



2022 Annual Report Town of Gypsum Mosquito Control Program



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**Town of Gypsum
Mosquito Management
Operations**

Annual Report For 2022

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VDCI's Commitment

West Nile virus remains the #1 mosquito-borne disease reported on an annual basis in the United States. Mosquitoes transmit diseases that kill upwards of 700,000 people every year and are considered the deadliest animal on our planet. With these facts in mind, we partner with the city, county, and state governments as well as mosquito abatement districts to help support their public health mission to protect residents and visitors to their community. VDCI utilizes an Integrated Mosquito Management (IMM) that can assist in reducing not only nuisance populations, but also species that could potentially vector mosquito-borne diseases.

Deemed the industry experts in Integrated Mosquito Management programs, we strive to target all phases of the mosquito life cycle to help to prevent the transmission of serious diseases. Surveillance provides our customers with valuable data that is captured and analyzed in our proprietary database. Providing data helps communities make better decisions, which leads to better results. Beyond this, our targeted action reduces the risk of developing pesticide resistance. VDCI currently has programs across the state of Colorado, providing services for towns, cities, counties, homeowners associations, Indian reservations, and encephalitis surveillance monitoring programs for county health departments.

As the contractor for the town of Gypsum, VDCI will continue to implement the resources, personnel, and expertise needed to maintain control of mosquitoes and mosquito-borne diseases, both routinely and in the face of any circumstance that may arise. We use scientifically established Integrated Mosquito Management techniques to survey and control local mosquito populations using bio-rational larval controls and limited low-toxicity insecticide applications. All the methods and materials used have been reviewed and registered by the US Environmental Protection Agency, the Centers for Disease Control, the Colorado Department of Agriculture and the American Mosquito Control Association.

Program Objectives

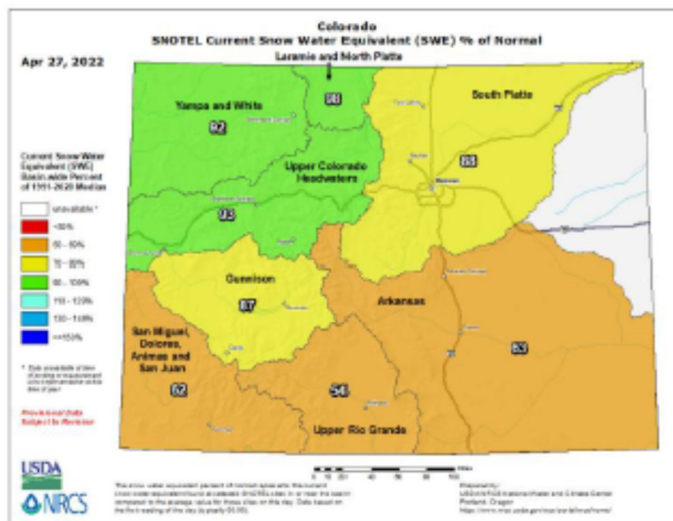
VDCI has designed a customized set of protocols for the Gypsum mosquito abatement program based on science, surveillance, and community outreach. The primary objective of the Town of Gypsum IMM Program is to reduce mosquito populations through the use of specific, environmentally sound control techniques. VDCI prioritizes the detection and elimination of larval mosquitoes in aquatic habitats, in conjunction with the control of adult mosquito populations through routine barriers and truck mounted adulticide applications.

Open communication is maintained by VDCI and the residents of Town of Gypsum in order to ensure that the highest level of mosquito control and epizootic response is achieved. This communication provides significant benefits to outdoor recreation and public health throughout the entire control area. VDCI often responds to individual calls for backpack barrier applications to provide relief in between truck fogging. In anticipation to community wide events such as Gypsum Daze, a combination of barriers and truck fogging is utilized to protect large crowds from potential mosquito-borne diseases.

2022 Season Perspective

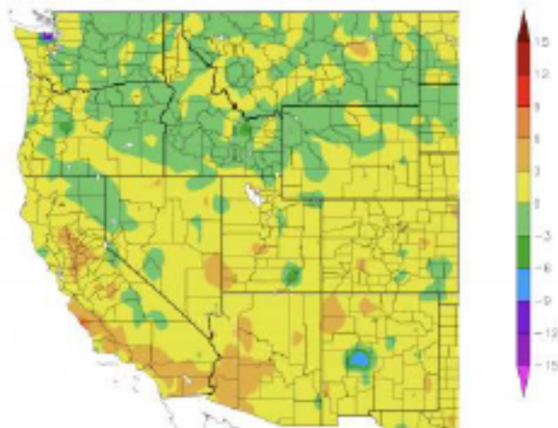
West Nile Virus first became reportable in Colorado in the summer of 2003. Most seasons typically run from May through October. In 2022, there have been 23 reported human cases. Of these cases, 13 were neuroinvasive and 14 resulted in hospitalization. The first human case of the West Nile Virus for the 2022 season in Colorado was detected in Delta County, as reported by state health officials on July 29th. In 2021, Colorado had 175 reported human cases of West Nile virus, including 11 deaths. The number of cases represents a 120% increase from the previous five-year average and the largest number of cases for the past 18 years.

In addition to the cases reported as of August 29th in Colorado, West Nile virus has been found in mosquitoes in Boulder, Larimer, Weld, and many other counties this season. The rapid increase in cases reported in the 2021 season combined with the widespread detection of West Nile virus thus far in 2022 has increased our efforts in consistent surveillance and testing throughout the program area.



The winter season in Gypsum consisted of a below-average snowpack, then picked up with a lot of snow at the end of December and continuing into the beginning of January. After that, most of January and February lacked significant storms. March provided more consistent snowfall and by April the Gypsum District mosquito control program was slightly below historical snowfall levels. Spring snowmelt was expected to be slightly below normal in accordance observed snowpack reports, which was 91% of normal statewide as of April 7.

Departure from Normal Temperature (F)
6/1/2022 - 6/30/2022



Generated 7/4/2022 at HRCC using provisional data.

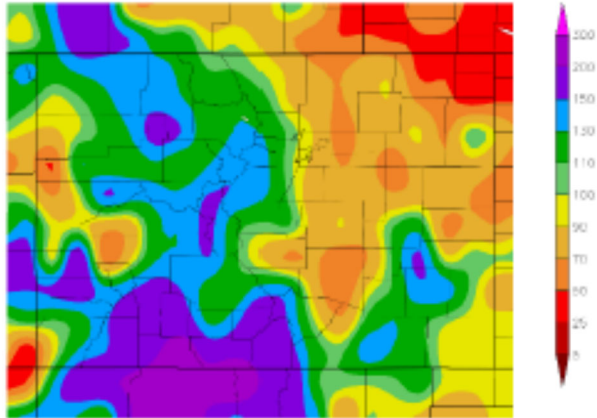
NGM Regional Climate Center

The snowpack going into the summer of 2022 was in a slightly better place at this point than it was last year and was slightly worse than this point in 2020. This led us to predict that many of the historically active breeding grounds in Gypsum would hold significant moisture moving into April and May. By Mid-May, increasing temperatures combined with spring runoff led to the detection of larvae in the fields, ditches and sloughs throughout Gypsum.

Regional temperatures were slightly above normal in the Gypsum control program area throughout the summer of 2022. The summer of 2022 started off

with a slightly below normal snowpack and warmer temperature conditions throughout Colorado. Temperatures were above average during July for the entire region. This led us to encounter relatively aggressive mosquito season due to the combination of standing water and sufficient mosquito breeding temperatures.

Percent of Normal Precipitation (%)
5/28/2022 – 8/25/2022



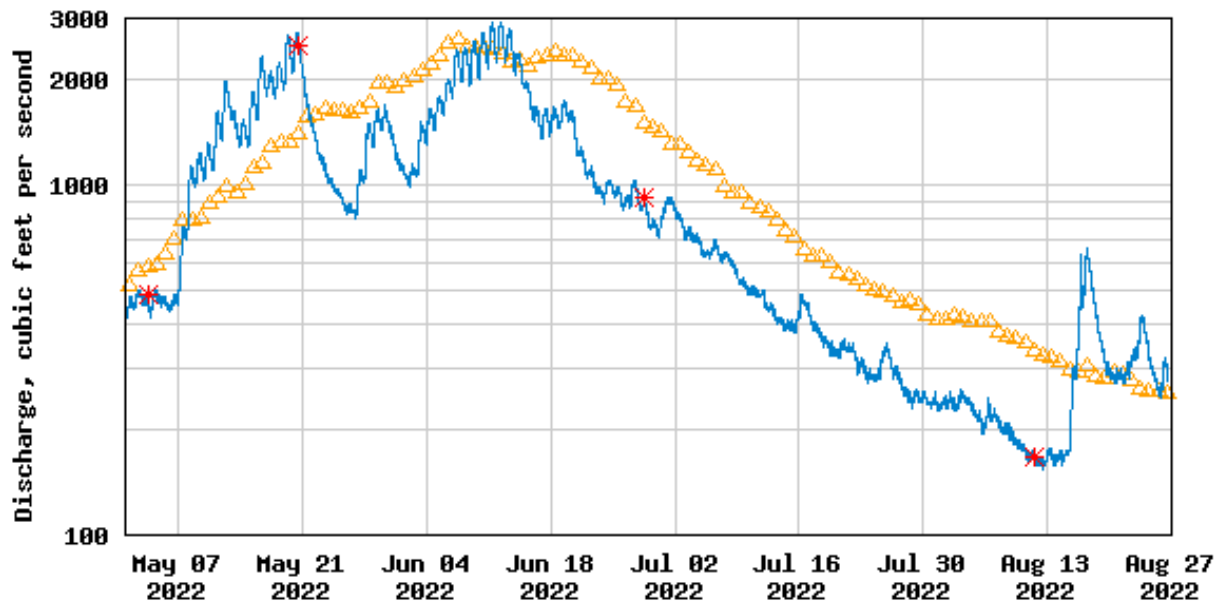
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NOAA Regional Climate Centers

From May to August the percent of normal precipitation in Eagle County was considerably higher than the historical average. A strong monsoonal weather pattern during July brought average to above average precipitation to most of Colorado. This extended the presence of standing within the fields, ditches and sloughs of the town of Gypsum well after spring runoff. As a result of precipitation events, regional drought conditions improved during July. VDCI encountered new as well as historically active mosquito breeding grounds throughout the months of July and August.

Peak flows of the Eagle River near Gypsum spiked in mid-May and once again in Mid-June. During this time many of the sites adjacent to the I-70 Frontage Rd and around the Gypsum Campground contained significant levels of standing water. Due to recent fires, VDCI had limited access to the sloughs and low laying terrain surrounding Gypsum Campground. After mid-June, flows on

USGS 09070000 EAGLE RIVER BELOW GYPSUM, CO.



----- Provisional Data Subject to Revision -----

△ Median daily statistic (75 years) * Measured discharge
— Discharge

the Eagle River dropped quickly. With the exception of a few spikes in discharge occurring in mid-August, sites along the eagle river were abnormally dry throughout most of July.

As the season progressed, extended periods of above average temperatures combined with substantial precipitation events led to a relatively harsh and extended mosquito season. Typically, the mosquitoes begin to emerge in late April and early May. In 2022, warm spring temperatures and early snow melt led to an initial emergence in early May as expected. The first larvae in Gypsum were detected on May 5th. This was about a week later than the first mosquito emergence in 2021.

When temperatures continued to increase in June mosquito larvae began to emerge rapidly but were limited to smaller sites due to relatively dry conditions. The first large-scale hatch was the first week of June, approximately one week later than last year. This trend continued throughout the summer. In 2022, as the season progressed, increased precipitation events led to a late season expansion of many temporary larval sites considerably extending control efforts.

Larval Mosquito Control

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 may have negative consequences that outweigh their benefits. Mechanical or physical habitat modification, called Source Reduction, is a technique which VDCI uses on relatively small scale projects, as the area to be modified and the extent to which the work will affect the surrounding area must be carefully reviewed. True biological controls, such as the introduction of predacious animal species, can also cause negative environmental impacts that outweigh the benefit of their control capacity.

VDCI's favored method of larval mosquito control is through the use of bacteria or biological control. The main product used by VDCI is a variety of bacteria (*Bacillus thuringiensis var. israeliensis*). *Bti*, as it is known, has become the cornerstone of mosquito control programs throughout the world. The benefits include its efficacy and lack of environmental impacts. When used in accordance with its label, successful control of mosquito larvae can be achieved without impact to non-target species such as other aquatic invertebrates, birds, mammals, fish, amphibians, reptiles, or humans. 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*). *BS* provides similar benefits to *Bti* while also providing residual control of certain species of mosquitoes. It is used specifically in difficult to treat areas where *Culex* are the predominant species due to its limitations and cost.

Larval mosquito control is the cornerstone of the IMM program for Town of Gypsum. It reduces the number of potential disease vectors and annoyances associated with biting adults. It also greatly reduces the reproductive potential of the mosquito as they never have the opportunity to lay eggs and increase the overall population.

VDCI began larval site inspections in many low elevation areas along the Eagle River in early April. These riparian areas west of town always produce mosquitoes early. Very few larvae were found during the early season inspections. As alluded to earlier, significant numbers of larvae were not observed until early May when temperatures increased enough to warm the water. At this time all of the breeding sites throughout the program area were producing several broods at once.

This was a result of the typical early season species not having the opportunity to emerge as conditions were not ideal. The result was a very heavy initial emergence.

In 2022, VDCI inspected and treated 55 sites within the Gypsum area. VDCI visited Town of Gypsum sites once a week until late August. During these site visits the field technicians applied 127 Lbs. of VectoBac (Bti) to the fields, meadows, and other breeding sites around Town of Gypsum.

The main problem areas were the sloughs along the Eagle River and Gypsum Creek. Sections along the Gypsum Creek golf course as well as ditches in the Cotton Ranch neighborhood also produced hatches weekly. The cat tail slough below the railroad grade had mosquitoes every week beginning in early June. The field technicians routinely observed several hundred larvae/dip in this area. In 2022, VDCI utilized 127 Lbs. of VectoBac (Bti), slightly more than last year due to precipitation events in July and August.

ADULT MOSQUITO CONTROL

When VDCI has determined that mosquito populations have exceeded acceptable levels and the risk of mosquito-borne illness increases, the application of chemicals is the culmination of an effective Integrated Mosquito Management program. The safest and most environmentally friendly products are selected and utilized with only the most up-to-date truck-mounted Ultra-Low Volume (ULV) application equipment. Equipment is routinely calibrated and maintained to the highest standards of quality ensuring the proper droplet size and accurate pesticide placement.

The goal of VDCI is to provide all residents of Gypsum program with the best options for effective modern mosquito management. The primary emphasis of the Town of Gypsum Metro Mosquito Management Program is to control mosquitoes in the larval stage, using biological control products. When mosquito complaints are received by the residents, VDCI used CDC and EPA approved adulticides to reduce adult mosquito populations.

In 2022, VDCI utilized the water based product Wisdom TC to conduct 14 barrier treatments around Gypsum. The barriers were routinely set around the Rec Center/Municipal Offices, the golf course, and in Willowstone. Additionally, several barriers were set up around specific homes within the program area to provide additional relief between truck spraying up to the aerial applications. Approximately 16 ounces of Wisdom TC was applied to these areas. In anticipation to community wide events such as Gypsum Daze, a combination of barriers and truck fogging is utilized to protect large crowds from potential mosquito-borne diseases.

In addition to barriers, VDCI conducted weekly fogging missions in 2022. This year VDCI conducted weekly treatments in Gypsum applying 31 gallons of Permanone RTU and Perm-X UL 4-4. In certain instances, technicians treated with both with truck foggers and backpack barrier machines to provide additional coverage during the peak emergence. These sprays covered approximately 91 miles. These applications were timed to provide additional control around the 4th of July and Gypsum Daze when complaints in certain areas were voiced. In 2022, VDCI sprayed approximately 2 additional gallons of Permanone RTU when compared to the summer of 2021.

Public Relations and Education

VDCI is dedicated to providing strong Public Outreach and Education Programs to residents in all of our communities. Citizen complaints, inquiry, information and satisfaction surveys can aid in evaluating the effectiveness of a program. VDCI constantly looks for ways to better serve the communities we work with and encourages both the citizen and local media involvement in order to increase the effectiveness of our programs. We have clearly demonstrated that commitment and belief by proactively serving Town of Gypsum (and all of our contracted communities) with numerous innovative programs, activities and services.

Customer service is always a high priority for VDCI. We take pride in training each and every technician so that they have the knowledge to provide residents with the correct answers to their questions. Each field technician spends part of their day responding to resident concerns in their work area. This in-field customer service personalizes the mosquito control program, provides VDCI with local information on mosquito activity and presents a valuable opportunity to educate our residents about mosquito biology and control.

MosquitoLine™

VDCI maintains a toll-free telephone line: (877) 276-4306 to accept calls from the public concerning:

- ✧ Information about mosquito biology and source reduction of mosquito habitats
- ✧ information on program components, operations and monitoring
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- ✧ Seasonal West Nile virus activity
- ✧ Personal protection options for mosquito annoyances and West Nile virus risk
- ✧ Reports about mosquitoes and possible larval mosquito habitats
- ✧ Requests to perform larvicide applications
- ✧ Opt-out of any adulticide spraying via a shut-off list
- ✧ Request notification when adulticide spraying is planned in their neighborhood
- ✧ Request health and safety information about mosquito control operations and pesticide products used in the Gunnison

VDCI has provided Mosquito Hotlines to the residents in communities which we are contracted to also reduce workload by municipal personnel. This enables direct communication and response by mosquito control employees to resident's concerns about West Nile virus and larval site activity and treatment. VDCI maintains a log of calls received and will summarize call activity in monthly and annual reports.

CALL NOTIFICATION & SHUTOFF SYSTEM

VDCI continues to maintain a comprehensive Call Notification & Shutoff database and will notify residents on the list when conducting ULV adulticide spray applications 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. Call & Shutoff forms are available online and may be submitted via mail or email.

Summary

VDCI feels the 2022 mosquito control program for Town of Gypsum was a success. The season presented unusual challenges with a rapid spring snowmelt, high temperatures and significant precipitation events which led to a season long mosquito emergence throughout the program area. VDCI managed the mosquitoes by greatly increasing the larval control efforts and conducting several barriers to augment truck mounted adulticide applications. The main increase in larval and adult control efforts was along the Eagle River and adjacent flooded areas. VDCI looks forward to providing Town of Gypsum with mosquito control in 2023.

Attachments

Gypsum Flood Plain Sites

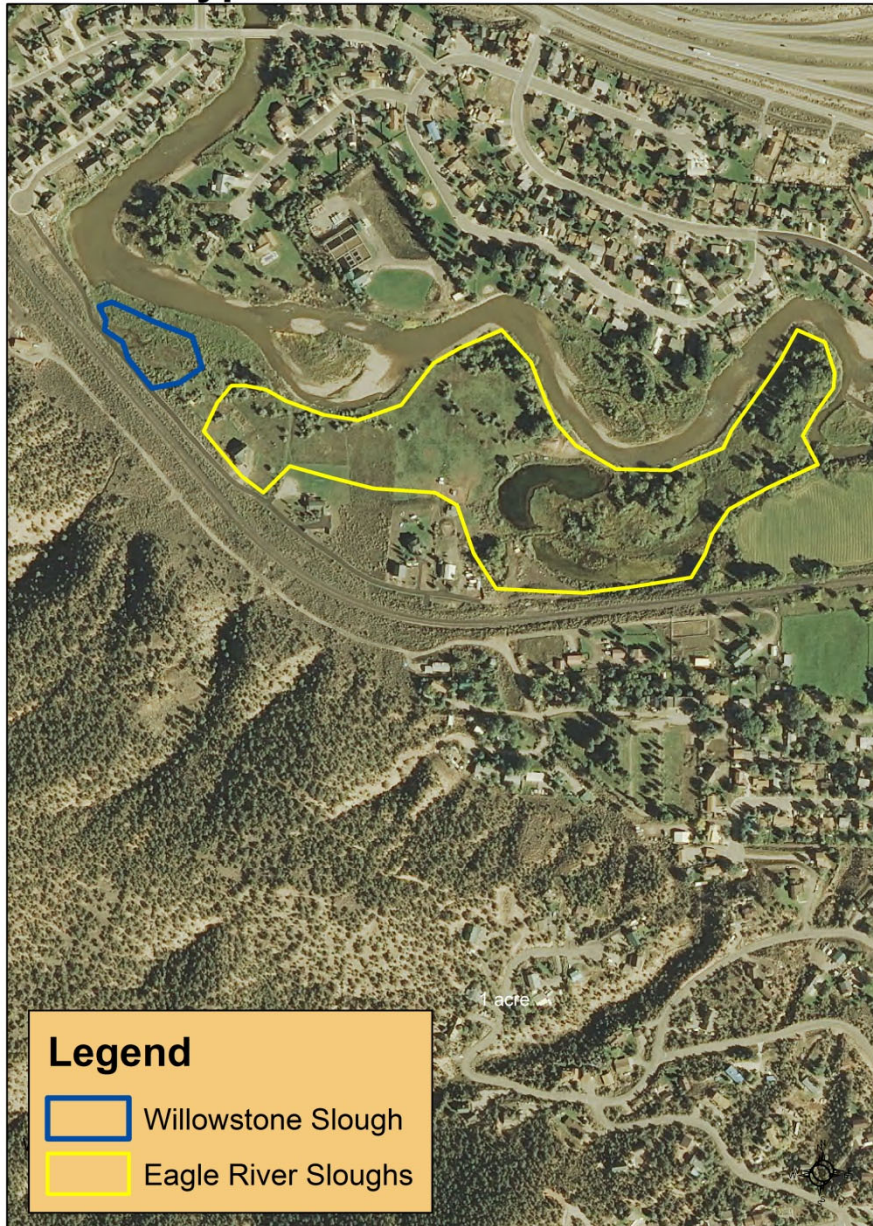


Figure 1 Town of Gypsum Larvicide areas