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Feature Article

Restoring a refuge: Cows depart, but can antelope recover?

by Kathie Durbin

LAKEVIEW, Ore. - David Dobkin crouches in an expanse of low sagebrush and admires clumps of grasses and forbs. It is morning on this sweep of high desert that stretches east from the rising fault-block mountain that gives Hart Mountain National Antelope Refuge its name. Umbrella-shaped canopies of mountain mahogany grow from the mountain's outcrops and ridges. Juniper punctuates the foothills, groves of aspen spill from draws, streams tumble from hidden springs.

To the west, out of sight, lies the Warner Lakes Basin, a world of pothole lakes and long vistas made famous in William Kittredge's elegiac book, Hole in the Sky. To the east across 30 miles of desert is Steens Mountain, with its spectacular U-shaped valleys and summer wildflowers. Along the roadway, exotic yellow and purple blooms invade disturbed ground. But away from the road, grasses and sedges are making a comeback.

It has been seven years since cows grazed this country, and the land shows it.

Under a 1994 management plan, Hart Mountain Refuge will remain cow-free until the year 2009. The question that haunts Dobkin is whether this respite will end before scientific lessons have been learned - and before the land itself has healed.

"That ticking clock is precisely why I'd like to see the refuge dedicated to restoration of these high desert ecosystems," he says.

But on this promising June day in 1997, 12 years seems a long way off. Milkvetch, showy white phlox and yellow hawksbeard, all choice foods for pronghorn antelope and sage grouse, grow between clumps of low sage. Shafts of desert buckwheat poke through the dirt. Waist-high grasses - Idaho fescue, bluebunch wheatgrass and bottlebrush squirreltail, favored by jackrabbits and other small mammals - rustle in the morning breeze.

Along streams and near springs, young aspen are in full leaf. Streambanks, trampled to hardpan by cattle hooves, are beginning to recover.

Dobkin, an ecologist of international stature, has studied this country's resurrection (see story, page 8). He can't contain his excitement.

"This is the result of existing plants being released from severe grazing impacts and growing more robustly," he says. "It just looks spectacular. This is getting close to what these landscapes used to look like."

In fact, it was the abundance of grasses and forbs in the 19th century that led to a tragic misunderstanding, Dobkin says. "The early ranchers saw these tall grasses and said, "This looks like great cow country." They didn't understand that this kind of plant community couldn't survive with intensive grazing."

To the untrained eye, sagebrush is sagebrush. Dobkin sees subtle differences among low sage, basin big sage, mountain big sage and silver sage. In this low-sage community, badger burrows have aerated the soil. It's sandy and more receptive to native plants.

What happens in the desert has far-reaching consequences for wildlife, plants and insects. Take bees, for instance. "This is one of the last places with an intact native bee community," Dobkin says. "Most agricultural areas lose their native pollinators to pesticides."

The Hart Mountain-Warner Valley region covers a broad swath of southeastern Oregon's basin and range country. It is exhilaratingly wild country, and remote even from the remote timber and ranching towns of Lake County, Ore.

The 278,000-acre Hart Mountain Refuge and its sister, Sheldon National Wildlife Refuge, a 575,000-acre expanse of desert across the state line in northwestern Nevada, together make up the largest chunk of cow-free land in the entire Great Basin.

Since cows were barred, the two desert refuges have become vast, open-air laboratories. As native plants, chewed down by cows or crowded out by alien weeds, make a comeback, so do the birds that frequent the moist oases around streams and springs. Dobkin's research at Hart Mountain has documented that birds closely associated with wetlands are returning to once-desolate streambanks because sedges and grasses now invite insects and provide cover.

In 1991, under contract with the U.S. Fish and Wildlife Service, Dobkin began a project to track the recovery of streamside vegetation and the return of birds to the refuge. He established research plots along a stream where cows had been fenced out since 1958, as well as in areas that had been heavily grazed until 1990.

In one study plot, grasses made a dramatic return after just three years without cows and with two years of heavy precipitation. By 1993, Dobkin was seeing Canada geese, American wigeon and sora, a wading bird that frequents wetlands. By 1994, he was spotting green-winged teal, gadwall and Wilson's phalarope. In an article written for the journal Conservation Biology, he concluded that with the absence of cows, and the two wet years, the water table had risen and the riparian zone had widened on both sides of the stream channel, inviting wetland birds to return.

But not all creatures on the refuge are flourishing. Some species, including the pronghorn antelope for which the refuge was established, are in decline.

"Habitat is in the best condition that it has been in since the establishment of the refuge," says refuge manager Mike Nunn. "Unfortunately, our monitoring of wildlife populations does not indicate similar improvement for many species." Not only pronghorn, but bighorn sheep, rabbit and small-rodent populations are down. Sage grouse and mule deer are at low levels when compared to the recent past.

It seems counterintuitive that pronghorn would be in trouble now, after cows have been banished and prescribed fire is restoring the forbs the antelope favor. The Hart Mountain experiment seems to be teaching another lesson: Natural systems don't always respond predictably.

It's possible, says Nunn, that the refuge has not been rested long enough to allow the expected response from wildlife. "It's also possible that this ecosystem is so out of balance from over a century of human influence that some wildlife-population management activities may be needed to give species such as pronghorn the freedom to realize their reproductive potential."

Translated from bureaucratic language, what Nunn is talking about is predator control, a contentious topic.

In 1996, he announced that the agency would begin shooting coyotes from planes to save newborn pronghorns, which were being killed by the animals at an alarming rate. The announcement brought condemnation not only from conservationists and animal-rights groups but from pronghorn biologists as well. Nunn was forced to backtrack (see story page 11).

Controversy is not new to Hart Mountain. The removal of cows from the refuge took five years and came at a high political cost: The Lake County commissioners at one point threatened to block the main access route to the refuge.

But three years later the controversy has largely died down. Of the four ranchers who held grazing permits on the refuge, one has since died. His property, the McKee Ranch, was purchased by The Nature Conservancy, which sold 759 acres to the Fish and Wildlife Service last March for eventual inclusion in the refuge. A Lakeview-based grazing association purchased the vast MC Ranch, 185,000 acres of private land and 900,000 acres of federal grazing leases; it provides alternative forage for the livestock of Lake County ranchers.

Some ranchers remain bitter, but that bitterness has lessened with time, says Lakeview Mayor Orval Layton. "New managers have come in. (Refuge manager) Mike Nunn met with the county commissioners and they had a fair exchange of ideas." The work of restoring the land - and restoring community relations - has begun. Yet even now, Nunn says with a smile, when ranchers visit the refuge, most see not an ecosystem on the rebound but "wasted feed."

The Great Basin we never knew

The familiar geographical zone known as the Great Basin covers portions of five states. What we see, as we drive across it at 80 miles an hour, is a sea of sagebrush and bare ground, broken by narrow streamside corridors of sedge and willow. This is the image most people conjure up, Dobkin says, "in the rare instances when the public thinks about the Intermountain West at all."

Range ecologists know a different landscape is possible: In a few places where cows and sheep have been excluded, the Great Basin blooms with bunchgrasses, sedges and flowering shrubs, and broad bands of lush vegetation mark stream channels.

Our conception of this region, Dobkin says, has been distorted by 130 years of intensive livestock grazing, which has altered everything from the condition of stream banks to the depth of the water table to the health of the soil and its plant and animal communities.

"We have lost from our collective consciousness what these landscapes looked like before fire suppression and grazing in the Intermountain West," he says.

In time, if ecological restoration is given a chance, the Hart Mountain Refuge may fill the gaps in our understanding, demonstrating on a grand scale what a healthy Great Basin looks like, and how native wildlife populations establish a predator-prey balance in this harsh land.

At present, about 1,800 pronghorn antelope and as many as 1,000 mule deer roam the refuge. About 500 bighorn sheep, from a population reintroduced in 1956, inhabit the sheer western escarpment of Hart Mountain, which runs in a north-south direction for more than 20 miles. When habitat is favorable, as many as 100 species of songbirds live in the aspen and willow draws of the refuge. Redband trout and endangered Lahontan cutthroat trout swim in its narrow streams.

When President Franklin D. Roosevelt carved the refuge from the public domain in 1936, he dedicated its lonely reaches as a range and breeding ground for antelope and other wildlife.

But almost from its inception, the refuge was managed more like a ranch. Most of its funds went to manage livestock, and many of the water sources within its boundaries were controlled by owners of private inholdings.

It was only in the late 1970s that The Nature Conservancy was able to buy out more than 10,000 acres of inholdings and sell those properties to the refuge as federal funds became available to buy them.

By the late 1980s, more than a century of grazing by cattle from surrounding ranches, compounded by several years of drought, had turned the refuge into a danger zone for wildlife. Cows, up to 4,000 during the April to October grazing season, had trampled springs and streambanks, transformed grasslands to sagebrush, and grazed young aspen and willow shoots to the nub.

In 1989, when Barry Reiswig, a courageous and outspoken U.S. Fish and Wildlife Service manager, took over Hart Mountain, he saw at once that change was needed. At the time, grazing occurred on about 150,000 acres, two-thirds of the Hart Mountain Refuge, with cattle rotated through more than two dozen fenced pastures. On the arid refuge, it takes an average of 17 acres to support one cow for a month.

But before the refuge was created, even more livestock - as many as 50,000 sheep and 10,000 cattle - grazed the open range each year.

"One refuge neighbor said it was just a race to the mountain to see who could get to the grass first," Reiswig recalls. Formal programs to regulate grazing didn't begin until the 1970s, after the first management plan for the refuge was adopted.

By 1991, forage had become so poor and water so scarce that Reiswig told ranchers they would have to find somewhere else to graze their cattle that year. Continued drought kept the cows off in 1992 and 1993.

Meanwhile, Reiswig rounded up a team of biologists, and they began the first-ever refuge inventory, looking at what wildlife need to survive.

Grazing's impact was evident: At the head of one creek, a herd of 600 cattle had destroyed a spring, toppled trees and nearly killed several willow and aspen groves.

An aerial survey revealed that 59 of the 76 waterholes and springs were bone dry. Though pronghorn don't eat grass and therefore don't compete directly with cattle for forage in normal years, they compete for both forage and water in dry years. Even bighorn sheep were beginning to suffer from drought; a

survey found underweight lambs and reduced rates of horn growth among adult sheep, a sign of malnutrition.

Range specialists found that 93 percent of meadows on the refuge had lowered water tables. More than half of all stream headwater areas lacked the aspen and willow cover songbirds need. Streams ran dangerously warm, threatening the survival of redband and Lahontan cutthroat trout. Upland areas, which make up 95 percent of the refuge, were covered with unnaturally dense stands of juniper. Instead of diverse vegetation, unbroken expanses of sagebrush, habitat suitable only for mule deer and a few hardy birds, blanketed the refuge.

The studies also showed that most streams on the refuge were "entrenched," that is, running several feet below the banks, and most of the shrubs along their banks were "pedestaled," a condition in which the bottom leaves are browsed off.

The Wilderness Society and the Oregon Natural Desert Association, irate over the condition of the refuge as revealed by leaked memos and news accounts, sued the U.S. Fish and Wildlife Service and then-Interior Secretary Manuel Lujan, demanding an end to all livestock grazing there.

Meanwhile, the Lake County Chamber of Commerce appointed a committee to draft its own refuge-management proposal. That proposal, a year in preparation, called for reducing grazing on the refuge by nearly 80 percent and contained detailed prescriptions for grazing on each refuge unit. It endorsed traditional hunting and fishing access, called for prescribed fire only when grazing would not serve the same purpose, and urged refuge managers to consider predator control as well as intensive management of water and habitat to increase deer and pronghorn populations.

When the biologists' assessment of Hart Mountain was completed, Reiswig's team wrote a draft environmental impact statement laying out alternatives for the refuge. Reading the writing on the wall, Lake County's committee wrote to Reiswig in October of 1993, urging him to consider the refuge's history.

"Upon creation of the Hart Mountain Refuge, grazing was a part of the original plan and agreed to by the United States government and local interests," they wrote. "We believe this indicates there is an unwritten agreement that grazing would continue on the Hart Mountain Refuge in perpetuity ... Without this agreement the refuge would never have been created."

Nevertheless, in July 1994, regional Fish and Wildlife Service Director Marvin Plenert chose an alternative that called for removing cows for 15 years; he validated the findings of Reiswig's team, confirming that the refuge was dangerously overgrazed.

Scientists on the team had concluded that grazing was preventing the refuge from reaching its potential as habitat for pronghorn, bighorn sheep, mule deer, sage grouse, Catlow redband trout, and many other species. "Even with an intensive restoration program, all refuge habitats will not be returned to their potential within 15 years," they warned in their final report. "Improved soil productivity and restored native plant communities may require a century or more to occur."

The decision infuriated Lake County ranchers, who believed the Fish and Wildlife Service had given their proposal short shrift. And so, on Oct. 5, 1994, the Lake County Commission passed an ordinance forbidding the Fish and Wildlife Service to add to its holdings in Lake County, and threatening to deny access to the refuge by county road unless the agency made back payments it allegedly owed the county

under the Refuge Revenue Sharing Act. The ordinance also ordered the agency to upgrade the rough dirt road across the refuge to county standards.

Mike Nunn remembers that meeting because it was his first day managing the Hart Mountain Refuge. A former game manager, Nunn is comfortable working closely with ranchers and hunters, so he was expected to soothe tensions between the feds and the community after Reiswig's departure for a new assignment.

But Reiswig had ruffled feathers even beyond the ranching community. On one memorable occasion, he had evicted members of the private, all-male club known as the Order of the Antelope from refuge property. The Order raised money for refuge programs, and each July its members had gathered to drink, grill steaks and carouse in a rare grove of ponderosa pine known as the Blue Sky Hotel. With members all over the state, the Order responded to the eviction by raising money to buy a private inholding within the refuge boundary, where the parties continue to this day.

"Barry (Reiswig) set himself up as the buffer between his staff and the community," says Susan Saul, a Fish and Wildlife Service spokeswoman. "He took the heat. He would step up and say, "I'm the target, I'm the responsible decision-maker." He had been that lightning rod, and we needed to move beyond that contentious political environment."

Mike Nunn took a different approach, Saul added. "The county threatened to dig a big trench and block the road to the refuge. Nunn had to go work with the commissioners and develop a different relationship with them."

Cows went quietly

In contrast to the furor over Hart Mountain, the removal of cows from the adjacent Sheldon Refuge, which Reiswig also managed, was swift, clean and non-controversial.

In 1990, Reiswig had begun work on an ecological-restoration plan. Hearings were held in Reno, Nev., and Cedarville, Calif. As at Hart Mountain, drought was taking its toll; one year in the early 1990s, Reiswig recalls, conditions were so dry that the Nevada refuge didn't even "green up" in the spring.

Ranchers who grazed cows at Sheldon quickly foresaw the outcome and went to federal officials, asking to be bought out. Unlike the Hart Mountain Refuge, which had the discretion to grant or withhold special-use grazing permits from year to year, the Sheldon Refuge was created under an Executive Order that gave the Bureau of Land Management responsibility for managing grazing there under the Taylor Grazing Act.

"Everyone from family ranchers to super-wealthy property owners to the grazing association - they all agreed to sell," Reiswig said.

When it became clear that the ranchers were willing sellers, the Mellon Foundation, using the Conservation Fund as its intermediary, offered to buy their permits, negotiating with each rancher separately and in secret. After the purchases were made, the foundation turned over the permits to the U.S. Fish and Wildlife Service.

Restoration headaches

Once the cows were gone - along with Reiswig - Nunn and his staff faced the challenge of beginning to repair the damage at both refuges.

Among other things, that meant bringing back fire. Historically, lightning ignited the grasses of the Great Basin regularly in late spring and summer. But the elimination of grasses by grazing cows reduced the frequency and size of natural fires and allowed sagebrush and juniper to take over the high desert.

The new management plan calls for burning up to 15 percent of the Hart Mountain Refuge - more than 40,000 acres - to encourage regeneration of grasses and forbs. Prescribed fire is targeted to areas where cows have eliminated much of the fuel that feeds natural fire. Since 1991, about 9,300 acres have been burned at Hart Mountain, and 15,000 acres at Sheldon. In most burned areas, grasses, shrubs, forbs and sedges are flourishing.

But fire in the desert is tricky. In 1985, a fire set by refuge staff got out of control and burned thousands of acres. Charred ground still marks where it rampaged across the basin.

Cheatgrass is another wild card. This introduced species thrives in overgrazed areas and now dominates nearly 100 million acres in the Intermountain West. It burns every three to five years, while the normal fire regime in the Great Basin is every 25 to 80 years.

"We can't simply use fire as a panacea because of the dominance of cheatgrass," Dobkin says.

Wildlife monitoring is another task that keeps the refuge complex staff busy. Thirteen staff members and several seasonal workers track the population size, reproduction rate and distribution of bighorn sheep, mule deer, coyotes, pronghorn, sage grouse, songbirds, small mammals and fish. When time and funding permit, they also seed native plants, plant willows along streams, close roads, remove fences, and build check dams on streams where cows' hooves have trampled the banks so severely that nature alone can't repair the damage.

The time is now

Information on the now-cowless refuges will pile up, but will it tell us anything valuable?

Dobkin is convinced that Nunn and his federal bosses are throwing away an unprecedented opportunity to chart the restoration of an overgrazed Great Basin landscape.

He says, for instance, that the subtlest and most profound impact of livestock grazing may have been the destruction of a bumpy ground cover known as the cryptobiotic crust. This crust, made up of tiny plants, holds the soil in place, retains moisture and helps species germinate. When cows graze, their hooves destroy the crust.

"By losing that crust we have lost the topsoil," Dobkin says. - 'Can we get it back?" and "How do we get it back?" are unanswered questions."

Published research on cryptobiotic crusts is relatively new, and no studies are planned at Hart Mountain.

"If you're trying to understand something about restoration, and you don't capture what's happening in the first two decades after livestock removal, you're missing those critical early responses," Dobkin says.

"We desperately need information on how these ecosystems respond in the absence of livestock in order to understand how they work. You can't do that when livestock are still a part of the system, because their impact alters everything. Here's an opportunity that has never presented itself at this spatial and temporal scale before."

Bill Pyle, who served as staff biologist for the Hart Mountain and Sheldon refuges under Reiswig, concurs. "There's no other place in the northern Great Basin quite like it. There is a tremendous amount that can be learned, for example, by exclusion of grazing in whole watersheds. The value of those two refuges has increased because of the institutional changes that have occurred. Down the line, we'll be asking, "What have we learned?"

While the Bureau of Land Management, Fish and Wildlife Service and the former National Biological Service have all ranked research at Hart Mountain as a high priority, money for research projects that don't involve some pending lawsuit or endangered species crisis has dried up, says Eric Campbell, Oregon wildlife-program manager for the Bureau of Land Management.

Alan Sands, former national upland game bird biologist for the BLM, now a Boise-based staff member for The Nature Conservancy, recalls a meeting he and Dobkin helped organize with federal biologists in early 1995. The two laid out a vision for a coordinated research project to study songbirds, sage grouse, big game and other wildlife species of the Great Basin, not only at Hart Mountain and Sheldon but on adjacent BLM lands, where cows are still present. After all, as he pointed out, BLM land is where most of the habitat is.

"I was looking for agencies to coordinate their efforts," he said. "It went nowhere."

The most ambitious research project on the refuge to date has been Dobkin's work on the restoration of streambank and meadow vegetation and the return of native bird species to these desert oases between 1991 and 1994. Funding for Dobkin's research dried up after 1994, and he has been unable to do any field work since.

Other research projects - on sage grouse, small mammals and pronghorn fawn survival - are under way on the refuge. But Nunn's assistant, Ron Cole, says he needs partners to help him win federal matching funds for 20 or more projects the refuge would like to launch.

"I need an Oregon Natural Desert Association, I need an Oregon Natural Resources Council, I need an Oregon Hunters Association to step forward," Cole says. "We have feral horses on Hart Mountain that are causing riparian damage, but because of legal constraints we cannot use motorized vehicles to round them up. We need funding to get those feral horses removed."

Nunn is not the reformer Barry Reiswig was, but he has won praise from the Oregon Natural Desert Association, a Bend-based conservation group, for pulling off a land swap that will protect 20,000 acres of heavily grazed wildlife habitat and 12 miles of a fragile trout stream on BLM land south of the Hart Mountain refuge boundary.

Under the swap, the land will be managed by the Fish and Wildlife Service as an addition to the refuge, and livestock will be removed. In exchange, the BLM will assume management of Shirk Ranch, an

isolated refuge outpost, which will continue to be grazed. "You could never have gotten the county or the ranchers to talk to you about this three years ago," Cole says.

From his current post as manager of the National Elk Refuge in Jackson Hole, Wyo., Barry Reiswig looks back on his confrontation with the Oregon ranchers with some satisfaction.

"I hated to get into an adverse situation with the folks there, but you really don't need cows to manage the Great Basin desert, especially on a national wildlife refuge," he says. "We had to break that old system in which the livestock industry dominated the management of those refuges."

The cows are gone. The desert is blooming. The birds are returning, though the antelope population is crashing (see story above). Two wildlife refuges finally have a chance to allow wildness to work itself out. If we allow ourselves to ask the right questions, we might just learn what it all means.