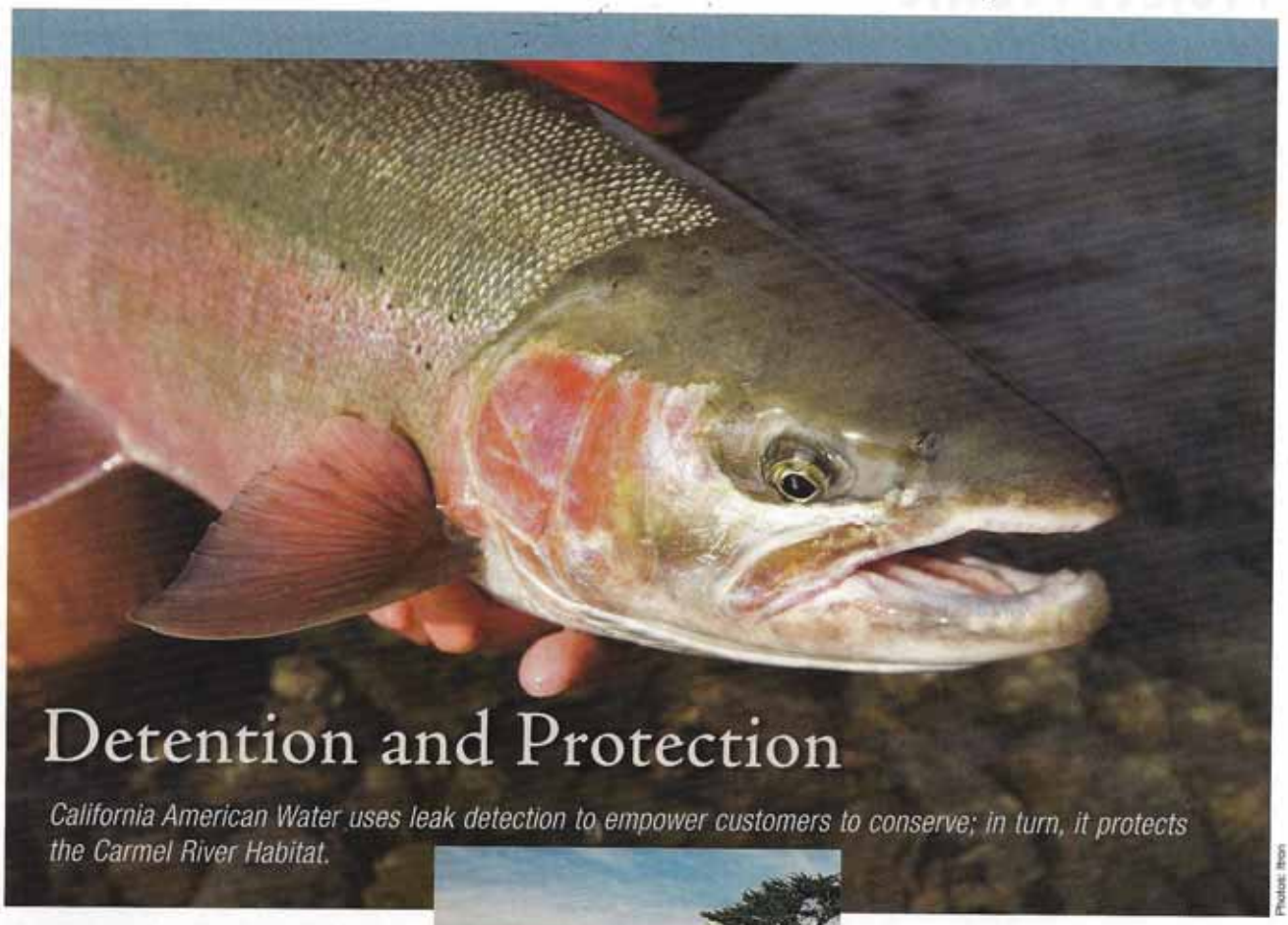

Detention and Protection

California American Water uses leak detection to empower customers to conserve; in turn, it protects the Carmel River Habitat.

Photos: Itron

By Kim Papich

Opportunity

A *water supply emergency*—the official decree for the past 14 years by the California State Water Resources Control Board pertaining to the Carmel River and its 36-mile span along the central cost of Monterey County, CA. The river is also home to two threatened species, the Central Coast Steelhead Trout and California Red-Legged frog. And it's all in context with Governor Schwarzenegger's declaration of a statewide water supply emergency, in February 2009.

Combined, these factors create a complex operating environment for California American Water, the company responsible for delivering water to Monterey County citizens by pumping more than two-thirds of its supply from the Carmel River watershed.

To that end, California American Water has invested thousands of hours and millions of dollars to protect the wildlife and habitat of the Carmel River. Such efforts include helping customers understand what they can do to help. One example: empowering them to help stem water loss. In this case, water that has been produced and is "lost" through behind-the-meter leaks. After all, even small leaks can quickly add up to many gallons lost. Just a one-eighth-inch-sized leak consumes more than 3,500 gallons per day.

Monterey, CA, coastline

Working with the Monterey Peninsula Water Management District, California American Water set a goal to reduce its water loss from 9.5% to 7%.

Says Ron Scaccia, operations supervisor for California American Water, "Conservation is vital to the prosperity of our community and its habitat. Reducing our unaccounted-for water is one additional way we can show leadership and stewardship in this effort."

Solution

Some leaks are easy to find, but many go undetected, wasting precious water and increasing associated production costs. A subsidiary of American Water, the largest investor-owned US water utility, California American Water went to its "parent" for help in how to identify leaks and, ultimately, reduce water loss. David Hughes, an infrastructure engineer with American Water's research group, answered the call. His job—to find good, practical ways to improve American Water's program for water loss and seek out technology that is innovative and allows the utility to be more effective in proactive water management.

On the East Coast, in Connellsville, PA, Hughes and his team found substantial success detecting leaks with MLOG, a network of intelligent, leak-detecting sensors from Itron. In early 2005, the Pennsylvania subsidiary installed 487 MLOGs in Connellsville, where it serves approximately 5,000 customers. With its mixed terrain, variety of pipe, and the extended age of the pipe, the town is considered a microcosm of the variations in

Carmel river is home to this threatened species: the California Red-Legged frog.

With digitized map information, the community water system is visible for directing field investigations.

American Water territories nationally.

Says Hughes, "In Connellsville, there is a pretty serious loss of water through leaking pipes. Compounding the problem, we don't make the water, we buy it, and it's fairly pricey. When we do lose water, it's a significant expense." The World Bank estimates the total cost to utilities worldwide of unaccounted-for water at $14 billion per year.

Momentum began building to develop a system that would help reduce leakage. The theory was if American Water could actually hear the leaks or look for suspects, and if they could find the leaks before they came to the surface, the utility would solve a great deal of its non-revenue water losses.

Continues Hughes, "We found that 50 to 70% of the city's main leaks start small and do not surface for significant periods of time. If we made repairs well before these leaks surfaced, we could avoid water loss, limit repair costs, and reduce property damage. The system quickly paid for itself."

Overall, the percentage of non-revenue water for Pennsylvania American Water dropped 11%, and that water loss level is still being maintained today. "We understood that California American Water needed to reduce its draw from the Carmel River," says Hughes. "Locating leaks and lowering water losses was a clear way to achieve its goals. That was certainly our experience with the MLOG system in Pennsylvania."

In Monterey County, a number of homes are second homes. Residents may water flowers with a hose bib before leaving on a Sunday night and forget to turn it off. Or due to watering mandates, homeowners, while sleeping, will water their yards or drip irrigate, and unknowingly blow a gasket. Leaks can also stem from something as simple as a leaky toilet.

Based upon the recommendations of Hughes and his team, detecting these system leaks is now based upon measuring sound vibrations that travel down pipes, by utilizing over 4,100 MLOG leak-detecting sensors—also known as loggers. They are spaced out along the entire distribution system adjacent to water meters, as well as providing visibility behind the meter. The loggers sense, and then record sound vibrations from leaks. Through use of 10 collectors placed in vehicles that cover the system, California American Water surveyors communicate with the loggers via radio frequency at a minimum of every 30 days, and often gather daily reads that coincide with meter reading.

Once a week, the administrator downloads his data, and meter readers do the same. On Mondays, all the information is consolidated. The data is then seamlessly uploaded to an Itron Web interface—mlogonline Network Leak Monitoring System—which handles data acquisition, ranking, and visually mapping the leak status display for each logger.

The interface sorts the readings according to the following protocol:

Leak	Status/General Assessment
Green	No Leak Likely
Yellow	Possible Leak
Red	Probable Leak
Gray	Out of status

These assessments correlate with digital images of area maps and detailed street plans used by California American Water. With the digitized map information, the entire community water system is visible for directing field investigations. It also tracks pipe history (sound level, nighttime variation, frequency shifts), as well as loggers near past repairs or chronic noise sources, to aid California American Water leak "detectives."

California American Water can then proactively share the leak information with its customers and encourage them to participate in water stewardship. Says Scaccia, "We're seeing customer leaks when they can't. It shows our customers that our commitment to the environment extends beyond the quality of our water and into the heart of who we are."

Benefits

Installation of MLOG leak detection devices began in October 2008. Soon after deployment, Itron's solution identified many behind-the-meter leaks and 19 total leaks in the California American Water system. In 2009, the water provider continued to find customer-side leaks—in total, another 19 system leaks. To date, they are well on their way to hitting their 2% targeted reduction. "The system is working," says Scaccia. "We look at it on a daily basis, and it's fascinating. As we ping the MLOGs, and they change color, each time we investigate it's allowing us to act as stewards of the communities we serve, and we are proud of the role we play in protecting customers and our environment."

Down the road, the water provider will continue to ensure water is available for future generations. They foresee looking beyond behind-the-meter leaks, utilizing MLOG to detect leaks in the distribution system—leaks that aren't surfacing. An affordable and comprehensive water loss management solution, MLOG, is an ideal solution for California American Water. It's allowing them to detect a variety of leaks, improve the effectiveness of their water conservation efforts, and, in turn, protect the habitat of the Carmel River. **we**

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