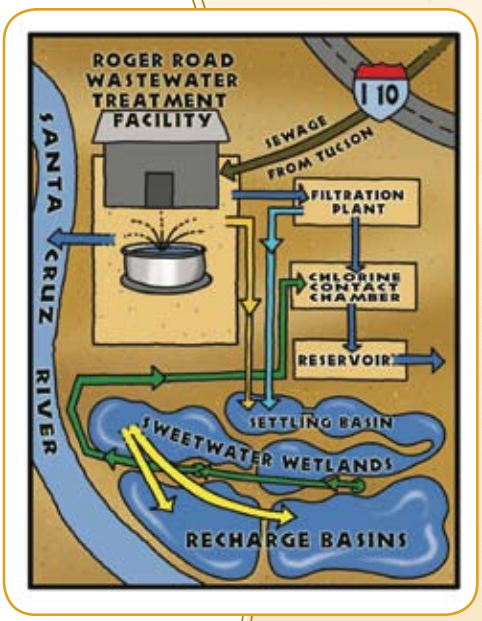
ABOUT SWEETWATER WETLANDS

HOW SWEETWATER WORKS: AN AMAZING DESIGN



Sweetwater Wetlands is designed to clean the backwash water from Tucson Water's Reclaimed Water Treatment Plant. The backwash water from the plant's filters is first piped to the settling basins at Sweetwater Wetlands. In the settling basins, suspended solids drop out of the water and settle onto the basin floor. These solids contain bacteria, viruses and metals. The large majority of these contaminants drop out early in the settling process. The solids are trapped in the soil and wetland plants in the basins.

The water next flows gradually downhill through a small channel to the wetland ponds for further "polishing", or cleaning. The water enters the ponds from the east side and slowly filters through the vegetation and around the islands toward the west side of the ponds. The water's movement through the ponds may take several weeks. During this time, more solids settle out and microbial transformations occur which clean the water of a variety of contaminants including pathogens and heavy metals. This water is recharged into the groundwater through the recharge basins. The flow of the water from the settling basins to the recharge basins is entirely directed by gravity: the water simply moves slowly downhill. After it filters through the recharge basins, it is pumped back to the reclaimed water plant where it is chlorinated and delivered to many parks, schools and golf courses.

The flow of water through the system – including the pumping of water to the wetlands, pumping water up from the ground, and delivery of the reclaimed water – is remotely controlled by Reclaimed Water Treatment Plant operators using computer commands. The amount of water that moves into and out of the wetlands is controlled by special gates called "weirs" that are operated manually. Reclaimed Water Treatment Plant operators must have complete knowledge of the entire system and the computers. Even the amount of water that is delivered to parks and golf courses all the way across the Tucson Basin is monitored and controlled by a plant operator at a computer.

Managing Sweetwater Wetlands

The design of Sweetwater Wetlands includes areas of deeper open water, shallow water, shorelines, and uplands. Each of these areas serves a particular purpose and provides specific habitat like that of a natural wetland system. Because Sweetwater Wetlands' primary purpose is to clean up water, it must be managed and maintained for that purpose. The wetlands cannot become overgrown with vegetation and the settling basins must occasionally be cleaned of the built-up sludge. Also, each spring the managers at the wetlands conduct a controlled burn to remove some of the bulrush and cattails that have grown thick during the past year. This not only keeps the vegetation from overgrowing at the wetlands, it reduces mosquito habitat and allows improved application of chemicals to control mosquitoes.

Mosquito Control

Mosquitoes breed in wetlands and Sweetwater Wetlands is no exception. The still waters amid the bulrush offer prime habitat for mosquitoes—especially the species *Culex tarsalis*, known to be a vector (or carrier) of encephalitis, a disease which inflames the brain. Due to this health risk, mosquito control at Sweetwater Wetlands is very important!

Because mosquito larvae live and develop in water, the managers at the wetlands have a very rigorous program for controlling these aquatic larvae. The "mosquito abatement program" includes weekly mosquito counts, annual vegetation removal, and weekly applications of a larvicide from March through November. This larvicide kills only the mosquito larvae in the water and is non-toxic to other organisms such as beneficial insects, reptiles, birds, and mammals. However, no pesticide can manage to kill all larvae. If large numbers of surviving larvae become adults, a company is hired to chemically fog the area with a low-toxicity pesticide. This pesticide is approved by the Environmental Protection Agency for use in aquatic environments.

This aggressive mosquito abatement program has greatly reduced mosquito populations at the wetlands. However, managers are constantly working to find new and improved ways for controlling the mosquitoes.

What You Can Do to Avoid Mosquitoes:

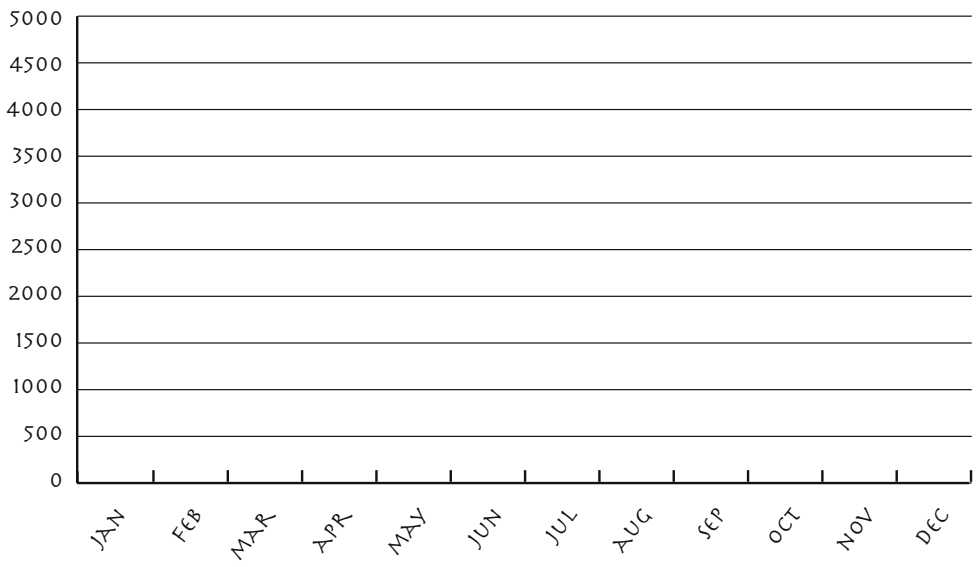
- It is important to understand that *Culex tarsalis* mosquitoes are nocturnal. During the day they are hiding out among the bulrush and cattails. Avoid going out at night near any mosquito breeding habitat.
- If you must go out at night, wear mosquito repellent.
- Wear long pants and long sleeves at night.
- When visiting Sweetwater Wetlands in the summer, stay away from the shoreline vegetation. This is where mosquitoes hide during the day because of the cooler temperatures and higher humidity.

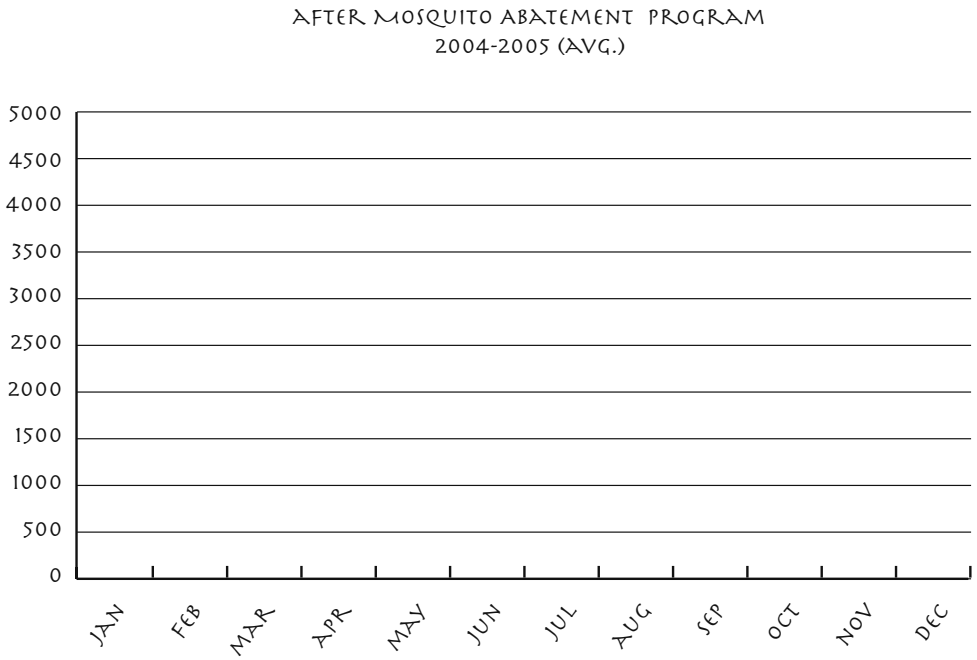
ACTIVITY: THEY'RE DROPPING LIKE FLIES (MOSQUITOES THAT IS)

Directions: Adult mosquitoes are trapped year-round at Sweetwater Wetlands. This table shows the average number of mosquitoes trapped per trap night, each month. Use the data in the table to complete the bar graphs, below. Compare your completed graphs then answer the questions at the bottom of the page.

MONTH	BEFORE PROGRAM AVERAGE MOSQUITOES PER TRAP NIGHT 1998-1999 (AVG.)	AFTER PROGRAM AVERAGE MOSQUITOES PER TRAP NIGHT 2004-2005 (AVG.)
JANUARY	—	6
FEBRUARY	13	4
MARCH	868	61
APRIL	823	150
MAY	3415	720
JUNE	4655	585
JULY	623	401
AUGUST	280	454
SEPTEMBER	501	963
OCTOBER	1075	309
NOVEMBER	292	18
DECEMBER	—	—

BEFORE MOSQUITO ABATEMENT PROGRAM
1998-1999 (AVG.)





1. The mosquito control program began in 1999. What has happened to the mosquito population since that year?

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2. Does the mosquito control program appear to be working? Why or why not?

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3. During which months are mosquitoes most prevalent?

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