



THE FOX AND THE (FOUR-WHEEL) HOUND



By Jaime Warren
and Andrew Jones

A current research project is exploring how off-highway vehicles affect desert-dwelling animals.

Spot any Arizona Game and Fish Department vehicle around the state and you'll notice this statement printed on the side: "Managing today for wildlife tomorrow."

As these words suggest, ensuring healthy wildlife populations in Arizona now and into the future is a main duty of the Arizona Game and Fish Department. However, so is facilitating recreational opportunities for the public. When it comes to recreation, one fairly recent phenomenon has reached the forefront of attention — the riding of off-highway vehicles.

This activity involves riding any all-terrain vehicle, dirt bike, dune buggy or four-wheel-drive vehicle over unpaved surfaces. By developing guidelines to effectively

manage the activities and areas used by off-road enthusiasts, the Game and Fish Department hopes to balance resource protection with enjoyable recreation.

The department has managed OHV use since 1972, when legislation gave the Arizona Game and Fish Commission authority to approve and expend funds to identify habitat damage, provide information and education about, and enforce laws related to OHV-related activities. Since then, OHV recreation has skyrocketed. Records from the Arizona Department of Transportation indicate a 493 percent increase in the number of registered or titled OHVs between 1998 and 2008.

Some wildlife species, such as coyotes, rabbits and some songbirds, can adapt to and tolerate a limited

KIT FOX BY BRUCE TAUBERT AND OHV BY GEORGE ANDREJKO



Cottontail rabbits, cactus wrens and coyotes are known to adapt to limited OHV use. Biologists hope this study will show how OHV use affects kit foxes (fox and den, this page lower right).

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amount of disturbance. However, many species quickly feel the impacts of our excursions into the natural landscape. Research has shown that OHV use can harm habitat and wildlife by damaging soils, destroying native vegetation and increasing habitat fragmentation. Many disturbances occur on “wildcat” roads created by individuals riding off designated roads through pristine habitat.

These impacts are potentially long-term and have led the federal Bureau of Land Management to close several areas to OHV use in Arizona. A limited number of studies have examined the impacts of recreational OHV use on the behavior and distribution of birds and mammals. The department’s understanding of OHV impacts on wildlife remains scant; few studies have focused on the effects of OHV use on desert habitats and wildlife.

To address this information need, the department started a study of potential OHV impacts on desert wildlife in 2009. By better understanding how recreational activities influence wildlife and habitats, we will be able to make sound management decisions and provide the public with detailed information about the influences of OHVs.



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Asking Questions of Kit Foxes

The department decided to study kit foxes (*Vulpes macrotis*) because they are potentially impacted directly and indirectly by OHV use. Kit foxes may be harmed through direct mortality from vehicle collisions. They also may experience destruction of burrows and vegetative cover, and alterations to their rodent prey base. This species could therefore act as a valuable indicator of impacts OHV activity may have on the environment.

This small predator may be especially susceptible to OHV use because it inhabits flat desert terrain often used by OHVs. Its habitat includes creosote bushes mixed with white bursage, paloverde and cacti. These plants, flat terrain and sandy soils provide the kit fox with necessary habitat



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elements for hunting, denning, hiding and dispersal activities. OHV use could damage this habitat, thereby making it unsuitable for this diminutive native carnivore.

In designing a study to measure the potential impacts of OHV use on desert habitat and wildlife, researchers decided to use the concept of “habitat selection.”



An adult male kit fox wears a radio collar, helping researchers better understand whether OHV use affects its choice of habitat.

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The habitat where an animal conducts the activities of daily life — foraging, sleeping, avoiding predators, and moving between such areas — is no matter of chance. An animal selects or avoids habitat based on what a particular area has to offer. A habitat selection study measures habitat variables across an area, as well as the study species’ movements, to determine the degree to which each variable affects an animal’s selection or avoidance of a particular area.

As part of this study, other landscape characteristics also are measured, such as the amount of vegetation cover and the relative abundance of predators and prey, because these may influence kit fox habitat use as well.

The end goal of this study is to determine if kit fox habitat selection is influenced by OHV use and to see if kit foxes change their habitat use as OHV use levels change.

Pursuing the Elusive

Starting in March 2010, researchers began trapping and outfitting adult male kit foxes with radio collars capable of recording a Global Positioning System (GPS) location once every seven hours. In addition, habitat characteristics were measured across two 30-square-mile study areas. These data are useful in determining where the foxes

OHV

Interested in OHV riding? Longtime rider looking for new areas to explore? Need to know the rules before you head out? The public can ride OHVs on roads and trails on most state and federal public lands such as Bureau of Land Management areas. The Arizona Game and Fish Department publishes a brochure outlining places to ride and OHV rules and regulations, which is available in print and online. Also available are the department’s all-terrain/off-highway vehicle safety course and links to Arizona State Parks and Arizona State Land Department OHV programs. Follow the links at www.azgfd.gov/ohv.



Remember, all vehicles weighing 1,800 pounds or less and designed for use over unimproved terrain are required by law to obtain the OHV Decal. It’s available from the **Motor Vehicle Division of the Arizona Department of Transportation**, online at www.servicearizona.com, or at any authorized MVD third-party service provider.



Responsible OHV riders who follow rules and posted signs help the department protect habitats for Arizona's wildlife and thereby help maintain opportunities for future outdoor recreation.



A biologist listens for the signal from a radio collar (above). Responsible OHV riders stay on roads and trails (right).

move and in evaluating their habitat use and movement patterns in relation to habitat characteristics, including the level of OHV activity across each study area.

To date, researchers have collared six male kit foxes at one of the study sites. Even though this study focuses on movement patterns of male foxes, we also have caught (and released) females and pups — as well as the occasional skunk.

VHF antennas are used to track fox movements from the ground and air. However, this can be extremely difficult when the foxes retire into their dens to snooze for the day. Even with today's technology, these elusive and cunning animals have been difficult to trap and to track.

Now in the second year of the planned three years, this study has been anything but easy. As part of the habitat assessment, researchers have had to contend with radio-collar failures; the deaths of two foxes, due to unknown causes; and hot summer hikes to count animal scats and rodent burrows.



Shaping the Future

There is still plenty of work to do. In the last year of the study, researchers plan to modify levels of OHV use to see how this might change kit fox activity patterns. At the end of the third year, a report and publications explaining the findings will be compiled and available to the public. This previously unknown information about the influences of OHV use on one of Arizona's native desert species will provide useful knowledge to inform decisions on management of outdoor recreation and wildlife.

Responsible OHV riders who follow rules and posted signs help the department protect habitats for Arizona's wildlife and thereby help maintain opportunities for future outdoor recreation. OHV use can be a safe and enjoyable activity that allows some individuals to scout an early morning hunt, and others to enjoy a ride through the desert at sunset. Whatever your interest, Arizona's diverse landscapes provide both wonderful scenery and an excellent opportunity to see and learn about Arizona's abundant wildlife. 🦊

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Kit Fox

Did you know? Kit foxes are the smallest members of the Canidae (dog) family in North America, weighing in at only 3–6 pounds.



They are mostly gray with a rusty wash on their sides, white underside and a black-tipped tail. Preferring large, flat desert areas with scattered creosote bushes, these foxes have large ears to help them dissipate heat during the hot summer months and to detect their prey. They dig dens with narrow openings, sometimes with multiple entrances, where they stay during the day. At night, they primarily hunt rodents and sometimes ground-dwelling birds.

Little is known about the status of kit fox populations in Arizona, making it important to gather baseline data and evaluate potential impacts on the species. In California, impacts such as urban encroachment and habitat conversion have contributed to the San Joaquin subspecies of kit fox landing on the federal list of endangered species. Research will help the department better understand potential negative impacts on Arizona's kit foxes.