

Interstate 17 Elk Fencing Enhancement Project

Background:

Interstate 17 (I-17) is utilized by millions of people each year to drive from the Phoenix metropolitan area to the northern portion of the state where elk roam the higher elevations. During any given day, more than 15,000 vehicles can be found traveling this higher elevation section of I-17 and the probability of a vehicle colliding with an elk is more than four-times the national average. It is not uncommon to see elk along the road when driving at night. Furthermore, a majority of these collisions take place in a 15-mile section south of Flagstaff with a large portion occurring between Munds Park and Woods Canyon. Elk can weigh several hundred pounds and can cause property damage, injury and in some cases death to motorists. In fact a recent report to Congress estimates that each elk-vehicle collision costs society around \$18,000/collision.

Previous research conducted by AGFD along State Route 260, indicated that animals would use bridges to cross under the highway if fencing was erected to “funnel” them to these structures. Following completion of fencing along stretches of State Route 260 elk-vehicle collisions were reduced by >85%. This provided the momentum to address issue in other parts of the state, including Interstate-17. In 2006, with the goal of reducing wildlife-vehicle collisions from Munds Park to Woods Canyon, personnel from the Arizona Department of Transportation (ADOT) and the Arizona Game and Fish Department (AGFD) began discussing the possibility of using existing structures (bridges, traffic interchanges and box culverts) to allow elk and other animals to move safely under the highway.

In 2007 ADOT and AGFD were approved for Transportation Enhancement funds and in 2011, the I-17 Wildlife Fencing Enhancement Project, which included elk exclusionary fencing between Munds Park and Woods Canyon, was implemented. The fencing would connect five existing structures: two bridges, two traffic interchanges, and one box culvert with the intention of funneling elk to these locations.





Existing structures connected by fencing. Pictured are Munds Canyon bridge (top left), Woods Canyon bridge (top right), Fox Ranch overpass (bottom left), and Schnebly Hill underpass (bottom right).

Additionally, if elk managed to access the right-of-way, more than 20 escape mechanisms (escape ramps and slope jumps) would be placed within the fence structure to allow the animal to move to the safe side of the fence. Motorists will notice large mounds of dirt along the road, these are the escape ramps.



Escape mechanisms. The road side of an escape ramp (top left) allows an elk to walk up the ramp and jump down to the safe side, while the ramp's back side height (top right) prevents the elk from roadway re-entry. A slope jump (bottom left) allows an animal to jump down-slope through the top, unfenced portion of the "H" brace to safety, while slope angle and gravity prevent the animal from re-entering the roadway. The 7.5 foot fence (bottom right) prevents elk from entering the roadway.

In order to prevent elk from utilizing the interstate on-ramps and off-ramps located at the Schnebly Hill and Fox Ranch Traffic Interchanges, eight electric wildlife crossing deterrent mats (“electrified cattle guards”) have been installed.



The electric wildlife crossing deterrent mats (above left and center) can be deactivated (above right) if a pedestrian wants to cross the mat barefooted or wants their animal to cross the mat unaffected. However, the mat will not affect people wearing regular footwear. To note: all Interstates and Highways are restricted and meant for motor vehicle traffic not pedestrian foot traffic.

Location:

The study area for this research project is along I-17 between Munds Park and Woods Canyon – mile posts 317 to 323.

Monitoring:

AGFD has been tasked to evaluate the project to determine if the fence is effective at reducing wildlife-vehicle collisions while providing habitat connectivity by still allowing elk to safely cross from one side of I-17 to the other. To evaluate effectiveness of the project AGFD will:

1. Monitor Wildlife-Vehicle Collisions: After fence installation, AGFD, ADOT, and the Department of Public Safety will gather data related to the location of road-kills along the I-17 study area. These data will be compared to that collected prior to fence installation.
2. GPS Movement Data: AGFD will use GPS data obtained from collars placed on elk that use habitat in close proximity to I-17. The collars will take waypoints for two years and at two hour intervals while elk are most active. These data will be compared to that collected prior to fence installation to determine changes, if any, in the ability of elk to cross I-17.
3. Monitor the degree to which the existing structures are used by wildlife after fence installation. These data will be compared to that collected prior to fence installation.

Benefits:

The information gathered and analyzed from this project will result in a better understanding of how existing roadway structures may be utilized as wildlife crossing structures. In addition, we will gain a better understanding of how “funnel” fencing, escape ramps, and slope jumps can be used on existing and future roadway projects. The end result will be a roadway system that is safer for motorists and wildlife.

Partners: Arizona Game and Fish Department, Arizona Department of Transportation, Federal Highway Administration.

Related Links - Wildlife - Highway Projects in Arizona:

http://www.azgfd.gov/w_c/research_elk_I17.shtml.

http://www.azgfd.gov/w_c/research_wildlife_interactions_sr64.shtml

http://www.azgfd.gov/w_c/StateRoute_260_Elk_Crosswalk.shtml

http://www.azgfd.gov/w_c/research_maintain_sheep.shtml

http://www.azgfd.gov/w_c/How_did_pronghorn_cross.shtml

<http://www.fhwa.dot.gov/environment/ecosystems/az.htm>

Video Links - Wildlife - Highway Projects in Arizona:

[http://www.viddler.com/explore/azgfd/videos/44/\)](http://www.viddler.com/explore/azgfd/videos/44/)

<http://www.youtube.com/watch?v=FxBIYDKPaoI>

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