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Bobcats and Drought

by Michael Tewes and Lon Grassman, Jr.

Drought conditions can have severe consequences on wildlife in Texas. We often hear of dismal harvest predictions for deer and quail following extended dry periods. Many other wildlife can be severely affected by drought conditions as well. If the drought is severe enough, then cascading effects eventually impact bobcats through reduction of their prey base as fewer rodents and rabbits occur.

In Texas, the hispid cotton rat and eastern cottontail are important in bobcat diets. They are large-size prey, relative to the other potential prey, with rabbits weighing 2–4 lbs and cotton rats about 9 oz. In addition, both prey can irrupt with high densities during normal or wet periods. Attributes of large prey size and periodic high abundance make these food items a profitable prey with high energy content and reduced search and handling times for the bobcat.

The former Director of the CKWRI, Dr. Sam Beasom, headed research in the early 1970s that studied bobcat diets in southern Texas. He examined 51 bobcat stomachs during a dry year (1971), and compared the findings to 74 stomachs from a wet year (1972). During the dry year, bobcats consumed 21 prey species. Although cotton rats and rabbits were not commonly observed in the wild in 1971, they still were the dominant prey accounting for 38% and 18% by volume in bobcat stomachs, respectively. In 1972, following rainfall that enhanced habitat conditions, over 100 cotton rats per mile were observed several times. Because of the abundance of cotton rats and rabbits following rainfall, bobcat diet contained these 2 species almost exclusively. This was apparent when comparisons by percent occurrence in the bobcat diet were

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made which indicated that these 2 prey species solely comprised 93% of the bobcat stomachs during the wet year, but only 33% during the dry year. Bobcats apparently responded to a change in prey availability by concentrating their hunting efforts on cotton rats and rabbits when these prey were abundant during the wet year. This information suggests that when cotton rats and rabbits are scarce, bobcats shift to other food resources.

We have found that drought can reduce prey abundance, which in turn can affect bobcat diet, home range and habitat use, health, reproduction, and survival. At the Rob and Bessie Welder Wildlife Refuge in southern Texas, Dr. Terry Blankenship found bobcats increased their home range size about 100% during low prey abundance. Also, bobcats increased their use of grasslands and water sources because alternate prey species (e.g., wading birds, waterfowl) occurred in these areas.

Following a prey decline in Idaho, researchers found some bobcats expanded their home range and made long extraterritorial forays, presumably in search of prey. This pattern also was observed in southern Texas, as bobcats demonstrated increased dispersal during periods of low prey abundance.

Bobcat pregnancy rates and litter sizes seem to be affected by low prey density. Drought-induced declines in prey availability reduced pregnancy rates of bobcats in Oklahoma. In southern Texas, Blankenship found that the number of litters and kittens decreased as prey declined, and no female bobcats were observed raising kittens on the study site during 3 years of low prey abundance.

Prey abundance strongly affects survival of bobcat kittens. During periods of scarce prey, adult females are believed to feed themselves before feeding their kittens. Blankenship found a 94% survival rate of bobcats during high prey abundance and 44% during low prey abundance. Lower bobcat survival may vary with social class, with transient bobcats experiencing lower survival than resident bobcats.

Three tagged adult bobcats in Idaho that starved to death during a period of low prey had body weights 64–69% lower than their previous capture weights. In Texas, Blankenship observed 2 bobcats that starved during periods of low prey and found a bobcat in poor condition that was probably killed by coyotes.

In summary, bobcats are affected by drought in various ways, including a switch in diet to less preferable prey, expansion of their territories, a reduction in reproduction effort, and a decrease in survival. Most of these effects are related to reduced prey and quality of habitat used by bobcats. Although the bobcat is adaptable, the scourge of drought can still affect this wild cat. ~

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By The Numbers

32	number of species of bats found in Texas
5	height in feet of the whooping crane (*Grus americana*)
125,000	estimated number of hatchlings of Kemps' Ridley sea turtle produced in North America (TPWD fact sheet)

Lost and Found

We are looking for past students and faculty of CKWRI. If you know where a past CKWRI family member can be located, please forward their information to Lori Alvarez at 361-593-4025 or e-mail us at CKWRI@tamuk.edu.

CKWRI NEWS

New Book to be Published

Dr. Lenny Brennan, Endowed Chair of the *Richard M. Kleberg, Jr. Center for Quail Research* at CKWRI, has put the finishing touches on the soon to be released book *Texas Quails: Ecology and Management*. Lenny served as editor and chapter contributor of this seminal work. The book is divided into 3 sections: Ecology and Life History of Texas Quails; Quail Populations in the Ecoregions of Texas–Management Opportunities and Research Challenges; and Culture, Heritage and Future of Texas Quails. In the forward, **Katharine Armstrong**, former Chair of Texas Parks and Wildlife Commission, wrote that "Anyone with an interest in Texas quails—hunter, landowner, manager, researcher, or biologist—should have a copy of this book." The book, published by Texas A&M Press, will be available in February 2007 from them or commercial outlets. Preprint orders can be made at www.tamu.edu/upress.

South Texas Natives Receives New Tractor

It has been said that "diamonds are a girl's best friend," but earlier this fall a shiny new orange tractor

The new *South Texas Natives* tractor being used to harvest sideoats grama.

was Paula Maywald's diamond. Paula, who is the director of *South Texas Natives*, was happy to see the new tractor gifted to *South Texas Natives* by the Stone Brothers (Stormy & Reagan Stone). It is a 70-hp Kubota tractor with a front-end loader attachment for mounting an 8-ft. flail-vac for harvesting seed. *South Texas Natives* would have been unable to harvest seed from production fields without this tractor, thereby delaying the release of several species of grasses for commercial production. ~

Did You Know?

Predators of the roseate spoonbill are primarily coyotes and raccoons, which feast on the eggs and young birds unable to fly.

The last gray wolves reported in Texas were in 1970 from Brewster County. (The Mammals of Texas, Davis and Schmidly)

Landscape Management for South Texas Wildlife

by Aaron M. Haines, Aaron D. Tjelmeland, and Timothy E. Fulbright

The South Texas region is home to a unique ecosystem known as the Tamaulipan thornshrub. This ecosystem contributes to a unique variety of habitats that support a wide diversity of animal life. It is used by nearly 400 types of breeding or migratory bird species. Additionally, it provides habitat for about one-half of all butterfly species found in the United States. A diverse rodent community also occurs in the thornshrub, thus providing prey resources for numerous predators. Furthermore, state and federally-listed threatened and endangered wildlife species reside within the thornshrub habitat of southern Texas. For example, researchers at CKWRI have found the ferruginous pygmy-owl in areas of mesquite-thicket thornshrub habitat with large-diameter trees.

Southern Texas is also renowned for trophy white-tailed deer and bobwhite quail. Large tracts of habitat are retained by private landowners for the management of these game species. Dense thornshrub cover provides white-tailed deer, bobwhites, Rio Grande wild turkeys, and other game species shade during the hot summer and insulation from heat loss during winter. The dense thornshrub also provides protection from predators.

Unfortunately, the Tamaulipan thornshrub in southern Texas (especially along the Rio Grande River) is considered an endangered ecosystem. This is in large part due to over 90% of thornshrub habitat within southern Texas being cleared for urban and agricultural uses during the 1970s. However, researchers at CKWRI have developed brush management plans for white-tailed deer in southern Texas emphasizing the importance of maintaining dense thornshrub cover. These brush management plans delineate a landscape consisting of a habitat mosaic of interconnected brush habitat blocks interspersed with small clearings, which improve white-tailed deer habitat. This type of landscape brush management plan would also benefit numerous wildlife species by providing a heterogeneous landscape incorporating thornshrub cover. Openings in the habitat provide feeding areas for bobwhites and white-tailed deer. Openings also provide nesting sites for the numerous ground-nesting birds that occur in the region.

Substantial areas of dense mature thornshrub left undisturbed will provide habitat for ocelots, ferruginous

© Timothy Fulbright

Creating a mosaic of interconnected brush habitat blocks interspersed with open clearings is necessary for a successful landscape brush management strategy in southern Texas.

Editor's Note: Dr. Haines is a former student at CKWRI and is currently a postdoctoral research scientist at the Center for Research on Invasive Species and Small Populations at the University of Idaho. Mr. Tjelmeland is a graduate student at CKWRI and Texas A&M University-Kingsville studying under the direction of Dr. Fulbright. Dr. Fulbright is a research scientist at CKWRI and professor at Texas A&M University-Kingsville.

An aerial view showing a landscape brush management system (Los Ebanos Biological Research Station and private cattle ranch).

pygmy-owls, migratory and breeding birds, butterflies, and rodents, while simultaneously providing escape and thermal cover for game species. In addition, brush-dominated corridors between tracts of thornshrub will allow the interchange of individuals among populations, which may facilitate genetic diversity.

The protection and restoration of dense thornshrub habitat with a landscape brush management plan requires participation from local private landowners, because important tracts of potential and existing dense thornshrub cover are privately owned within southern Texas. Thus, the benefits of establishing a landscape brush management plan should be promoted to private landowners. Ultimately, the benefits will include an increase in wildlife aesthetics and wildlife values (i.e., hunting, nature photography, and ecotourism opportunities) to the landowner. In addition, government incentive agreements provided by the Farm Bill, conservation easements, and safe harbor agreements may offer further benefits that encourage landowners to preserve, maintain, and expand thornshrub habitat.

University researchers and federal and state biologists and wildlife managers can work with private landowners to develop landscape brush management plans for the benefit of wildlife. This can be done effectively if landowners are aware of the benefits of thornshrub cover to the unique and diverse wildlife found in the Tamaulipan thornshrub ecosystem. ~

What Do They Eat?

The swift (kit) fox eats a wide range of prey including small mammals, birds, reptiles, amphibians, and insects, and will also consume seeds and other vegetative material.

The northern harrier eats a wide range of prey items, including small rodents and mammals, birds, amphibians, and reptiles.

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