2. Endangered animal communities: The keystone concept

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CHAPTER TWO

Endangered animal communities
The keystone concept.

Prairie dogs are a keystone species. A keystone is a particular block of stone in the central position of an arched entranceway; all the other blocks lean on it for support. The keystone locks the stones of the arch in place and, if you remove it, the arch collapses. Like a keystone, prairie dogs are the central species in a natural community that supports a large complement of other kinds of creatures, such as black-footed ferrets and burrowing owls. Biologists have identified more than 170 species that rely on prairie dog towns in some way. Each of these species is like a block of stone in the archway, and if we exterminate prairie dogs, we lose these other species as well. “The listing of animals that rely on prairie dogs reads like a catalog of rare, endangered, or threatened species,” says Bill Stroh, a wildlife biologist for the U.S. Bureau of Land Management (BLM). Burrowing owls, kit foxes, sage grouse, Swainson’s hawks—all species whose long-term survival is questionable today—depend on prairie dogs for food, shelter, or both.

UTAH PRAIRIE DOG
When you drive south on I-15 through Cedar City, scan the median strip between the north and southbound lanes near the 200 North interchange. Here you’ll see—sandwiched between four lanes of roaring interstate traffic—a thriving colony of rare Utah prairie dogs.
There may be only 5,000 individuals of this species of ground-dwelling squirrel remaining on Earth, mainly because humans don’t want prairie dogs on their ranches and farms. Massive poisoning campaigns decimated the colonies on private land. Now, the Utah prairie dog—one of three species of prairie dog that live in the state—survives only in seven southwestern Utah counties.

These squirrels-without-trees are fun to watch. They’re energetic in the daytime and they don’t store food in their burrows, so you can observe them eat and play in daylight. Also, prairie dogs clip the tall vegetation around their burrows, which makes them easier to spot.

Individually, Utah prairie dogs are unimposing. They are about a foot long, stocky, and have short legs, ears, and tails. Their fur is buff or light brown with a paler underbelly. They weigh about two pounds and have sharp claws for tunneling. Like the four species of prairie dogs that survive in other places, Utah prairie dogs live in burrows in small family groups adjacent to other prairie dog households.

When on the surface feeding, several individuals stand guard on hind legs and watch for approaching trouble while their relatives eat. The warning barks, squeaks, and yips that serve as alarms—delivered with a tail flip, head snap, outstretched paws—are elements of the world’s most sophisticated animal language. “Specific prairie dog vocalizations seem to be tied to aerial predators, terrestrial predators, or humans, and they vary with the level of danger,” notes Keith Day, native species biologist with the Utah Division of Wildlife Resources. The more enthusiastically a watchdog delivers the alarm, the more immediate the threat. When the warning is sounded, all dogs within earshot disappear into burrows.

Prairie dog burrows are elaborate underground condos. What we see on
the surface are small volcano-shaped mounds drilled with six-inch diameter holes. Prairie dogs work hard to maintain those mounds because they prevent their homes from flooding during a hard rain.

The burrows twist down into the earth for 10 to 15 feet. Then they branch into several horizontal tunnels that hold grass nests. Down there, prairie dogs are safe from temperature extremes and from most predators.

A typical Utah prairie dog family includes one adult male, several females, and pups from the past year. Each family defends its territory from other prairie dogs. Within families, prairie dogs kiss, nuzzle, groom, and touch teeth to reinforce their kinship. In the spring, boundaries between families relax to allow interbreeding. Pups come in litters of three to five, and emerge from their burrows to forage at six weeks.

Though prairie dogs are known as vegetarians and prefer to munch on grasses and broad-leaved weeds, they also eat insects, particularly grasshoppers and crickets. They don’t drink water but instead get all the moisture they need from the food they eat.
Utah prairie dog.
Because Utah prairie dogs are digging, spawning, and fertilizing machines, their colonies support a vast array of local plants and animals, from burrowing owls, kit foxes, sage grouse, and Swainson’s hawks to many kinds of toads, spiders, salamanders, ants, and beetles. “The trouble is that Utah prairie dogs prefer the same land that is most productive for humans,” Day says. “And the main problem now is that most of them are on private land.”

Next to humans, plague is the Utah prairie dog’s worst enemy. They have no immunity to it, and a colony can go from 1,000 individuals to zero very quickly.

Iron County, where the Cedar City colony thrives, has a habitat conservation plan for the Utah prairie dog. The goal of wildlife officials is to establish three self-sustaining populations on public land. The plan is supported by the Utah Division of Wildlife Resources and by Iron County, said Marilet Zablan, a U.S. Fish and Wildlife Service biologist who has worked on it for the past two years. The plan will protect some existing habitat and care for Utah prairie dogs displaced from private property, she says.

Just as importantly, it will have an educational component, which may include an area for animal watchers to view a prairie dog town. “We want to turn around negative public opinion about Utah prairie dogs,” Zablan says. “We want to show that they are unique and an indicator of a healthy ecosystem. We want people to know that the Utah prairie dog can coexist with man.”

**BURROWING OWL**

What bird borrows a rodent’s nest, a cow’s smell, and a rattlesnake’s warning sound? Here’s a hint: you can see them most times of the year in a small park in suburban Salt Lake City.

Imitation is the most effective form of self-defense for the stubby-tailed, long-legged, ground-dwelling burrowing owl. And, thanks to biologist Bob
Walters of the Utah Division of Wildlife Resources, you don’t need to travel to a remote wilderness area to watch this rare and resourceful bird in its natural habitat.

Common in the Salt Lake Valley when the Mormon pioneers arrived, the number of local burrowing owls plummeted when plows furrowed the valley into farm fields. Today, those burrowing owls remaining are threatened when bulldozers blade over farm fields for subdivisions and strip malls.

Adapted to treeless plains, you’ll see this vigilant small owl perched on the mound of abandoned rock squirrel or prairie dog burrows. Because they hunt and stand watch during most of the day, they’re easy to spot. About the size of a prairie dog—slightly less than a foot tall—burrowing owls have a round head without ear tufts, and plumage that is checkered light and dark brown. They have oversize yellow eyes, and above each is a stroke of white feathers that looks like an eyebrow.

“Burrowing owls migrate into the Salt Lake Valley in mid-March, probably from Arizona,” Walters states. “The same nests are used each year, but we don’t know if it’s the same pairs that are nesting in them.” Walters, director of DWR’s Watchable Wildlife program, observed pairs of burrowing owls nest each year in an open lot, near 6700 South and 4800 West in West Valley City, Utah, that had been an informal neighborhood dumping ground. In 1994, as the rapidly growing human population closed in on them, Walters lobbied Salt Lake County to set aside a small open area for the owls as a nature preserve. Then, with the help of friends, he built a surrounding fence that protects the owl nests from the thumping that off-road vehicles had been giving them. Burrowing owls are remarkably

**BURROWING OWL**

**Status:** State Species of Special Concern.

**Estimated Number:** 1999 estimate is 80 to 100 pairs in Utah.

**Tips for Viewing:** In open landscapes, look for a small owl with a rounded head and long legs standing watch on a low mound or sitting on a fence post.
tolerant of human intrusion, he notes, but four-wheelers catching air over their homes is too much.

The owls depend on finding abandoned nests of ground-dwelling mammals—in West Valley City, it’s rock squirrels; other places it’s prairie dog towns—to incubate their eggs and to raise their young.

Burrowing owls seem to live in permanent pairs. When they find a suitable burrow, they move in and renovate it. Digging with beak and claws, they kick loose dirt backwards and out of their new home. The male owl scouts the area and collects dried horse or cow dung to leave at the burrow entrance. The female shreds the droppings and lines the nest inches deep with it. The pungent aroma is so effective in concealing their smell that biologists have reported watching badgers sniff the entrance to burrowing owl nests and trot away, apparently confused. Scientists believe that the dung lining provides insulation and regulates humidity in the nests as well.

A female burrowing owl incubates her six to nine eggs for a month. During that time, her male partner does all the hunting and delivers meals to her. Three weeks after her eggs hatch, the young birds can hop and flap. Eventually, both mom and dad go out to hunt. The young birds wait at the
burrow entrance for their parents to deliver food. If threatened, the fledglings retreat into their nest and make a chattering sound that perfectly imitates a rattlesnake. After eight weeks, the fledglings can practice hunting by chasing and mugging disabled bugs their parents bring them.

Unlike most owls, burrowing owls hunt during the day and at dusk. They spot prey by perching on observation points such as fence posts or prominent rocks. They have a rising and falling flight pattern, can hover, and snag meals with their talons. They chow on insects such as grasshoppers, beetles, and crickets and can snatch—on the wing—moths and dragonflies. Their diet is varied though: they also eat mice, lizards, snakes, small birds, and the young, unprotected pups of rock squirrels and prairie dogs.

As the young family grows and the burrow gets crowded, the owls improve their nest by enlarging it. They shovel it out—along with the dung lining. The male stands guard day and night—except in the midday heat when no predators hunt—alert for approaching trouble. For a five-ounce animal, the burrowing owl is big-hearted: it will frighten trespassers by bobbing up and down and fluffing its feathers and will chase and strike intruders. In November when daylight is brief and temperatures dive, burrowing owls head south for the winter.

As clever and courageous as these small owls are, it remains to be seen if they can survive constant human encroachment. “The burrowing owl is a Utah Species of Special Concern because its population is declining,” observes Walters. “Urban and rural expansion is squeezing them out.” Campaigns to eradicate ground-dwelling mammals, such as the prairie dog, also limit the burrowing owls’ nesting and food choices. “It goes to show that if we treat one animal—like the prairie dog—as vermin, it endangers other species as well,” Walters notes.

But the reverse is also true. By saving a small piece of natural area for burrowing owls, Walters has provided a home and a way to make a living for other native Salt Lake Valley animals. On a recent visit to this seven-acre, postage stamp wilderness, we listened to a yellow-throated meadowlark singing its chirtly-chir melody with zippity-do-dah-like optimism.
Burrowing owls.
We watched a blue-winged American kestrel—a type of falcon—hovering and swooping for bugs. A rock squirrel bolted in and out of stone crevices, then suddenly froze, eyes like black buttons and tail arched. Walters said he’d seen a red fox nearby that morning.

“These burrowing owl pairs have successfully hatched and raised young” in an area surrounded by subdivisions, Walters says. “It’s one of only a half-dozen locations in the Salt Lake Valley in which they’re known to exist.” His only question is, will humans allow them to continue here?

BLACK-FOOTED FERRET
With any luck, alert hikers and bikers in the Uintah Basin may see the rarest mammal in North America. The U.S. Fish and Wildlife Service has released captive-bred black-footed ferrets—a squirrel-size member of the weasel family—into several healthy white-tailed prairie dog towns west of Vernal, Utah.

Black-footed ferrets are difficult to spot, but easy to identify. They have a slender, torpedo-like body and short legs. They are often seen with their long backs arched gracefully, both when walking and standing still. A black-footed ferret’s coat is buff with paler buff on the underside, but its most distinctive coloration is its black mask, feet, and last quarter of its tail. Its throat, its muzzle, and a band across its forehead are white, while the top of its head is brown and it has a brown stripe down its back. The black-footed ferret is North America’s only native ferret.

Though measuring just two feet long and weighing only two and a half pounds, the black-footed ferret is remarkable for its ability to snatch and kill—single-handedly—prairie dogs that are nearly its own size. One swift bite to the back of the neck nails its meal, which it then drags back to its own burrow. Prairie dogs are feisty, however, and ferrets endure cuts and scratches to the muzzle and head from their struggle.

Black-footed ferrets depend on prairie dogs for both food and shelter.
Ferrets live in prairie dog burrows and dine on these rodents almost exclusively. A female black-footed ferret with young will eat a prairie dog about every other day.

It was this dependence on prairie dogs that nearly led to the black-footed ferrets’ extinction. When the first European settlers came to eastern Utah, they found large white-tailed prairie dog colonies on the high deserts and plateaus. As the pioneers settled in, they began a massive effort to shoot and poison prairie dogs, thinking that it wasn’t safe for cattle to step around their burrows.

Black-footed ferret sightings, which were rare even when their population was healthy, shrank to almost none in the late 1970s. By 1986, the worldwide population was 18. Since then, the U.S. Fish and Wildlife Service has operated a successful captive-breeding program and reintroduced the black-footed ferret into several other states. Now the plan is to bring them back into the healthy white-tailed prairie dog towns of Coyote Basin—25 miles east of Vernal and a few miles south of U.S. Highway 40—or to other nearby colonies.

Scientists are still learning about this polecat-like carnivore. Black-footed ferrets are nocturnal and move primarily underground, so they’re difficult to observe. They’re thought to be solitary, but they’re not isolated. One prairie dog complex in Wyoming had over 60 ferrets, “which is at least a visiting density,” says BLM biologist Stroh. “We’re learning more about them all the time.”

Females have litters of one to six pups. Offspring leave mom’s den within a few months after birth. Young females remain close by, but males must range long distances to find their own territory. Life expectancy in the wild is about four years.

Despite increased scientific knowledge about it, the black-footed ferret will reenter an environment that’s changed from the one to which it was adapted before it disappeared. The ferrets’ survival on the high desert of today’s eastern Utah is not a sure bet. For one thing, coyotes are top dog in Utah now. Coyotes eat black-footed ferrets and compete with them for prairie dogs. Before European-Americans settled the area, wolf packs kept coyote populations down. Now that wolves themselves have been driven out, coyotes are here in greater numbers. Also, black-footed ferrets are vulnerable
Black-footed ferret.
to the canine distemper virus carried by domestic dogs, and the ferrets’ essential food supply, prairie dogs, can be wiped out by plague.

It takes 100 to 150 acres of white-tail prairie dog town to support one adult ferret. The colonies in eastern Utah are large, so that’s not a problem. Eastern Utah still has 60 to 65 percent of the white-tailed prairie dog colonies that it had when European-American settlers arrived, reports Stroh.

The reintroduced population of black-footed ferrets in the Coyote Basin area will have the special legal designation “experimental” and “nonessential,” which exempts them from full Endangered Species Act protection. This was supposed to reduce opposition from local human residents to regulations that accompany endangered animals. “But there’s been a lot of local resistance and I think it’s based on misinformation,” Stroh says. Black-footed ferrets are no threat to grazing animals and aren’t bothered by oil wells or mining operations. “If any endangered species is compatible with multiple use of the land, it’s the black-footed ferret.”

Stroh is optimistic: “If the reintroduction is successful, we fully expect it to become a popular pastime for the public to come out to eastern Utah and watch the black-footed ferrets and the prairie dog towns.”
Bison, often inaccurately referred to as buffalo.