THE SACRAMENTO BEE sacbee.com

Sacramento area is Delta's top pesticide source, study finds

mweiser@sacbee.com

Published Tuesday, Jul. 14, 2009

Urban Sacramento is the leading source of pesticide contamination disrupting the Delta aquatic environment, according to new research on pollution in the estuary.

The study, led by UC Berkeley toxicologist Donald Weston, found enough pyrethroid pesticides in the American River to kill tiny shrimp – among the first links in the aquatic food chain.

Those pesticides likely reached the river from urban storm drains, which collect runoff from the Sacramento area's 1.4 million residents.

For five years, biologists have hunted for the cause of a collapse in the Sacramento-San Joaquin Delta ecosystem, a water supply for 23 million Californians. Nine fish species are declining, from tiny Delta smelt to giant green sturgeon.

Weston's research supports the theory that no single villain is to blame. The problem probably lies at the complex interface between people and water.

"We were just amazed by this data," said Weston. "The American River is not supposed to be toxic. I think it reflects the fact that the river's going through 30 miles of heavy urbanization."

The study also found that among the water sources tested, Sacramento's regional wastewater treatment plant is the single largest source of pyrethroid pollution in the Delta. The plant discharges treated sewage into the Sacramento River near Freeport.

The reason for this contamination is less clear. It may be caused by people dumping unused pesticides into sink drains. It could also come from consumer products, such as shampoos made to kill lice and fleas.

There is no evidence pyrethroids are harmful to people at typical consumer exposure levels. But they are proving harmful to aquatic life at very low concentrations.

"It might be that a public education program could go a long way," said Stan Dean, chief of policy and planning at the Sacramento Regional County Sanitation District, which operates the regional wastewater treatment system. "Ultimately, you might need to have more controls on consumer products that have pyrethroids in them."

Pyrethroids are manufactured versions of pyrethrins, natural insecticides produced by certain species of chrysanthemum. These stronger synthetic versions began to dominate the retail market in 2000.

That followed the phasing out of pesticides known to be more dangerous to humans and other mammals – mainly the organophosphates diazinon and chlorpyrifos.

Pyrethroids were considered safer, partly because they don't easily dissolve in water. But biologists learned later that pyrethroids are actually more harmful to aquatic life.

The chemicals attach easily to soil. They can remain toxic in creek beds or landscaping for months, then hitch a ride downstream when overwatering or a storm washes topsoil into storm drains.

Pyrethroid-based pesticides dominate the shelves at grocery and hardware stores. They are common in powders and sprays used by homeowners and pest control companies to kill a variety of insects, from flies to cockroaches.

Weston presented his findings last week to the Central Valley Regional Water Quality Control Board in Rancho Cordova.

The board funded the study and plans to list several area waterways as "impaired" because of pyrethroids, including Strong Ranch and Chicken Ranch sloughs, and Arcade, Morrison and Elder creeks.

In 2006, the state Department of Pesticide Regulation began a process to regulate pyrethroids. This could bring new usage rules and even a ban on some products. It has found pyrethroids in waterways throughout the state.

Pyrethroids found most often in Weston's sampling were bifenthrin and cyfluthrin, common on ingredient labels of many consumer pesticides.

He and a team of researchers sampled water in the American, Sacramento and San Joaquin rivers, as well as creeks in Vacaville, on several occasions in 2008 and 2009. They also sampled agricultural runoff on several Delta islands, and sewage treatment outfalls in Sacramento, Vacaville and Stockton.

They found the Delta islands are a small source of pyrethroids. Urban areas appear to be a much bigger source, with Sacramento by far the largest among the areas sampled.

Researchers used a species of shrimp as a test subject. Toxic effects were revealed by exposing the quarter-inch shrimp to water samples for four days and counting how many were killed or paralyzed.

Almost no pyrethroids were found in Stockton's treated wastewater. Unlike Sacramento, Stockton holds wastewater in giant ponds as long as 30 days before discharging to the Delta. The ponds may allow pyrethroids to settle out or degrade before discharge.

Paul Towers, state director of Sacramento-based Pesticide Watch, noted many other areas also likely are adding pyrethroids to the Delta, such as Redding, Chico and Contra Costa County.

"Ultimately, if we took better steps to keep pests from entering our homes, or redefined what our landscapes should look like, we wouldn't have to use these chemicals," he said.

Call The Bee's Matt Weiser, (916) 321-1264. To read more about Delta issues, visit www.sacbee.com/delta.