. A broad label allows for the use of the product in the majority of the habitats throughout the service area. Another bacterial product closely related to *Bti* is *Bacillus sphaericus* (*Bs*). In addition to all of the benefits of *Bti*, *Bs* is by definition a true biological control agent in that it remains in the system through multiple broods, or generations, of mosquitoes. Unfortunately, the residual benefit of the control comes at a cost in price at approximately three times that of *Bti*.

Other larval control products include a growth regulator (methoprene), a mineral oil, and an organophosphate (Abate). Methoprene is a synthetic copy of a juvenile growth hormone found in larval mosquitoes. The hormone prevents normal development of the adult mosquito in the pupal stage, eventually causing death. While a good control product, the cost is prohibitive to be the predominant product in a large scale program. The benefits of these products are the availability of 30 and 150 day formulations. Abate, the one chemical larval control product CMC uses, serves as an effective product, but label restrictions limit its use in many areas. CMC limits the use of chemical larvacides to areas with little biodiversity, such as gravel pits, or areas which chronically produce large amounts of mosquitoes, but only as a

last resort when other solutions are not present. Mineral oil is the only product effective on the pupal stage and therefore is an essential tool when pupae are found.

All of the aforementioned methods and products represent the essential ingredients of Integrated Pest Management. Mosquitoes are very well adapted insects and can be found in many different habitat types from a cattail marsh to a cup littered on the side of the road. A variety of tools must be used to prevent resistance and ensure the best method will be available for any given situation.

During the 2009 season, there were 4,289 site inspections performed in Garfield County with 79% (3,390) of those sites being wet. Of the 3,390 wet sites 32% (1,087) of them required treatment totaling 426.3 acres treated. In comparison, in 2008 there were 169.7 acres treated for larvae during the season with only 344 sites requiring treatment. Larval treatment was increased throughout the early part of the season due to early season rains and irrigation. This continued through late August as conditions became ideal for standing water *Culex* mosquitoes to breed.

CMC Surveillance Laboratory

Data on mosquito abundance and species identity is critical in the operation of a successful mosquito management program. Over the past few years, identifying, packaging, and sending *Culex* mosquito pool samples to the CDPHE or CSU labs for West Nile Virus testing has also become critically important in the battle against West Nile Virus and other mosquito-borne diseases. The Colorado Mosquito Control Surveillance Laboratory, managed by Dr. Michael “Doc” Weissmann, has become the largest single source of adult and larval mosquito surveillance data in the state of Colorado. Specifically, CMC has 4 stereo zoom binocular microscopes, 94 CDC dry-ice baited Light Traps, 21 Reiter Gravid Traps and all associated equipment and hardware.

In 2009, Colorado Mosquito Control monitored a statewide network of over 250 trap sites, with over 3,100 trap nights set, collecting more than 499,000 adult mosquitoes that were counted and identified to species by the CMC Surveillance Laboratory. While individual traps provide only limited information, trap data is interpreted in the context of historical records for the same surveillance location, going back in time more than a decade in some locations. Individual traps are also compared to other traps from around the region that were set on the same night and therefore exposed to similar weather conditions.

Technicians working in the Surveillance Laboratory at Colorado Mosquito Control, Inc. are trained to provide accurate species identification of mosquito specimens for both adults and larval mosquitoes. More than 50 mosquito species are believed to occur in Colorado and more than 20 of those were identified from samples processed during the 2009 season from across the state, including one species found in the Pueblo area that was previously not known from Colorado.

CMC employs two kinds of traps to monitor mosquito populations. The CDC light trap uses carbon-dioxide from dry ice as bait to attract female mosquitoes that are seeking a blood meal from a respiring animal. Once attracted by the CO₂, the mosquitoes are lured by a small light to a fan that pulls them into a net for collection. The gravid trap uses a tub of highly-organic water as bait to attract female mosquitoes that are looking for a place to lay their eggs. A fan placed close to the water surface forces mosquitoes that come to the water into a collection bag.

Additionally, the CMC Surveillance Laboratory conducts an intensive larval identification program with over 10,000 larval mosquito samples collected by field technicians. Collections are made prior to larvicide applications and identification of species and this information is recorded in our database. This information is invaluable in targeting mosquito control efforts as we gain a greater understanding of the habitat types preferred by mosquito species of Colorado and the seasonality of these habitats as sites for mosquito development.

Specimens and data collected from these traps and larval identification are used in:

- Determining effectiveness of larval control efforts. Each mosquito species prefers specific kinds of habitats for larval development. If a trap includes large numbers, it could indicate the

presence of an unknown larval habitat and, based on the species identification and known habitat preference for that species, this information will direct field technicians as to possible sources of the mosquitoes collected.

- Determining larval and adult mosquito species. This helps to illustrate the threat of mosquito-borne disease amplification and transmission.
- Determining where adult control efforts were necessary. While mosquito eradication is impossible, significant population reduction is achievable. In places where larval control was insufficient, especially in neighborhoods where adult mosquitoes migrated in from larval sources outside of the control area, it may be necessary to use adulticide methods, such as ULV truck fogging or barrier sprays of nearby harborage areas. Trap counts that exceeded an acceptable threshold for an area trigger adult control measures.
- Surveillance for Mosquito-borne Disease. Historically, CMC efforts were targeted primarily at controlling mosquito nuisance problems with limited disease surveillance. However, since the arrival of the West Nile Virus in Colorado in August of 2002, the paradigm has shifted toward disease prevention and control. Accurate species identification of the mosquitoes in the traps is important when monitoring population trends. It also is necessary for evaluating whether a population spike represents an actual increase in disease transmission potential or only an increased nuisance level.

CDC Surveillance Light Trap Data Comparison

In 2009, an average of 2 surveillance light trap locations monitored adult mosquito populations within Garfield County weekly. Weather permitting, CDC battery-operated “light traps” were set weekly in each location to provide adult mosquito population data for seasonal comparisons. Surveillance trapping began June 1 and trapping was concluded on September 4, halted by cooler temperatures during the first weeks of September.

In 2009, 230 surveillance light traps were set within Garfield County, which collected 4029 total mosquitoes. The average number of mosquitoes collected per trap per night was 269 and the average number of *Culex* mosquitoes collected per trap per night was 15. The percent composition of mosquitoes collected in 2009 included 83.7% (3371) *Aedes/Ochlerotatus spp.*, 5.7% (230) *Culex spp.*, and 4.8% (195) *Culiseta spp.* mosquitoes. Please refer to the CDC Light Trap Details for Species Composition and Season Trends by individual surveillance trap location.

2009 ADULT CONTROL

The goal of Colorado Mosquito Control, Inc. is to provide all residents of Garfield County Cooperative with the best options for safe, effective, modern mosquito management. The primary emphasis of the Garfield County Cooperative Mosquito Management Program is to control mosquitoes in the larval stage, using safe biological control products. This environmentally focused program maintains adulticiding applications as a final resort when mosquito populations surpass nuisance or risk thresholds. Mosquito surveillance trapping results are used to make data-driven decisions regarding areas that need to be sprayed for adult mosquito control. Adult mosquito control spraying is targeted to specific sectors determined by this trap data, thereby reducing the area sprayed and the frequency of spraying in each sector.

The Garfield County Cooperative Mosquito Control Program uses all available data from CDC light traps, gravid traps, Mosquito Hotline annoyance calls, and field technician reports to focus adult mosquito control efforts on specific, very limited “targeted” areas. In parts of the community where high numbers of mosquito annoyance calls are received, “floater” CDC light traps are set to evaluate adult population levels and species make-up. In many cases, a direct correlation is evident between areas with high complaint calls and high trap counts. While this correlation allows us to focus adult control in these areas, the emphasis is placed on finding the larval habitat sources of the trapped adults and continued larval control measures.

Colorado Mosquito Control uses state of the art technology, calibrated application timing, and least-toxic products to minimize non-target impacts. All adult mosquito control is accomplished using Ultra Low Volume (ULV) fogging equipment and performed after dusk when the majority of mosquito species are most active. This type of equipment produces droplets averaging 12 microns in diameter and allows for a minimal amount of product to be put into the environment. These treatments take place in the evening when mosquitoes are flying in greater numbers and non-target insect activity (for example, day-flying pollinators like bees) is greatly reduced. Using this application technique, the overall goal of minimal environmental impact and effective adult control is achieved in the targeted area.

CMC continued use of the water-based product AquaLuer for ULV adult mosquito control in 2009. Its’ active ingredient, permethrin, is highly effective against mosquitoes, while the water-base provides a much more environmentally sound solution to traditional oil-based adulticides. Results this year have again proven that this is the right choice for the adulticide portion of the Integrated Mosquito Management Program.

As we look towards the 2010 season, we will continue to evaluate treatment areas and new control products coming to the market. As always we will listen to the goals and needs of our customers so as to continue to provide an effective program that minimizes environmental impacts.

TECHNOLOGY

CMC has strived to improve the programs offered to its customers with novel and progressive advancements, continually evaluating and implementing new products and new technologies, not only with regard to control efforts but also for data processing and information reporting. CMC shares the belief that timely information should be accessible to customers and residents, so that the people who fund the programs can access the work that is being performed. CMC also believes that the ability to access the data will improve both the resident's and municipality's ability to stay informed about West Nile Virus risk in their community.

CMC WEBSITE

Our website, www.comosquitocontrol.com, is the leading website in the State of Colorado when it comes to providing up-to-date, factual, and comprehensive information on, and links to, mosquito biology and control, mosquito-borne diseases, pesticide toxicology information, and a wealth of topics relating to mosquitoes. Our website continues to be an integral tool for dissemination of operational data to the citizens we serve, minimizing the resources and time required by the city and its employees for answering for fielding public inquiries.

LINKS FROM WEBSITE

CMC was one of the first mosquito control organizations anywhere to publish adult mosquito control spray schedules on the web. Adult mosquito spray schedules are posted daily by 3PM.

CMC has led the industry with dissemination of data via our online dashboard. Over the past year CMC introduced a radical departure from traditional reporting methods: *Digital Interactive Reporting*. No other mosquito control company anywhere has DIGITAL INTERACTIVE REPORTING. These CMC exclusive technologies allows our customers to quickly and easily analyze thousand of data points, simply create and instantly view charts and graphs that can visually compare years of data and show trends not easily detected from traditional data analysis.

Visit the Dashboard at: <http://www.comosquitocontrol.com/garfield.html>

CMC also established client website pages in 2008 and 2009 that contain program information and goals, product information, larval control areas, and annual reports in easily accessible and downloadable PDF formats.

Welcome Larval Control LT Map & Data LT Charts Adult Control WestNile Climate

Welcome to the Garfield County Cooperative Mosquito Control Program Interactive Data Dashboard

This Unique Dashboard will allow instant access to all aspects of your Mosquito Control Program's Current and Historical Data, ALL INTERACTIVELY! This means that you can select the data that you want, in the format and time frame that you are interested in. It's a little difficult to describe, but it's INCREDIBLY EASY TO USE! This is your window into the data behind your program, use it often to keep up to date.

Directions: 1. Select from the "Tabs" above to visit your area of interest. 2. From there feel free to select any button, pull-down list, or selector to customize the view. 3. Roll your mouse cursor over any chart's bars, lines or pie slices to view the underlying data. 4. Enjoy!

- * Larval Control Tab - Larval site inspection & larvicide application data
- * LT Map & Data Tab - Adult surveillance trap location map & weekly data per trap
- * LT Chart Tab - Adult trap surveillance data (YTD vs. previous years)
- * Adult Control Tab - YTD ULV adulticide application totals & comparisons
- * West Nile Tab - YTD & previous years human WNV disease totals
- * Climate Tab - Current year rainfall & temperature vs. previous years

Since this is a new technology, exclusively introduced to the mosquito control industry by CMC, we need your feedback! Please let us know of any questions, problems, technical issues or improvement ideas. Click [here](#) to send us an email:

[GCEH](#) [CDPHE](#) [CDC](#)

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PUBLIC OUTREACH & DATA DISSEMINATION

For 23 years, CMC has demonstrated that strong Public Outreach programs, quality Data Dissemination and outstanding Customer Service standards are the keys to success in providing large-scale municipal mosquito control programs. Citizen feedback, inquiry, and satisfaction surveys aid in evaluating the effectiveness of our program. CMC constantly looks for ways to better serve the communities we work with and appreciates the citizen involvement in improving the programs that we offer. We have clearly demonstrated this commitment by proactively incorporating numerous innovative programs, activities and services into the Garfield County Cooperative Mosquito Control Program.

CALL NOTIFICATION & SHUTOFF SYSTEM

CMC maintains a comprehensive Call Notification & Shutoff database, and will notify residents on this list whenever ULV adulticide spray applications will be conducted within 2 blocks of their property or within the effective ULV spray drift distance (300-500 ft depending on wind speed and direction). All Shutoff locations are mapped in ArcView GIS and updated annually. Call & Shutoff forms are available online and may be submitted via the CMC website or by mail.

“PREVENTION & PROTECTION” PRESENTATIONS

CMC staff provides informative presentations about personal protection, repellents, West Nile Virus activity and ways to reduce mosquitoes by dumping/ draining standing water. Examples of groups that have benefited from these presentations include employees in the Parks & Recreation Department, Utility Workers, “at risk” employees exposed to mosquito bites from outdoor work, and senior populations within communities.

FLOATER TRAP PLACEMENT for annoyance reports at resident homes in locations away from standard trapping sites.

FLYER POSTING NEAR LAKES/ RESERVOIRS with reminders to dump standing water from paddle boats, canoes & kayaks that can breed mosquitoes after sitting stagnant over winter and after rainfall.

MUNICIPAL CLIENT ON-LINE SURVEYS

In the fall of 2008 CMC implemented its first on-line customer service survey utilizing Survey Monkey. The results from the survey were very encouraging. The feedback was analyzed by CMC management and resulted in several new service improvements for 2009.

SUMMARY

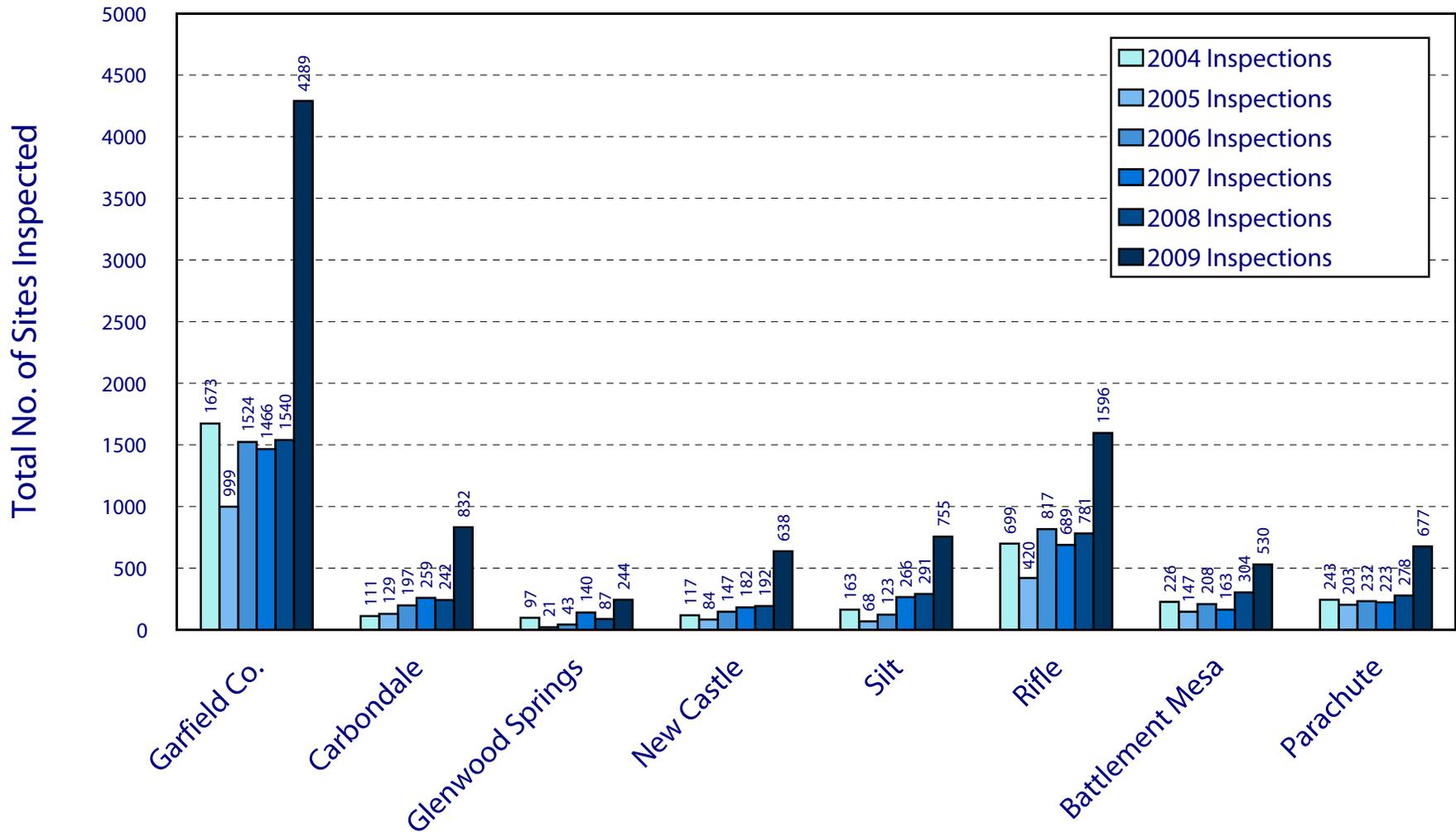
The 2009 Garfield County Cooperative Mosquito Control Program once again provided challenges and successes. Fortunately the threat of West Nile Virus Disease and transmission was significantly reduced when compared to previous years. In fact, there were no human or animal cases confirmed in Garfield County during the 2009 season. We have learned a lot since the inception of the Garfield County Cooperative Mosquito Control program, and have made some great improvements towards improving the program; in both the mosquito-borne disease realm and also on the nuisance side. Work will always continue in the arena of public education, notification and dissemination of information about personal protection and the mosquito control program itself. CMC's website continues to be successful based on the number of "hits," favorable e-mails and requests for more information received from program residents and others from around the world.

During the 2009 season Colorado Mosquito Control, Inc. continued to effectively serve the residents of the Garfield County Cooperative Mosquito Control Program using integrated mosquito management technology to reduce mosquito nuisance and the related potential for disease transmission including West Nile Virus. CMC continued to promote a responsible IPM approach to mosquito management, fully utilizing all available biological control techniques while minimizing the use of chemical pesticides. CMC has been able to develop both a cost-effective and efficient program in Garfield County over past seasons and looks forward to the 2010 season and beyond.

CMC is proud of the service it has provided Garfield County residents and we look forward to serving their needs in the years to come. We know that there is always room for improvement and have high expectations for meeting new program goals and new successes in future years.

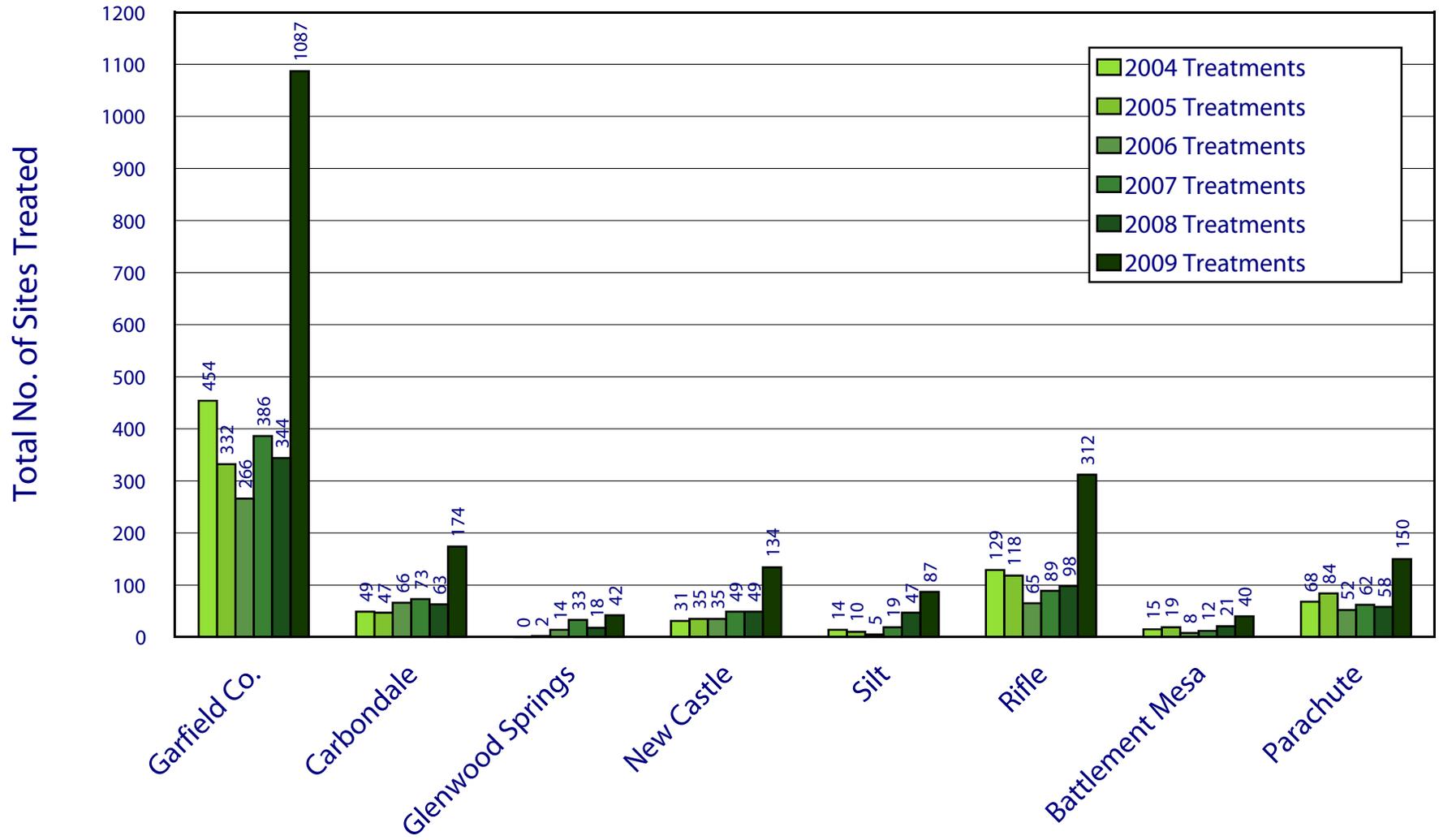
Larval Site Inspections by Service Area

2004-'09 Garfield County Mosquito Control Program



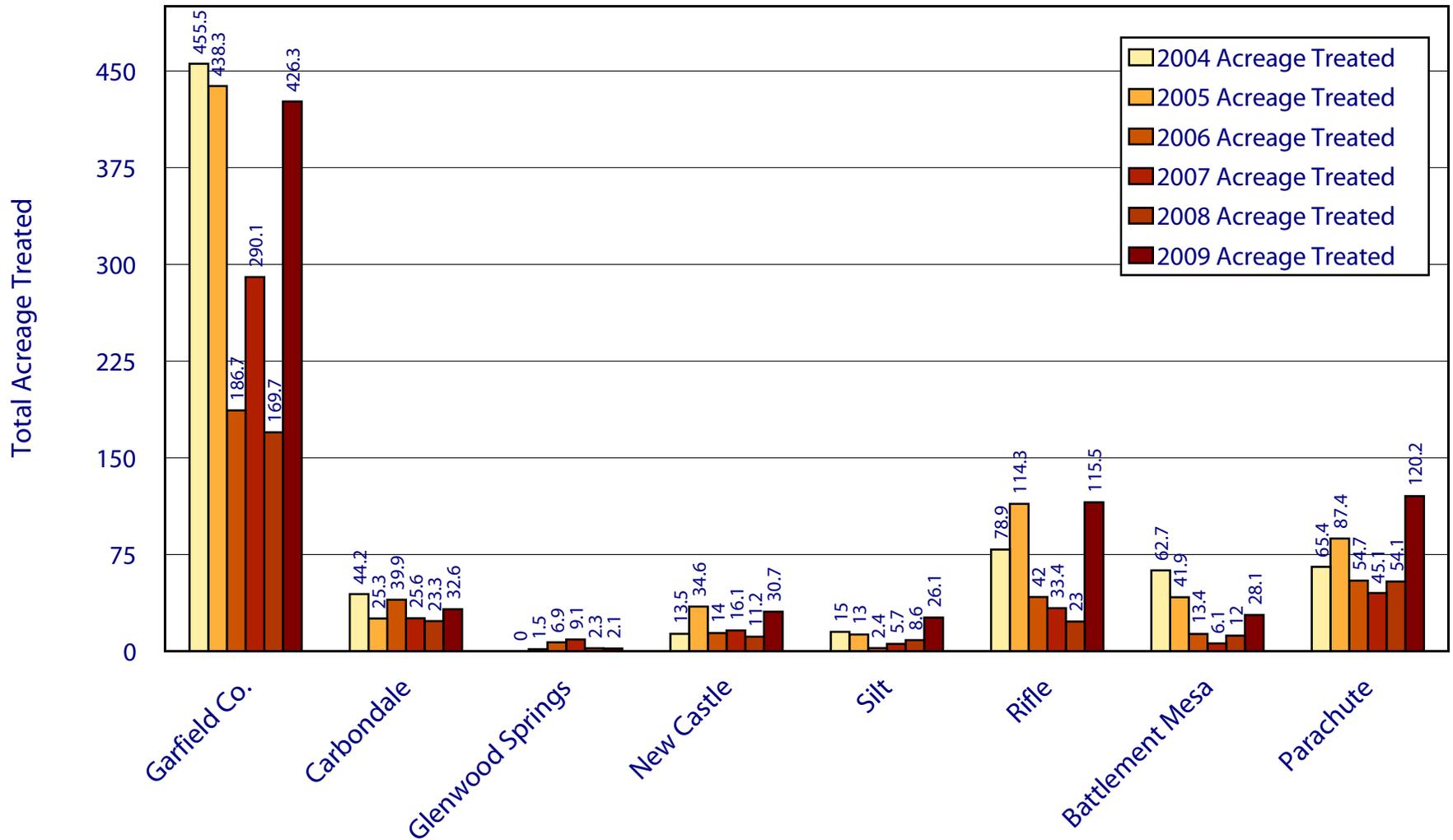
Larval Site Treatments by Service Area

2004-'09 Garfield County Mosquito Control Program



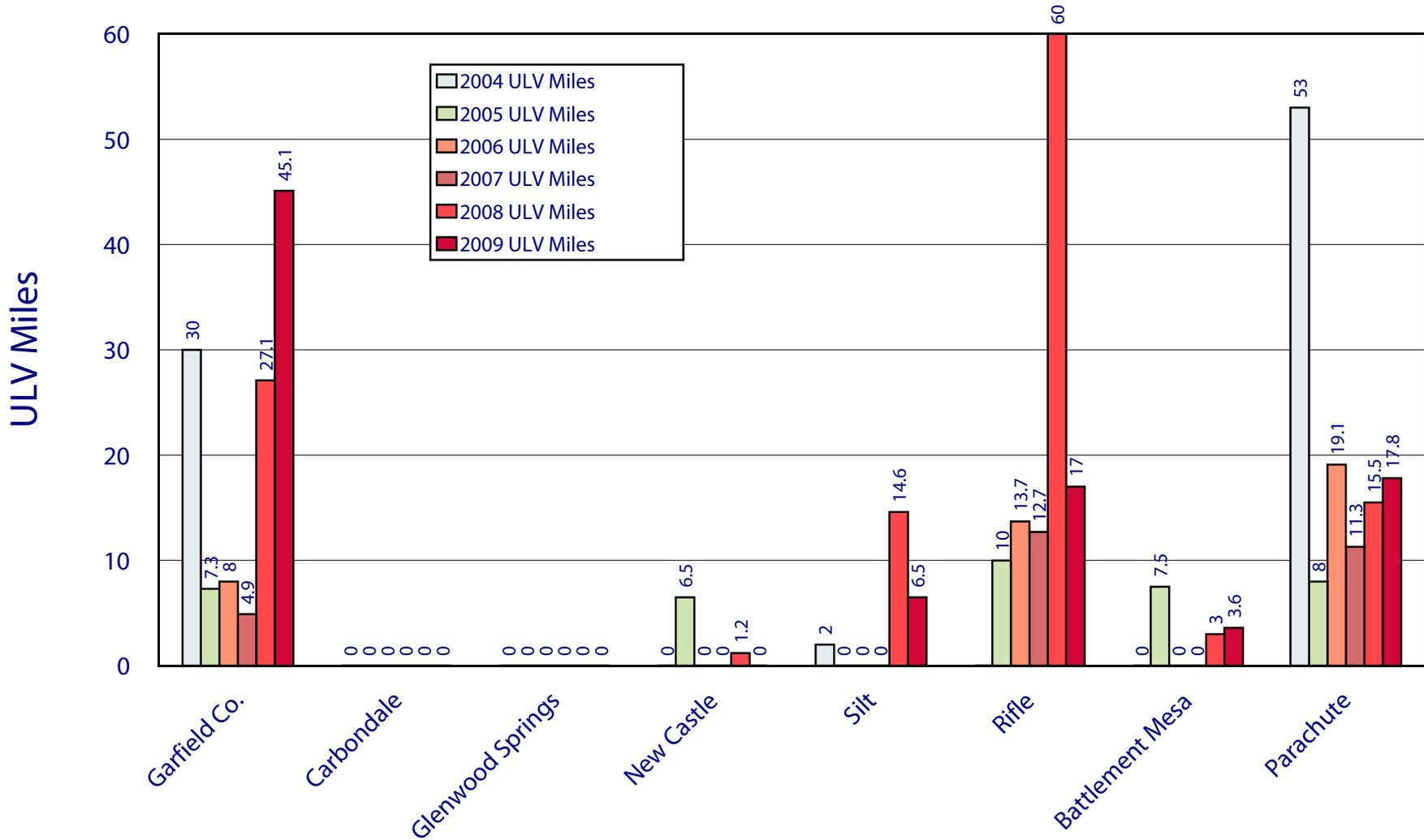
Larval Acreage Treated by Service Area

2004-'09 Garfield County Mosquito Control Program



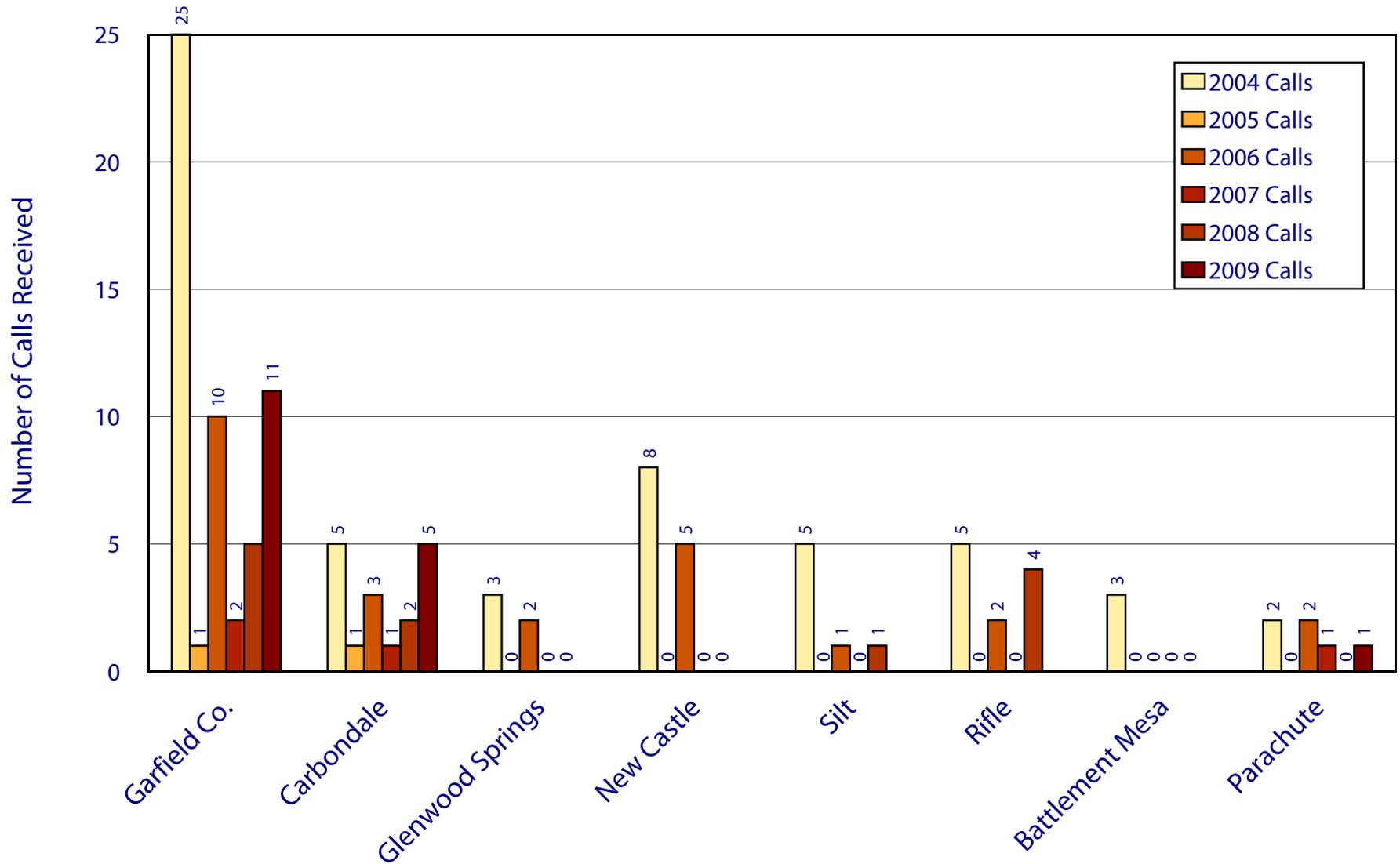
ULV Adulicide Comparison By Service Area

2004-'09 Garfield County Mosquito Control Program



MosquitoLine Calls by Service Area

2004-'09 Garfield County Mosquito Control Program





Larvicide Data Summary

by REPORT DATE: 1/1/2009 to 9/21/2009

by COUNTY: Garfield

	Total Site Inspections	No. Wet Sites	Percentage Wet Sites	No Sites Treated	Percentage Breeding*	Total Acres Treated
Battlement Mesa	530	219	41 %	40	18 %	28.1
Carbondale, Town of	832	772	93 %	174	23 %	32.6
Garfield County Unincorp	4289	3390	79 %	1087	32 %	426.3
Glenwood Springs, City o	244	189	77 %	42	22 %	2.1
New Castle, Town of	638	536	84 %	134	25 %	30.7
Parachute, Town of	677	498	74 %	150	30 %	120.2
Rifle, Town of	1596	1056	66 %	312	30 %	115.5
Silt, Town of	755	307	41 %	87	28 %	26.1

* (Sites Treated/Wet Sites)



Customer	Subdiv/Area	Material	Start Time	End Time	Miles	
Battlement Mesa						
Truck ULV						
05/29/2009	MIKE METCALF	AquaLuer ULV	20:00:00	20:15:00	1.3	
06/24/2009	RV PARK	AquaLuer ULV	22:47:00	22:53:00	0.8	
08/13/2009	WILLOW CREEK	AquaLuer ULV	21:43:00	22:00:00	1.5	
Truck ULV					Sum	3.6
					Avg	1.2
					Min	0.8
					Max	1.5
Garfield County Unincorporated						
Truck ULV						
06/02/2009	MILE POND	AquaLuer ULV	20:05:00	20:18:00	1.7	
06/12/2009	MILE POND	AquaLuer ULV	20:01:00	20:12:00	1.7	
06/17/2009	MILE POND	AquaLuer ULV	20:41:00	21:05:00	2.7	
06/22/2009	GRASS VALLEY RD	AquaLuer ULV	20:28:00	21:03:00	2.8	
06/24/2009	MILE POND	AquaLuer ULV	21:54:00	22:04:00	1.4	
06/24/2009	COAL RIDGE HS	AquaLuer ULV	21:02:00	21:07:00	0.8	
06/24/2009	BAIR RANCH	AquaLuer ULV	19:36:00	20:33:00	3.5	
06/30/2009	MILE POND	AquaLuer ULV	22:08:00	22:28:00	1.7	
06/30/2009	BAIR RANCH	AquaLuer ULV	20:16:00	21:22:00	3.5	
07/01/2009	MILE POND	AquaLuer ULV	20:40:00	20:52:00	1.0	
07/09/2009	BAIR RANCH	AquaLuer ULV	20:11:00	21:48:00	5.5	
07/23/2009	MILE POND	AquaLuer ULV	23:14:00	23:26:00	2.2	
07/23/2009	BAIR RANCH	AquaLuer ULV	19:22:00	20:47:00	9.8	
08/05/2009	WILLOW CREEK	AquaLuer ULV	20:10:00	20:20:00	2.4	
08/20/2009	WILLOW CREEK	AquaLuer ULV	20:50:00	20:57:00	1.1	
08/20/2009	COAL RIDGE	AquaLuer ULV	21:21:00	21:26:00	0.5	
08/24/2009	COAL RIDGE	AquaLuer ULV	19:52:00	20:04:00	1.3	
08/27/2009	WILLOW CREEK	AquaLuer ULV	21:10:00	21:18:00	1.5	
Truck ULV					Sum	45.1
					Avg	2.5
					Min	0.5
					Max	9.8
Parachute, Town of						
Truck ULV						
06/12/2009	COTTONWOOD PARK	AquaLuer ULV	19:20:00	19:28:00	0.6	
06/24/2009	COTTONWOOD PARK	AquaLuer ULV	23:03:00	23:09:00	0.7	
07/01/2009	COTTONWOOD PARK	AquaLuer ULV	21:12:00	21:20:00	0.8	
07/09/2009	COTTONWOOD PARK	AquaLuer ULV	23:04:00	23:17:00	1.4	
07/14/2009	COTTONWOOD PARK	AquaLuer ULV	20:57:00	21:24:00	2.7	
07/23/2009	COTTONWOOD PARK	AquaLuer ULV	22:16:00	22:44:00	3.3	



Adulticide Data

Customer	Subdiv/Area	Material	Start Time	End Time	Miles
07/30/2009	COTTONWOOD PARK	AquaLuer ULV	21:42:00	21:55:00	1.3
08/04/2009	COTTONWOOD PARK	AquaLuer ULV	21:20:00	21:36:00	1.3
08/13/2009	COTTONWOOD PARK	AquaLuer ULV	21:12:00	21:29:00	2.3
08/20/2009	COTTONWOOD PARK	AquaLuer ULV	20:33:00	20:45:00	1.2
08/27/2009	COTTONWOOD PARK	AquaLuer ULV	20:37:00	21:01:00	1.1
09/02/2009	COTTONWOOD PARK	AquaLuer ULV	20:11:00	20:18:00	1.1

Truck ULV	Sum	17.8
	Avg	1.5
	Min	0.6
	Max	3.3

Rifle, Town of

Truck ULV

06/12/2009	LYON PARK	AquaLuer ULV	19:45:00	19:55:00	1.0
06/17/2009	RIFLE MIDDLE SCHOOL	AquaLuer ULV	20:27:00	20:39:00	1.5
06/17/2009	LYONS PARK	AquaLuer ULV	20:00:00	20:08:00	1.1
06/24/2009	RMS	AquaLuer ULV	21:32:00	21:42:00	1.3
06/24/2009	LYONS PARK	AquaLuer ULV	22:08:00	22:15:00	0.9
07/08/2009	RIFLE MIDDLE SCHOOL	AquaLuer ULV	20:30:00	20:39:00	0.8
07/08/2009	LYONS PARK	AquaLuer ULV	20:47:00	20:56:00	0.9
07/14/2009	LYONS PARK	AquaLuer ULV	21:49:00	22:02:00	1.1
07/23/2009	LYONS PARK	AquaLuer ULV	23:30:00	23:36:00	1.0
07/28/2009	RIFLE MIDDLE SCHOOL	AquaLuer ULV	21:46:00	21:57:00	1.2
07/30/2009	LYONS PARK	AquaLuer ULV	21:10:00	21:24:00	1.6
08/04/2009	RIFLE MIDDLE SCHOOL	AquaLuer ULV	20:30:00	20:42:00	1.7
08/04/2009	LYONS PARK	AquaLuer ULV	20:48:00	21:01:00	1.5
08/13/2009	LYONS PARK	AquaLuer ULV	20:27:00	20:34:00	0.8
08/20/2009	LYONS PARK	AquaLuer ULV	20:09:00	20:16:00	0.6

Truck ULV	Sum	17.0
	Avg	1.1
	Min	0.6
	Max	1.7

Silt, Town of

Truck ULV

06/12/2009	KUM AND GO	AquaLuer ULV	20:23:00	20:31:00	1.0
06/24/2009	KUM AND GO	AquaLuer ULV	21:12:00	21:19:00	0.7
07/01/2009	KUM AND GO	AquaLuer ULV	20:20:00	20:30:00	1.0
07/08/2009	KUM AND GO	AquaLuer ULV	21:40:00	21:54:00	1.1
07/23/2009	KUM AND GO	AquaLuer ULV	23:52:00	00:00:00	0.7
08/04/2009	KUM AND GO	AquaLuer ULV	20:09:00	20:19:00	1.1
08/13/2009	KUM AND GO	AquaLuer ULV	20:04:00	20:11:00	0.9

Truck ULV	Sum	6.5
	Avg	0.9



Colorado Mosquito Control, Inc.

Adulticide Data

Customer	Subdiv/Area	Material	Start Time	End Time	Miles
				Min	0.7
				Max	1.1
				Grand Total	90.0



Colorado Mosquito Control, Inc.

Mosquito Line Call Summary

County	Customer Name		
Garfield			
	Carbondale, Town of		5
	Garfield County Unincorporated		9
	Misc. Customer		2
	Parachute, Town of		1
		Total Calls	17

2009 Garfield County Trap Composite Data

Total number of trap/nights set: 162
 Total number of mosquitoes collected: 48,478
 Average mosquitoes per trap/night: 299
 Average Culex per trap/night: 192

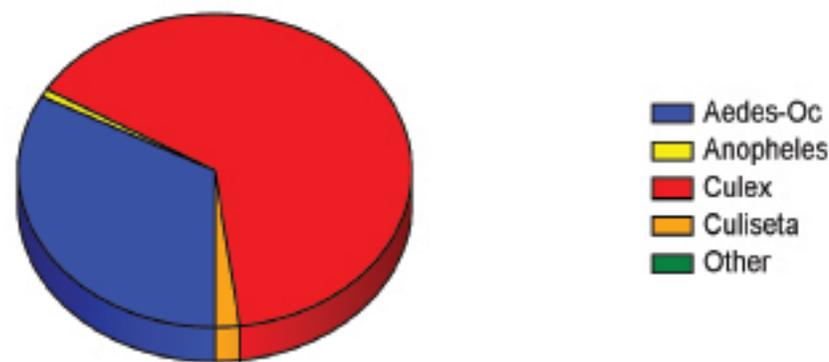
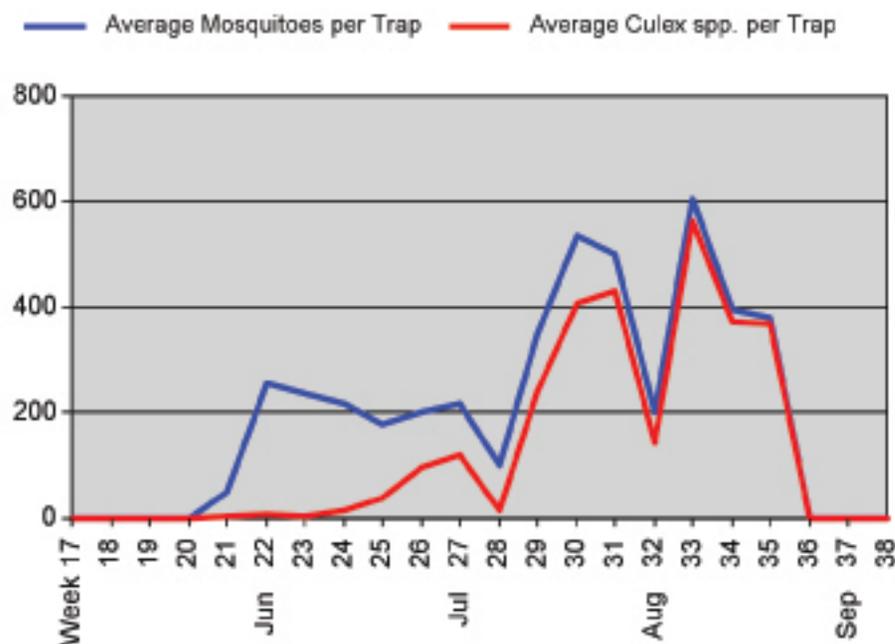
Species collected and abundance:

<i>Aedes (Oc.) cataphylla</i>	1	0.0%
<i>Aedes (Oc.) dorsalis</i>	213	0.4%
<i>Aedes (Oc.) epactius</i>	2	0.0%
<i>Aedes (Oc.) hexodontus</i>	2	0.0%
<i>Aedes (Oc.) increpitus</i>	155	0.3%
<i>Aedes (Oc.) melanmon</i>	1399	2.9%
<i>Aedes (Oc.) nigromaculis</i>	44	0.1%
<i>Aedes (Oc.) spencerii idahoensis</i>	13	0.0%
<i>Aedes (Oc.) trivittatus</i>	27	0.1%
<i>Aedes cinereus</i>	203	0.4%
<i>Aedes vexans</i>	13847	28.6%
<i>Aedes/Ochlerotatus spp</i>	12	0.0%
<i>Anopheles hermsi</i>	412	0.8%
<i>Culex erythrothorax</i>	28167	58.1%
<i>Culex pipiens</i>	154	0.3%
<i>Culex saltnarius</i>	656	1.4%
<i>Culex tarsalis</i>	2192	4.5%
<i>Culiseta impatiens</i>	1	0.0%
<i>Culiseta incidens</i>	11	0.0%
<i>Culiseta inornata</i>	967	2.0%

Genus proportions:

Genus	Number	Percent of Total
<i>Aedes/Ochlerotatus</i>	15,923	32.8%
<i>Anopheles</i>	412	0.9%
<i>Culex</i>	31,171	64.3%
<i>Culiseta</i>	979	2.0%
Other	0	0.0%

Seasonality



BM-08: Battlement Mesa Activity Center

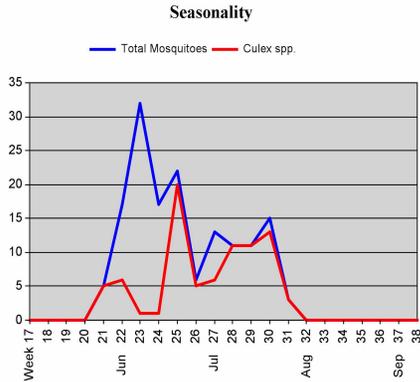
Season: 2009
 Trap Type: Light/CO2
 Location: 100 yards from the Activity Center, 0398 Arroyo Dr
 GPS: N39 26.555', W108 1.315'

Total number of trap/nights set: 10
 Total number of mosquitoes collected: 141
 Average mosquitoes per trap/night: 14
 Average Culex per trap/night: 7

Species collected and abundance:

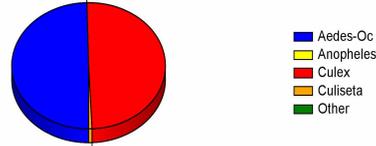
<i>Aedes (Oc.) hexodontus</i>	2	1.4%
<i>Aedes (Oc.) increpitus</i>	2	1.4%
<i>Aedes (Oc.) melanimon</i>	3	2.1%
<i>Aedes (Oc.) nigromaculis</i>	1	0.7%
<i>Aedes vexans</i>	61	43.3%
<i>Aedes/Ochlerotatus spp</i>	1	0.7%
<i>Culex pipiens</i>	1	0.7%
<i>Culex tarsalis</i>	69	48.9%
<i>Culiseta inornata</i>	1	0.7%

[TRAP REPLACED BY BM-09 IN AUGUST AND SEPTEMBER]



Genus Proportions:

Genus	Number	Percent of Total
<i>Aedes/Ochlerotatus</i>	70	49.6%
<i>Anopheles</i>	0	0.0%
<i>Culex</i>	70	49.6%
<i>Culiseta</i>	1	0.7%
Other	0	0.0%



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BM-09: Willow Creek

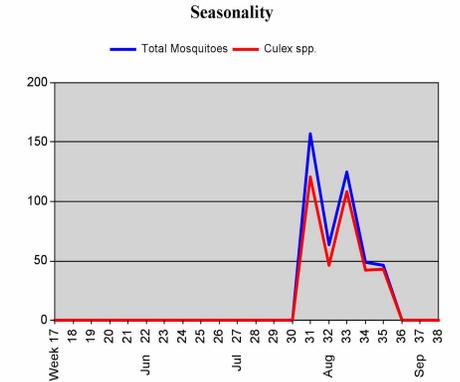
Season: 2009
 Trap Type: Light/CO2
 Location: Battlement Mesa - Willow Creek
 GPS: N39° 26.625', W108° 2.525'

Total number of trap/nights set: 5
 Total number of mosquitoes collected: 441
 Average mosquitoes per trap/night: 88
 Average Culex per trap/night: 72

Species collected and abundance:

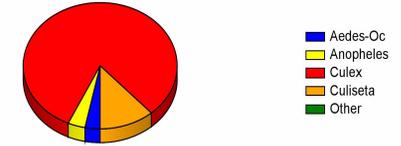
<i>Aedes (Oc.) dorsalis</i>	2	0.5%
<i>Aedes (Oc.) increpitus</i>	1	0.2%
<i>Aedes vexans</i>	11	2.5%
<i>Anopheles hermsi</i>	16	3.6%
<i>Culex erythrothorax</i>	79	17.9%
<i>Culex pipiens</i>	69	15.6%
<i>Culex salinarius</i>	3	0.7%
<i>Culex tarsalis</i>	209	47.4%
<i>Culiseta inornata</i>	51	11.6%

[REPLACED BM-08 IN AUGUST AND SEPTEMBER]



Genus Proportions:

Genus	Number	Percent of Total
<i>Aedes/Ochlerotatus</i>	14	3.2%
<i>Anopheles</i>	16	3.6%
<i>Culex</i>	360	81.6%
<i>Culiseta</i>	51	11.6%
Other	0	0.0%



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CD-02: East Carbondale Saint Finbar

Season: 2009
 Trap Type: Light/CO2
 Location: In Saint Finbar neighborhood nr. Equestrian Ctr.
 GPS: N39° 24.070', W107° 9.240'

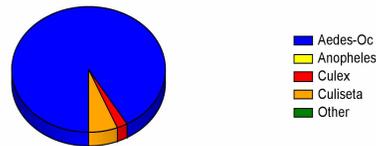
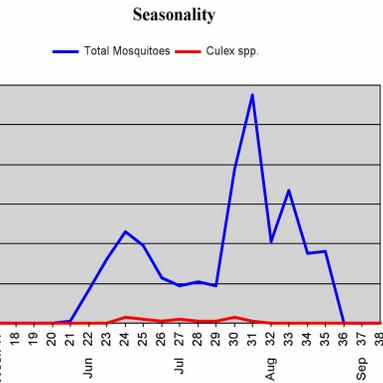
Total number of trap/nights set: 15
 Total number of mosquitoes collected: 589
 Average mosquitoes per trap/night: 39
 Average Culex per trap/night: 1

Species collected and abundance:

<i>Aedes (Oc.) dorsalis</i>	27	4.6%
<i>Aedes (Oc.) spaciatus</i>	2	0.3%
<i>Aedes (Oc.) increpitus</i>	28	4.8%
<i>Aedes (Oc.) melanimon</i>	6	1.0%
<i>Aedes (Oc.) nigromaculis</i>	1	0.2%
<i>Aedes (Oc.) idahoensis</i>	4	0.7%
<i>Aedes (Oc.) trivittatus</i>	5	0.8%
<i>Aedes cinereus</i>	27	4.6%
<i>Aedes vexans</i>	429	72.8%
<i>Aedes/Ochlerotatus spp</i>	11	1.9%
<i>Culex tarsalis</i>	13	2.2%
<i>Culiseta inornata</i>	36	6.1%

Genus Proportions:

Genus	Number	Percent of Total
<i>Aedes/Ochlerotatus</i>	540	91.7%
<i>Anopheles</i>	0	0.0%
<i>Culex</i>	13	2.2%
<i>Culiseta</i>	36	6.1%
Other	0	0.0%



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CD-11: Carbondale CRMS

Season: 2009
 Trap Type: Light/CO2
 Location: Colorado Rocky Mountain School entrance
 GPS: N39° 24.470', W107° 13.645'

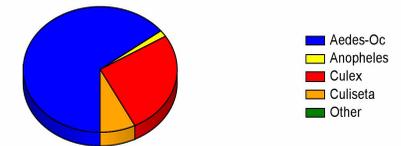
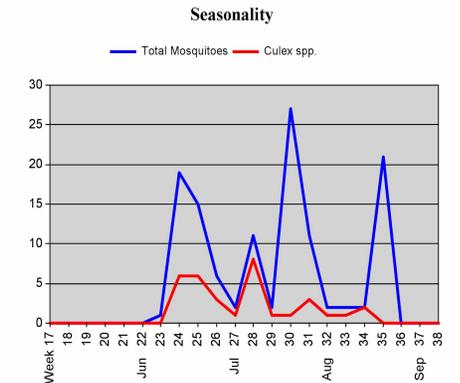
Total number of trap/nights set: 15
 Total number of mosquitoes collected: 121
 Average mosquitoes per trap/night: 8
 Average Culex per trap/night: 2

Species collected and abundance:

<i>Aedes (Oc.) dorsalis</i>	4	3.3%
<i>Aedes (Oc.) increpitus</i>	6	5.0%
<i>Aedes (Oc.) melanimon</i>	1	0.8%
<i>Aedes vexans</i>	67	55.4%
<i>Anopheles hermsi</i>	2	1.7%
<i>Culex tarsalis</i>	32	26.4%
<i>Culiseta inornata</i>	9	7.4%

Genus Proportions:

Genus	Number	Percent of Total
<i>Aedes/Ochlerotatus</i>	78	64.5%
<i>Anopheles</i>	2	1.7%
<i>Culex</i>	32	26.4%
<i>Culiseta</i>	9	7.4%
Other	0	0.0%



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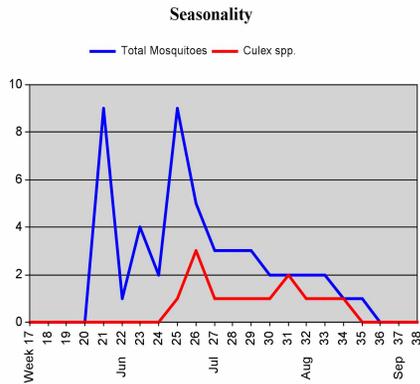
GW-09: Glenwood Springs Cemetery

Season: 2009
 Trap Type: Light/CO2
 Location: Cemetery Road east of 12th St.
 GPS: N39° 32.465', W107° 19.230'

Total number of trap/nights set: 15
 Total number of mosquitoes collected: 44
 Average mosquitoes per trap/night: 3
 Average Culex per trap/night: 1

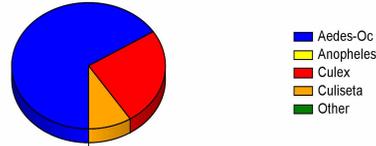
Species collected and abundance:

<i>Aedes (Oc.) increpitus</i>	18	40.9 %
<i>Aedes (Oc.) melaninon</i>	1	2.3 %
<i>Aedes vexans</i>	10	22.7 %
<i>Culex tarsalis</i>	11	25.0 %
<i>Culiseta incidens</i>	3	6.8 %
<i>Culiseta inornata</i>	1	2.3 %



Genus Proportions:

Genus	Number	Percent of Total
<i>Aedes/Ochlerotatus</i>	29	65.9 %
<i>Anopheles</i>	0	0.0 %
<i>Culex</i>	11	25.0 %
<i>Culiseta</i>	4	9.1 %
Other	0	0.0 %



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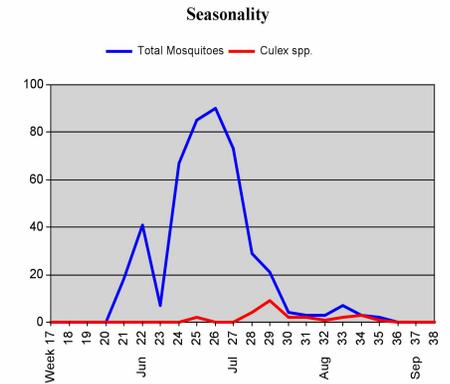
NC-03: New Castle Elmentary School

Season: 2009
 Trap Type: Light/CO2
 Location: in trees between Hwy. 6 and school lot
 GPS: N39° 34.290', W107° 32.500'

Total number of trap/nights set: 15
 Total number of mosquitoes collected: 453
 Average mosquitoes per trap/night: 30
 Average Culex per trap/night: 2

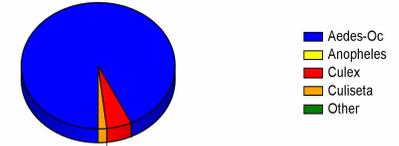
Species collected and abundance:

<i>Aedes (Oc.) increpitus</i>	17	3.8 %
<i>Aedes (Oc.) melaninon</i>	2	0.4 %
<i>Aedes (Oc.) trivittatus</i>	2	0.4 %
<i>Aedes cinereus</i>	1	0.2 %
<i>Aedes vexans</i>	399	88.1 %
<i>Culex pipiens</i>	3	0.7 %
<i>Culex salinarius</i>	1	0.2 %
<i>Culex tarsalis</i>	20	4.4 %
<i>Culiseta incidens</i>	7	1.5 %
<i>Culiseta inornata</i>	1	0.2 %



Genus Proportions:

Genus	Number	Percent of Total
<i>Aedes/Ochlerotatus</i>	421	92.9 %
<i>Anopheles</i>	0	0.0 %
<i>Culex</i>	24	5.3 %
<i>Culiseta</i>	8	1.8 %
Other	0	0.0 %



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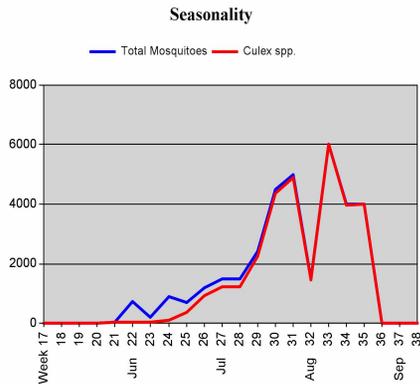
PR-01: Parachute - Cottonwood Park

Season: 2009
 Trap Type: Light/CO2
 Location: west of Cottonwood Park next to fishing ponds
 GPS: N39° 26.600', W108° 2.880'

Total number of trap/nights set: 14
 Total number of mosquitoes collected: 32,698
 Average mosquitoes per trap/night: 2,336
 Average Culex per trap/night: 2,118

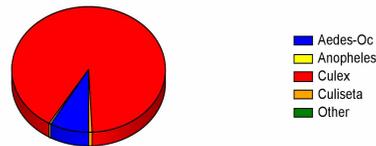
Species collected and abundance:

<i>Aedes (Oc.) dorsalis</i>	7	0.0 %
<i>Aedes (Oc.) melaninon</i>	51	0.2 %
<i>Aedes (Oc.) idahoensis</i>	8	0.0 %
<i>Aedes vexans</i>	2608	8.0 %
<i>Anopheles hermsi</i>	131	0.4 %
<i>Culex erythrothorax</i>	28042	85.8 %
<i>Culex pipiens</i>	3	0.0 %
<i>Culex salinarius</i>	650	2.0 %
<i>Culex tarsalis</i>	958	2.9 %
<i>Culiseta inornata</i>	240	0.7 %



Genus Proportions:

Genus	Number	Percent of Total
<i>Aedes/Ochlerotatus</i>	2,679	8.2 %
<i>Anopheles</i>	131	0.4 %
<i>Culex</i>	29,653	90.7 %
<i>Culiseta</i>	240	0.7 %
Other	0	0.0 %



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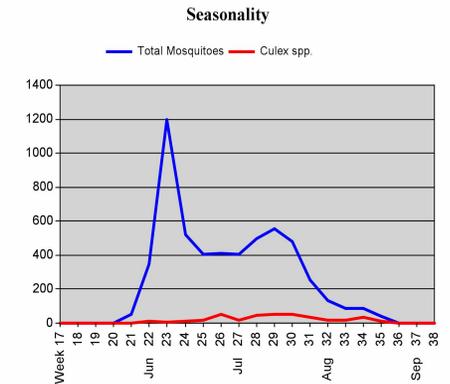
RF-01: Rifle Lyons Park Rest Area

Season: 2009
 Trap Type: Light/CO2
 Location: next to marsh south of Lyons Park Rest Area
 GPS: N39° 31.515', W107° 47.135'

Total number of trap/nights set: 15
 Total number of mosquitoes collected: 5,477
 Average mosquitoes per trap/night: 365
 Average Culex per trap/night: 25

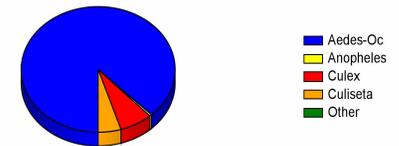
Species collected and abundance:

<i>Aedes (Oc.) dorsalis</i>	47	0.9 %
<i>Aedes (Oc.) increpitus</i>	4	0.1 %
<i>Aedes (Oc.) melaninon</i>	277	5.1 %
<i>Aedes (Oc.) nigromaculis</i>	11	0.2 %
<i>Aedes (Oc.) trivittatus</i>	18	0.3 %
<i>Aedes cinereus</i>	150	2.7 %
<i>Aedes vexans</i>	4302	78.5 %
<i>Anopheles hermsi</i>	26	0.5 %
<i>Culex erythrothorax</i>	35	0.6 %
<i>Culex pipiens</i>	40	0.7 %
<i>Culex tarsalis</i>	305	5.6 %
<i>Culiseta inornata</i>	262	4.8 %



Genus Proportions:

Genus	Number	Percent of Total
<i>Aedes/Ochlerotatus</i>	4,809	87.8 %
<i>Anopheles</i>	26	0.5 %
<i>Culex</i>	380	6.9 %
<i>Culiseta</i>	262	4.8 %
Other	0	0.0 %



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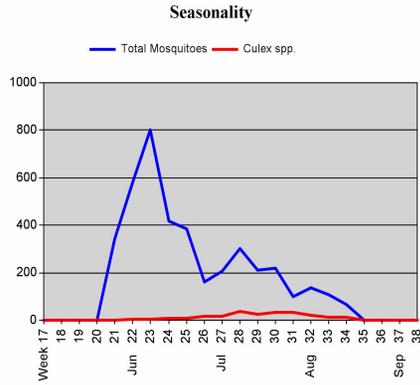
RF-15: Rifle - Mile Pond Road

Season: 2009
 Trap Type: Light/CO2
 Location: pulloff 0.2miles NE of ArdvarkStorage Facility
 GPS: N39° 32.170', W107° 45.330'

Total number of trap/nights set: 15
 Total number of mosquitoes collected: 4,029
 Average mosquitoes per trap/night: 269
 Average Culex per trap/night: 15

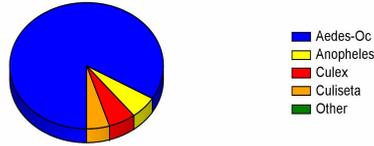
Species collected and abundance:

<i>Aedes (Oc.) cataphylla</i>	1	0.0 %
<i>Aedes (Oc.) dorsalis</i>	9	0.2 %
<i>Aedes (Oc.) increpitus</i>	5	0.1 %
<i>Aedes (Oc.) melaninon</i>	294	7.3 %
<i>Aedes cinereus</i>	1	0.0 %
<i>Aedes vexans</i>	3061	76.0 %
<i>Anopheles hermsi</i>	233	5.8 %
<i>Culex erythrorhax</i>	8	0.2 %
<i>Culex pipiens</i>	12	0.3 %
<i>Culex tarsalis</i>	210	5.2 %
<i>Culiseta incidens</i>	1	0.0 %
<i>Culiseta inornata</i>	194	4.8 %



Genus Proportions:

Genus	Number	Percent of Total
<i>Aedes/Ochlerotatus</i>	3,371	83.7 %
<i>Anopheles</i>	233	5.8 %
<i>Culex</i>	230	5.7 %
<i>Culiseta</i>	195	4.8 %
Other	0	0.0 %



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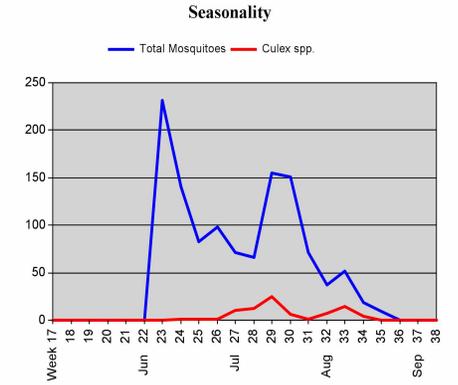
RF-16: Rifle - Middle School

Season: 2009
 Trap Type: Light/CO2
 Location: NW of Rifle Middle School
 GPS: N39° 32.140', W107° 47.155'

Total number of trap/nights set: 13
 Total number of mosquitoes collected: 1,183
 Average mosquitoes per trap/night: 91
 Average Culex per trap/night: 6

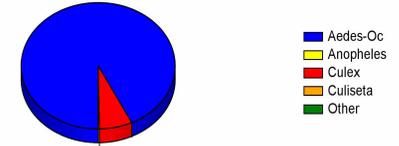
Species collected and abundance:

<i>Aedes (Oc.) dorsalis</i>	11	0.9 %
<i>Aedes (Oc.) increpitus</i>	2	0.2 %
<i>Aedes (Oc.) melaninon</i>	92	7.8 %
<i>Aedes (Oc.) nigromaculis</i>	4	0.3 %
<i>Aedes cinereus</i>	2	0.2 %
<i>Aedes vexans</i>	987	83.4 %
<i>Culex pipiens</i>	21	1.8 %
<i>Culex tarsalis</i>	61	5.2 %
<i>Culiseta inornata</i>	3	0.3 %



Genus Proportions:

Genus	Number	Percent of Total
<i>Aedes/Ochlerotatus</i>	1,098	92.8 %
<i>Anopheles</i>	0	0.0 %
<i>Culex</i>	82	6.9 %
<i>Culiseta</i>	3	0.3 %
Other	0	0.0 %



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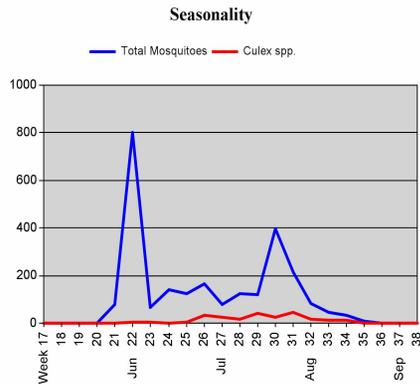
SI-09: Silt Kum & Go

Season: 2009
 Trap Type: Light/CO2
 Location: SE of Kum & Go Store, 905 Main Street
 GPS: N39° 32.780', W107° 39.195'

Total number of trap/nights set: 15
 Total number of mosquitoes collected: 2,476
 Average mosquitoes per trap/night: 165
 Average Culex per trap/night: 16

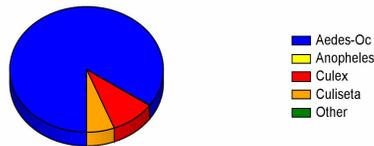
Species collected and abundance:

<i>Aedes (Oc.) dorsalis</i>	83	3.4 %
<i>Aedes (Oc.) increpitus</i>	61	2.5 %
<i>Aedes (Oc.) melaninon</i>	609	24.6 %
<i>Aedes (Oc.) nigromaculis</i>	1	0.0 %
<i>Aedes (Oc.) idahoensis</i>	1	0.0 %
<i>Aedes cinereus</i>	22	0.9 %
<i>Aedes vexans</i>	1318	53.2 %
<i>Anopheles hermsi</i>	3	0.1 %
<i>Culex erythrorhax</i>	3	0.1 %
<i>Culex pipiens</i>	3	0.1 %
<i>Culex tarsalis</i>	227	9.2 %
<i>Culiseta impatiens</i>	1	0.0 %
<i>Culiseta inornata</i>	144	5.8 %



Genus Proportions:

Genus	Number	Percent of Total
<i>Aedes/Ochlerotatus</i>	2,095	84.6 %
<i>Anopheles</i>	3	0.1 %
<i>Culex</i>	233	9.4 %
<i>Culiseta</i>	145	5.9 %
Other	0	0.0 %



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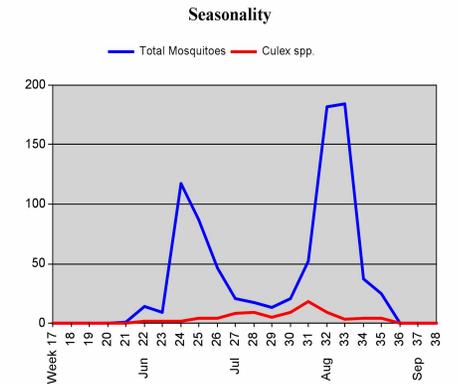
SI-10: Silt Coal Ridge High School

Season: 2009
 Trap Type: Light/CO2
 Location: near retention pond SE of Coal Ridge H.S.
 GPS: N39° 33.010', W107° 36.430'

Total number of trap/nights set: 15
 Total number of mosquitoes collected: 826
 Average mosquitoes per trap/night: 55
 Average Culex per trap/night: 5

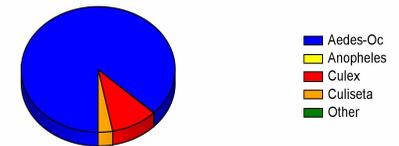
Species collected and abundance:

<i>Aedes (Oc.) dorsalis</i>	23	2.8 %
<i>Aedes (Oc.) increpitus</i>	11	1.3 %
<i>Aedes (Oc.) melaninon</i>	63	7.6 %
<i>Aedes (Oc.) nigromaculis</i>	26	3.1 %
<i>Aedes (Oc.) trivittatus</i>	2	0.2 %
<i>Aedes vexans</i>	594	71.9 %
<i>Anopheles hermsi</i>	1	0.1 %
<i>Culex pipiens</i>	2	0.2 %
<i>Culex salinarius</i>	2	0.2 %
<i>Culex tarsalis</i>	77	9.3 %
<i>Culiseta inornata</i>	25	3.0 %



Genus Proportions:

Genus	Number	Percent of Total
<i>Aedes/Ochlerotatus</i>	719	87.0 %
<i>Anopheles</i>	1	0.1 %
<i>Culex</i>	81	9.8 %
<i>Culiseta</i>	25	3.0 %
Other	0	0.0 %



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