

The Sacramento Bee

Scientists: Trees help, not hinder, levee safety

U.S. Army Corps of Engineers hears challenges to its removal policy at Sacramento hearing.

By Matt Weiser - Bee Staff Writer

Published 12:00 am PDT Wednesday, August 29, 2007

Story appeared in METRO section, Page B1

Though federal officials on Tuesday faced a deluge of evidence that trees do not threaten levees, they continued to tout their own policy that could require every mature tree to be cut down on Sacramento levees.

At a symposium on the issue in Sacramento, a parade of scientists summarized decades of research showing that trees may, in fact, improve flood safety when planted on levees.

The backdrop to Tuesday's meeting were the 32 Central Valley levee districts that in February failed a maintenance inspection by the U.S. Army Corps of Engineers. Most failed because their levees had too many trees and shrubs.

The corps, which is preparing a new national levee maintenance policy, currently says no vegetation larger than 2 inches in diameter should grow on a levee. But that standard has not been applied in California. In fact, the local district of the corps has worked for decades with local, state and federal agencies to plant more trees on levees.

The issue affects levee managers nationwide, but it is especially critical in California, where levees provide virtually the only remaining riverside wildlife habitat.

"By and large ... trees have a positive or beneficial influence on the safety of levees," Donald Gray, a geotechnical engineering professor at the University of Michigan, told the symposium.

The findings were included in a 1991 paper he co-wrote based on a study sponsored by the corps. "This report was vetted by all the corps districts before its publication," Gray said.

However, David Pezza, engineering and construction chief of the corps' civil works branch, said officials did not consider the study in their maintenance policies because "it didn't match what they saw in the field."

"We do a lot of research in support of our civil works program. But in that particular case, we did not find that science was relevant to what we were

Levees with trees

Many local flood control districts have failed federal inspections partly because they have trees on their levees. A U.S. Army Corps of Engineers maintenance standard is being applied in California for the first time.



Source: U.S. Army Corps of Engineers
Map data: ESRI, TeleAtlas, USGS

Sacramento Bee/Nathaniel Levine

doing," Pezza said. "Vegetation is very hazardous to infrastructure when it's not done in an integrated way."

Much of the corps' policy is based on a Federal Emergency Management Agency document called "FEMA 534 Technical Manual for Dam Owners," which explains threats to earthen dams from trees and other vegetation.

"When trees grow, they tend to corkscrew their way into an embankment and that tends to loosen the soil," said Bill Bouley of the U.S. Bureau of Reclamation, co-author of the FEMA document. "Tree roots do not stabilize soil mass. On the contrary, tree root penetration loosens the soil."

Other scientists at Tuesday's symposium contradicted that.

Douglas Shields, a hydraulic engineer at a U.S. Department of Agriculture lab in Mississippi, has studied levees on the Sacramento River and elsewhere. He said tree roots improve the shear strength -- the point at which soil yields under stress -- of the soil they grow in.

"You see a major increase in factor of safety as we move from a minimal root area ratio to a higher level," he said. "We concluded that maintenance standards should favor shrubs and woody trees."

This year, he and several colleagues used a computer model to show that trees also offer more erosion protection than a uniform carpet of grass, the levee cover favored by the corps.

More than 500 people from as far away as Holland are attending the symposium, organized by the Sacramento Area Flood Control Agency and the Corps of Engineers. It continues today at the Sacramento Convention Center on J Street. Some asked what the consequences would be to flood safety if trees were clearcut from levees, leaving their roots behind.

UC Davis horticulture professor Alison Berry said this could destabilize levees by causing a large and disparate root mass to decay in unison. Levee erosion also might increase.

Dirk Van Vuren, a UC Davis professor of wildlife biology, said removing trees could create better conditions for animals that are most troublesome for levee managers: burrowing rodents.

Gophers, ground squirrels and voles are the most prolific burrowing mammals on area levees, Van Vuren said. But they actually prefer open landscapes to easily detect predators. So a tree-clearing program on levees, he said, is likely to improve their habitat and cause their numbers to grow.

Joe O'Connor, who lives along the American River Parkway, said he is grateful the corps is willing to listen to science on the issue. He just hopes engineers use it to guide policy.

O'Connor fought to preserve three heritage oak trees during design of a new levee in his Butterfield-Riviera East neighborhood. He lost that battle last year to the corps, which insisted on a standard levee design that required the trees to be cut down.

"Safety is No. 1, always," O'Connor said. But, he said, "There's no need to damage the parkway if it's not going to produce a beneficial effect."

About the writer:

The Bee's Matt Weiser can be reached at (916) 321-1264 or mweiser@sacbee.com.



The Sacramento Bee

Several thousand trees may be cut About 5,100 violate corps' levee policy, partial survey finds.

By Matt Weiser - Bee Staff Writer

Published 12:00 am PDT Thursday, August 30, 2007

Story appeared in METRO section, Page B1

A cursory survey found that about 5,100 mature trees could be headed for the chopping block on just two urban levee sections in Sacramento if the U.S. Army Corps of Engineers goes ahead with a new levee maintenance policy.

The findings, from a survey commissioned by the Sacramento Area Flood Control Agency, were presented Wednesday at a conference on the issue.

The survey of Sacramento River levees in the city's Natomas and Pocket areas provides a window on the potential consequences of a corps levee maintenance policy being enforced in California for the first time.

The nationwide policy conflicts with decades of practice in California, where levee vegetation offers the only remaining riverside habitat for a host of endangered species.

The surveyed levees represent only about 25 percent of Sacramento levees, and a tiny fraction of the 1,600 miles of Central Valley levees affected by the policy.

"We believe there would be major ecosystem-level effects by implementing the policy," said Michael Hoover, assistant field supervisor at the U.S. Fish and Wildlife Service.

The corps in February notified 32 Central Valley levee districts that their levees don't meet national maintenance standards -- in most cases because of too many trees and shrubs.

The corps is preparing a new national policy, which it promises will be more flexible to accommodate local environmental needs. In the meantime, those 32 local districts have until March 30, 2008, to comply with the existing policy or lose federal funding to rebuild levees after a flood.

And starting this fall, more Valley levee districts will be inspected under the national criteria. Many are likely to fail, including those in Sacramento.

Ken Rood, an engineer at Northwest Hydraulic Consultants in Sacramento, which surveyed the levees for SAFCA, said an estimated 3,800 mature trees would have to be cut along the Sacramento River adjoining Natomas and 1,300 along Sacramento's Pocket neighborhood.

In many cases, these are mature oak, cottonwood and sycamores that shade public roads, bike trails and private yards.

"You're probably looking at significant reconstruction of levees to remove these trees and then restore the levee," Rood said.

The corps also inspected 1.5 miles of American River levee east of Watt Avenue as a pilot project according to the national criteria. It found the entire distance would require tree removal and partial levee rebuilding.

"There are a lot of people that will be very upset if the trees are removed," said Meegan Nagy, emergency manager at the corps' Sacramento district.

The cost of tree removal and levee rehabilitation is likely to be huge, said Les Harder, deputy director of the state Department of Water Resources. There are also costs to comply with environmental laws.

"Local agencies are going to be looking for the state to pay for some of this," Harder said.

But the state may not have the money. Flood-control bond measures approved last year raised \$5 billion but were intended to build certain projects, not to pay for levee maintenance.

Similarly, a \$326 million local property tax assessment approved by Sacramento voters this year is intended to build specific flood control projects.

"We may end up spending a great deal of money to comply with policy, when the actual risk factor may not be that great," said Stein Buer, executive director of SAFCA, which organized the conference.

Buer and other state flood-control experts said they have never heard of vegetation causing a levee failure. Rick Burnett, a flood fight specialist at DWR, said dense shrubs may hinder levee inspection. But he said plants don't affect repairs in a flood because they can be quickly stripped away by emergency crews.

About the writer:

The Bee's Matt Weiser can be reached at (916) 321-1264 or mweiser@sacbee.com.



The Sacramento Bee

Corps spares levee trees

*Published 12:00 am PDT Saturday, September 1, 2007
Story appeared in METRO section, Page B2*

SACRAMENTO -- The U.S. Army Corps of Engineers has dropped a deadline that could have forced 32 Valley flood control districts to cut down trees on their levees by March 30.

The action came Thursday at a meeting of state and federal agencies, after a Sacramento conference that covered much of the available science on levee vegetation.

In February, the corps said that 32 Central Valley levee districts failed its national maintenance policy, which was being applied in California for the first time. Many failed because local policy has encouraged tree planting to improve wildlife habitat. The corps policy allows no plants larger than 2 inches in diameter.

A more flexible policy is promised by year-end. But recognizing that time is running out, the corps dropped the compliance deadline for vegetation problems. For other issues -- erosion, pest control, structure encroachment -- the March 30 deadline stands, said Col. Tom Chapman, corps district commander.

"All along, we have only had public safety in mind," Chapman said. "Our hope is that we can be in alliance with all the science."

-- *Matt Weiser*



The Sacramento Bee

Pact gives a reprieve to Valley's levee trees

By Matt Weiser - Bee Staff Writer

Published 12:00 am PDT Saturday, September 22, 2007

Story appeared in METRO section, Page B1

Levee managers in the Central Valley are being told to holster their chain saws following a deal announced Friday to stay the execution of thousands of trees on area riverbanks.

The U.S. Army Corps of Engineers has agreed not to enforce the vegetation component of its levee maintenance rules while a new policy is developed. The decision grants a reprieve to riverbank trees and their supporters throughout the Central Valley.

"What a sad place this would be without those trees," said Sacramento Mayor Heather Fargo, who chairs the Sacramento Area Flood Control Agency. "I am pleased that by really looking at the science and listening to experts we are on the way to policies much more appropriate to Sacramento. We're back on the right track now."

For decades, the Army Corps allowed trees and large shrubs on Central Valley levees -- and even encouraged planting more. They did so in cooperation with wildlife agencies because there is almost no other riverbank habitat left.

Then, after Hurricane Katrina hit New Orleans in 2005, the corps took a more rigid stance and enforced its national vegetation policy in California for the first time. That policy allows no plants larger than 2 inches in diameter on levees.

As a result, 32 Central Valley levee districts learned in January that they had failed a maintenance inspection, largely because of excessive vegetation. Many more, including urban Sacramento levees, were likely to fail another round of inspections this fall. The potential consequences of a failed inspection include losing access to federal levee rebuilding funds after a flood, and decertification by the Federal Emergency Management Agency.

Many local levee districts objected because of the expense required to clear vegetation. In many cases, levees would have to be rebuilt after removing tree roots. Residents feared loss of shade, scenery and habitat.

In hopes of settling the dispute, the Sacramento Area Flood Control Agency held a symposium on levee vegetation last month. Experts presented evidence that trees may actually strengthen



HEATHER FARGO "We're back on the right track now," the mayor said of the pact.

levees by binding soil layers together. There was little evidence that trees contribute to levee failure.

"It's the Fish and Wildlife Service position that, in many cases, vegetation is neutral or beneficial to levee integrity," Paul Henson, the federal agency's assistant regional director, said Friday.

The Bee first reported Sept. 1 that the Army Corps had dropped a March 30, 2008, compliance deadline for levee districts already warned about vegetation. In the new agreement, the corps goes further, promising to use "best available science" in concert with other agencies to craft a policy that meets local needs. Until that policy is finalized, levee districts will not be punished for excessive vegetation in upcoming inspections.

The March deadline, however, remains in place for other maintenance problems, such as levee erosion or encroachment by structures. And the new policy will probably still require some trees to be removed if they clearly threaten levee stability.

"Without compromising public safety, our intent is to develop solutions that take into account the concerns of science and natural resources," said Col. Tom Chapman, Sacramento district commander at the Army Corps.

Friday's agreement arose from a meeting organized by the California Reclamation Board. It was endorsed by the board, SAFCA, Army Corps, U.S. Fish and Wildlife Service, National Marine Fisheries Service, local levee districts, and the state Water Resources and Fish and Game departments.

About the writer:

The Bee's Matt Weiser can be reached at (916) 321-1264 or mweiser@sacbee.com.

Editorial: Waters may rise, but so will region's readiness

Score one for trees -- and federal, state and local efforts to prepare for wet years

-

Published 12:00 am PDT Saturday, September 29, 2007

Situated where it is, Sacramento must take advantage of the dry periods to prepare for the wet ones. Lately, there have been several notable developments -- some out of the public eye -- to improve the cause of protecting Sacramento and the Central Valley from the next major flood.

Saving the trees

Until this month, it appeared the U.S. Army Corps of Engineers might enforce a one-size-fits-all approach in requiring trees to be removed near flood control levees. Strict enforcement might have denuded parts of the American River Parkway and other riverbanks in the Valley. It also would have forced flood agencies to spend huge sums on tree removal -- money needed for other projects.

That threat has eased. The Sacramento Area Flood Control Agency held a scientific conference that revealed strong evidence that healthy trees pose little or no structural risks near levees, and can be beneficial.

Mayor Heather Fargo, Department of Water Resources Deputy Director Les Harder and others urged the corps to review this evidence before acting.

This month, the corps said it would not enforce the strict policy until a new one is developed. Credit goes to Lt. Gen. Robert Van Antwerp, the corps' chief engineer, for working with local officials. Although there's more to be done on developing an updated policy on levee vegetation, flood agencies can now focus fully on more pressing priorities.

Shoring up the dikes

The corps and U.S. Bureau of Reclamation are working well together on a new spillway for Folsom Dam that will greatly reduce flood risks on the American River. The bureau is moving forward with plans to shore up three earthen dikes on Folsom Reservoir that need to be strengthened.

This latter project has drawn protests from some Granite Bay residents, since the bureau plans to dig soil from Mooney Ridge, near lakefront homes, for some of the work. The bureau has spent months trying to assure residents that dust and noise will be kept to a

minimum and that the alternatives would pose far larger regional impacts. If the bureau were to truck in soil, officials say there would be 3,500 truckloads hauled, adding to traffic and air pollution.

Flood legislation

Before adjourning, the Legislature passed Assembly Bill 930, which allows SAFCA to acquire easements from willing landowners in the Sacramento Valley. The agency's goal is to help upstream farmers keep their land undeveloped. Farms and wetlands act like a sponge for potential flood waters. SAFCA has a long-term plan for both preserving these areas and helping rural communities with levee work and other projects.

The Legislature also approved another bill, Senate Bill 276, which would allow SAFCA to speed up work on Folsom Dam and levee upgrades to bring Sacramento to 200-year flood protection.

Gov. Arnold Schwarzenegger should sign these bills, as well as a larger flood package the Legislature passed -- Assembly Bills 5, 70, 156 and AB 162, and Senate Bills 5 and 17. Although this package doesn't go far enough in preventing development in deep, marginally protected flood basins, it's a step forward. More work will be needed next year, although, in this place known as the Inland Sea, the work will never be done.