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BOBCATS OF THE BORDERLANDS

by Dan Taylor, Randy DeYoung, and Michael Tewes

Some of the highest rates of human population growth and land-use changes in the U.S. are currently taking place in the Lower Rio Grande Valley of South Texas. Urbanization and expansion of farming have left only small patches of wildlife habitat scattered across the landscape. This fragmentation of habitat is an issue of concern for the future persistence of native wildlife in this unique region.

Bobcats are among the many species of wildlife native to the Lower Rio Grande Valley. Bobcats are capable of living in small habitat patches within urban landscapes, and their movements through the fragmented areas can be indicative of the effects of fragmentation on other species.

As part of a collaboration with Dr. Terry Blankenship of the Rob and Bessie Welder Wildlife Foundation, we used genetic monitoring to assess the effects of habitat fragmentation. Genetic methods are ideal because ecological disturbances that affect multiple generations are reflected in patterns of genetic diversity. Genetic diversity is essential for a population to avoid the effects of inbreeding, limit susceptibility to disease, and adapt to environmental change.

We compared genetic differentiation and diversity from bobcats sampled in fragmented areas to bobcats sampled in contiguous rangeland habitats. Bobcats often defecate on roads or trails as a means of scent-marking and communication to other cats. DNA extracted from the scats is an efficient way to study bobcat populations. We used DNA extracted from bobcat scat to genetically confirm 68 individuals at sampling sites within the Lower Rio Grande Valley.

Our genetic data revealed significant evidence for restricted movement and dispersal of bobcats in fragmented habitat patches

Editor's Note: Mr. Dan Taylor is a graduate student at CKWRI/Texas A&M University-Kingsville; Dr. Randy DeYoung is a research scientist at the CKWRI and associate professor at Texas A&M University-Kingsville; Dr. Michael Tewes holds the Frank Daniel Yturria Endowed Chair for Wild Cat Studies at the CKWRI and is a Regents Professor at Texas A&M University-Kingsville.

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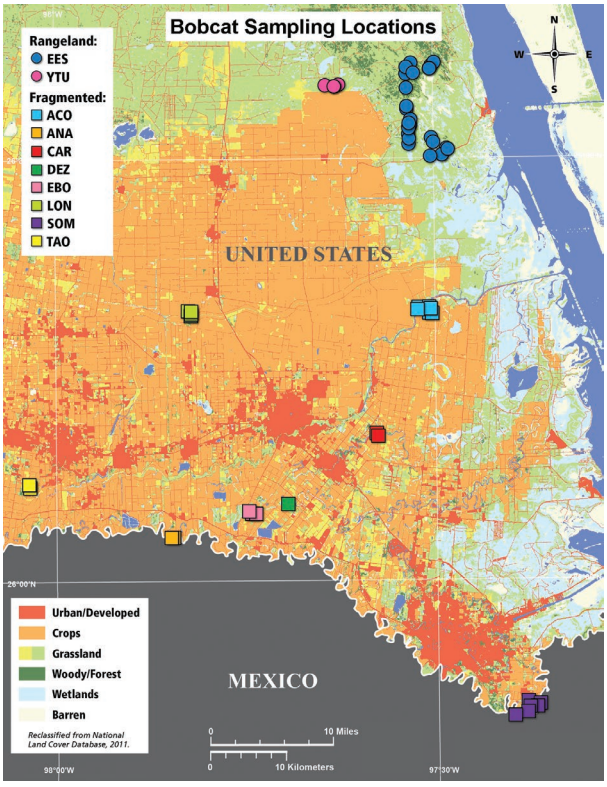

Individual bobcats sampled within the heavily altered landscape of the Lower Rio Grande Valley of South Texas.

compared to contiguous rangeland. In fragmented areas, bobcats sampled within 15 miles of each other were genetically similar. Bobcats sampled in rangelands showed no relationship between genetic similarity and geographic distance. Bobcat dispersal appears restricted in the fragmented areas, and bobcats may have a difficult time avoiding mating with close relatives.

We also conducted analyses to determine migration rates among fragments and rangelands. Estimates indicated that bobcats in the fragmented areas are likely to remain within or disperse to rangeland, but dispersal rarely occurred into the fragmented areas from the rangeland. Only about 3% of bobcats per generation in urban areas migrated from rangelands, whereas about 29% of bobcats per generation in rangelands migrated from urban areas. This evidence for directional migration from urban areas to rangelands raises concern for diseases such as those resulting from feline leukemia virus and feline immunodeficiency virus that could be spreading from urban areas that have higher prevalences of these diseases to rangeland populations.

Monitoring connectivity of habitat corridors will be important for the long-term conservation of wildlife in the region. Habitat patches that can be used as stepping-stones or travel corridors to more secure habitats should be protected or established to ensure sufficient dispersal from the bobcat population of the Lower Rio Grande Valley to favorable ranchland habitat.

Bobcats should continue to be used as an indicator species for the effects of habitat fragmentation on wildlife populations because of their wide range, mobility, and adaptable generalist diet. Habitat fragmentation that affects bobcats will likely affect other species of wildlife that are less adaptable in responding to landscape changes, such as the endangered ocelot. ~

The proportion of individual bobcats per generation that migrated from or stayed within their respective rangeland or urban populations, estimated from genetic data collected in 2016–2017.

Bobcat Population Dispersal

	FROM Rangeland	FROM Urban
TO Rangeland	71.4%	28.6%
TO Urban	3.3%	96.7%

By The Numbers

88 average weight in pounds (40 kg) of an adult female pronghorn in Texas (The Mammals of Texas, W.B. Davis and D.J. Schmidly, Texas Parks and Wildlife Press)

22–23 incubation period in days needed for scaled quail eggs to hatch (Chapter 5: Scaled Quail Ecology and Life History *by* N.J. Silvy et al. *In* Texas Quails Ecology and Management, L.A. Brennan editor, Texas A&M University Press)

CKWRI NEWS

New Advisory Board Member

We are excited to announce CKWRI's new advisory board member **Jeff Hildebrand**. He is executive chairman and founder of Hilcorp Energy Company, an independent oil and gas exploration and production company located in Houston, TX. Hilcorp has been named to FORTUNE Magazine's 100 best workplaces in America for the past 5 years. Prior to founding Hilcorp in 1989, Jeff was with Exxon, the Dan A. Hughes Company, and American Energy Capital Corporation. He earned a BS in geology in 1981 and a MS in petroleum engineering in 1985, both from The University of Texas at Austin.

Mr. Jeff Hildebrand is CKWRI's new advisory board member.

Mr. Hildebrand actively participates in the community, serving on the boards of Central Houston, Inc., Houston Livestock Show and Rodeo, Houston Police Foundation, Rice University's Baker Institute for Public Policy, The University of Texas Systems Board of Regents, The University of Texas Investment Management Company, and the University Lands Advisory Board.

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http://www.ckwri.tamuk.edu

TCTWS Meeting Highlights

Research by the CKWRI was on display at the 54th meeting of the Texas Chapter of The Wildlife Society (TCTWS) held February 9–11 in Dallas, TX. Twenty-six of 87 (30%) oral presentations and 29 of 87 (33%) poster presentations were by CKWRI researchers, graduate students, and undergraduate students working with CKWRI researchers.

Gael Sanchez and **Janel Ortiz** placed 1st and 3rd in the *Clarence Cottam Award* competition. Gael's

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Gael Sanchez receiving the 1st place *Clarence Cottam Award* from Corey Mason, outgoing president of the TCTWS.

presentation "Analysis of Allelic Variation in Prion Protein Gene of Texas Mule Deer" was coauthored by CKWRI scientists **Drs. Randy DeYoung**, **Damon Williford**, **David Hewitt**, **Timothy Fulbright**, and **Humberto Perotto-Baldiviseo**, and **Dr. Louis Harveson** (Sul Ross University) and **Shawn Gray** (TPWD). Janel's presentation "Taking Them Under My Wing: Integrating Wild Bird Conservation

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Janel Ortiz receiving the 3rd place *Clarence Cottam Award* from Corey Mason, outgoing president of the TCTWS.

Did You Know?

The ear of an eastern cottontail is 50–60% as long as its hind foot. (The Mammals of Texas, W.B. Davis and D.J. Schmidly, Texas Parks and Wildlife Press)

The common moorhen makes 4 types of nest structures: false nests, egg nests, brood nests, and platforms. (Chapter 10: Common Moorhen *by* E.D. Greij. *In* Migratory Shore and Upland Game Bird Management in North America, T.C. Tacha and C.E. Braun editors, Allen Press)

Curriculum into the Sixth and Seventh Grade Classroom" was coauthored by CKWRI scientists **Drs. April Torres Conkey** and **Leonard Brennan**, and **Drs. La Vonne Fedynich** and **Marybeth Green** (TAMUK).

Receiving the *Outstanding Popular Article Award* was **Dr. Michael Tewes** for "Clinging to

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Dr. Michael Tewes receiving the *Outstanding Popular Article Award* from Corey Mason, outgoing president of the TCTWS.

Survival in the Borderlands," which was published in the September/October 2017 issue of The Wildlife Professional—a publication of The Wildlife Society. ~

TANGLEHEAD MANAGEMENT WITH CATTLE AND BURNING

by Chase H. Walther

Tanglehead is a native bunch grass once named a "decreaser" and "good forage grass" for cattle. It has expanded at an unprecedented rate on native rangelands, particularly in the sand sheet region of South Texas. This region is characterized by beef production and wildlife enterprises, and the increased dominance of tanglehead has concerned landowners and scientists because of the changes it is causing to the ecosystem.

Research has shown invasive grasses can reduce plant community diversity and decrease the abundance of birds and insects. Tanglehead has also earned itself a new reputation for being poor in palatability and is avoided by cattle when it matures.

CKWRI researchers have been studying tanglehead for a number of years to gain insights on how to counteract its expansion. They found that seeds from the plant decrease in viability over time within the soil, prompting recommendations to reduce soil disturbance, thereby preventing the addition of seeds into the seedbank. Prescribed burning in fall months will destroy seeds on plants and the ground surface, preventing them from making their way into the soil. However, after burning, seedlings will rapidly establish themselves, at times covering the soil surface at one seedling

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Prescribed burning was conducted in tanglehead pastures, which had fine fuel loads of over 5,000 pounds per acre.

Editor's Note: Mr. Chase Walther is a graduate student at CKWRI/Texas A&M University-Kingsville whose advisor and mentor is Dr. J. Alfonso Ortega-Santos, research scientist at CKWRI and professor within the Department of Animal, Rangeland, and Wildlife Sciences at Texas A&M University-Kingsville.

per square inch. This facilitates the invasion instead of controlling it. To confront the issue, a new study is being conducted using cattle to counteract the explosive regrowth after a fire.

Tanglehead is highly palatable in its early growth stages after a fire. We are using this characteristic in conjunction with patch-burning to develop a technique that would reduce tanglehead dominance.

Patch-burning concentrates cattle on the burned areas because they prefer the new growth. This maximizes grazing pressure on the emerging tanglehead seedlings, preventing them from maturing and producing seed while allowing other plant species to establish themselves. Cattle also benefit from the high nutrient content produced after the burn and still have enough dry matter available in the rest of the pasture to fulfill their daily requirements. Because all their nutritional requirements are being met, cattle can be selective when grazing, thereby avoiding forbs and other native grasses to focus on tanglehead.

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GPS-collared cattle were placed in mature tanglehead pastures a month before the burns to assess their movements and use.

The study is ongoing, but the results gathered thus far are promising. Vegetation sampling shows that nearly twice as many native plant species can be found in burned areas compared to unburned areas. Data from GPS collars placed on cattle show that cattle are 4.5 times more likely to graze tanglehead after burning than before burning. Cattle also used 8 times more of the available forage in the burned areas compared to the unburned areas.

GPS monitoring and vegetation sampling will allow us to get an accurate picture of cattle movements and tanglehead response to burning and grazing as the plant community develops. The next step in the study is to burn more patches, creating a diversity of growth stages available to cattle and wildlife while reducing the dominance of tanglehead. ~

Consider giving a tax-deductible donation to CKWRI

What Do They Eat?

Pipevine swallowtail caterpillars only forage on the leaves of plants found in the Pipevine Family. (http://whatdocaterpillarseat.com/)

Belted kingfishers mainly eat fish, but will take crustaceans, snails, amphibians, and small birds. (Handbook of Birds of the World, Vol. 6, del Hoyo et al., Lynx Edicions)

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