NOTE: This issue of Birding *is accompanied by a 23×29 inch map (see insert following page 64) depicting the national network of U. S. Department of Defense holdings that support ongoing bird conservation initiatives. This article focuses in particular on a creative partnership at one such military base—the U. S. Army Post at Fort Carson, Colorado.*

We birders tend to flock to habitats that offer vertical structure diversity, elevational gradients, a flood of water sources, and sheer magnitude of bird species and numbers. A perusal of birding tours listed in ABA publications confirms that the prairie is not exactly a destination of choice. Although I have long been intrigued by the unique management challenges of the prairie, I have been among those who ignored that ecosystem as a birding destination. However, I recently spent several days in the shortgrass prairie at the invitation of a unique conservation partnership, and I have had cause to reassess my previous take on the birding merits of the prairie. The flight from Chicago to Colorado Springs, completely across historic prairie habitat, gave me a bird's-eye view of an ecosystem that reveals its wonders and secrets only if you enter its world at ground level.

The Military-Conservation Complex

An Innovative Partnership Strives to Protect Prairie Birds

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Flying west from O'Hare International Airport, we travel across the Eastern Tallgrass Prairie (known to conservation planners as Bird Conservation Region 22, or BCR 22 for short) of Illinois, Iowa, Missouri, and eastern Kansas. From 30,000 feet, the pattern of corn and soybean fields is striking and pervasive. The modern moniker, "corn belt", is apropos. Agricultural conversion plus suburban and exurban development have reduced the tallgrass prairie of pre-settlement days from 57 million acres to fewer than 5 million acres. As we pass over Fort Riley, Kansas, the lack of form on the landscape demarks this 100,000-acre military installation. On the border of the Central Mixed-Grass Prairie (BCR 19), Fort Riley supports 50,000 acres of native tallgrass prairie, the largest contiguous tract of its kind remaining. Outside the installation borders, section-sized (one square mile, or 640 acres) and quarter-section-sized squares immediately return. As we continue over Kansas, an increase in center pivot irrigation corresponds to a decrease in precipitation from east to west. As we transition into the Shortgrass Prairie (BCR 18) in western Kansas, center pivot agriculture slowly gives way to ranching. And as we approach Colorado Springs Airport, ranching almost imperceptibly gives way to suburban expansion: first, the occasional inherited "back 40" sold by the descendant of a rancher; next, a few quarter- and half-section blocks; and, finally, contiguous, section-sized developments packed with suburbanites craving too many manicured sod lawns and trees for the water-deprived shortgrass prairie.

The Central Shortgrass Prairie eco-region is 55.7 million acres in extent, and essentially comprises the northern two-thirds of BCR 18. For someone like me who grew up in a forested landscape, the prairie may at first appear drab, boring, and insignificant. The native birds seem to act more like small mammals than birds, foraging stealthily behind clumps of grass or sand sage in the comparatively featureless landscape. There are no colorful warblers singing explosively from forested perches. Only drab feathered rodents scurrying between the sparse grass and shrub cover. And what's the dawn chorus

The declining **Mountain Plover** faces numerous threats throughout its restricted range and specialized habitat. How best to conserve the species, plus others like it that depend on the imperiled central shortgrass prairie eco-system? This article describes an innovative collaboration involving the U. S. Department of Defense, The Nature Conservancy of Colorado, private land-owners, and other partners. *Pawnee National Grassland, Colorado; July 2000. © Brian E. Small.*

without the deafening jumble of thrushes, tanagers, and warblers found throughout the forest's vertical structure?

To be sure, dawn in the eastern forests is not the same experience as dawn on the shortgrass prairie. But having now experienced a prairie sunrise, I confess that it is no less spectacular. The plaintive—yet intricate and mesmerizing—chorus of Cassin's Sparrows is underway well before sunrise. It is not long before other species join in: Lark Sparrow, Brewer's Sparrow, Lark Bunting, Horned Lark, and Western Meadowlark. But perhaps the most spectacular aspect of the dawn chorus on the prairie is the accompanying visual element. Known as "larking", this method of courtship and territorial display is employed by all the "larks" of the prairie, and many of their non-lark brethren, too. As Fred Samson and Fritz Knopf describe it in their 1996 book *Prairie Conservation*, "the sun rises on calm spring mornings and males burst from their herbaceous hidings in a flight that exposes brightly colored underparts and melodious songs, often with accentuated wing movements that more resemble insects than birds."

Aerial displays are an adaptation to open habitats with a lack of exposed perches. With larks and other prairie species, the flight song display is an amazing exhibition. The display begins with a steep ascent into the wind, or in wide irregular circles in the absence of wind, until the bird reaches a height of 50 to 500+ feet. At this point the male extends his tail and wings and soars, emitting his song of twittering, jingling metallic sounds. He returns to an even higher altitude and repeats this song, usually facing into the wind. The end of this remarkable performance usually finds the bird plummeting back to earth with closed wings, opening them just in time to avoid what would appear to be certain death. To witness this spectacle truly makes one feel as though one has been extended one of nature's most special invitations.

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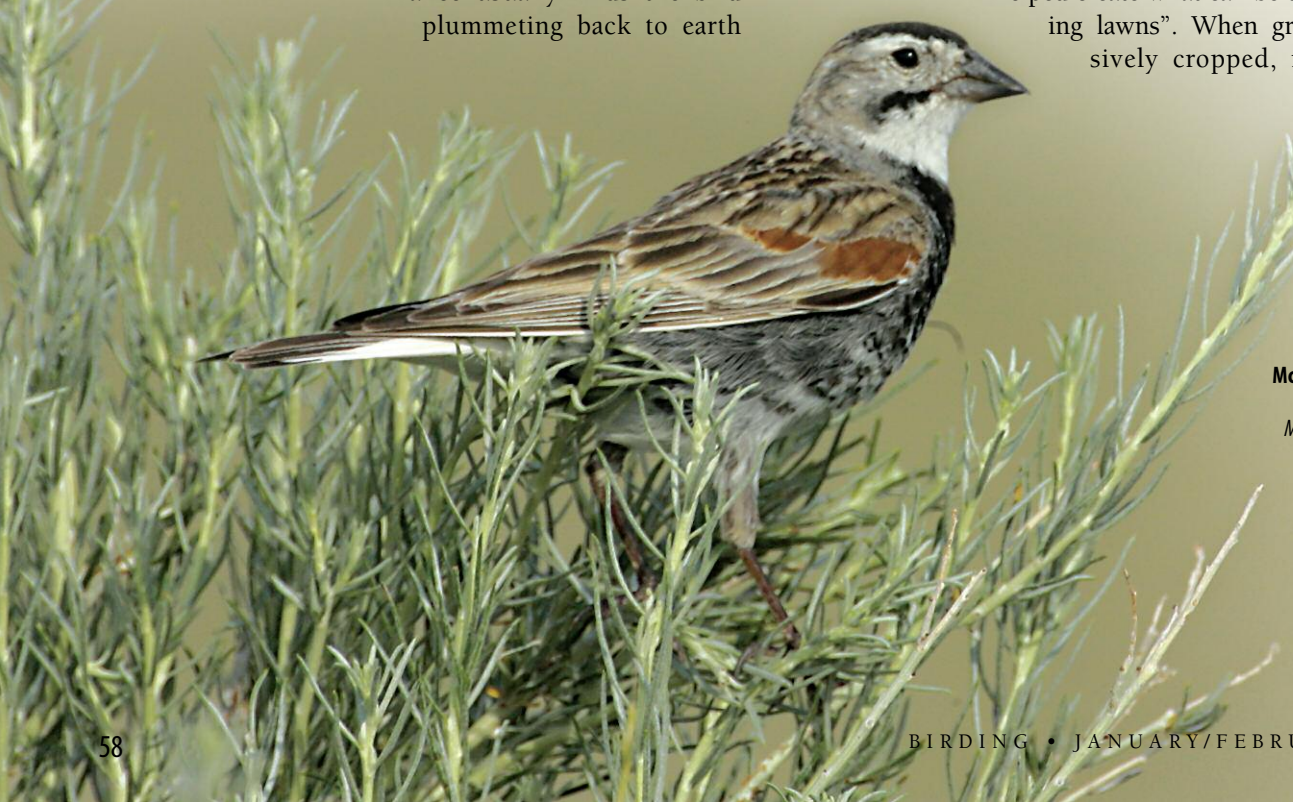
Two hundred years ago, the Great Plains landscape appeared to many observers to be a monotonous sea of prairie grasses. However, careful observation would reveal a gradual moisture gradient, decreasing from the wet tallgrass prairies of Illinois to the dry shortgrass prairies of eastern Colorado. A subtle patchwork of different grasses and forbs thrived in each prairie region. A variety of disturbances influenced and shaped the vegetation patterns. Fires, grazing, wallowing by bison, ephemeral water sources, and prairie dog towns created a shifting mosaic of habitat patches. Relatively dry conditions and adaptations to grazing contributed to, and still contribute to, the vertically-challenged stature of shortgrass prairie plants. A handful of birds are adapted to live in these small micro-habitats, and they depend on the disturbances which formed them.

Grazing has had perhaps the largest influence on the shortgrass prairie, perhaps more so than in any other ecosystem in North America. Native grazers included bison, pronghorn, and elk, in abundance rivaling that of the grazers on today's African Serengeti. Large herbivores grazed over vast expanses of prairie and then moved on to other foraging areas, whereas prairie dogs grazed large areas intensively and continuously. Bison and prairie dogs helped create what can be termed "grazing lawns". When grass is intensively cropped, new growth



McCown's Longspur.
Beaverhead County, Montana; June 2006.
© Bob Steele.

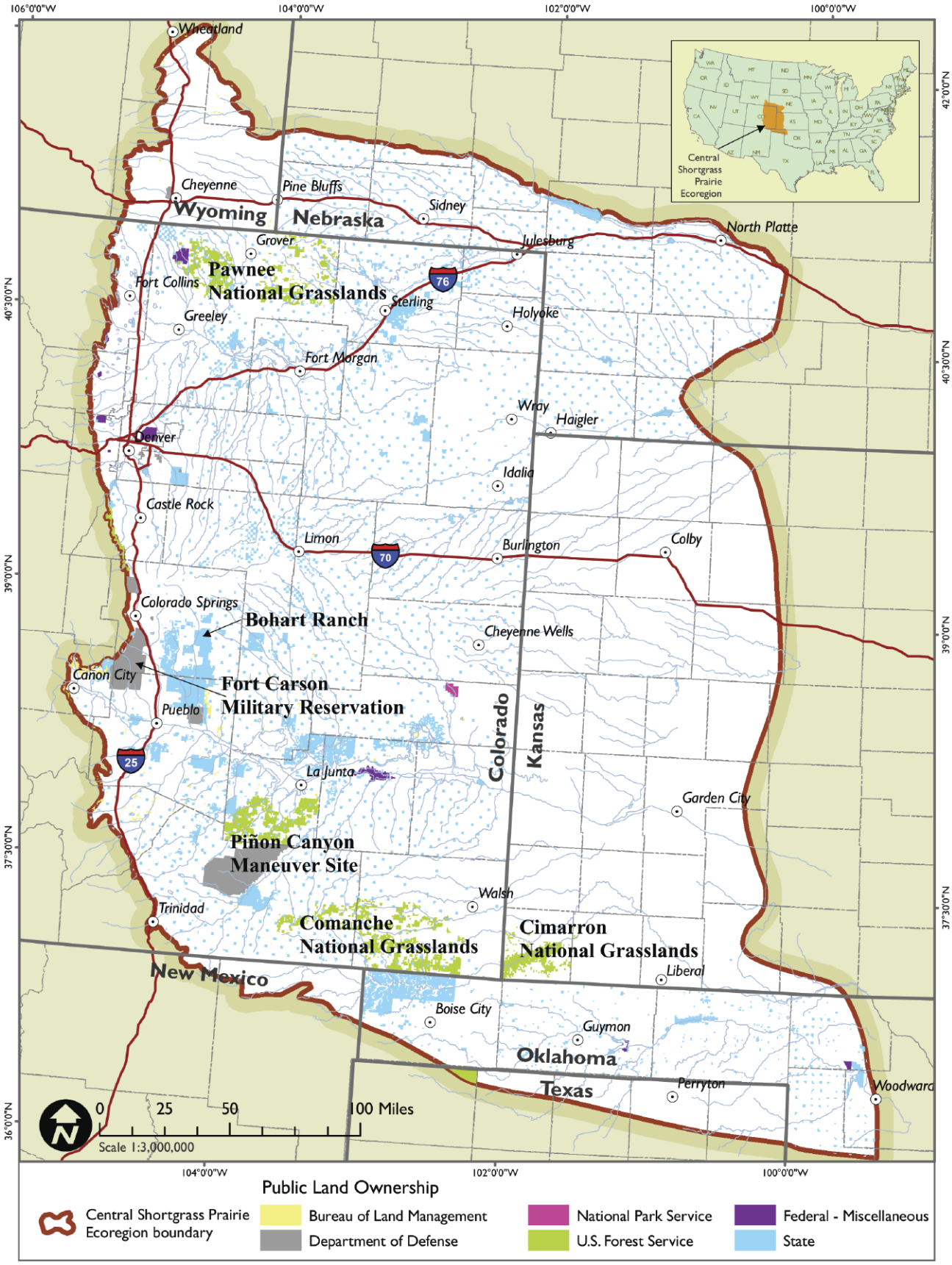
Lark Bunting. *Pawnee National Grassland, Colorado; June 2002. © Maslowski Productions.*

comes from the base of the stem rather than the tip. This new growth is more nutritious, shorter, denser, and more easily digested than older grass. For grazers that demand significant nutrition from grasses each day, prairie dog towns may be analogous to the suburbanite juice bar—a one-stop nutrition buffet. In the modern-day prairie, cattle have assumed the role of the dominant large herbivore in many areas. The evolution of the prairie seems to suggest that grazing, if not too intense, actually sustains and improves conditions for grazers and other prairie animals.

Prairie dog colonies attract a disproportionate number of large grazers, as well as other symbiotic community members. Burrowing Owls nest and roost in abandoned burrows; black-footed ferrets once depended on prairie dogs as a food source and for burrows; Ferruginous Hawks also prey on prairie dogs. However, it is the Mountain Plover that may be especially tied to grazing—and specifically to prairie dogs. In his 2001 book *Prairie Birds*, Paul Johnsgard writes, "Mountain Plovers, shortgrass prairie, and prairie dogs simply once belonged together." The range of this shortgrass endemic breeder largely overlaps with that of the black-tailed prairie dog. It thrives in the open "grazing lawn" landscape created by prairie dogs, where it feeds on ants and ground-dwelling beetles that are more abundant in prairie dog colonies than in surrounding habitats. The hunting technique of the "prairie ghost", as the Mountain Plover is sometimes known, involves running across open ground and stopping frequently to scan for prey. On the whole, Mountain Plovers seem to benefit from the combined grazing efforts of prairie dogs and large herbivores—whether bison or bovine.

The timing, intensity, and magnitude of fire and its role in the formation of the prairie is not widely appreciated. Like grazing, however, fire helps produce and maintain a type of grassland upon which many prairie species depend—the shifting mosaic of habitat patches mentioned above. When either grazing or fire are removed from a prairie system, or when grazing is too intense for too long over too large an area, the intricate patchiness of the native prairie and the fauna dependent upon these patches begin to disappear.

Although a good morning birding in eastern forests can yield 60 or more species, observing 30 species out on the open shortgrass prairie would be considered a banner outing. According to Samson and Knopf's 1996 book *Prairie Conservation*, it is not uncommon for three or four species to account for up to 87% of all avian observations in prairie research. In my graduate fieldwork in the bottomland forests of Georgia, I found that it takes 18 species to comprise 87% of the total observations. Nine avian species are endemic to or critically dependent upon prairie habitats in the Great Plains, according to Samson and Knopf, and another 20 have strong affinities to the region. Of the near-endemics, Mountain Plover, Long-billed Curlew, and



Map showing the diversity of property ownership types in the central shortgrass prairie eco-region. *Map by Kei Sochi.*

McCown's Longspur are associated only with shortgrass systems. Ferruginous Hawk, Chestnut-collared Longspur, and Lark Bunting associate with short and mixed prairies. Of these six species that depend critically on the shortgrass prairie, all but the Ferruginous Hawk have shown a negative population trend during the past 30 years, according to the Breeding Bird Survey.

A viable population is one that is able to maintain its vigor and its potential for evolutionary adaptation. Given the steady decline in these specialist prairie bird species, it might be argued that changes in the landscape are compromising their ability to persist as viable populations. Grasslands in general, and the prairie in particular, are faced with an enormous array of threats to their own ongoing viability. Not surprisingly, most of these changes are anthropogenic in nature. Habitat conversion and degradation top the list. Housing and urban/suburban/exurban development probably contribute most significantly to habitat loss and degradation. Direct loss from housing subdivisions, increased road density, altered fire and hydrologic regimes, and energy development from increased demand are the most pervasive agents of change. Introduction of invasive species often follows human encroachment. The changing economics of cattle grazing often force ranchers to graze more cattle on smaller ranches, creating inappropriate or incompatible impacts on prairie systems. Ranchers who can't sustain a viable ranching operation often sell their land to developers, adding to the loss of prairie habitat.

This scene is from a private holding adjacent to the U. S. Army post at Fort Carson. The Nature Conservancy, the U.S. Department of Defense, and private interests are partnering to protect shortgrass prairie bird species on and in the vicinity of Fort Carson. *Pueblo County, Colorado. © Peter McBride / Aurora Photos.*

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For the past 40 years, the U. S. Army post at Fort Carson, Colorado, has hosted intensive training of troops, tanks, and artillery. The post was established miles from the cities of Colorado Springs and Pueblo. However, today Fort Carson and many other military installations across the country are finding the urbanized world rapidly encroaching upon their borders. The increased population density and bright lights of subdivisions adjacent to military training areas threaten to compromise their training missions. In addition, with less habitat outside the fence, biodiversity seeks out refuge within the borders of military bases. This creates a disproportionately high number of species of concern inhabiting training areas—another potential threat for a place like Fort Carson, given its primary mandate as a training facility. In fact, Department of Defense (DoD) lands are home to 20 percent of all federally listed species—more than in our national parks—and have more federally listed and at-risk species per acre than any other federal agency.

Because these threats jeopardize the future of both the U. S. military and the nation's biodiversity, a new coalition has been needed to take control and secure the future. The Nature Conservancy (TNC) and DoD have crafted efficient and creative partnerships for many years, mostly focusing on managing endangered species on military lands. Land ownership of Red-cockaded Woodpecker habitat is often referred to as "military lands" and "other", in part due to the effective work of TNC in increasing woodpecker populations while preserving the training mandate for numerous military sites. Work at Fort Hood, Texas, has taken partnerships to another level. The Conservancy manages the endangered species program for the Black-capped Vireo and Golden-cheeked Warbler. Populations of both species have soared on the post, and a partnership with biologists on the warbler's wintering grounds has proven especially significant by improving our knowledge of the entire annual cycle of the Golden-cheeked Warbler.

Congress has recognized the potential impact of urban encroachment on the military's ability to train. It has also recognized that protecting the training mission involves protecting wildlife habitat "outside the fence" to minimize

conflicts with listed species that are forced onto bases as habitat is gobbled up and paved over by development. In the 2003 National Defense Authorization Act, Congress provided a mechanism to slow growth around military bases by authorizing DoD to create buffer zones around bases where the training mission was threatened. The legislation encouraged the military to seek outside partnerships to facilitate this process. As a result, the Army created the Army Compatible Use Buffer program.

Fort Carson manages about 85% of the roughly 450,000 acres of military land in the Central Shortgrass Prairie. Gary Belew, Program Leader for Cooperative Conservation at Fort Carson, was instrumental in creating easements with the two area families' 60,000 combined acres on the Fort's southern and southeastern borders. These ranches are home to geologically unique shale barrens and several rare plants, and they have some of the best unbroken shortgrass prairie. However, Belew was looking to the future not just of Fort Carson but also the shortgrass prairie: "If we don't know how Fort Carson and the Piñon Canyon Maneuver Site fit into the shortgrass ecosystem, we can't understand how to effectively manage either our lands or the prairie." He envisions a partnership focused on the entire shortgrass prairie as a potential catalyst from traditional management to true ecosystem management.

Tom Warren heads the Directorate of Environmental Compliance and Management at Fort Carson, which means the buck stops with him regarding any natural resource or environmental issue on the 377,000 acres at Fort Carson and nearby Piñon Canyon. Warren began serious dialogue with the Fort's leadership in the 1980s, when he realized that encroachment was threatening the post's future. In the 1970s it was many miles to Colorado Springs (to the north) or Pueblo (to the south). However, Colorado Springs grew 30% in the 1990s, and there are no signs that its population increase is slowing. Pueblo is starting a similar growth pattern. When houses started popping up along the Fort Carson fence line and encroachment literally stared them in

Shown here is the Bohart Ranch (Pikes Peak in background), which still supports thousands of acres of remnant sand-sage prairie—home to Cassin's and Brewer's Sparrows, Lark Buntings, and other inhabitants of the central shortgrass prairie eco-region. *El Paso County, Colorado. © Harold E. Malde.*

It is easy, from a distant vantage point, to imagine that the shortgrass prairie is an endless sea of grass. Actually, it is a complex mosaic of varied microhabitats, as depicted in this scene from the Bohart Ranch. *El Paso County, Colorado. © Harold E. Malde.*

the face, the post's leadership finally understood its potential impact on their mission. "Here we are with this little piece of the public trust that was becoming an island of diversity," Warren says. The diversity to which he refers includes not only flora and fauna, but also "combat systems, cultural artifacts, and habitat for thousands of men and women trying to learn how to survive on a modern battlefield."

During a recent visit to Fort Carson, I was able to secure a 20-minute appointment in Warren's crammed schedule. Ninety minutes later, it was clear that he not only has a clear vision for the value of managing at a landscape level, but also quite an affinity for birds. As our conversation progressed into the issues of shortgrass prairie, partnerships, and birds, he became visibly more relaxed and jovial. Warren is one of the highest-ranking civilians on the post, but it is obvious where his passions lie.

When discussions of encroachment led to discussions about partnerships, it was a natural decision to contact The Nature Conservancy as the link to engage all the key stakeholders with a common vision. Belew and Warren worked with The Conservancy to prepare a proposal for funding from the Legacy Resource Management Program. Their collective vision over several decades laid the groundwork with The Conservancy and other partners for this concept, which made for a solid proposal that received funding. With this "seed" money, the Central Shortgrass Prairie Assessment and Partnership Initiative was born. Fort Carson leadership grasped this project because it made sense; Pentagon-level leadership also supported it because of the leverage that DoD funds generated. More than a dozen partners contribute to the partnership, and additional stakeholders are participating—including private landowners, who own 92% of the eco-region.

What's in it for the military? Unlike other federal agencies with substantial public landholdings, DoD is not a land management agency. Admittedly, even partnership-oriented initiatives within the military, such as the DoD Partners in Flight program, receive table scraps for funding when compared to the overall military budget. However, partnerships are the most effective means to protect the military's mission of training troops. The DoD is looking for information to better manage its lands and the plants and animals that inhabit them. The partnership is focused on helping the military and others manage their lands for outcomes that benefit conservation. Members of the partnership have been working with private landowners to place voluntary conservation easements on biologically important lands near Fort Carson, between Pueblo and Colorado Springs. The result is a win-win-win situation: The easements restrict development that can encroach on military training; ranchers are able to realize the value of their development rights, while keeping the land in cattle production; and important wildlife habitat is protected. In short, the partnership is working with DoD and others to preserve the benefits of working ranchlands supporting ecologically sustainable land uses that are a key component of the economy throughout most of the eco-region. And the military

understands that this is what will preserve its training mission.

Betsy Neely, Senior Conservation Planner for The Nature Conservancy and the Team Leader for the Central Shortgrass Prairie Assessment, says the partnership works because of the "talented and savvy staff at Fort Carson". She continues, "They really know their area, and they work diligently at comprehending how they fit into the larger landscape. They understand what makes this partnership work, and are committed to its ongoing success." That commitment was recognized in 2005 when Tom Warren accepted the first U. S. Fish & Wildlife Service Military Installation Conservation Partnership Award on behalf of Fort Carson. The success of this partnership is opening the eyes of other groups, too. In July of this year, Ducks Unlimited signed an agreement with the Army to help conserve wetlands and associated habitats on key areas of the Army's 16.5 million acres of land through the Army Compatible Use Buffer program. Perhaps playa lakes and other prairie wetlands will attract yet additional stakeholders to the prairie partnership.

As the late afternoon sun at The Conservancy's Bohart Ranch starts to dip over the Rocky Mountains in the distance, a Western Meadowlark sings on a fence post nearby—a song for me that now symbolizes the shortgrass prairie. Subtle, elegant, and complex. To be sure, the dawn chorus of deciduous forests is one of nature's most spectacular exhibitions. But a meadowlark singing farewell to the prairie evening touches my soul in a way that defies words. If you are afraid to leave for forest for the trees, the prairie's elegant simplicity is calling your soul to an unexpected birding treasure.

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RIGHT: **Western Meadowlark.** *Billings County, North Dakota; June 2001. © Maslowski Productions.*

BELOW: This Bradley armored fighting vehicle is engaged in maneuvers only a few hundred yards from the border of Fort Carson Army Base. *Pueblo County, Colorado. © Peter McBride / Aurora Photos.*