



Camera Trapping to Estimate Population Size of Wild Cats

by Daniel G. Scognamillo, Thomas J. Yamashita,
and Michael E. Tewes

If we had to define any species of wild cat with one word, that word would be 'elusive,' meaning very difficult to detect. Wild cats are elusive predators. Their fitness, or in other words their livelihood, depends on their ability to go undetected by their prey. Their effectiveness to find and kill prey depends in part on their elusiveness. It is this same elusiveness that makes it very challenging to study wild cats in nature; we know they are out there, but we rarely see them.

Most species of wild cats are endangered. Their population numbers are low because of, among other factors, habitat loss and fragmentation, roadkill, and conflict with human activities. The path to their recovery rests on conservation and management plans developed on two main elements: knowing how many individuals there are and where they are found. But how can we gather this information for species that are elusive? The answer came with the development of infrared trail cameras. The development of this technology has given us a powerful tool for the detection of wild cats in the field, and the opportunity to have accurate estimates of their abundance and distribution.

Trail cameras allow us to be present at different locations 24/7. These cameras can collect information



Camera trap photo of a male ocelot on the edge of brush habitat in South Texas.

on any individual of a species of wild cat that walks by at any time during the day or night. The cameras take high quality images that allow us to uniquely identify wild cats based on the spot pattern in their fur or any other natural marks (such as scars), and when multiple cameras are arranged in pairs and in a grid covering a large area, we can also produce very accurate estimates of population size and distribution.

Nowadays, with trail cameras we can sample several sites simultaneously and visit them several months after the cameras have been deployed, to only retrieve the memory cards with the images collected or to replace batteries. Depending on the size of the area sampled and the length of the sampling period,



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more than a million photographs could be collected at a sampling site. Processing all those images is also challenging, but automated image recognition with the use of artificial intelligence allows us to separate in a few days photographs with animals from ‘ghost’ photographs (photos without animals which have been taken by the cameras because of being triggered by moving grasses, wind, or rain). Going from photographs of wild cats to the estimation of the size of the population is a methodical process that requires keen observation of each photograph and the use of statistical models. Inspecting these photographs is a process that we all enjoy, whether you are a highly experienced cat biologist, an undergraduate student, or a very enthusiastic volunteer with an interest in conservation.

Researchers in the Caesar Kleberg Wildlife Research Institute are currently using this methodology to estimate population size and distribution of ocelots and bobcats in different study sites in Texas (Laguna Atascosa National Wildlife Refuge, El Sauz Ranch, Frank Yturria Ranch) and in Mexico, and to estimate leopard abundance in Botswana. ~

CKWRI News

H-E-B Supports Ocelot Conservation

We are proud to announce that H-E-B is supporting CKWRI’s ocelot conservation and research through a generous donation and through Our Texas, Our Future Films: A five-part original docuseries celebrating Texas’ beautiful state parks, resilient wildlife, and the people helping conserve and protect them. “Ranching with Ocelots” features our partners at East Foundation, and donations received will support CKWRI’s ocelot conservation and research. Visit our website (“Media” tab) to watch these beautiful films.

3MT Awards

Two CKWRI graduate students were winners in the East Foundation’s 3MT (Three Minute Thesis) competition. Forrest Fay won the People’s Choice award for “Effects of Prescribed Burning on Nearest Neighboring Plants,” and Bryan Spencer won Judge’s Choice for “Cattle Grazing and White-tailed Deer.” Congratulations to Forrest and Bryan!

Quail Associates 2.0

The CKWRI is reviving the Quail Associates program with version 2.0. The emphasis is on engaging landowners across South Texas to conduct quail roadside surveys at the end of summer to 1) develop a spatial map of bobwhite abundance to help forecast the upcoming quail season, and 2) develop habitat relationships with quail abundance to provide habitat management recommendations. Quail Associates 2.0 will provide a way for CKWRI to keep a pulse on the quail population in South Texas, gain new insights into local and regional factors that influence populations, and better assist area landowners and managers.

For more information or to become a partner, visit our website and look for Quail Associates 2.0 under the Research Programs tab.



Stevens and June Herbst Endowment

Thanks to Steve and June Herbst, CKWRI will now have funds to study iconic South Texas species that do not attract a lot of research support. This new endowment will support studies on horned lizards, Texas tortoises, javelina, and other iconic South Texas wildlife. We can all be thankful to Steve and June when we get to show our kids or grandkids a horny toad.

Prairie Strips: An Opportunity to Balance Conservation and Production

by Jordan Giese

For most people, a trip down Interstate 80 through America's heartland is a dull experience, filled with endless stretches of corn and scattered grain elevators. For an ecologist, it can be a disheartening reminder of how much we've transformed a landscape once blanketed by vast prairies and roaming bison. Today, opportunities for conservation usually take place on less productive tracts of land where potential crop yields don't justify a planter. Recognizing the dilemma, a team of researchers at Iowa State University sought to strike a balance between long-needed conservation and agricultural production.

The STRIPS (Science-based Trials of Rowcrops Integrated with Prairie Strips) project began at Neal Smith National Wildlife Refuge in 2003, where scientists launched a study on the effects of incorporating narrow strips of prairie into crop fields. Among their early investigations, the team found that converting just 10% of a field to prairie vegetation reduced topsoil loss by 95% and chemical runoff by 89%. In 2012, the project was expanded to several commercial farms across the state of Iowa. It was further boosted by its inclusion as a Conservation Reserve Program practice in the 2018 farm bill (CP43). As of early 2023, over 15,000 acres of prairie strips have been installed across 15 states.

Dr. Jordan Giese is an Assistant Professor of Research at the CKWRI. ~



Prairie strips planted within row crops in Cass County, Iowa.

Did You Know?

Green Jays are excellent mimics. They may imitate the call of various hawks to frighten away other bird species from food they want to eat (The Cornell Lab. Green Jays. www.allaboutbirds.org).



Questions about the value of prairie strips as wildlife habitat arose from the start. Researchers were concerned that narrow strips of prairie (usually 10-20 feet wide) would entice nesting by birds only to expose those nests to predators such as raccoons, skunks, and coyotes. Most grassland bird species, like Dickcissels, Eastern Meadowlarks, and Grasshopper Sparrows, have experienced drastic population declines since the 1960s and are extremely vulnerable to nest predators. A study of the effects of prairie strips on local bird communities and their nest success was launched in 2015, asking these three questions: 1) Do prairie strips increase the number of birds in a field? 2) Do birds frequently nest in prairie strips? 3) Are those nests actually successful?

After conducting 1,583 bird surveys and finding 1,604 nests of 30 bird species on commercial farms, researchers had more answers. Farm fields with prairie strips had 88% more birds and 165% more grassland birds than fields made entirely of crops. The most common species in prairie strips were Red-winged Blackbirds, Dickcissels, and Common Yellowthroats.

Because birds don't readily nest in crop fields, researchers compared nesting rates between prairie strips and other common grassy features on farms including terraces, waterways, and creek buffers. During 6 summers, researchers monitored 847 Red-winged Blackbird and 332 Dickcissel nests. By revisiting nests every 2-3 days, they tracked the number of nests that successfully produced chicks vs. those that failed. Both Red-winged Blackbirds and Dickcissels nested more frequently and had higher rates of nest success in prairie strips than other grassy features. For Red-winged Blackbirds, success rates of nests in prairie strips were even higher than nests in large, intact prairies reported by similar studies.

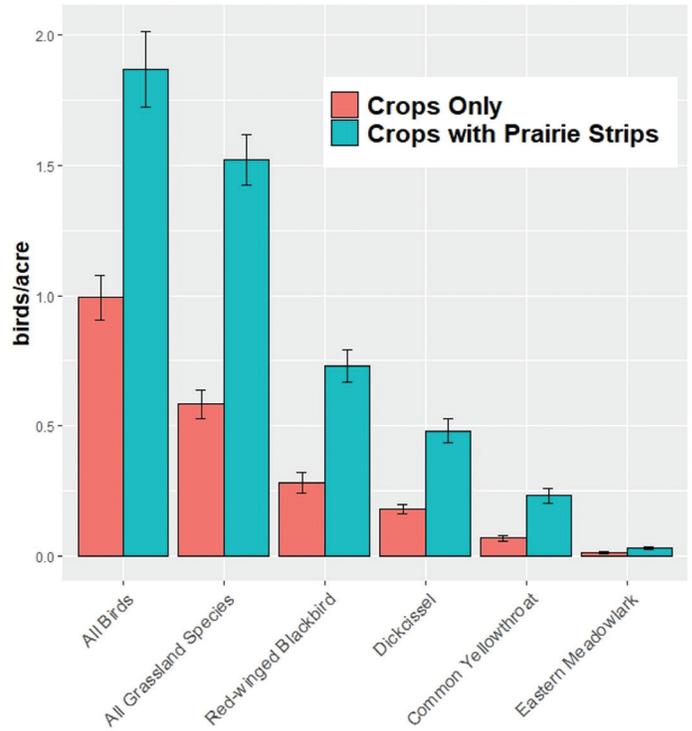
What Do They Eat?

Javelinas feed on a variety of plants, including agave hearts, roots, and flowers, but one of their favorite foods is prickly pear cactus stems, pads and fruits (GrandCanyonNPS. Minute Out In It: Javelinas Eating Cactus. www.youtube.com/watch?v=v5PejT_Tim0).

Other research has found that the installation of prairie strips resulted in 42% less surface water runoff, 84% less nitrogen runoff, 4 times more native plant species, 2.6 times more insects, and 3.5 times more pollinators than all-crop fields. Additional studies are examining effects of prairie strips on reptiles and small mammals, and the value of strips as winter habitat for Ring-necked Pheasants. Whatever their form and location, patches of native habitat within working landscapes, including those in Texas, would provide extensive benefits to wildlife, pollinators, and the environment at large.

More information can be found at <https://www.nrem.iastate.edu/research/STRIPS/> ~

The graph to the right shows the number of singing male birds per acre and illustrates the value of strips of native prairie planted within crop fields.



By The Numbers

30 Years is the lifespan of the Little Brown Bat (<https://www.fws.gov/species/little-brown-bat-myotis-lucifugus>).

Advisory Board

The Advisory Board of the Caesar Kleberg Wildlife Research Institute (CKWRI) provides leadership in all aspects of our work. We are indebted to them for their commitment to the CKWRI and its mission.

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Wildlife Research is printed on recycled paper.

