

and Agriculture, local mosquito and vector control districts, and other agencies on a statewide surveillance program for WNV. The UCD/CVB biocontainment laboratory tests tissues from all reported dead birds, blood from sentinel chickens (in 232 flocks of 10 each), and pools of 50 mosquitoes each gathered from nearly 3,000 traps around the state (see figure, page 133).

The risk of serious illness from WNV in humans is low, with the elderly, the young and those with compromised immune systems at greatest risk. While most infected individuals will not experience any illness or only mild symptoms, some of those infected will develop serious neurological symptoms such as encephalitis or meningitis. In 2003,

9,862 WNV cases were reported to the U.S. Centers for Disease Control nationwide, with 264 deaths.

Statewide, the UC Division of Agriculture and Natural Resources funds the Mosquito Research Program, which provides grant support for UC research projects that investigate the vectors of WNV and other mosquito-borne diseases and seek environmentally safe methods to improve mosquito management. Likewise, about 40 members of the UC Mosquito Research and Extension Workgroup are working together to establish research priorities and seek extramural funding to pursue additional WNV-related research.

— Editors  
(As we went to press, the number of human cases in California continued to climb, totalling 17 on July 10.)

## Outreach news

John M. Harper



Water-quality short course participants evaluate a sediment source site (bank-cutting) along Parson's Creek using the Sediment Inventory Method, at the UC Hopland Research and Extension Center in Mendocino County.

## *Courses help ranchers, farmers mitigate water-quality impacts*

Most of the water-quality problems in the United States are from runoff, and in many places much of this nonpoint source pollution in rivers and lakes comes from agriculture, according to the U.S. Environmental Protection Agency (EPA). Ranching and farming practices can degrade streams and coastal waters with nonpoint source pollutants such as sediment, heat and nutrients (see pages 138 to 163). This degradation can threaten salmon, which need cold, clear water for spawning.

In 1989, the range livestock industry recognized that it needed to address water quality and asked UC for help. "The industry knew regulation was

coming," says Melvin George, UC Cooperative Extension (UCCE) rangeland management specialist.

In 1994, the UCCE Rangeland Watershed Program began working with ranchers and state agencies to develop the Ranch Water Quality Management Planning Shortcourse, which helps ranchers develop voluntary plans for managing water quality on their land. "The beauty of it is that landowners can make their own decisions so they don't have a regulatory agency come and tell them what to do," says George, who helped develop the short course.

Landowners in watersheds with rivers listed as impaired by the EPA must help meet total maximum daily load (TMDL) regulations, which stipulate how much pollution bodies of water can receive and still meet water-quality standards.

The ranch water-quality short course entails about 10 to 15 hours of classroom and field instruction, including clean water laws; monitoring pollution sources; and management of nonpoint source pollution, such as sediment from cattle grazing and trampling, heat from decreased riparian vegetation, and nutrients and pathogens from manure. The short course culminates in developing individualized ranch water-quality management plans that identify and prioritize water-quality problems and outline how to address them.

The short course has had more than 60 sessions attended by more than 800 ranchers from 31 counties, and by mid-2004 had resulted in plans covering 1.3 million acres of rangeland. A 2002 survey of participants showed that 60% had completed a plan in class and 67% had implemented at least one



Road crossings at streams are an important source of potential sediment on North Coast rangelands.

of the recommended practices for protecting water quality. These practices include installing fences to exclude cattle from riparian areas; revegetating riparian areas; and slowing down the movement of water along and across dirt roads, which are a major source of sediment on slopes. "We proved that a voluntary program can work," George says.

The short course also encourages landowners to form watershed management groups. "Nonpoint source pollution is not an individual problem, it's a watershed problem. If everyone gets together, they can have an effect," George says. Course participants have formed watershed groups in counties including Humboldt, Mendocino and Monterey. Other benefits of forming such groups are that they are more likely to get water-quality grants and can streamline permitting for watershed activities such as modifying streambeds.

A similar course for Central Coast farmers was patterned on the successful ranch course a few years ago, spearheaded by UCCE farm advisor Mary Bianchi. Unlike many other irrigated agricultural areas in California, many Central Coast farms are on slopes that are susceptible to erosion. Moreover, these watersheds drain into Monterey and Morro Bay estuaries or into rivers where salmon spawn.

This new course for farmers may be particularly relevant to growers in coming years. While agricultural discharges in California have historically been exempt from water-quality regulations, the State Water Resources Control Board recently began developing a compliance process for growers who discharge irrigation return water. The process would include monitoring and management measures to protect downstream water resources.

Like the ranch short course, the Farm Water Quality Management Planning Shortcourse culminates in developing a water-quality management plan that addresses farm nonpoint source pollution such as sediment, nutrients and pesticides. The short course is now offered in all seven Central

Coast counties from San Mateo to Santa Barbara, and already 16% of the Central Coast producers have participated (about 400 out of 2,500). The course is offered in both English and Spanish, and binder materials will soon be available in Spanish.

"[The short course] encourages growers to complete conservation plans that integrate their production goals and management practices with water quality, habitat conservation and soil conservation goals," says Julie Fallon, representative for the UCCE Farm Water Quality Planning Program.

— Robin Meadows

## Dairy workers learn husbandry, management skills

While California is the top milk-producing state nationwide, many workers in the state's 2,125 dairies lack basic husbandry skills. In addition, as dairies have gotten larger, the dairy herdsman's role has grown to include training and managing other employees. "California dairies are getting so intricate that employees need state-of-the-art training," says Gerald Higginbotham, UC Cooperative Extension (UCCE) dairy advisor.

To help meet this need, UCCE dairy advisors and specialists established the Dairy Herdsman Shortcourse. Higginbotham coordinates the program, which was developed with input from the California State University (Fresno and Chico), UC School



Students in UC Cooperative Extension's dairy herdsman short course receive state-of-the art training in basic husbandry and dairy herd management. Gerry Sanchez (with stethoscope) listens for the heart and lung sounds of a dairy cow at the California State University, Fresno, dairy farm.