

The Highway 89 Stewardship Team

Interagency Cooperation Paves the Way for Migrating Deer and Wildlife in the Sierra Nevada

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Kyburz Flat Undercrossing location during construction.

A lone mule deer buck emerges from a meadow edge and makes his way toward Highway 89. He is on his way to the winter range on the Department of Fish and Wildlife's (DFW) Hallelujah Junction Wildlife Area in Sierra County. He moves confidently through the meadow, then slows as he approaches the highway. As the noise picks up from the passenger vehicles and 18-wheelers speeding past, he becomes more cautious. Up on the bank he gets two hooves on the pavement, then turns back. Again he tries to cross the highway but too many cars are coming and he moves back. He walks along the highway waiting for the right moment but it doesn't come and soon he darts back across the meadow and into the safety of the willows. He knows he has to cross to reach the winter ground and he does this twice a year during spring and fall migration but the traffic has become a barrier.

Transportation (CalTrans) has been documenting the pickup of roadkill deer along this 25-mile stretch since 1985, and the numbers are staggering. Over 900 of the Loyalton-Truckee deer herd have been struck and killed on this highway in 23 years. That doesn't include those that were injured and died later, or those that were drug away by coyotes, or those that were flung into the brush and not counted. It also doesn't represent the myriad of species that are killed by vehicles on California's highways from bears to raccoons to frogs. In a 2008 report to Congress, the United States Department of Transportation's Federal Highway Administration estimated between one and two million large animal/vehicle collisions occur each year in the United States, the majority of which involve deer.

This is a scene becoming all too familiar for wildlife along California's Highway 89 between Truckee in Nevada County and Sierraville in Sierra County. In fact, the Department of

The emerging field of Transportation Ecology is becoming more prominent as the number of vehicles and wildlife/vehicle collisions on all roadways increases. But the deer can't wait for science to catch up – enter the Highway 89 Stewardship Team (H89ST or Team).

The H89ST is a multi-agency and local group made up of biologists, researchers and interested parties from DFW, the United States Forest Service (USFS), CalTrans, the Sierra County Fish and Wildlife Commission (FWC), UC Cooperative Agriculture Extension, UC Berkeley's Sagehen Creek Field Station, UC Davis, California Deer Association and the Sierra County Board of Supervisors (BoS). The Team formed in 2002 after some members had been contacted individually by the BoS and FWC expressing concern over the number of deer seen dead on the highway. Eventually, those individuals pulled together the partners who agreed that something should be done. The Team's purpose is to reduce the issues facing wildlife and drivers, reduce the deer/vehicle collisions and other wildlife mortal-





Sara Holm holds dart gun after successful capture.

ity, increase public safety, include the public and educate students of the situation, and conduct applied research and monitoring. Initial team goals were the installation of crossings for wildlife and showing a reduction in deer mortality.



It didn't take long for the H89ST to devise a plan to help wildlife safely cross the highway. The first step was to break down the database from CalTrans and identify "hot spots" where lots of deer were being killed. This would give the most likely place for a crossing. We looked at habitat, vegetation that deer were moving into and out of, age, sex, time of year, and total numbers by highway mile marker. When done we had identified several hot spots and began to evaluate them on the ground. We also ran each site through a value analysis adapted from CalTrans. This allowed an unbiased way to rank each site based on weighted parameters such as feasibility,

effectiveness, cost and aesthetics. It was decided that the best way to know where an undercrossing would help the most animals was to collar them and see where they were currently crossing the highway and in the largest numbers. The

available information suggested that collars and roadkills weren't enough to determine the best spot so we also designed and set a series of camera arrays along the highway.

While this background work was being done, the H89ST was also working on the biggest hurdle — finding funding. Thanks to hard work and persistence, we received a Highway Safety Transportation Enhancement Grant. Unexpectedly it came with a due date for completion that meant we had to choose a location and design a crossing prior to getting back data from the collared deer. The H89ST had to rely on collaborative knowledge, observations in the field, and our conclusions from analyzing the data we had. We chose a location at Kyburz Flat, near mile marker 5 in Sierra County for our first

undercrossing. Engineers from CalTrans came out to see the site and get our ideas before heading back to complete the design. Though we had early hopes of the large overpasses that have successfully

been installed in Banff, Canada, we did not have the topography or the funds to make it happen. Instead we ended up with a Structural Steel Plate Pipe Arch that measures 15.5 feet wide by 11 feet tall. This kind of wildlife crossing isn't new, in fact they've been in place on Highway 395 north of Reno, Nevada for years as well as on Interstate 80 just out of Truckee. Many states and other countries use this technique to help wildlife cross roads, but the H89ST team is unique.

In 2006, as CalTrans began the process of environmental permits, design, bids, traffic control and all that would go into getting our structure on the ground, DFW began to collar deer.

Every year a team of biologists, veterinarians, and wardens are sent to the Wildlife Investigation Lab's (WIL) Wildlife Handling and Restraint class. Here we receive classroom and hands-on training for the safe capture of wild animals. Once certified, we are sent back into the field to do this delicate work independently.

With 10 collars to put on deer, it was decided that the most effective way to do it was to chemically immobilize deer by ground darting. There are hundreds of deer to choose from as they congregate on critical winter range at the Antelope Valley and Hallelujah Junc-

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Sara Holm and Henry Lomeli process deer.

Photo by Paul Raquel.



Aerial tracking of collared deer.

tion wildlife areas where they can find enough to eat and survive winter weather and temperatures. The trick is to get close enough to safely dart them. This means about 35-50 yards, and with large groups on the lookout for trouble, this can be difficult. However, with good training and practice in the field we have become efficient and in 2008 deployed all 10 collars in six field days. The collars weigh about three pounds and have a battery box on the bottom, and the GPS and antenna on the top of the leather collar. They have enough power to last for about 12 months, with waypoints taken and stored hourly during fall and spring migrations and daily the rest of the year. A VHF function allows DFW to monitor the location of the animals monthly during telemetry flights. In late December when migration is complete and deer are again on the winter range, a command unit is used to retrieve the collars from the deer. A signal transmits to the collars, causing a mechanism to release

and allow the collar to open and fall to the ground. A receiver and antenna unit is used to navigate to the collars. Once we have them, the information is downloaded and placed on a map to determine the movement of the deer. In the last two years we have had five collared deer independently cross Highway 89



within a half-mile from the undercross site. This data is encouraging. In early 2008, the H89ST received a second Transportation Enhancement Grant for \$445,000 to complete fencing along both sides of the highway at the crossing site. With escape structures built into the fence, this will serve to keep deer safe from the highway while guiding them to the crossing.

For three years the H89ST has been involved in the education component of our project by creating a classroom program for the students of the Loyalton and Downieville high schools. Hundreds of students have participated in classroom exercises and hands-on training with our educational coordinator. Some have been hired for our summer program where they participate in scientific research such as track plate operation and stream sampling, and in environmental projects like storm drain stenciling. In 2007, the work-program students designed interpretive panels to educate highway travelers. Their handiwork can be seen at the Little Truckee Bridge near mile marker 2.75. Professionals

from the H89ST put on a program at Sagehen Creek Field Station for over 100 students in 2007. Each group rotated through stations such as macroinvertebrate collection and identification, trailmaster camera set up, deer collaring, and wildlife track and sign. These students have learned about subjects not featured in standard curricula and have had the chance to participate and learn valuable lessons about habitat connectivity, ecosystem function and transportation ecology.

Through a three-pronged approach of research, education and mitigation, the H89ST has long-term plans to bring transportation ecology to the forefront in the western United States. We continue to pursue partnerships and grants that will help fund more crossing structures along the highway. The Team is working to garner a highway designation that will signify the importance of research and technology in this field. The H89ST is leading the way with this innovative approach and hopes to answer questions and provide field-tested solutions that can be applied state-wide and nationally for improved wildlife/highway interaction.

The first completed mitigation project can be seen when driving north of Truckee on Highway 89 at Kyburz Flat. The undercrossing was completed in mid-September of 2008 and was dedicated in a media event in June 2009. If the structure is as successful as we hope, it will be that you just might run over a deer but it will be safely crossing the highway underneath you.



Dart gun used to immobilize deer.

