

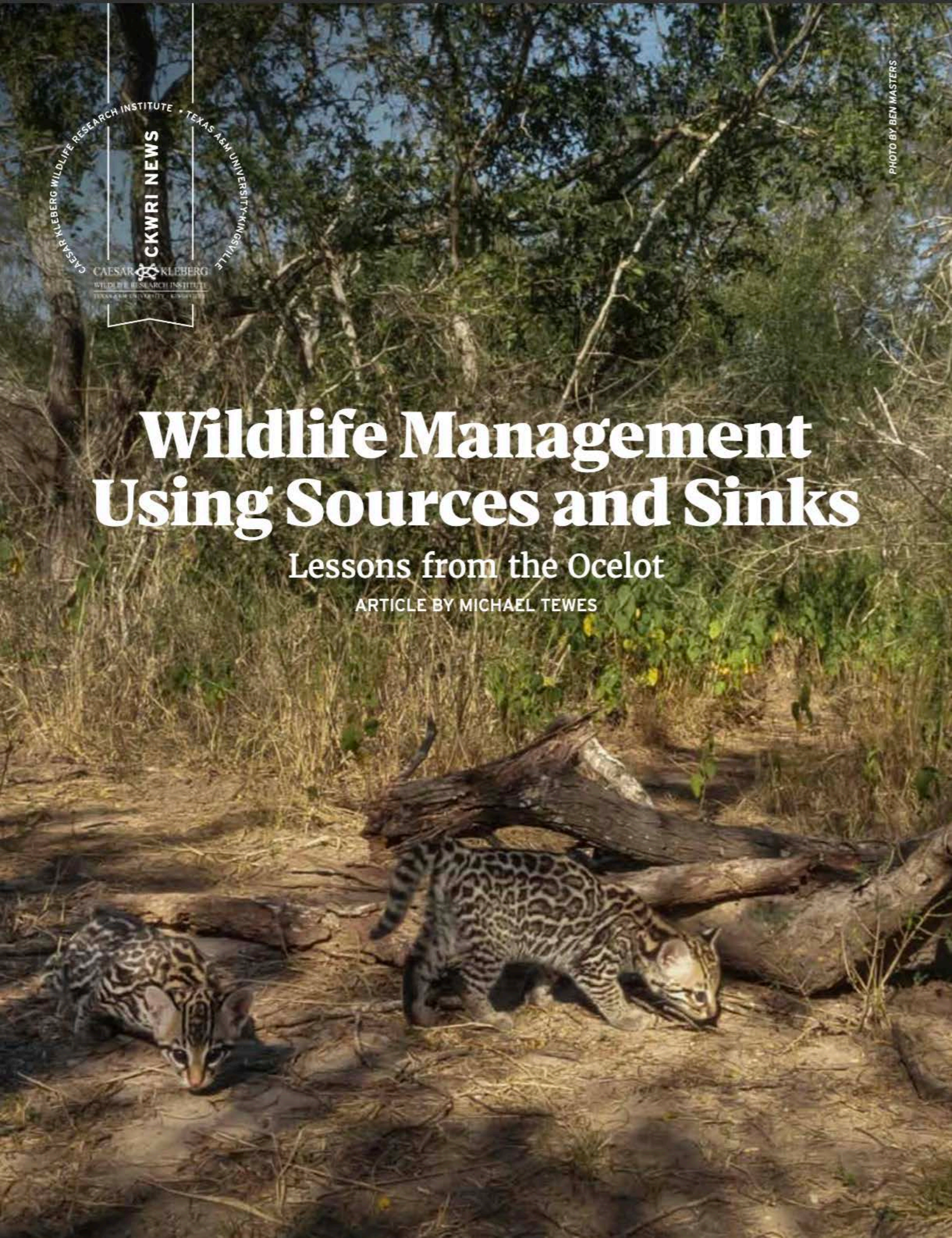


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Wildlife Management Using Sources and Sinks

Lessons from the Ocelot

ARTICLE BY MICHAEL TEWES



The ocelot is a small, endangered cat weighing about 20 pounds. Currently, fewer than 120 individuals remain in the United States. I have been fortunate to spend the past 43 years studying this beautiful cat in my homeland of South Texas where the last of its home range has been greatly reduced. During this time I have applied a diverse range of wildlife concepts toward ocelot conservation. In this article I will describe a particular one called source-sink management, which may prove helpful for a variety of land and wildlife management practices across the state.

Source-sink management is a powerful idea that can be applied to most wildlife populations, including game and nongame. However, to explain this concept it is important to know its key terms.

Sink habitat have similar meanings as described above. Source habitat produces more offspring than deaths of all individuals. Sink habitat has high mortality levels while successful reproduction fails to compensate for the loss.

Texas ocelots serve as a prime model for the source-sink ecology concept. Ocelots habitat includes the densest brush imaginable with 95 percent horizontal cover. They prefer mixed thornshrub communities composed of up to 30 plant species including granjeno, brasil, blackbrush, white brush, lotebush and catclaw. They avoid mesquite-huisache communities with little brush understory. This makes it difficult for biologists to measure which habitat tracts have enough prey, so the cover component is used to describe the quality of ocelot habitat.



PHOTO BY BEN MASTERS

The simple definition of a source population is one that produces more young than the death of all individuals. Favorable conditions for a particular source population result in several young for each female, high survival of those young to adults, and fewer deaths in the population from reduced predation, diseases or mortality agents.

In contrast, a sink population is one with more deaths of individuals in the population than young produced. The conditions are substandard, such as poor nutrition, diseases or a high predator load. Individuals die at a higher rate than they are replaced through reproduction.

A similar concept can be applied to habitat. Generally, a typical definition for habitat includes the basic survival elements--food, water and cover--that are needed for a particular species to thrive. Thus, source habitat and

In areas where there is an ocelot population, the likely source and sink habitats can sometimes be inferred on the landscape. A large patch of dense brush with the proper elements may tentatively be identified as a source habitat, thereby hosting a source ocelot population for colonizing other surrounding habitats tracts.

In contrast, if this same large tract of theoretical source habitat is adjacent to a busy highway, it may serve as a sink habitat if roadway-caused mortality is not offset by reproduction.

The size and distribution of habitat patches to consider will depend, in part, on the species of interest whether it be deer, quail, coyotes or tortoises. Also, the scale of a source habitat can vary in size. It may be an entire ranch, part of a ranch or pasture, or simply a habitat tract of any size.

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Let's look at white-tailed deer as an example. One ranch owner may spend considerable time, resources and funding to manage a few trophy bucks for personal hunting purposes. An adjoining lease property may have little interest in trophy bucks in favor of recreational hunting where hunters want to harvest several management bucks each season. The lease could potentially serve as a deer population sink if it is not managed properly. In this example, a fence line could represent the boundary between a source and sink deer population.

Keep in mind that any given year a population or habitat can be a source, whereas the following year may produce conditions that result in a sink. For example, consider a habitat source that benefits from abundant rainfall that produces ample foliage and food. For the next three years, drought conditions cause the same pasture to become a habitat sink due to greater mortality than replacement of young.

A rancher may manage certain pastures to create optimum combinations of grass-forb areas intermixed with small patches of woody cover to enhance bobwhite quail production. If this management plan is changed or neglected, extensive brush encroachment could rapidly return. Thus, a source habitat with its source quail population could experience sink conditions in a relatively short window.

Conversely, wildlife managers may intentionally create a habitat sink for coyotes to benefit certain production goals for other species. This example creates an intentional sink to remove some coyotes from management areas. Although I have always generally believed that unless coyote control is done intensively and extensively, meaning long-term control efforts over large areas, then coyotes will simply pour in from surrounding source populations because of their resilient traits and ability to travel long distances.

The sources and sinks concept is one of many wildlife management tools. It may help toward designing management plans for your favorite wildlife species. However, a worthy goal is to strive for rich complex ecosystems with diverse plants and wildlife populations. A healthy landscape can better absorb a variety of impacts, such as weather extremes and drought, than an unhealthy landscape. It also increases land values for future generations.

In addition to source-sink management, other concepts include metapopulation management, corridor ecology and landscape connectivity and diversity. It's my hope that "out-of-the box" thinking can help land managers and wildlife enthusiasts apply various applications to achieve management goals. ✨

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