



Desert Wetlands *News & Views*

Mosquitoes

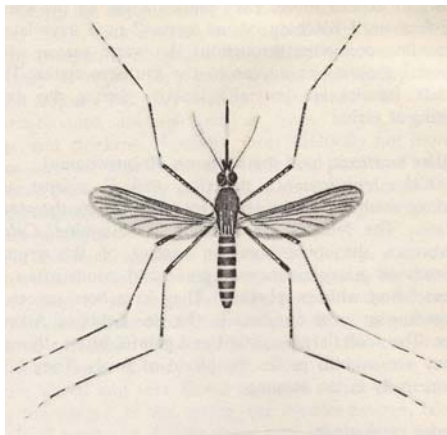
With contributions from Elsie Sellers, CCP&R, Gretchen Andrew, UNLV, and Jim Pollard, UNLV

Inside this issue:

Mosquitoes	1,2
Damsel fly	3
DU Ponds	4

Information?

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Culex tarsalis

Desert Wetlands
Conservancy

The mission of the DWC is to influence policy, create partnerships, and initiate activities in advocacy or the Las Vegas Valley Watershed, including the Desert Wetlands Park.

The Clark County Parks and Recreation Department has an agreement with researchers from the UNLV Harry Reid Center for Environmental Studies to trap, monitor, and report on mosquito populations in the Nature Preserve. The most recent study was performed in the Wetlands Park Nature Preserve at four surveillance sites. The study focused on several objectives including: The comparison of activity patterns with established visitor hours, determining diurnal activity patterns, and addressing seasonal variations and variations by genus. The genera observed were

Culex, *Anopheles*, and *Culiseta*. However, there are at least five genera (and nine known species) of mosquitoes that call Southern Nevada home.

Culex is most active from early spring to late autumn and their activity peaks in mid to late summer.

Anopheles is most active spring to autumn, peaks in summer, and semi-hibernates in winter. Based on data collected from spring 2001 to fall 2008, *Culex tarsalis* is the most abundant species in the Wetlands

Park annually. Based on the same data, *C. tarsalis* is most abundant in the spring summer and fall, but in the winter, *Culiseta* is most abundant.

Types of Arbovirus that are cause for concern include West Nile Virus, Western Equine Encephalitis (WEE) and St. Louis Encephalitis (SLE). *Culex tarsalis*, commonly named the Encephalitis Mosquito is

the chief vector for all three viruses. *C. tarsalis* feeds on a wide range of hosts but seems to prefer birds in the spring and early summer. It shifts to mammals in mid-summer, is moderately aggressive and readily enter dwellings for blood meals. Sources mostly agree *Culex* are crepuscular (active at twilight), and/or nocturnal.

The study looked at the 24 hour cycle and concluded that visitors are not likely to encounter mosquitoes during the Nature Preserve visiting hours. The risk for being bitten starts around dusk and ceases near dawn. Daytime activity is rare, though there may be slight variations in activity patterns among species. All genera appear to be nocturnal in host-seeking activity, and so people in the park after dark (e.g. researchers) are vulnerable to mosquito bites and should take precautions against bites (repellant and proactive clothing)..

All mosquitoes must have water in which to complete their life cycle. This water can range in quality from natural or man-made ponds and swimming pools to sewage effluent and it can be in any container imaginable. The mosquito goes through four separate and distinct stages of its life cycle. Eggs are laid one at a time and they float on the surface of the water, usually stuck together in rafts. Most eggs hatch into larvae within 48 hours. The larvae live in the water and come to the surface to breathe. They shed their skin four times growing larger after

Continued on Page 2

Mosquitoes Continued from Page 1

each molting. The larva feed on micro-organisms and organic matter in the water. On the fourth molt the larva changes into a pupa. The pupal stage is a resting, non-feeding stage. This is the time the mosquito turns into an adult. It takes about two days before the adult is fully developed. When development is complete, the pupae floats to the surface and the pupal skin splits allowing the mosquito to emerge as an adult. The length of life of the adult mosquito usually depends on several factors: temperature, humidity, sex of the mosquito and time of year. Most males live a very short time, about a week; and females live about a month depending on the above factors.

The Wetlands Park encourages mosquito management with natural predators by creating healthy habitats. The popular predator for the larval and pupal stages is the mosquitofish (*Gambusia affinis*). The ponds are managed to increase access for the fish. For the adult stage, there are birds, bats and other insects, including our new state insect, the Damsel Fly. There are times, however, that breeding locations are not favorable for natural means such as times when a tire has created a rut that has filled with rain or groundwater or when vegetation is too thick for mosquitofish to navigate. It is at those times that methoprene is applied. Only sites identified with larvae (a "hot spot") and fish cannot be transplanted there are treated. Methoprene is "a juvenile hormone analog which can be used as an insecticide that acts as a growth regulator." This chemical does not kill adult mosquitoes. Rather, it interferes with the growth stages of the developing larvae by mimicking natural juvenile hormone of mosquitoes. The hormone must be absent for a pupa to molt to an adult. A methoprene-treated larva will not be able to successfully change from a pupa to an adult. The biological life cycle of the mosquito is broken and prevents a recurring infestation. Methoprene is an important measure in the prevention of West Nile virus.



C. tarsalis larvae. Source: Public Health Image library.

The mosquitofish is a member of the family Poeciliidae of order Cyprinodontiformes. The genus name 'gambusia' is derived from the Cuban Spanish term 'gambusino', meaning useless, which certainly is not the case in terms of mosquito control. In appearance and size, it is similar to the popular aquarium fish, the guppy (*Poecilia reticulata*), and similarly livebearers, producing broods of around 50 advanced live young. These fish are native to the watershed of the Gulf of Mexico, where it has long been known that they feed readily on the aquatic larval and pupal stages of mosquitoes. They are remarkably hardy, surviving in waters of very low oxygen saturations, high salinities (including twice that of seawater), and high temperatures; they can even survive in waters up to 42 °C for short periods. For these reasons, this species may now be the most widespread freshwater fish in the world, having been introduced as a biocontrol to tropical and temperate countries in both hemispheres, and then spreading further both naturally and through even further introductions.

A March 2009 issue of the Sun had an article discussing the introduction of mosquitofish to stagnant swimming pools of foreclosed homes as a public health move more effective than chemical treatment. The article noted that the Nevada Health District has a squad of specialists set up to deliver the fish.



Female Mosquitofish, adult females are 7 cm. in length, while the males only reach 4 cm. in length.. Source: Wikipedia

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Vivid Dancer Damselfly

Nevada was one of eight states without an official insect. To address this, a group of educators and scientists picked the damselfly as its choice for state insect from more than 70 nominations and essays sent in by 57 fourth-grade classes across the state. The winner was John R. Beatty Elementary School in Las Vegas.

After short deliberation, the Senate Government Affairs Committee accepted the recommendation of three Clark County fourth-graders and voted for Senate Bill 166 to make the vivid dancer damselfly the official state insect. The bill has passed both houses of the Legislature and was signed by the Governor in May. The designation will become official on October 1, 2009.

The Vivid Dancer Damselfly (*arcia vivida*, Suborder *Zygoptera*) is an insect in the Order *Odonata* (which means toothed jaw). Damselflies are similar to dragonflies, but the adults can be differentiated by the fact that the wings of most damselflies are held along, and parallel to, the body when at rest. Furthermore, the hindwing of the damselfly is essentially similar to the forewing, while the hindwing of the dragonfly broadens near the base, caudal to the connecting point at the body. Damselflies are also usually smaller, weaker fliers than dragonflies, and their eyes are separated. The male damselfly is bright blue, while female is tan. Students said that part of their decision was based on its color.

Their front and back wings move separately so they can stop and change direction in mid air as well as flying at speeds of up to 30 miles an hour. They have huge eyes; each made up of thousands of tiny eyes packed together. They are capable of detecting movement up to 15m away. They are very successful hunters feeding on mosquitoes and other small insects. They have bristly front legs to catch their victims and large mouth parts to crunch them up.

Damselflies undergo incomplete metamorphosis that includes three distinct stages: the egg, an aquatic nymphal stage, and the adult stage, or imago. The female lays eggs in water, sometimes in underwater vegetation, or high in trees, in bromeliads or other water-filled cavities. Nymphs are carnivorous, feeding on daphnia, mosquito larvae, and various other small aquatic organisms. The gills of damselfly nymphs are large and external, resembling three fins at the end of the abdomen. After molting several times, the winged adult emerges. Much of the odonate life cycle occurs underwater. While adult

damselflies live only a few days or weeks, the young survive the winter in the muck at the bottom of a stream or pond.



Dancer Damselfly at rest, (photo by Ray Brunn)

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WE NEED YOUR SUPPORT

PLEASE CHECK THE EXPIRATION DATE ON YOUR MAILING LABEL TO SEE IF IT IS TIME TO RENEW! If you have not yet taken the plunge to join, please do so now. You will demonstrate that you want to help in the development of new features in the Park for our community!

The Park is a place to enjoy! Have you visited the Park recently? The temporary Visitor Center is at the very end of Wetlands Park Lane. Cross Boulder Highway and travel 1 mile east, then look for the Wetlands Park sign, just where Tropicana turns into Broadbent Ave. If it has been a while since you've visited the Park, you will be amazed at the changes and improvements that have taken place. The Park is for your benefit, come and enjoy it!

There are many opportunities to get involved and to show your support-not only through membership in the Friends, but by contributing funds or labor for needed physical improvements, and educational materials. If you have put off renewing, remember your membership ends one year from the date you paid your dues.

Ducks Unlimited Ponds

The Ducks Unlimited ponds are still under construction, but they are already attracting a good deal of attention for our birding community. The ponds offer some of the best mud flats and shallow open water in Southern Nevada right now. It is an ideal habit for migrating shore birds.

Debbie VanDooremolen, SNWA, has noted from recent postings that six species not reported in the study area since the 1970s have been spotted. They are Black-bellied Plover, Marbled Godwit, Pectoral Sandpiper, Bonaparte's Gull and California Gull.

In addition, one new species, the Franklin Gull, has been reported and added to the listing. There now have been 212 bird species reported in the study area (lower Las Vegas Wash and Wetlands Park) since 1998. The best way to access the ponds is from the Duck Creek Trailhead



Franklin's Gull, photo courtesy of the Seattle Audubon Archives

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