



Shining the flashlight to look for possible bridge access areas for bats.



Environmental Scientists Sarah-Jane Gerstman (left) and Jen Greslik inspect bat guano.



Gerstman and Greslik under the Highway 49 Bear River Bridge at the Placer-Nevada County Line.

(Caltrans photos/Gilbert Mohtes-Chan)

Working in the Fields and Streams to Protect the Environment While Answering the Transportation Needs of the Community

By Gilbert Mohtes-Chan

Armed with flashlights, headlamps, high-tech bat detectors and a night vision monocular, a small team of hard-hat wearing North Region environmental scientists fanned out under the four-lane, 242-foot-long Bear River Bridge, which straddles the Placer-Nevada County line and connects thousands of daily commuters traveling on State Highway 49 between Auburn and the Grass Valley-Nevada City area.

Mosquitos swarmed overhead as the late summer sun settled over the foothills. The sounds of cars and trucks echoed under the bridge.

Sarah-Jane Gerstman and Alyssa Herring carefully crossed over the slippery rocks and waded through the slow-flowing water to inspect the bridge abutment on the south end.

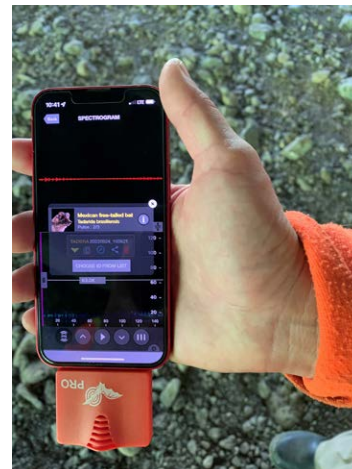
Two other colleagues – Gregory Saiyo and Dotrik Wilson – stayed on the north end, shining flashlights at the bridge bents, girders, and abutment, and peering through the night vision monocular.

"I only saw one bat so far. If there are significant numbers, you're going to see hundreds," Wilson said. "A lot of times they come here to digest their food and hang out (under the bridge). It's safe from predators."

Saiyo checked his iPhone that had a small microphone capable of picking up ultrasonic calls of bats – sounds inaudible to the human ear. A bat detector app recorded a call, flashing a photo and description of the winged mammal: Mexican free-tail bat.

As few minutes later, Gerstman trekked back from across the narrow river and reported her findings.

"A couple of bats came out of the abutments," she said. "They could be up there (living) in the bridge. Or they could come here at night to forage."



A bat detector attachment on the iPhone picks up an ultrasonic bat call and then a special app displays the bat species on the screen.

(Caltrans photo/Gilbert Mohtes-Chan)

(Continued on Page 10)

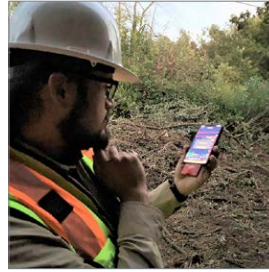
(Continued from Page 9)



Bat Detector box.



Alyssa Herring and Gregory Saiyo huddle under the Bear River Bridge during a nighttime bat survey.



Saiyo checks results from the bat detector sensor.



Dotrik Wilson uses a night vision monocular to look for any bats flying around the bridge.

(Caltrans photos/Gilbert Mohtes-Chan)

The nighttime bat survey will help Gerstman determine if the bridge serves as home to bats or a nighttime hangout following an evening of dining on insects along the river. More importantly, her evaluation will shape how a contractor will conduct bridge repairs scheduled for 2023.

"We're trying to come up with measures to avoid impacts to bats during the joint seal work," Gerstman explained.

Indeed, environmental scientists like Gerstman help Caltrans navigate a myriad of complex local, state, and federal regulations the National Environmental Policy Act (NEPA) enacted in 1970, which requires governmental agencies to "use all practicable means to create and maintain conditions under which man and nature can exist in productive harmony."

"Oftentimes there is a misconception that there are no sensitive resources in the (government-owned) right of way, but this is far from reality" said Suzanne Melim, Caltrans North Region Environmental Division Chief. "The transportation system can often bisect critical habitat for migratory wildlife like deer and elk, and aquatic species like amphibians and salmon. Californians value their natural resources as demonstrated through efforts to protect and preserve habitats."

Statewide, Caltrans boosts more than 700 professionals representing a full range of environmental sciences, planning, engineering and

other specialty areas, including biology, archaeology, architectural history, community resources, Native American consultation, paleontology, air quality, noise and vibration, water quality, stormwater, and hazardous waste.

It's the job of environmental scientists such as biologists and archaeologists to identify any sensitive habitats, plants, animals or cultural resources in a project area and work with Project Development Teams to devise a gameplan to avoid and minimize the effects of construction and maintenance activity on the environment.

"Their job is to find a balance between the safety and operational needs of the traveling public while preserving these valuable resources," Melim said.

Those mitigation plans may be as basic as fencing off a historic horse water trough from dozers working to realign a segment of Highway 191 near Paradise to screening off sensitive elderberry plants during construction of the new 162 Butte City Bridge and Viaduct in Glenn County. Others are incorporated into projects such as the construction of a wildlife undercrossing on Highway 49 in Sierra County or a fish passage on U.S. Highway 101 in Del Norte County.

In 2011, District 3 published a 63-page historical publication as part of the mitigation efforts for the Highway 49 Logtown Curve Realignment Project in El Dorado County. The project affected part of the old mining town's historical archaeological site.

(Continued on Page 11)

(Continued from Page 10)

Sometimes, designers wind up going back to the drawing board. Back in the 1970s, engineers proposed a new alignment for a section of Highway 20 between Grass Valley and Penn Valley. An environmental consultant later discovered a new species of the mallow plant family growing in the path of the new segment. That prompted engineers to rework the construction design to shift the roadway 30 feet north to protect the plant, which botanists later named Scadden Flat checker bloom.

Of course, there are times when something is missed during the environmental survey and later surfaces after the start of construction.

In September 2019, for example, construction crews unearthed a Native American burial site during work on an overcrossing on Interstate 405 in Orange County, which was part of a massive \$2.1 billion freeway corridor improvement project.

The discovery halted work for several months as Caltrans District 12 and the Orange County Transportation Authority worked with the contractor, local tribal representatives, and other stakeholders to develop a construction monitoring program and a treatment plan for the remains and cultural resources at the site. Some construction activity was allowed to resume the following January. "Treatment of the remains and resources is ongoing today," said Cheryl Sinopoli, a D12 archaeologist.

On average, environmental scientists spend about 40 percent of their time in the field. Their assignments will see them climbing up hillsides and over boulders, hiking through thorny brush and poison oak or wading in streams and rivers while keeping a close eye for a rare flower, endangered frog or remnants of a Gold Rush-era bottle. And then there are nerve-wracking chance encounters with a mountain lion, rattlesnake or even unfriendly property owner.

"It takes a very determined person to conduct this work. When a scientist goes out in the field they don't always know what to expect and there are so many different potential resources to survey for," Melim said. "They work on projects throughout the North Region in a variety of habitats: valleys, meadows, wetlands,

rivers, forests, coastline, redwoods, oak woodlands, sagebrush and the Sierra crest to name just a few."

"People who get into the field sciences love to be out in the field collecting data," Melim said. "When you go out thinking that you might find something, and you do it is very exciting. Whether digging in the dirt, using a scope to peer in a bird nest, looking at the tiny parts of plants or using our tech equipment like drones or the XRF (X-ray fluorescence device), collecting data to answer important questions is the fun part of the job. Since we do most of our field work with a field buddy or a team the comradery makes for a good day."

As a biologist, Gerstman has performed field work for Caltrans since 2017. She typically surveys a project area three times.

During an initial morning visit to the Bear River Bridge, Gerstman and colleague Jen Greslik conducted the first survey under the structure for any evidence of roosting bats.

Crevices and expansion joints in the bridge can offer an ideal, safe shelter for bats. At the same time, concrete bridges absorb heat from the sun during the day that is released slowly at night, allowing bats to stay warm at night. (The Interstate 80 Yolo Causeway viaduct, for instance, houses more than 200,000 Mexican free-tail bats, the largest colony in the state. Motorists and bird watchers will see thousands of bats streaming from under the causeway at dusk.)

As Gerstman and Greslik followed a rocky dirt path to the riverbed under the bridge, Gerstman quickly spotted an elongated strip of black pellets.

"See all that black stuff. It's bat poop," she said, adding the droppings are technically called guano. She then points overhead to the girders where an army of bats hang out – upside down of course.

The big question, she says, is "Where they are coming from?"

Are they roosting in the nearby trees during the day, then heading out at night to gobble up bugs before coming to the bridge to digest their food and socialize? Or is the bridge a day roost for the bats,

(Continued on Page 12)

(Continued from Page 11)

meaning they have found a home inside the structure. The answer will affect how the contractor approaches the joint seal work in 2023.

After completing her bat survey, Gerstman compiled her report and recommended to the project team that avoidance and minimization measures a pre-construction bat survey and work window, be incorporated to avoid impacts to bats during construction.

She said the evidence at the structure indicates that bats likely use this bridge for “night roosting” – a place to search for food or rest after eating.

“Protocol level bat surveys would need to be conducted (at least three times over the spring/summer) to make a full determination as to whether bats day or maternity roost at the bridge. However, the crevices in the abutments do not seem to be ideal for a day roost, as the gaps are rather large,” Gerstman said.

“Bat guano and staining were predominately located in areas where there were no gaps or crevices for day roosting, but rather a small ledge for hanging/resting,” she said.

As a result, Caltrans will direct the contractor to conduct the Bear River Bridge work during the fall season in the day to avoid impacts to night roosting bats. The added measure for pre-construction bat surveys will focus on the crevices at the abutments and

qualified biologists will check to make sure no bats are present in these areas prior to joint seal construction.

While their job involves a lot of paperwork – from writing reports to preparing permit applications to poring over voluminous environmental guidelines – environment scientists will tell you they look forward to the field work – although their real-life experiences fall well short of the movie reel adventures of the fictional archaeologist Indiana Jones.

“People that get into the field sciences love to be out in the field collecting data,” Melim said. “When you go out thinking that you might find something and you do it is very exciting. Whether digging in the dirt, using a scope to peer in a bird nest, looking at the tiny parts of plants or using our tech equipment like drones or the XRF (An X-ray fluorescence instrument), collecting data to answer important questions is the fun part of the job. Since we do most of our field work with a field buddy or a team the comradery makes for a good day.”

The teamwork was evident during a warm summer morning at the Caltrans-owned 186-acre Placer 65 Coon Creek Conservation Ranch near Sheridan in Placer County.

Gerstman, Greslik and environmental scientist Hannah Clark donned water boots in search of the foothill yellow-legged frog in calming, slow flowing Coon Creek.

(Continued on Page 13)



Gerstman and Greslik measure depth and water flow speed of Coon Creek.



Ready to snag a frog with a fish net.



Fanning out to search for frogs.

(Caltrans photos/Gilbert Mohtes-Chan)

(Continued from Page 12)

"Since it's a Caltrans property we want to know what's here," Gerstman said. "There are a lot of fish in here," she said as the trio waded through knee-deep water. "Frogs are typically along the shore."

With a fish net in hand, Gerstman was in pursuit of their catch of the day. "Did you see that. He jumped over the bush. That definitely was a bullfrog."

"You kind of have to sneak up on them," Clark said, offering some friendly advice.

Clark then raised a pair of binoculars strapped over her neck and looked upstream.

As the late morning sun grew more intense, the team headed back down stream – empty handed on this day.

"I think we scared the frogs," Gerstman sighed.



The trio wades in knee-deep water.
(Caltrans photo/Gilbert Mohtes-Chan)

UNEXPECTED DISCOVERIES PUT ROADWORK ON HOLD

By Gilbert Mohtes-Chan

Sometimes tiny critters can bring big jobs to a sudden halt. Just ask highway construction crews across California, the United States and the globe. They'll tell you about:

- The nesting Swainson's Hawks that delayed the August 2022 start of construction of Caltrans District 4's long-awaited \$54 million Soscol Junction Interchange Project in Napa County.

After D4 and the Napa Valley Transportation Authority hosted a groundbreaking ceremony on June 22 hailing the summer start of a three-year project to reduce congestion and improve traffic operations in southern Napa County, crews were ready to begin construction in late August. Unfortunately, the hawk family decided to stay longer in the nest. (Young hawks normally hatch sometime between March and July and remain in the nest for 30 days.) As a result, Caltrans put the brakes on the dozers for about two weeks until the raptors headed south for the winter.

- The unexpected discovery of a rare slithering legless lizard that interrupted the widening of a State Highway 126 overpass in Santa Clarita Valley, Los Angeles County in October 2013. A special permit needed to be issued by the state Department of Fish and Wildlife before construction could resume.
- The endangered Braken Bat Cave meshweaver, a dime-sized spider that stopped construction of a San Antonio highway underpass for two years and prompted the Texas Department of Transportation to shift gears and instead build a \$44 million overpass in 2014. The final price tag was nearly four times the original cost.
- The large Indian rock python that was discovered in March 2022 curled around 24 eggs during construction of a highway culvert in India. Crews stopped work for 54 days to allow the snakelets to hatch.



Interstate 405 widening project in Orange County.
(Orange County Register photo)

HOW A MAJOR SOUTHLAND CORRIDOR PROJECT HANDLED THE UNEARTHING OF A TRIBAL BURIAL SITE

By Gilbert Mohtes-Chan

Environmental Division staff members are the go-to experts when it comes to helping Caltrans navigate the myriad of local, state and federal laws and regulations.

Their expertise can be especially valuable when roadwork hits an unexpected and complicated snag:

The unearthing of a sacred Native American burial ground along a major interstate freeway in Southern California.

The discovery was made in September 2019 by excavation crews working on a massive \$2.1 billion Interstate 405 corridor improvement project by Caltrans District 12 and the Orange County Transportation Authority.

Construction activity immediately stopped in the area – as required by the National Historic Preservation Act, California Health and Safety Code and California Public Resources Code.

Some roadwork at the undisclosed location resumed three months later, but other construction activity in the vicinity was delayed for about nine months, D12 officials said. In response, the project team had to juggle construction staging and sequencing plans so crews could work at other locations along the 16-mile construction area.

In the meantime, archaeologists played an important role in guiding the project team through the extensive process of preserving and protecting the Native American remains and grave goods.

- The Orange County coroner was called to determine if the remains were of Native American origins. After confirmation, the coroner then followed up with the Native American Heritage Commission (NAHC), which in turn contacted tribal members that are a Most Likely Descendent (MLD).
- D12 Archaeologist Cheryl Sinopoli sent notification to other Native American groups that were consulted on this project during the environmental phase.
- The contractor's environmental consultant was tasked with preparing a Treatment Plan outlining a strategy and protocols for identifying any additional remains or resources, treatment procedures in consultation with the MLD and documentation needed. By January 2020, the plan was completed and submitted to the State Historic Preservation Officer (SHPO) for review in January 2020.
- After consulting with Caltrans Headquarters' Cultural Studies Office, a coring program was developed to help identify areas within the vicinity of the discovery that may contain archaeological deposit and subject to additional archaeological testing, treatment, and Native American monitoring. As a result, a larger area than the discovery location was designated as an Archaeological Monitoring Area.

More than three years later, Sinopoli said, "the treatment of the remains/resources is on-going today and will result in: Reburial of all the remains/resources collected and inventoried when construction is done within the overall vicinity, designation of the area as a Sacred Land site with the NAHC, and reports prepared documenting the discovery, actions taken to mitigate..., inventory of remains/resources identified, Native American involvement and interpretations of archaeological context."