MORE MOUNTAIN MEADOWS

Could revitalizing high-country pastures in northwestern Montana lead to more huntable elk on public land? BY ANDREW MCKEAN

FOOD FROM FIRE Elk graze on grasses and wildflowers in a mountain valley that burned the previous year. Periodic fires keep conifers from taking over high-country parklands and shading out the nutritious vegetation needed by elk. PHOTO BY BRETT THUMA

Dave Wrobleski paints a lovely scene when describing classic elk summer habitat in the Northern Rockies. "I picture a mosaic of scattered larch, spruce, and subalpine fir above cool, shady streams, and below open ridges dominated by grass that stays green well into summer," says Wrobleski, a Lolo National Forest district ranger. "It has a diversity of flowering plants, and maybe some young aspen stands, too."

Unfortunately, that scenic high-country landscape doesn't exist much anymore, at least not across a wide sweep of western Montana and northern Idaho. On the Lolo National Forest surrounding Plains and Thompson Falls, those summer elk pastures are small and getting smaller and drier by the year. Hot summers bake the high country while conifers creep in from the edges. As these subalpine parks get dried out and shaded in, they lose the nutritious grasses, tasty wildflowers, and succulent shrubs that fatten elk, as well as the boggy spots favored by wallowing bulls during September's rut.

The implications of this loss have only recently been reckoned, as researchers discover that productive summer range—in addition to the low-elevation winter habitat that has dominated hunters' and biologists' thinking for decades—is responsible for healthy calves and robust herds, as well as happy hunters and landowners.

"We're learning even more about how female elk that have access to high-quality forage in August and September not only get pregnant at higher rates than those with poor summer forage, but have a better chance of getting through a tough winter," says Rebecca Mowry, an FWP wildlife biologist whose district includes the Bitterroot Valley south of Missoula. "And her calf typically has better survivability, too."

In other words, these mountain meadows are the engines of population growth in a region seeing widespread declines of its previously abundant elk herds. Elk in western Montana hunting districts with plenty of high-elevation national forest land—the Purcell, Salish, Bob Marshall, Sapphire, Garnet, and West Fork Bitterroot—are all below FWP population objectives.

BUILDING FAT RESERVES Lush, abundant summertime food is essential for helping elk—especially young ones—survive Montana's harsh winters.

It's not that western Montana lacks nutritious elk habitat in summer. Far downhill in most river valleys, irrigated alfalfa and cereal grains can provide plenty of calorie-rich food. Increasingly, that's where elk descend during the warm months, making themselves unwelcome in a hurry. Landowners and wildlife managers alike would prefer that mountain elk, hard-wired to migrate uphill each spring, graze the high parks and meadows that Wrobleski so poetically describes.

The trouble is, in recent years wildlife biologists and forest managers haven't found a way to maintain these high, wild gardens watered by snowmelt and bathed in sunlight that coaxes up bunchgrass, potentilla, and aspen daisies. So elk head downhill.

That didn't used to be a problem. For most of the past century across western Montana, commercial logging opened up enough of the forest canopy to stimulate greening vegetation that kept elk in the high country until deep snow or hunters pushed them lower. Historically, fires sparked by lightning or strategically set by American Indians kept trees out of mountain meadows and allowed the nutritious grasses and forbs to bloom and grow.

But public-land logging operations have declined almost as precipitously as western Montana's elk population. According to the Montana Bureau of Business and Economic Research, timber harvest in national forests during the 2010s was just one-third that of the 1980s and '90s. Depending on who you ask, the cause ranges from federal environmental and endangered species regulations to competition from Canada. Meanwhile, almost all wildfires are suppressed lest they turn into uncontrollable infernos that burn through entire mountain ranges and threaten the growing number

SUMMERTIME SWITCH Historically, mountain elk spent summer and fall in lush, nutrition-rich high-country meadows (above) kept open to sunlight by periodic wildfires and also, in the first half of the 20th century, clear-cut logging. But in recent years, as high elevations dry up and more landowners install irrigation pivots in low-elevation cropland, many herds have moved downhill to private valley pastures—and stay there year-round (below). This puts them beyond the reach of public-land hunters and creates crop depredation and fence damage on valley ranches.

CLOCKWISE FROM LEFT: LEA FRYE; DAVID M. RICHARDS; SAM BELANGER

of houses popping up in forests.

The result? National forests in western and northwestern Montana are full of hikers, mountain bikers, anglers, and hunters, but contain far fewer elk than 30 or 40 years ago. Making things worse are western Montana's increasingly parched summers, which sap mountain meadow habitat of its nutritional value.

"A hot, dry summer followed by a hot, dry fall followed by a tough winter is when we really see the impacts of depleted forage," Mowry says. "You have low birth rates, and high overwinter mortality of calves. It's the triple threat, and it all starts with poor nutrition on those summer ranges."

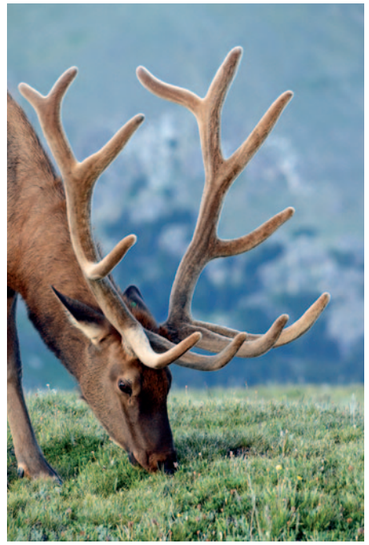
SUMMER FORAGE CONNECTION

Much of the research highlighting the importance of abundant summer mountain habitat for elk has been led by Dr. Kelly Proffitt, FWP's senior wildlife research biologist. Her initial investigation into the relationship between forage and elk distribution started in 2009 as a predator-prey study in the upper Bitterroot Valley, spurred by local concerns about declining elk numbers.

"The first year showed elk pregnancy rates of 57 percent, in an area where we'd expect them to be 90 percent," says Proffitt. "The department decided that instead of focusing solely on predation, which we were doing, maybe we should also better understand habitat and habitat quality. Our resulting research showed strong evidence that populations exposed to different qualities of forage on their summer range correlated to pregnancy rates the next winter."

Additional research in the Sapphire Mountains, the Blackfoot-Clearwater area, and the Elkhorn Mountains over the past decade further confirmed the connection between summer forage and both pregnancy rates and overwinter survival. This year, Proffitt is focusing on elk in the Kootenai National Forest south of Noxon.

The overarching conclusion of Proffitt's work—and studies by researchers in northern Idaho—is that much of what drives elk population dynamics in the Northern Rockies happens in the summer, says Justin Gude, FWP's research chief. "For a generation or more, wildlife managers have focused on conserving winter range because everyone knew that winter is the time of highest mortality, and that these areas were being lost to housing developments, agriculture, and other land use changes," says Gude. "And while winter habitat remains important, we're now learning that the potential for population growth is entirely affected by summer habitat, by the amount and the quality of forage available to elk. That becomes even more important the farther west you go in Montana."



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FWP's recently released elk management plan stresses the connection between summer nutrition and herd health. "The plan definitely makes clear that elk body fat levels in spring are a function of fat levels from the previous fall," says Lindsey Parsons, author of the massive management document. "The plan cites studies by Kelly and other researchers that show how summer nutrition can affect pregnancy rates, adult and calf body size, and the amount of fat that elk accrue to help get them through the winter."

Gude stresses that this insight isn't new. "For years, scientists have known about the connection between the summer forage and herd productivity," he says. "But what we know now has become far more precise and detailed, thanks to recent work conducted in Montana and other western states."

CLEAR-CUTTING NO MORE

In the past, productive summer elk habitat was a by-product of aggressive logging that included far more clear-cutting that opened the forest canopy. Because that's no longer happening, "mountain forage for elk isn't a given anymore," Gude says. "Now we're looking for new ways to produce more of that habitat."

Because FWP wildlife biologists have no say over forest management, any actions are largely in the hands of national forest supervisors. Fortunately for elk fans, many of those officials have been closely following Proffitt's research. The Lolo National Forest's draft revised management plan specifically mentions improving subalpine meadows and parks to benefit elk and other wildlife. The Bitterroot National Forest, too, is reconsidering management priorities for subalpine meadows.

Manipulating habitat at a scale large enough to affect elk numbers is difficult at higher elevations, given the steep grades, short working seasons, remote locations, and few roads. It's also hard to get what land managers call "habitat treatments"—which might include livestock grazing or logging—approved through the Forest Service's review process. Proposals are regularly nixed by federal judges citing environmental laws. What's more, a century of fire suppression has created dense, tinder-dry forests, making it difficult to contain prescribed burns. Lastly, there's little commercial value for the scrawny timber that might be cut in high-elevation thinning projects.

The hunting editor at Outdoor Life, *Andrew McKean lives on a small ranch near Glasgow.*

TOP: RICHARD J. JACKSON; MIDDLE AND BOTTOM PHOTOS: MORGAN JACOBSEN/MONTANA FWP

LISA BALLARD

FIND, NET, COLLAR, FOLLOW
Top: Elk graze on new growth in a mountain meadow in early spring. Left: A helicopter with Quicksilver Air, which FWP contracts for elk captures, hovers over a herd as a gunner positions himself to fire a net onto a cow. Below right: Proffitt fits a collar on another cow. By tracking elk, she and other researchers learn which habitats elk prefer throughout the year. National forest managers are using the information to adjust management plans to create more open mountain meadows.

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CHALLENGING YET ESSENTIAL TOOL Prescribed fires can burn back conifers taking over mountain meadows. But western forests have become so dry from record heat that controlled burns can escape their boundaries and threaten housing and other human development.

MIGRATION MEMORY LOSS

Another result of fewer and smaller high-mountain pastures is that elk could lose their historical knowledge of ancient migration routes across the Northern Rockies.

Mountain elk historically winter in low-elevation valleys. In spring they head uphill, sometimes traveling more than 100 miles. Then in early winter, deep snow drives them back downhill again. And so the cycle goes, generation after generation.

But if elk don’t venture to higher habitats, grazing national forest meadows into September and October, they aren’t accessible to public-land archery and firearms hunters.

Elk that remain in private, irrigated valley-floor sanctuaries are not only protected from public hunters but tend to have better forage in fall and winter. They also have higher birth rates. But Proffitt fears that repeat generations of alfalfa-fed elk may mean some animals never learn how and where to find historical mountain summer range and pass that knowledge to their young. “So even if we can find ways to restore high-elevation pastures, and we then increase hunting pressure on private-land elk to drive them uphill, elk born on that low-elevation land who have never left that property and experienced seasonal migrations might have no idea the habitat is up there and how to reach it,” she says.

Proffitt suspects the multi-generational behavior that selects for resident private-land elk herds may already be established in some herds.

That’s an added conundrum for elk managers, Gude says. But the more immediate problem is finding ways to make high-elevation parks more attractive to elk. “We obviously can’t control precipitation to make mountain meadows more lush, and it’s hard to imagine widespread logging will return to national forests,” he says.

Despite its many complications, fire seems to be the best solution. “That’s a constant we have found repeatedly in different studies including the Bitterroot, Northern Sapphires, and Blackfoot-Clearwater. Wildfire creates good forage, and elk use it,” Gude says. “The amount of digestible energy in native forage following a wildfire is comparable to that of an irrigated alfalfa field. Elk select for it in the year after a fire and for at least the next five years.”

> “Could we retrain elk to return to public lands? I think so, but it won’t happen without coordinated intervention, and in some areas and with some herds, it’s possible that we’re already too late.”

COORDINATED INTERVENTION

Yet fire alone won’t solve Montana’s elk-distribution problem. The rise of ATVers, mountain bikers, hikers, and campers on national forests make it increasingly difficult for secretive elk, mule deer, moose, and other wildlife to follow historical migration routes to public lands. The Forest Service, recognizing the lack of escape cover in middle and higher elevations, promotes creating a “diversity of elk habitat that provides ecological conditions that supplement recreational opportunities that include wildlife enjoyment, viewing, and hunting” in its new forest-management plans. Those conditions might include creating big-game security areas, limiting human access during certain times of the year, and managing fire in ways to specifically improve the high meadows that elk need.

The management implications are not lost on Proffitt, who spends her time designing research projects, collaring elk, and monitoring their movements. “In both the most recent FWP elk management plan and in the Forest Service plan revisions, there’s alignment between the agencies,” she observes. “What if we could work with the Forest Service to improve the forage quality? Would elk be more likely to stay on public lands? With focused hunting pressure on private lands, could we retrain elk to return to public lands? I think so, but it won’t happen without coordinated intervention, and in some areas and with some herds, it’s possible that we’re already too late.” ■

STAY PUT! Wildlife managers, cattle ranchers, and hunters all want elk to stay in mountain parks in the fall. Using FWP research, national forest managers are now finding ways to reinvigorate these high-elevation grasslands to keep elk up high where they are more available to public-land hunters and do less crop damage on private property.

TOP: LANCE GILLILAND; LEFT AND FAR LEFT: MONTANA FWP

JACK BALLARD

CARNIVORES AND CLEAR-CUTS

Adding to the pressures on northwestern Montana’s elk are increasing numbers of black and grizzly bears, wolves, and mountain lions. While those predators don’t normally have a big influence on elk abundance in healthy herds, they can disproportionately pare down diminished populations, where every calf is critical to herd viability.

A new multi-year study by FWP’s Dr. Kelly Proffitt and University of Montana researchers is looking at the extent to which both habitat *and* predators affect elk numbers. In the winter of 2022-23, scientists began tracking radio-collared elk and large carnivores along the lower Clark Fork River. They are focused on Hunting District 121, which surrounds the river from Thompson Falls northwest to Heron and the Montana-Idaho border.

Biologists capture and collar a mountain lion in HD 121 last winter as part of the new multi-year study.

Proffitt and her colleagues will also examine the effects of timber management on elk habitat and elk productivity over various periods of time. Researchers are working with the U.S. Forest Service to look at harvested tracts 15, 25, and 50 years after logging to measure how elk respond to different post-harvest habitat conditions.

“We’re hoping to better understand elk population dynamics in northwestern Montana by studying top-down influences like predation and bottom-up influences like habitat,” Proffitt says. ■

Wildlife research scientist Jesse DeVoe collars a baby elk in HD 121 near Noxon as part of the FWP study to learn what factors most affect calf survival.