

The Great Plains

*America's Best Chance for
Ecosystem Restoration, Part 2*

Key words: Great Plains, prairie, grasslands, Conservation Reserve Program, CRP, fragmentation, restoration, reserves

by Daniel S. Licht

In Part I of this two-part series we discussed the exorbitant costs and limited biodiversity benefits of the federal government's Conservation Reserve Program. One of the more salient points from that discussion is that the American taxpayer is paying fee-title prices to temporarily retire 35 million acres of farmland from agricultural production. Most of that acreage is in the Great Plains and prairies. We concluded Part I by suggesting that a much more cost-efficient and beneficial land-retirement strategy would be to permanently restore large areas of the grassland biome.

In Part II we will identify and discuss some potential ecological reserves for long-term conservation of grassland biodiversity. We will also discuss two case studies, one from the northern Great Plains and one from the tallgrass prairie, which will further elucidate the feasibility and benefits of the proposed reserves.



The Omernik (1987) ecoregion classification delineates a 650,000 square mile area of contiguous grassland in the central United States (excluding ecoregions of grassland/forest mosaics and savanna, e.g., Illinois and northwestern Missouri: Figure 1). This enormous grassland ecosystem is commonly known as the Great Plains and true prairies. In many ways this vast region is America's most distinctive landscape, and also its most damaged.

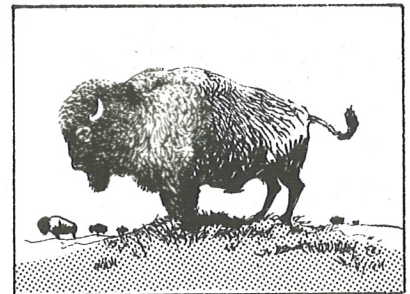
I propose that a series of large ecological reserves be established throughout the Great Plains and prairies to conserve grassland biodiversity, provide recreational and scientific opportunities, restore cultural values, create new economies, and reduce farm surpluses. I have identified 12 sites that could be converted to large ecological reserves (Figure 1). The sites I identified were based on 1) ecological uniqueness, 2) presence of public or other protected lands, 3) human demographics, 4) recreational opportunities, and 5) miscellaneous other factors.

These reserves correlate fairly well with the various grassland ecoregions described by Omernik (1987). They also tend to be evenly distributed across the grassland states, a distribution that is politically "fair." The establishment of such reserves could conserve in perpetuity almost all grassland species. Just as important, the reserves are large

*While I know the standard
claim is that Yosemite, Niagara
Falls, the Upper Yellowstone
and the like afford the greatest
shows, I am not so sure but the
prairies and Plains last longer,
fill the esthetic sence fuller,
precede all the rest and make
North America's characteristic
landscape.*

—Walt Whitman

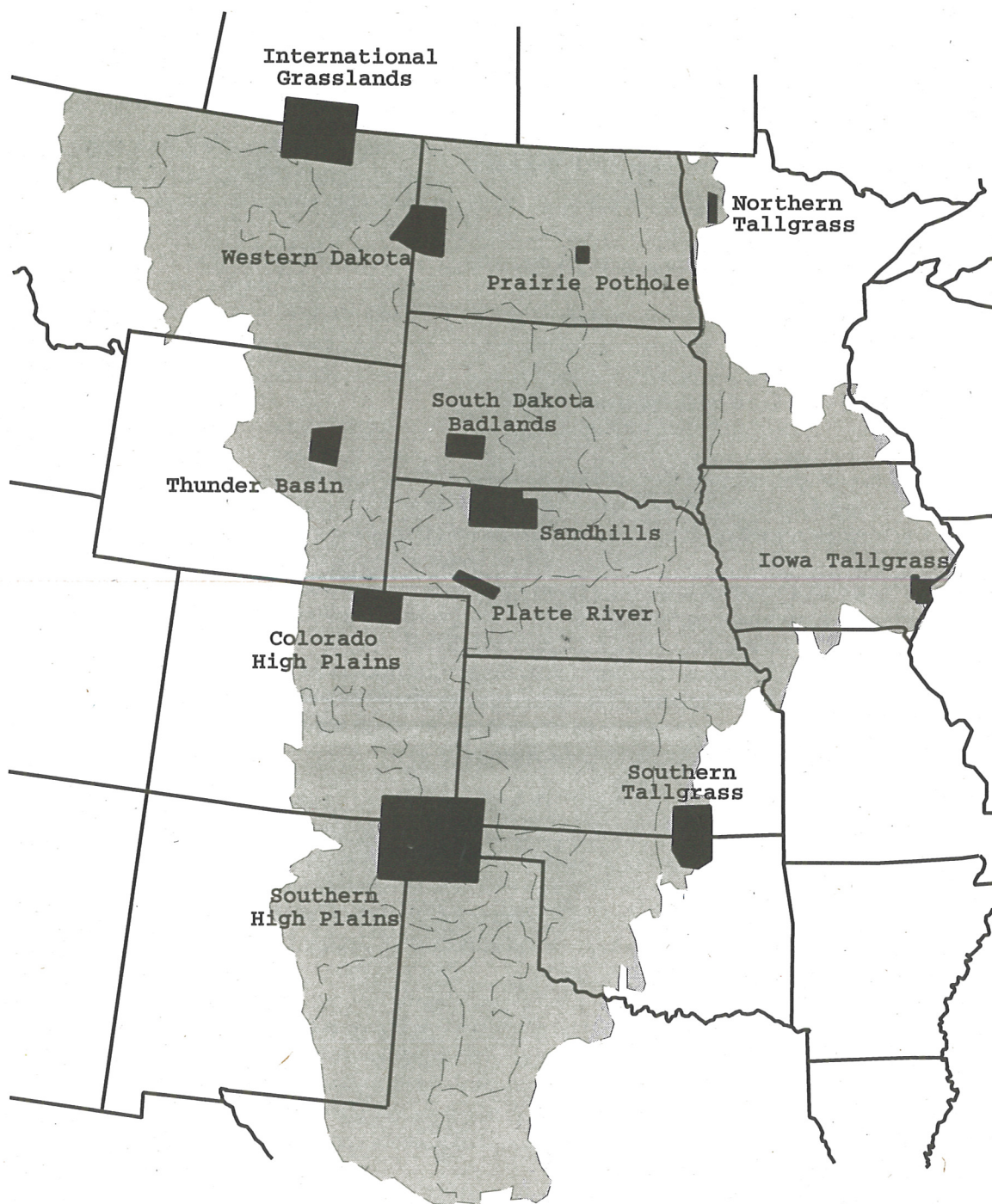
America's Characteristic Landscape, 1882



Potential Reserves in the Grassland Biome

(Does not include savanna type ecoregions)

■ = Grassland ecoregions (Omernik 1987)



enough to restore the ecological processes necessary for sustaining these species.

Many recent studies, including some in grassland ecosystems, have described the benefits of large tracts of land and the deleterious effects of fragmented habitats (Kantrud 1981, Samson and Knopf 1982, Boettcher and Bragg 1989). Most of these studies are limited to birds, but the causative factors and underlying principles can be applied to the entire grassland biota. The destruction and alteration of natural processes eventually leads to the decline and extirpation of many grassland species.

For example, Gray Wolves (*Canis lupus*), along with Bison (*Bison bison*) and prairie dogs (*Cynomys sp.*), were among the major biotic influences on the grassland ecosystem. The presence of wolves in the grassland community had a ripple effect on many other species. Wolves tend to displace Coyotes (*Canis latrans*; Carbyn 1982, Fuller and Keith 1981) which, in the absence of wolves, can be severe predators on Black-footed Ferrets (*Mustela nigripes*) and Swift Fox (*Vulpes velox*). The successful restoration and conservation of these latter species is uncertain in degraded ecosystems.

The largest of the reserves proposed here is the 5365 square mile Sandhills reserve in north-central Nebraska. The proposed reserves in northern Texas, western North Dakota and north-central Montana are all over 4000 square miles. In addition, the Montana reserve could be substantially enlarged by merging it with a similar reserve in Canada.

These reserves are large enough to support viable self-sustaining populations of ferrets, Swift Fox and most other grassland species. They can also support small populations of Gray Wolves.

Of course, the proposition of wolves and Bison roaming wild in the middle of the Great Plains seems politically impossible now. Yet there may be solutions that, while not perfect, are workable. For example, in the relatively flat and treeless Great Plains and prairies, large-animal proof fences could be established around even the biggest reserves. This may seem an abomination to some conservationists, but the unfortunate truth is that animals within the proposed reserves are already surrounded by artificial barriers, including private fences. Such restrictions may be politically necessary if grassland reserves are ever to become reality. Moreover, if the reserves are large enough, then perhaps most of the animals within would never make contact with the perimeter fences (which begs the philosophical question, are the animals really fenced in at all?).

The size of the 12 reserves proposed in this article represents only 4.2 percent (27,655 miles²) of the contiguous grassland biome. The acreage of these proposed reserves is only 50 percent of the nation's CRP acreage.

As explained in Part 1, by modifying agricultural set-aside programs, the nation could conserve grassland biodiversity while reducing federal farm expenditures. More than for any other similar-size region in the United States, the argument for establishing a series of large reserves in the Great Plains and



prairies can be made in economic terms that can be comprehended by the average citizen.

Other researchers have also observed this possibility. The geographer Bret Wallach (1985) wrote, "a prairie-restoration proposal, in other words, sounds outrageous until it is compared with what we've already got."

Frank Popper observed that, "like every other Plains state, this (Oklahoma) is a subsidized, exporting economy. People, oil, farm products stream out, federal subsidies for petroleum, lead and zinc, welfare, agriculture, and defense pour in" (Matthews 1992). The Poppers (1987) concluded that a wiser use of the arid Great Plains would be to restore it to a "buffalo commons."

CASE STUDY 1: SOUTH DAKOTA BADLANDS

The Badlands of South Dakota are a landscape set apart, not only in space, but also in time. The movie "Dances With Wolves" immortalized the region by using it as a panoramic backdrop. Of all the places in the lonely Great Plains, this most exemplifies solitude.

I propose that a large ecological reserve be established in southwest South Dakota that includes the northern 1/4 of Shannon County, the western part of Pennington and Custer Counties, and a small portion of northwest Jackson County. Essentially, a 70 mile east-west by 35 mile north-south rectangle that encompasses the existing Badlands National Park, much of the Buffalo Gap National Grasslands, and the northern portion of the Pine Ridge Indian Reservation, would be protected.

The area within the proposed reserve is already 40 percent public land. Sixty-one percent of this public land is comprised of the Buffalo Gap National Grasslands, lands which the government acquired during the resettlement programs of the 1930-40s. At that time the federal government acquired large amounts of Great Plains farmland (although only a fraction of what some recommended) because of crop surpluses, environmental degradation and failing economies—not unlike the current situation.

The remainder of the public land is Badlands National Park. This land is already protected from cattle grazing, mining and other uses that compromise the integrity of the National Grasslands. Unfortunately, the Park is currently unable to assure the long-term conservation of the shortgrass ecosystem because it is too small and has too high a perimeter-to-area ratio.

That leaves only 940,800 acres of private land within the proposed reserve boundaries. The total market value of this land, including buildings, is only \$140 million (approximately \$150 per acre: US Bureau of Census 1989). To put this in perspective, the federal government spent \$87.4 million for 2.1 million acres of CRP in South Dakota in 1991 alone (US Dept. of Agriculture 1992). The total cost of CRP to taxpayers will be over \$800 million in South Dakota over the life of the program.

Assuming that the federal government pays 1.5 times the

market value of the private lands (an incentive which is necessary and fair), the total cost to acquire a 2450 square mile reserve in southwest South Dakota would be only \$210 million. The establishment of a large-animal proof fence would cost another \$4.2 million (estimated at \$20,000 per mile). These amounts are trivial compared to current farm program expenditures. Farm subsidies for the state of South Dakota alone for 1991 were \$286 million.

State politicians will, of course, object to the federal government acquiring more land in their state. The 768,000 acres of fragmented National Grasslands and Bureau of Land Management properties in South Dakota outside the proposed reserve could theoretically be divested by the federal government in exchange for land acquisitions within the reserve; however, such an exchange would not be in the best interest of the nation since it would not reduce crop surpluses.

Considering what such a reserve can do for biodiversity conservation, outdoor recreation, scientific study, and economic development, the cost to the nation is a bargain. Just as significantly, the benefits it could produce for Native Americans would be enormous.

The present condition of the Pine Ridge Indian Reservation is deplorable. The high rate of economic and emotional poverty is the result of generations of well-chronicled injustices against Native Americans. Although many of these wrongs are irreversible, efforts can still be made to improve the living conditions of the people. They have no sense of purpose. Current welfare approaches only exacerbate feelings of irrelevance and helplessness.

I propose that a South Dakota Badlands reserve be administered cooperatively by the US Government and the people of the Pine Ridge Indian Reservation. The nation would benefit because of the environmental, educational and recreational benefits of such an arrangement, while Native Americans would benefit materially as well as spiritually. Administering and maintaining such a reserve could restore a sense of direction and pride to the Sioux tribe. Employment as tour guides, wildlife managers, service providers, etc., would create economic independence and stability for the people. Perhaps most important, the restoration of a large naturally functioning grassland ecosystem, with all of its indigenous flora and fauna, could restore a Native American spirituality that has been missing since the last Bison disappeared.

Just about every species associated with the shortgrass region of the Great Plains could be conserved in such a reserve. A population of perhaps 50-100 Gray Wolves could exist in the area. Twenty-thousand Bison could live there, a large enough population to allow for limited human harvest (as was the case historically). Bighorn Sheep (*Ovis canadensis*), Elk (*Cervus elaphus*), Pronghorn (*Antilocapra americana*), and Mule Deer (*Odocoileus hemionus*) would also be abundant. Coyotes would still be present; but because of the wolves, they would be less numerous, mostly restricted to the rugged buttes and draws. Because Coyotes would be rare on the vast plains,

Black-footed Ferrets and Swift Foxes could exist at historic densities. Ferruginous Hawks (*Buteo regalis*) could again successfully nest on the ground. Black-tailed Prairie Dogs could prosper in large complexes, in contrast to the present situation where the towns are isolated and persecuted.

CASE STUDY 2: IOWA TALLGRASS

Because of its proximity to the metropolitan areas of Chicago, Kansas City, St. Louis, Minneapolis/St. Paul, and Des Moines, a tallgrass reserve in east-central Iowa would likely receive more human use than any other of the proposed reserves. This is significant. According to the US Forest Service (1990), "close-to-home open space, which is the most heavily used and demanded recreation source, is most severely threatened by development." And as Aldo Leopold (1966) pointed out many years ago, "recreation is valuable in proportion to the intensity of its experiences, and to the degree to which it differs from and contrasts with workaday life."

I propose that a 400 square mile reserve be established in eastern Iowa, approximately 15 miles north of Burlington. The reserve could restore and conserve a functioning tallgrass prairie, and provide excellent outdoor opportunities. The reserve would protect the canoeable Iowa and Cedar rivers, before they empty into the Mississippi.

The creation of a large reserve in Iowa would go a long way toward reducing the nation's crop surpluses. In 1992, almost 2 million acres in Iowa were in federal agriculture set-aside programs (1.3 million in CRP and .6 million in annual set-asides: US Bureau of Census 1994). The proposed reserve would permanently relieve the American taxpayer of at least 164,417 acres of cropland (US Bureau of Census 1994).

Granted, the establishment of a reserve in central Iowa will be much more challenging than elsewhere in the prairie states. Land values are higher (\$1097 per acre, including buildings: US Bureau of Census 1994) and the area is much more densely populated (11,592 people in the proposed reserve: US Bureau of Census 1993). In addition, the land is more degraded, so restoration will be more costly and time-consuming. Yet, that should not remove the area from consideration. Economically and socially, Iowa is suffering as much as the other grassland states.

Iowa lost 5 percent of its population between 1980 and 1990; most of this loss occurred in rural areas. Agriculture, the traditional mainstay of the state's economy, continues to falter despite huge government subsidies (in 1987, subsidies to Iowa farmers were \$1.2 billion, about \$16,000 per farmer). The number of farms in the proposed reserve has declined 13 percent between 1987 and 1992, to 554. Meanwhile, tourism, an industry that continues to grow in other parts of the country, is comparatively insignificant in Iowa in large part because there are no noteworthy tourist attractions.

Bison and wolves could both be restored to such a reserve. Elk, which probably reached their highest historic densities in tallgrass prairies, could be reestablished in their "preferred" habitat. Endangered, Threatened, and candidate species to be conserved include prairie fringed orchids (*Platanthera sp.*), Meade's Milkweed (*Asclepias meadii*), Dakota Skipper butterfly (*Hesperia dacotae*), Regal Fritillary butterfly (*Speyeria idalia*) and many others.

A large reserve would also restore the sometimes subtle processes necessary for species sustainability. For example, skippers are a primitive group of butterflies that have limited vagility. The long-term viability of skipper populations depends on the presence of numerous subpopulations in close proximity to each other such that individuals can recolonize nearby sites should the populations become extirpated or reduced in number. Such interchange within a metapopulation also enhances the genetic variability of the species.

Small tracts of native prairie, several thousand acres or less in size, do not provide the conditions necessary for long-term skipper survival when they are isolated within agrarian landscapes. That's one reason why several grassland skipper species will likely be listed under the Endangered Species Act in the near future.

In the long run, the establishment of big reserves is an efficient and politically-judicious conservation strategy. Americans are willing to protect endangered mammals, birds and other charismatic species, even if there is a cost to society; but they do not feel the same way about invertebrates, reptiles, mollusks and other less "desirable" species (Kellert 1993). When conservation for invertebrates and other non-charismatic species becomes front page news, especially when it conflicts with development or jobs, the public's level of support for the Endangered Species Act decreases. When that happens all endangered species are further threatened. The creation of large reserves can preclude these "endangered species train wrecks."



In summary, the establishment of a series of large reserves can benefit both the American taxpayer and the grassland environment. For the nation as a whole, it's a win-win situation.

The United States must come to grips with land-use in the Great Plains and prairies. Staying the present course would cost taxpayers billions of dollars annually, and lead to a vast wasteland of brome grass (*Bromus sp.*), dilapidated buildings, unmaintained roads, and dying communities. A wiser alternative would set aside large tracts of land within the grassland biome as ecological reserves. Such reserves will not only conserve grassland biodiversity for future generations, they will also educate, entertain, and inspire. ■

Author's note: Informal discussions on the 1995 Farm Bill are under way. Conservationists are again urged to contact their congressional delegation and the Clinton administration and demand that a component be implemented into the 1995 bill that **permanently** takes some cropland out of production. Although a comprehensive ecosystem reserve strategy for the Great Plains would be difficult to propose prior to the 1995 bill's enactment, land adjacent to large public tracts should be recommended for permanent removal from agricultural production and return to the public domain.

We landed, ascended the bank, and entered a small skirting of trees and shrubs, that separated the river from an extensive plain. On gaining a view of it, such a scene opened to us as will fall to the lot of few travellers to witness. This plain was literally covered with buffaloes... The males were fighting in every direction, with a fury which I have never seen paralleled, each having singled out his antagonist. We judged that the number must have amounted to some thousands, and that there were many hundreds of these battles going on at the same time... I shall only observe farther, that the noise occasioned by the trampling and bellowing was far beyond description. In the evening, before we encamped, another immense herd made its appearance, running along the bluffs at full speed, and although at least a mile from us, we could distinctly hear the sound of their feet, which resembled distant thunder.

—John Bradbury, 1811

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Daniel Licht worked as a wildlife biologist in North Dakota before recently transferring to Forest Lake, Minnesota. He is currently preparing a book describing Great Plains biodiversity, current land-use practices in the region, and proposals for restoring the Great Plains ecosystem.

Swainson's Hawk (Buteo swainsoni) by Darren Burkey

