



Owens Valley Mosquito Abatement Program



2009
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MANAGER'S FORWARD

I am pleased to present the 2009 Annual Report for the Owens Valley Mosquito Abatement Program. The Program continues on its mission to enhance public health and comfort through providing safe, effective and economical mosquito control in the Owens Valley made possible through area wide, responsive service. The following report outlines the work performed by the Program to achieve these mission objectives.

A perfect year for us would be one that used little to no adulticide, one that we were able to keep control solely through the use of larvicides. Well, we *almost* pulled off the perfect season. Ahh, almost...

As a general rule and for obvious reasons, drought years require less material applications than wet years for controlling mosquitoes, and this drought year *was* following the general rule like it was written on a stone tablet. In late August, however, we were thrown a curve ball from the Department of Water and Power that resulted in a massive hatch of day biting mosquitoes. More on this later on in the report but, needless to say, our almost perfect season won't be remembered for being almost perfect but will be remembered only for its late season mosquito debacle.

West Nile virus (WNV) for 2009 on a State level was relatively mild, which could be related to the statewide drought. All of the metrics used to measure WNV prevalence were lower except sentinel chicken flocks. The long term weather forecast, however, is predicting a moderate El Nino which could bring some good snows to the Sierra and once again bring WNV back from wherever it's been hiding.

As always, the Program continues to better its delivery of control services to succeed in its mission to protect public health. We strive, to the best of our ability, to keep up-to-date technologically, both chemically and informationally, and to be innovative in controlling mosquito-borne threats to public health.

Respectfully,



Jerrold Oser, Program Manager



OWENS VALLEY MOSQUITO ABATEMENT PROGRAM

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The Vision of Inyo County Government for its public is to provide responsive decision making while supporting cultural and historical values, the natural environment and rural quality of life. It has as its priority for actions to:

- Maintain Inyo County's natural environment and rural quality of life.
- Support and expand tourism in Inyo County.
- Improve government decision making in Inyo County.
- Improve health care, social services, and education in Inyo County.
- Promote economic development.

Our mission is "To enhance public health and comfort through providing safe, effective and economical mosquito control in the Owens Valley" which supports Inyo's vision in many ways.

To accomplish our mission, the OVMAP provides continual surveillance of mosquitoes to determine the threat of disease transmission and annoyance levels, then uses safe, integrated vector management methods to keep mosquitoes below those levels.

The OVMAP provides year-round mosquito control to an area of about 1200 square miles within the Owens Valley. As a comparison, the entire state of Rhode Island is 1045 square miles. All that coverage area is divided into 5 geographical zones, with technicians responsible for all aspects of mosquito control in their assigned zone, from surveillance to eventual treatment.

ADMINISTRATIVE STAFF

Owens Valley Mosquito Abatement Program



GEORGE MILOVICH,
AG COMMISSIONER



ROBIN CONKLIN,
EXEC. SECRETARY



JENNIFER SARTEN,
ACCT. TECHNICIAN

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FIELD STAFF



Robert Miller Hello, my name is Robert Miller, I have been employed with the Owens Valley Mosquito Abatement Program since 2001. I am responsible for the control of mosquitoes in the Bishop/Round Valley area, as well as maintenance and repair of our equipment. I also assist in the field training of new personal.

The mosquito season of 2009 started out real well. We had very good success in controlling mosquitoes in all of the flood irrigated pastures, seeps, ponds, and other sources throughout the valley. Good mosquito control had been obtained due to our experienced, returning seasonal personnel, who did not need field training. They possess knowledgeable skills in the surveillance and treatment of mosquitoes. The month of September brought an abundance of adult mosquitoes, due to an increase of the Owens River flow, which led to a series of fogging treatments both along the river and surrounding communities.



Casey Freeman 2009 was the second season that I was responsible for the Cottonwood to Blackrock zone. As I get more familiar with this zone, I am able to use less pesticide and still control the mosquito count. The majority of the summer was great. Mosquito populations were at a minimum, praise from the community was abundant, and life was good. At the end of August, the river was raised, filling all the oxbows and side channels that were previously dry. This led to another huge emergence of adults and caused the community to forget that the entire summer was good. Complaints began to overwhelm me. Over the winter I hope our

plans for the new equipment and products come through. This is our best hope for controlling the river.



From L to R: Walter, Rob, David, Bo, and Casey

Seasonal Field Staff

Seasonal technicians were Bruce (Bo) Mack, who has been with us since 2003 and works full time with the County but is seasonally split between us and the Inyo County Water Department for their Salt Cedar Program in the winter months. David Miller, who finished his 3rd season, also works with the Salt Cedar Program in the winter. Our newest technician, Walter Davison, did a great job and, as long as the mosquitoes didn't beat him up too bad, should return for 2010. The ability to offer winter seasonal opportunities to these first-rate employees and have them return year after year, is a great asset to the program and the public it serves. Every effort should be made to continue these opportunities, such as with the Salt Cedar Program, in the future.

INTEGRATED PEST MANAGEMENT (IPM)

IPM refers to the systematic, repeated application of pest surveillance and control technology to reduce the economic impacts of diverse insects, pathogens, nematodes, weeds, and animals that damage agriculture (Sterner, R., 2008).

We don't have to look too far back in the records to see that mosquito abatement in the Owens Valley in the 60's and 70's revolved around heavy reliance on organophosphate chemicals and diesel fuel as the weapons available for control. The treatments being done at that time were largely reactive to adult mosquitoes entering communities and surveillance limited to adult

mosquito densities through light traps. In fact, the same can be said throughout much of the State.

Thankfully, those days are behind us. Modern IPM uses chemicals as a last resort, when all else fails or when dealing with mosquito-borne disease emergencies. Education (both public and employee), good surveillance (both population and disease monitoring), non-chemical control measures, safe biological larvicides, and insect growth regulators are all critical to successful IPM and are exhausted before adulticides are even considered. Achieving great control without even starting an adulticiding fogger would be a perfect year.

EDUCATION

Public Education

Public education plays a key role in any IPM dealing with mosquitoes. Without this component, a good program would be incomplete. There is a common misconception that mosquito control equals "spraying" or "fogging", referring to adulticiding. In reality, adulticiding makes up a small portion of the OVMAP when, as explained above, our best efforts at other control methods have failed or we are in the midst of a mosquito-borne disease outbreak.

Keeping the public aware of control operations that aren't as audible or visible as adulticiding, as well as current mosquito conditions, source reduction procedures, disease threats, and bite prevention measures are all ongoing through the use of the usual media channels such as local radio, TV, and newspaper. We also use other media and events such as the Inyo-Mono Agriculture website, the Tri County Fair, community get-togethers, and one-on-one conversations. Field staff are encouraged to engage inquiries with courtesy, and look at a one-on-one conversation in the field as an opportunity to share the parts of the Program that are not as well known by the public. New for this year, we are trying to use the latest social networking media such as Facebook and Twitter.

A detailed look at OVMAP IPM can be found in the document "Integrated Pest Management Strategies for the Control of Mosquitoes in the Owens Valley" found at our website: www.inyomonoagriculture.com

Several times a year, we will try to get into local classrooms with programs that educate and engage students. For example, Home Street Middle School's science programs have a series of classes on ecology and habitat. Small groups of students work with an aquarium based aquatic ecosystem, adding different organisms daily. This hands-on curriculum provides a great opportunity for OVMAP staff to make available mosquito larvae for the ecosystem and a talk about mosquito biology and control, a true symbiotic relationship.

Employee Education

In a report written by Ben Keeney (Inyo County Health Department Mosquito Control Agency) titled "Prevention and Control of *Culex tarsalis* In Owens Valley 1969 Season (sic)", Mr. Keeney writes, "The basic problem of the present mosquito control program is the difficulty of securing adequate personnel. Seasonal nature of the work and modesty of the wage where unskilled men are expected to perform a sophisticated duty reduce the desirability of the job." He then continues "[higher wages would] interest help, which would return year to year. This would build a backlog of skill and experience in the entomological aspect so important to the work."



40 years ago Mr. Keeney understood the importance of having seasonal employees return year after year and today we have reached that goal. Currently, we have an arrangement with the Inyo County Water Department's Salt Cedar Program (active during the winter months) to utilize OVMAP seasonal employees during the mosquito off season. Once the Salt Cedar Program season ends, the employees return to us with no down time when mosquitoes become active in the spring. This is an ideal situation to gain that cumulative knowledge base so essential to both programs. In the interest of work quality, efficiency, and safety using potentially hazardous chemicals and equipment, interdepartmental relationships like this should be sought after and continued.

Full time employees are encouraged to study for and pass the California Department of Public Health Vector Control Technician exams in categories "A" (pesticide use and handling) and "B" (mosquito abatement). Upon successfully passing the exams, licensed technicians are required to fulfill continuing education requirements in both categories through State approved seminars, programs, and recorded media.

Ahh, the perfect season in mosquito control, one that we use very little, if any adulticide, where we are able to get good control through using larvicides exclusively. We had it in our grasp until late August when the Los Angeles Department of Water and Power needed to move some water down to L.A. Decisions to raise the Upper Owens River above 450 CFS do have huge consequences in terms of mosquito populations that explode at the river and easily move into nearby towns in the Owens Valley.



Lots of folks believe that mosquitoes need stagnant water to breed in and this is true for many species of mosquitoes where gravid mosquitoes seek out suitable water sources to lay their eggs.

There are species, however, the floodwater mosquitoes, that lay eggs in fresh mud from a receding water source. Once dry, these eggs can wait years for water to rewet the now dry mud. Over time these egg banks become flush with literally millions of eggs just waiting for a flood event to hatch and grow.

When the Owens River flow is augmented out of Pleasant Valley Reservoir to numbers above 400 CFS, the river begins to move outside its banks and find its way into old, dry river channel. It is these ancient channels that hold the vast egg banks.

Ahh, the perfect season in mosquito control...

These massive river-inspired hatches are nothing new, presumably happening since there was an Owens River. Since the OVMAP's inception, we have been battling these hatches. Why then have the past couple of years seemed so severe?

There are many possible answers, each contributing a small part to the overall picture. For instance, what time of year the hatches occur is critical because too early and inclement weather often bars us from fogging effectively, or, too late and heavy vegetation keeps us from accessing sources and applying larvicides.

Additional surface water in the Valley, i.e. the lower Owens River and the Big Pine ditch system, play an integral role in aiding mosquito migration, enabling hungry mosquitoes to quickly move deep into town where they are harder to treat effectively.

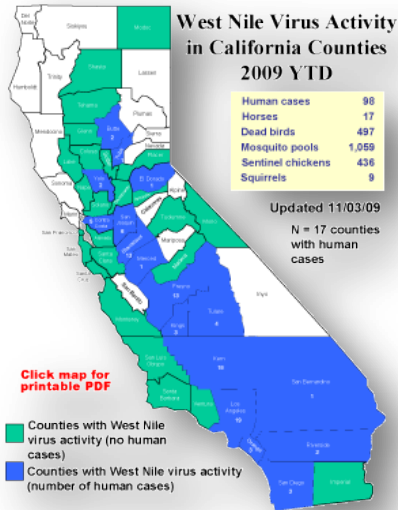
Material choice is another concern. There are many formulations and chemical classes that have their own pros and cons. Are we choosing wisely?

Next year will bring changes based on lessons learned the last two years. We will be re-evaluating surveillance tactics, rotating new classes of chemicals into our product line, and increasing our use of barrier treatments on known mosquito flyways and migration routes.

WEST NILE VIRUS ACTIVITY

West Nile Virus Activity

West Nile (WNV) on a state level was less active than years previous. Was this a natural ebb and flow of the disease or because of area-wide drought conditions limiting mosquito production?



Our data suggests perhaps a little of both on the local level. *Culex tarsalis* numbers (the mosquito species that is most capable at transmitting the disease on the Owens Valley) were on par with numbers we've seen in previous years. We submitted 81 pools of 50 mosquitoes each for testing to the State. All 81 pools came back negative for the virus even in places that were previously positive.

Dead bird reports were minimal for the Owens Valley with 21 being reported from mid-March to September. 7 of the 21 were submitted to the State for WNV testing, of which 0 returned positive.

Even with a lull in activity this year, residents should not let their guard down and continue using CDC recommended repellents when visiting areas with mosquito activity.

LOWER OWENS RIVER

The lower Owens River this year was very manageable because of drought conditions. The spring enhancement flow that typically is 200 CFS (cubic feet per second) was reduced to just 107 CFS to reflect the low accumulation of Sierra snowpack.

There was perhaps a secondary effect, however, of the Lower Owens not directly raising mosquitoes but aiding their dispersal by providing a moisture-rich migration highway. During the September river hatch in the Owens River from Pleasant Valley to Tinemaha, we saw increases in light trap numbers clear down to Independence. From surveillance, we knew the lower Owens River was under control which left migration as the most likely culprit for the increase.



What do we do in the winter?

This is a great question, and one we get asked all the time. First of all, our crew of five or six shrinks to just three in the winter to reflect the less aggressive nature of the work performed this time of year. If routine maintenance takes a little longer than expected, it's no big deal. If mosquito control work takes a little longer than expected, the office phone will start ringing with service calls from irritated residents who can't walk to their car without getting woozy from blood loss.

During the summer there is precious little time to do anything more to our equipment than basic and necessary maintenance to keep things running. The off-season is when we can really dig in and strip down our ATVs and amphibious vehicles. This is meant quite literally, as the equipment is run through water all summer long and needs the attention to detail that time only the winter can afford to spare us. This care and attention to detail is paid to all the equipment we have, from backpack sprayers, to mosquito traps, to the pickup trucks we get around in.

What's New?

New for this year was our big move from logging treatments with pencil and paper to logging treatments on a PDA. It may not sound like a big deal but this move enabled us to quickly get our data into a database and produce reports

We also have to perform maintenance on the paths we use to access and treat the mosquito sources. With all the water in these places, plant growth is feverish. Without this important maintenance, after a few years, we would not even be able to get our products where they need to be. This work is a cooperative effort between the Department of Water and Power, the California Department of Forestry (Owens Valley Conservation Camp), and the OVMAP staff.



Ideas that pop into our heads during the season that would make our work more efficient or safe are turned into a reality during this time. Training programs, public education plans, website development, treatment protocols, integrated pest management strategies, space management, and material application techniques are all discussed and refined. As an example, if we acquire a new piece of equipment like an ATV, it is a stock machine. It is not ready for the trauma we put it through nor is it outfitted with the application hardware needed to accurately distribute mosquito control products. We fabricate most of these modifications in-house or with the help of other County departments such as the Road Department.

Early spring is also the time we perform calibrations and in-house inspections to make sure we are operating within County, State, and Federal laws for pesticide application, storage, and disposal. It is essential, both practically and legally, that our application rates are within pesticide label ranges for the pests we are treating.

In summary, we go-go-go from April through September, with little time to do anything but kill as many mosquitoes as we can in the most safe and effective manner. The off-season is a time to slow the pace just bit, debrief the season; what worked, what didn't, and adapt the program to best meet the needs of the communities we serve; to repair and rejuvenate our tired equipment, and maybe even our tired bodies

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FINANCIALS

REVENUES

| | <u>07/08</u> | <u>08/09</u> |
|-----------------------|------------------|------------------|
| Benefit Assessments | \$328,918 | \$378,099 |
| Contracts/Grants | \$ 86,972 | \$ 87,454 |
| Interest | \$ <u>4,842</u> | \$ <u>3,475</u> |
| Total Revenues | \$420,732 | \$469,028 |

EXPENDITURES

| | | |
|---------------------------|------------------|------------------|
| Salaries & Wages | \$249,000 | \$273,782 |
| Services & Supplies | \$208,231 | \$196,036 |
| Capital | \$ <u>0</u> | \$ <u>0</u> |
| Total Expenditures | \$457,832 | \$469,828 |

