

# Elkhorn Ranchlands Assessment Summary

July 2008



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## **Introduction**

The USDA-Forest Service completed the acquisition of the historically significant 5200 acre Elkhorn Ranch located in the badlands of western North Dakota along the Little Missouri River on April 25, 2007. Theodore Roosevelt, the nation's 26<sup>th</sup> president, operated a large ranching operation for many miles along the river from his Elkhorn cabin site in the 1880s. The ranch lands, purchased from the Eberts family, will become part of the Little Missouri National Grasslands and will be administered by the Dakota Prairie Grasslands, Medora Ranger District.

Now that the acquisition is complete, the Forest Service is assessing the current conditions of the property and the associated facilities. We will be identifying opportunities to rehabilitate or restore those areas in need and look at options for the future uses of the acquired lands and the surrounding area (see maps 1 and 2).

The assessment is organized by the resources that are currently available on the acquired lands and the other public lands that have been used in conjunctions with the acquired lands. The format for this report is to first characterize the resource through a short summary, then describe the current condition or status of the resource. The third section will describe the reference or potential condition of the resource. The fourth section will be some interpretations of the differences in the current condition and the potential and a discussion of any probable reasons for the differences. Finally a list of references or data sources will be provided for each resource. Tables, charts, pictures and maps will be used to help portray the information provided.

Open houses were held and input was requested from the public on future management of the Elkhorn Ranchlands in September of 2007. These open houses were held in Dickinson, Bismarck and Medora, North Dakota. Information on current conditions of the land and resources was available at these gatherings and opportunities were given for the public to provide feedback at the open house or to submit comments at a later date. As of July 11, 2008, about 55 individuals and groups have submitted comments and suggestions for the future management of the Elkhorn Ranchlands.

The comments received provided a wide variety of suggested management options but some items were more commonly suggested than others. Using the lands for livestock grazing but as a forage reserve or 'grassbank' was the most prevalent comment received. Other common suggestions included restoration of native vegetation on the ranchlands, protection of the viewshed from the historic ranch home site, limit impacts from developments and to provide primitive recreation opportunities that involve limited structural development. These comments will be used as we develop the proposed action and alternatives for the planning process that will incorporate the acquired lands into the Dakota Prairie Grasslands Land and Resource Plan (LRMP). There will be additional opportunities for the public to be involved in this part of the process also.

This document was completed to provide a summary of the current information on the resources in the area of the Elkhorn Ranchlands Acquisition. It is not an analysis of alternatives or a proposal for future use. We hope that the readers of this summary document will use the information to provide us with their vision of what the future uses of these lands should be as we develop a range

of alternative uses that best meet the needs of the public in the revision of the LRMP. This assessment will be also be posted on-line at <http://www.fs.fed.us/r1/dakotaprairie/>.

## **Range resources**

### **Characterization**

The acquired Elkhorn Ranchlands are situated in six different allotments within the northern portion of the Medora Ranger District approximately 24 miles north of Medora, North Dakota or approximately 18 miles northwest of Fairfield, North Dakota. (Map 3) The majority of acquired Elkhorn Ranchlands acres can be found in allotments 279 and 280, for which the Eberts Ranch held grazing permits.. The total size of these two allotments is approximately 23,585 acres with a combination of National Forest Systems (NFS) Lands, Acquired Elkhorn Ranch (NFS-ACQ) Lands, Private (PTV), and State Land intermingled. The remaining acres of the Elkhorn Ranchlands acquisition can be found in allotments 128, 135, 256, and 287.

These lands have been used as a year round livestock operation. A portion of the acquired lands were intermingled with other federal, state and private lands and have been grazed by cattle and horses during the summer and fall. The season of use has been approximately May 1 through December 31. About 1000 acres of the recently acquired lands were managed in this fashion. The remaining 4200 acres were a mixture of farmland and rangeland with two home sites and other out buildings. The grazing lands were used from about January 1 through April 30 each year. These lands served as the headquarters, wintering and calving area for the operation. Winter feeding was done on some of the lands when forage or weather conditions required supplemental feeding. The permits for the livestock grazing use have been administered for the Dakota Prairie Grasslands by the Medora Grazing Association.

About 423 acres of the acquired lands were farmed or hayed in ~20 separate fields. The farming was primarily dry land, but about 160 acres are sprinkler irrigated. (Map 4)

### **Allotment 279**

Allotment 279 consists of seven different pastures ranging in size from 2270 to 157 acres and, in total, is approximately 7739 acres of rough badland topography. Based on Natural Resource Conservation Service (NRSC) soils survey and ecological sites, the carrying capacity of this allotment is approximately 1976 AUM's. The recently acquired lands make up 1247 acres of the area and 370 AUMs of the estimated capacity of allotment 279. This allotment has been permitted as a private allocation turn-in permit for 145 head for 8 months. Three of the seven pastures have historically been used from May 1 to December 31 with two pastures managed as a deferred rotation and the third used after weaning of the calves for two to three weeks. These three pastures have a good native plant species component, however, there are areas where introduced cool season species are present. The remaining four pastures within this allotment have historically been used from January 1 to April 30. These four pastures have been used for winter grazing, winter feeding, and calving.

Plant species composition is a variety of introduced cool season species (crested wheatgrass, smooth brome, Kentucky bluegrass and Japanese brome) and native plant species. The introduced

species are more prevalent in areas where there have been disturbances such as haying or winter feeding. Water developments found in this allotment included reservoirs, wells, pipeline, and spring. Allotment 279 also contains two crop and hay fields. The carrying capacity figures have not been adjusted for the cropped field or the hay field. The existing hay field is approximately 10.4 acres in size and shows signs that it hasn't been hayed for several years based on the amount of silver sage present.

### **Allotment 280**

Allotment 280 consists of nine different pastures ranging in size of 8,134 to 135 acres and totals about 15,846 acres of rough badlands. Based on Natural Resource Conservation Service (NRSC) soils survey and ecological sites, the carrying capacity of this allotment is approximately 3690 AUM's. The recently acquired lands make up 3174 acres of the area and 937 AUMs of the estimated capacity of allotment 280. This allotment has been permitted as a private allocation turn-in permit for 322 head for 8 months. Three of the eight pastures have typically been grazed from May 1 to December 31 in a deferred rotation. These three pastures have a good native plant species mix, however, there are areas within the pasture where introduced cool season species are present. The remaining five pastures have been used from January 1 to April 30. These five pastures have been used for winter grazing, winter feeding, and calving. Plant species composition is a variety of introduced cool season species (crested wheatgrass and smooth brome) and native plant species. The introduced species are more prevalent in areas where there have been disturbances such as haying or winter feeding. Within allotment 280 there are nine crop fields, eleven hay fields, and a gravel pit. The carrying capacity estimates have not been adjusted for the crop and hay fields present within allotment 280.

### **Other allotments**

The other four allotments effected by the Elkhorn Ranchlands Acquisition are presently being grazed during 1<sup>st</sup> of May to the 31<sup>st</sup> December. These three allotments are also set in the rough badlands topography. The acquired Elkhorn Ranchlands in these four allotments do not have any water developments and the only improvements are barbed wire fences. Based on Natural Resource Conservation Service (NRSC) soils survey and ecological sites, the estimated carrying capacity of the acquired lands in these allotments is approximately 101 AUM's as shown on the following Table:

*Table 1. Acres of NFS lands in Allotments*

<b>Allotment</b>	<b>Acres of NFS-ACQ within Allotment</b>	<b>AUMs</b>
128	140	27
135	431	27
256	82	16
287	125	31

### **Reference Conditions**

Reference conditions would be indicated by proper soils stability, hydrologic function, and biotic integrity for the complex of ecological sites or habitat types found within the Elkhorn Acquisition project area. Although not completed for the Land Management Resource Area (LMRA) of 58C, Badlands, the desired condition would be found within the ecological site descriptions. Desired conditions for habitat types have been developed and can be found within the Ecological Sites and Habitat Types of the Little Missouri National Grassland and Western North Dakota (Draft II) (Jensen et al. 1992). Also see botany, wildlife, soils, and hydrology report for reference conditions.

### **Synthesis and Interpretations**

Proper soil stability, hydrologic function, and biotic integrity are important to the health of the grasslands. There is a need to perform a range inventory of the Elkhorn Ranchlands Acquisition study area. The information gained from this inventory would help identify resource conditions that deviate from the reference conditions. From this inventory a proper stocking rate and the proper time to graze these pastures would be determined as well as the potential native vegetation that could be re-established on the areas that are currently being farmed or hayed. This inventory would also identify which range improvements are important for proper livestock distribution and which range developments may be contributing to a resource issue. Also see vegetation/botany, wildlife, soils, and hydrology reports.

There are several options for the use of the grazing capacity on the acquired lands and the associated allotments. All or some of the capacity could be used as a “forage reserve” for the current members of the Medora Grazing Association that would provide for pasture that could be used if their other pastures were unavailable, such as when restoration activities are being conducted or wild fire had occurred in their normal use area. The capacity could be allocated to current association members and added to the current permit to the association, or some or all of the capacity could be set aside for resource protection or to enhance wildlife and watershed resources.

## **Vegetation/Botany**

### **Characterization**

Botanical resources of the Elkhorn Ranchlands acquisition were assessed through analysis of GIS landscape-level modeling that estimate existing and potential vegetation respectively referenced as dominance type groups and habitat types. Both of the type layers are estimates across the landscape and do not reflect precise species compositions on a specific piece of ground. Assessments were also conducted from aerial photographs, personal knowledge of the general landscape within and surrounding the Elkhorn Ranchlands acquisition, and reports from brief visits by co-workers. Plant communities are characterized by species composition and dominant growth forms of grassland, shrubland, and woodland.

### **Current Conditions**

The largest acquired parcel containing the Elkhorn Ranchlands is bisected by Blacktail Creek just above its confluence with the Little Missouri River. Flood plains and lower level terraces along the Little Missouri River and Blacktail Creek support almost 100 acres of riparian woodland habitat ranging from stands of plains cottonwood and coyote willow saplings along active gravel bars, to linear bands of mature plains cottonwood and Rocky Mountain juniper trees on terraces above the channels, to mixed and denser stands of plains cottonwood, Rocky Mountain juniper, and green ash furthest from the channels. The riparian communities are most extensive along the Little Missouri River but also occur along Blacktail Creek in greater prominence than is usually observed on similar drainage reaches throughout the national grassland. Two of the three smaller acquisition parcels contain no riparian woodland, but one of the parcels at the upstream end of Whitetail Creek contains a moderate sized woodland stand.

Shrub layers that typically develop among the later seral stages of riparian woodlands appear to be under-represented on the acquired lands, and non-native grasses with varying degrees of invasiveness include smooth brome, crested wheatgrass, Kentucky bluegrass, and Japanese brome, as well as invasive sweetclover. Noxious weeds such as leafy spurge, Canada thistle, and wormwood are also present. Livestock have been pastured in the general area of the woodlands during the winter months and some areas have probably experienced heavy trampling and mechanical damage. Approximately 140 acres of potential woodland habitat has been converted to agriculture.

Upper level terraces above the Little Missouri River and major drainages with relatively broad valleys and deep soils support large communities of silver sagebrush. Understory grasses include native western wheatgrass and needlegrass species intermixed with the above named invasive grasses, which also form dense patches where they have gained dominance. Noxious weeds such as Canada thistle and leafy spurge are also present. Winter pasturing and feeding of livestock has also occurred in these communities in the main Elkhorn Ranchlands parcel, which has likely assisted the spread of invasive grasses and weedy broadleaf species such as kochia, various mustards, and pigweed. More than 100 acres of the silver sagebrush / western wheatgrass habitat type has been converted to agriculture.

Several tributary drainages flow from the uplands into Blacktail Creek and the Little Missouri River in the main Elkhorn Ranchlands parcel, and into Whitetail Creek and Mikes Creek in the three smaller parcels. These upland drainages support over 400 acres of green ash – American elm / chokecherry that are referenced as woody draw communities. Canada thistle and common burdock are present in several of the woody communities and similar to most if not all woody draw communities across the LMNG, invasive Kentucky bluegrass has become the dominant species in the understory, which likely has an adverse impact on woody species regeneration. In general, the condition of these communities increases with increasing distance from water for livestock, ruggedness of the surrounding terrain, and relative proportion of woody communities in the immediate landscape. Woody draw communities tend to be in better ecologic condition in the three smaller acquisition parcels compared to the main ranch parcel, but they are less well represented, in part due to the prominence of Rocky Mountain juniper communities in these parcels.

Dense stands of Rocky Mountain juniper comprise a distinct type of woody community that tends to occur in rugged topographic settings and north aspect slopes. Green ash trees and several shrub species can be scattered among the Rocky Mountain juniper, especially along the toe slopes above drainages. There are 400-500 acres of Rocky Mountain juniper communities, with the majority occurring among the more rugged and dissected topography of the three smaller acquisition parcels. These communities tend to be in good to excellent ecologic condition due to difficult access and infrequent or low severity disturbances among the rugged topography.

Upland sideslopes along drainage valleys and relatively level benches, ridgelines, and plateaus support 1,800 acres of upland grass communities. Native plant compositions are dominated by western wheatgrass, green needlegrass, needle and thread, and blue grama, but invasive grasses have also infested significant portions of these communities along the lower and most accessible topographic positions. Scattered patches of Canada thistle and leafy spurge are also present. Some of these communities have also been cut for hay and/or have been used for winter livestock feed areas. Native grasses generally persist as dominants in the higher topographic positions and within the three small acquisition parcels, but rangeland assessments coupled with satellite imagery indicated that more than half of these communities were at a low production levels relative to their potential during the late 1990s (USDA Forest Service, 2001). Inclusions of less developed soil support little bluestem, prairie sandreed, sideoats grama, and the low shrub creeping juniper. Small shrub inclusions include aromatic sumac, gooseberry, buffaloberry, chokecherry, and snowberry.

Prominent landform features of exposed parent material comprise the most rugged habitat involving steep unstable slopes and escarpments above the present and historic Little Missouri River channel, and among the more heavily dissected topography of the three eastern acquisition parcels. About 600 acres of this habitat supports sparse shrub communities of Wyoming big sagebrush and spiny saltbush, while 250 acres is referenced as barren lands with little or no vegetation cover. Difficult access and low forage value results in minimal human related disturbances to these habitats.

No known sensitive plant populations are documented among the four Elkhorn parcels but potential habitat is present for all thirteen of the listed species. Most of this potential habitat involves the driest or harshest environments with sparse vegetation cover, but alluvial deposits

along the Little Missouri River and major creek channels also present habitat for some species. At least two spring developments present potential habitat for the only wetland sensitive species and several watch plant species. One of these spring areas is invaded by smooth brome.

### **Reference Conditions**

The most obvious departure of existing conditions to potential conditions involves lands within the main Elkhorn Ranchlands parcel along the Little Missouri River, Blacktail Creek, and relatively low topographic positions that have been converted to agriculture or become dominated by invasive species. Approximately 400 acres of agricultural land has affected the extent of green ash / snowberry, silver sagebrush / western wheatgrass, and western wheatgrass – green needlegrass habitat types.

Additionally, approximately 215 acres of land has been directly disturbed by oil and gas developments and related access roads and utility corridors that have impacted native vegetation through the loss of plant cover and assisted in the spread or introduction of invasive plant species. These infestations have tended to occur in the most vegetatively productive sites along lower topographic positions with good soil characteristics. The amount of infested acreage has not been determined but could easily involve 1000 acres or more. The lower topographic positions above the drainages would likely have exhibited more extensive stands of western wheatgrass and green needlegrass relative to the present occurrences and/or dominance of invasive grasses. Big bluestem, which is only found in trace amounts on the grasslands today, may have been much more extensive within these productive bottomlands. Invasive/noxious species appear less frequent within the three smaller pieces of the Elkhorn Ranchlands acquisition due to more rugged topography that limits access and human related disturbances.

Active fire suppression has decreased historic fire frequencies and this has undoubtedly affected the extent of the various woody species communities. Differences in the riparian woodland acreage from reference conditions is probably the least affected, but it is likely that communities of Rocky mountain juniper, silver sagebrush, and woody draws are more extensive today relative to historic times.

### **Synthesis and Interpretation**

About 140 acres of riparian woodland in the Elkhorn Ranchlands parcel that has been converted to agriculture could be actively restored through direct tree planting. These areas could possibly be restored passively by allowing the agriculture fields to naturally re-vegetate, but rapid invasion of the fields by native and invasive grasses and weedy forbs could largely inhibit successful tree establishment. Portions of Whitetail Creek in two of the smaller acquired parcels should also be supporting riparian woodland communities and these might be most easily restored through changes in the timing, duration, or number of grazing livestock. At least moderate levels of tree regeneration observed along riparian areas in the main ranch parcel where livestock are pastured in the winter support the theory that winter grazing allows greater regeneration of these species compared to summer grazing. Headwater areas of Mikes Creek in one of the smaller acquired parcels are probably not capable of supporting riparian woodlands due to steeper gradients and poor retention of available moisture.

It is unrealistic to believe that all invasive grass communities could be eradicated from the acquisition parcels in order to return the system entirely to native species compositions. However, site specific measures could be incorporated to re-establish native species as opportunities such as final reclamation of abandoned well sites or access roads arise, relatively isolated infestations are identified, or infestations are identified that appear to be expanding into uninfested communities of relatively high condition. Control of invasive grasses would likely require herbicide treatments, and high levels of infestation where native species have largely been extirpated would require reseeded.

## **Noxious Weeds**

### **Characterization**

The Medora Ranger District performed an assessment of the newly acquired Elkhorn Ranchlands in the summer 2007. This assessment was to get an idea of what noxious weed species were present and how much. A two to three person crew physically walked and GPS'ed the location of each weed species. The information was then integrated into the Medora Ranger Noxious Weed data base for allotments 279 and 280.

### **Current Conditions**

Historical data and the assessment of 2007 showed seven different noxious weeds were present within allotments 279 and 280. Five of the seven species were found on the NFS-ACQ lands with leafy spurge (*Euphorbia esula* L.) being the most abundant species. The most abundant weed species found on the NFS lands was Canada thistle (*Cirsium averense* L.). Four of the seven species identified are state noxious weeds in North Dakota and the other three are listed as county noxious weeds in Billings County.

Location of these noxious weed species varied in location along the landscape, however, the majority of these species are found along the Little Missouri River, Whitetail Creek, and Blacktail Creek (riparian habitat) and within woody draws. Current control of these noxious weed species has been through a cooperative weed agreement with the Billings County Weed Board and the Forest Service on the NFS lands, however, on the newly acquired Elkhorn Ranchlands, the past and current permittees have initiated control. Control agents have been herbicides, biocontrol, and some mechanical. Biocontrol has been used in the control of leafy spurge by past owners of the Elkhorn Ranch.

### **Reference Conditions**

Desired conditions would be proper soils stability, hydrologic function, and biotic integrity for the complex of ecological sites or habitat types found within the Elkhorn Ranchlands Acquisition project area. Within these desired condition there would be no noxious weeds present or the density of the noxious weeds would not affect soil stability, hydrologic function, and biotic integrity of the ecological sites or habitat types.

## **Synthesis and Interpretations**

The location and amount of noxious weeds inventoried are having some type of an affect on the soil stability, hydrologic function, and biotic integrity of the ecological sites or habitat types within the study area, although not all. A majority of these species were inventoried within woody draws, along Blacktail and Whitetail Creeks, and along the Little Missouri River. The results from research studies and reports from other states indicate that the species of noxious weeds inventoried are of concern to the ecology of the grasslands.

## **Heritage Resources**

### **Characterization**

Native American Indians inhabited the Northern Great Plains for 12,000 years before Euro-Americans first visited the region. Early accounts by fur trappers, explorers and other travelers to the area, mention vast herds of bison, abundant elk, deer and antelope and Audubon sheep. Plains grizzly bear were also present. From the 1600s to the 1800s, Northern Great Plains indigenous people tolerated these temporary incursions by a small number of whites. But during the early 1860s, gold strikes in Idaho and Montana territories, lured adventurers, entrepreneurs and settlers further west. The Northern Plains Frontier which formerly began in Minnesota shifted as pioneers began to swarm to the more distant western territories. Except for sporadic development along the Missouri River, the Frontier leapfrogged the Dakotas which did not experience settlement for another quarter century. Plains Indian tribes, who continued to range freely, deeply resented the intrusions and threatened travelers as they crossed the Dakotas. Tribes were also vehemently opposed to the intended railroad. The US government responded by committing more military units to escort westward bound immigrants. Army officers also negotiated tribal treaties; the most well-known of which is the 1868 Fort Laramie Treaty which established the Great Sioux Reservation in present day South Dakota.

In the early morning hours of September 8, 1883, Theodore Roosevelt first arrived by train at Little Missouri village (sometimes called Comba) located on the west side of the Little Missouri River. He spent the remainder of the night at the Pyramid Park Hotel. The railroad was trying to attract tourists to the Badlands and wanted to rename the town Pyramid (badlands topography slightly resembles pyramids). Initially Roosevelt came to Dakota Territory to hunt bison and other big game. Although bison had been all but exterminated, the region was still considered frontier. He was also interested in the cattle business having earlier purchased a partial interest in a ranch in Colorado. In 1884 Roosevelt came back to the Badlands and acquired the Maltese Cross Ranch. He also discovered a second ranch location 35-miles north of Medora. On a subsequent visit, Roosevelt found the remains of two bull elk that had locked horns while fighting and starved to death. He named the place the Elkhorn Ranch, brought in a management team from Maine and had an eight room, 60 ft x 30 ft house built with the veranda facing the Little Missouri River. From Roosevelt's writings, it is clear he regarded the Elkhorn Ranch as his Dakota home.

At that time most of the cattlemen owned little or no land. They built homes, but did not hold legal title to the property on which they grazed their herds. A rancher was by custom entitled to a swath of land four-miles upriver and four-miles downriver from his headquarters, while the eastern and western boundaries from the river were extended indeterminately. Roosevelt held property under this informal land tenancy. He invested approximately \$82,500 in the Maltese Cross and Elkhorn ranches and at the peak owned between 3,500 to 5,000 cattle. Active in the local community, he became the first president of the Stockmen's Association based in Medora. In the early-1880s, the cattle business in the Little Missouri and Missouri Plateau regions flourished until the summer drought of 1886 that further reduced an already scanty supply of grass. The following winter was disastrous; ranchers across the Northern Plains lost 60-75% of their herds. Many cattlemen gave up including the Marquis De Mores who went back to France. Roosevelt downsized, reorganized, and kept up ranch operations until 1898. Some ranchers including Pierre Wibaux and Huidekoper also continued to function. Huidekoper was the last to go, with his selling the HT Ranch in 1905, the era of the cattle baron was over (Brooks and Mattison 1958, Albers and Tweton 1999, Jenkins 2006).

### **Current Conditions**

Historic values associated with Theodore Roosevelt's former Elkhorn Ranch were the major reason the USDA Forest Service purchased the Ebert property in 2007. As noted earlier, the remains of the original Elkhorn Ranch buildings are located on west side of the Little Missouri River, opposite the Ebert's property, and part of Theodore Roosevelt National Park. Most of the Ebert Ranch buildings are of fairly recent vintage and not historically significant. Two dilapidated sheds and a Homestead Era cabin retain some significance. Through time, owners have modified the original setting by agricultural practices. At present oil production facilities and noisy pump jacks further degrade the historic landscape.

Given the general subsistence and life-way patterns of Native Americans on the Great Plains, Forest Service archaeologists expect to find prehistoric, protohistoric and perhaps sacred sites on the property. On previously surveyed DPG allotments, rangeland improvements and associated livestock trailing and trampling caused an estimated 45% damage to archaeological sites, (see Floodman and Kurtz 2000). This percentage of site impact will probably hold true for the un-surveyed Ebert property and adjacent allotments. Ecologically there has been a reduction of native flora and faunal diversity from the Reference Period, and an increase in invasive and non-native species.

## **Reference Conditions**

For heritage portion of this assessment, the Forest Service is defining the Reference Period as the 1880s. In 1883 bison were scarce when Theodore Roosevelt first came to the Badlands to hunt, although the region was still considered Frontier. By the close of the 1880s, Roosevelt had witnessed the rapid degradation of the Badland's environment with many plants and animals gone or facing annihilation. Overgrazing by cattle had eroded the soil and once abundant grasses. It was during this period Roosevelt formulated his ideas on the need for conservation. Reference Conditions consisted of heavily cropped grasses of buffalo grass and blue gramma that dominated mid-size mixed grasses. This vegetation mix was present when Theodore Roosevelt was in residence. Earlier bison herds more frequently grazed the area because of the availability of Little Missouri River water (Severson and Hull Sieg 2006). Access to water for livestock was also a prime attraction for later ranchers.

## **Synthesis and Interpretations**

The property is of major historical significance because of its former association with Theodore Roosevelt. A figure of international stature, his credentials include being one of the greatest US Presidents as well as a statesman, conservationist, war hero, scholar, sportsman and author. For the next three years, the Dakota Prairie Grasslands proposes the following actions:

- Nominate and place the former Elkhorn Ranch on the National Register of Historic Places as a National Landmark (the DPG intends to first negotiate a Programmatic Agreement with the Advisory Council to insure no additional legal burdens are placed on the property).
- Carry out an archaeological survey of the property to locate and record historic and prehistoric resources.
- Complete a Heritage Management Plan for the Elkhorn Ranch.
- Finish a comprehensive Interpretive Plan.

The National Park Service property containing the remains of the former ranch buildings could also be included in the National Landmark designation. Archaeological survey efforts will focus on locating and recordation of new sites and site mitigation. We will survey areas containing cropland after the ground is plowed. Heritage will focus on researching and producing a historic context document detailing the life, ranching efforts and conservation accomplishments of Theodore Roosevelt. Opportunities exist for historic interpretation and historic tourism most probably in conjunction with associated future recreation facilities.

The landscape or viewscape is currently degraded; however, DPG management intends to bring the land back to the Reference Conditions. This will require restoring cropland to native grasses; seeding crested wheatgrass with more native species and controlling for smooth brome, yellow sweetclover and Kentucky bluegrass (Svingen 2007, personal communication). Screening mineral production facilities and muffling pump jacks ought to be part of this landscape restoration effort. The two ramshackle sheds, on the Ebert property, should be properly documented and removed, while the log cabin researched, documented and perhaps renovated for reuse.

## **Recreation**

### **Characterization**

Theodore Roosevelt initially came to Dakota Territory to hunt bison and other big game, and found peacefulness and solitude that was needed in his life. Hunting and solitude are two major recreation opportunities that people seek today.

### **Current Conditions**

The four miles of county road that are currently open to the general public for motorized travel provides the opportunity for the visitor to drive for pleasure - the most participated in recreation activity on National Forest System lands since the 1960's. The remaining 19 miles of road that are in the recently acquired area are currently closed to the public but the lands are available for non-motorized recreation. Most of these roads, along with the additional 23 miles of existing roads that are in the assessment area, are used in the ranching and oil and gas operations. A short segment of the Maah Daah Hey trail also traverses the assessment area. Based on the number of inquiries, hunting is likely to continue to be popular in the assessment area and on the newly acquired land as well.

### **Reference Conditions**

For the recreation portion of this assessment, the reference period is the late 1800s, during the time that Theodore Roosevelt lived and worked in the area.

### **Synthesis and Interpretations**

There is a wide range of recreation opportunities possible on the Elkhorn Ranchlands property, from the most primitive to highly developed. It is possible that the public would prefer recreation that allows them to enjoy the land in its reference condition, providing the solitude and wildlife viewing/hunting opportunities that Theodore Roosevelt was seeking when he came to this area, or there may be a desire to have a more developed recreational opportunity established in the area. It is our hope that the public involvement process will help us to define the future management of this area.

## **Soils/Watershed**

### **Characterization**

The Elkhorn Ranchlands is situated in the heart of the Little Missouri Badlands approximately 24 miles (40 kms) north of Medora, North Dakota, near the north end of the Medora Ranger District of the Little Missouri National Grassland. It is located on the east side of the Little Missouri River. The landscape is characterized by badlands topography—steep, sparsely vegetated hillslopes composed of readily eroded, lower Tertiary sedimentary rocks and Quaternary alluvial deposits.

## Hydrology

Most of Elkhorn Ranchlands is in the lower and middle reaches of Whitetail Creek and Blacktail Creek watersheds, and includes a 640 acre parcel in the upper Mikes Creek drainage. These and many other streams in the Little Missouri Badlands are characterized by high, flashy runoff (meaning the streamflow rapidly increases after the onset of summer rainstorms and quickly abates), short hydroperiod (meaning streams flow for only a short period after rainstorms, though water may be held for extended periods in deep, instream palustrine basins), steep gradients, erosive energy potential, high suspended and bed sediment loads, and dynamic channel behavior.

**Figure 1 and Figure 2**



**Figure 1.** Reach of Whitetail Creek. Channel has incised 20-30 feet in this reach. The water table typically falls, alluvial aquifers drain, riparian vegetation is sparse, and sediment movement is great in incised channels.



**Figure 2.** Another reach of Whitetail Creek shows an extremely high W:D ratio, low sinuosity, copious recent sedimentation, and paucity of riparian vegetation.

Many stream channels in the Little Missouri Badlands are deeply incised, have low sinuosity, have high width:depth ratio, and are sparsely vegetated in the riparian area (Figs. 1 and 2). Incision may result from management activities, such as overgrazing, channel straightening, or concentrated runoff from road construction; or it may result from natural processes, such as meander cutoff, climatic fluctuations with concomitant changes in vegetative cover throughout the watershed, or episodic transport of accumulated sediment in an oversteepened reach. However, the potential and desired condition is for channels to be at geomorphic equilibrium with a low width:depth (W:D) ratio, high channel sinuosity, and banks well vegetated with obligate and facultative riparian plants (Fig. 3).

**Figure 3.**

Streams in equilibrium with the environment are meandering, have a low W:D ratio (i.e., deep channels), are protected from high-energy streamflows by abundant cover of riparian vegetation on the banks, and transport low amounts of suspended sediment and bed load. Beaver dams, such as the one here, are common in reaches where stream sediment load are not excessive.



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**Soils**

Soils in the Little Missouri Badlands generally fall into two broad categories: those that are weakly developed because rates of geologic erosion are high in comparison to rates of pedogenesis, and those that are moderately to moderately well developed on landforms that have low rates of geologic erosion.

**Current Conditions**

**Hydrology**

The project area contains 3.9 miles of perennial stream (Little Missouri River) and 25 miles of intermittent streams (Whitetail Creek, Blacktail Creek, and Mikes Creek). Each intermittent stream is fed by scores of short, steep, ephemeral channels and drainage ways.

Most of the Little Missouri River through the Little Missouri National Grassland is in private ownership, therefore its riparian condition is largely outside the control of US Forest Service. Acquisition of the Elkhorn Ranchlands provides the US Forest Service with one of its largest contiguous blocks of ownership of river-front property and a rare opportunity to actively manage the bottomland community of a Great Plains river. This reach of the Little Missouri River has not yet been evaluated using the Proper Functioning Condition (PFC) protocol (Prichard et al., 1998).

Whitetail Creek, Blacktail Creek, and Mikes Creek have been evaluated using the PFC protocol. The current status of riparian condition is shown on map 5.

Two developed springs, both emanating from a Tertiary lignite seam, have been located on the Elkhorn Ranchlands. Both are in relatively good physical shape, although annual and noxious weeds and invasive grasses are abundant. These and other springs support diverse riparian communities that occur on a relatively small (<1%) part of the landscape. These springs serve as important sanctuaries for many amphibians and reptiles.

## **Soils**

Soils have been mapped by the Natural Resources Conservation Service (NRCS). The soil maps for Billings County, North Dakota, which includes the Elkhorn Ranchlands area, are available online from the NRCS Soil Data Mart: <http://soildatamart.nrcs.usda.gov/>.

## **Reference Conditions**

### **Hydrology**

Gonzalez (2001a, 2001b) and Biek and Gonzalez (2002) have studied and described the character and processes of streams in the Little Missouri Badlands. Periods of natural channel incision with accelerated rates of erosion and high rates of sediment movement are common in the Holocene epoch, but they tend to be relatively short-lived and separated by longer periods of relative geomorphic stability and low rates of gradual channel aggradation.

In areas that have low road densities, moderate grazing pressure, and rotational grazing systems with long rest periods (which would simulate grazing by native ungulates prior to European settlement and prior to the development of range infrastructure), streams of the Little Missouri Badlands had relatively high sinuosity (sinuosity is ratio of channel length to valley length) of 1.5 or greater; a relatively low width to depth ratio, development of well vegetated point bars, establishment of a dense riparian plant community dominated by obligate wetland sedges, rushes, bulrushes, and spike rushes in the channel and lower banks and facultative wetland forbs and grasses in the upper bank and floodplain. In addition, riparian trees, such as plains cottonwood, coyote willow, peach-leaf willow, and box-elder would be common in those reaches capable of supporting trees—i.e., those with neutral to near neutral pH and a readily available supply of shallow groundwater. Trees, where present, should show multi-age stands and multi-story structure. Recruitment of seedlings would occur episodically as climatic and hydrologic conditions permit.

Tributary drainages would go through short-lived episodes of erosion with relatively long periods of stability and gradual aggradation. Erosion of low-order tributaries would likely proceed with channel incision or formation of a deep gully. Erosion would continue through headward migration of a nickpoint or headwall retreat.

## **Soils**

Soil is the foundation of plant growth, which in turn is the basis for developing vegetative structure and forage to meet needs of fauna. The desired conditions will vary by site potential. Tight, clay-rich, and shallow soils with little moisture-retention capacity may be dominated by shrubs and relatively low annual forage production (less than 700 lbs/acre), whereas loam, silt loam, sandy

loam and other medium-textured, deep soils with high moisture-retention capacity should support a herbaceous community, dominated by native grasses and capable of annual forage production exceeding 2000 lbs/acre. Run-on sites, such as subirrigated soils or overflow sites that receive runoff water from surrounding landforms, may contain trees, such as green ash, wild plum, chokecherry, aspen or may be dominated by native grasses and wetland riparian plants (e.g., obligate and facultative wetland sedges, rushes, bulrushes, and spikerushes) capable of annual forage production exceeding 2500 lbs/acre.

The degree of rilling, gullying, pedestalling, and bare ground exposure will vary with site potential too. Steeper sites are more prone to erosion from running water, and soils capable of growing more biomass are likely to have less exposed bare ground.

The potential natural plant communities, average forage production estimates, and degree of erosion or exposed bare ground for each ecological site or habitat type have been or are currently being determined by the NRCS as part of a FS/NRCS interagency agreement in 2007. This study should conclude in 2009. The desired soil and plant conditions are also captured in the Little Missouri National Grassland Range Assessment study (USDA Forest Service, 2002), based on nearly 2000 ecological and 900 soil study plots. Plots were selected on their perception of containing plant communities that were at or near potential natural vegetation.

## **Synthesis And Interpretations**

### **Hydrology**

Adverse impacts to the hydrology of the area are generally attributable to:

- Road construction and development of oil-field infrastructure;
- Concentration of livestock in riparian areas, especially stream channels and springs;
- Loss or absence of beavers in perennial and some intermittent stream channels;
- Construction of dugout and stock ponds, which alters natural hydrologic processes; and
- Shifts in plant communities, which can alter infiltration and runoff rates.

Alteration of upland hydrology has had a noticeable and detrimental impact on channel conditions in the project area. Alterations appear to be related to the relatively dense network of roads serving a mature oil field (Fig. 8) and from alterations in rangeland hydrology attributed to undesired changes in plant communities. Changes in vegetation generally reflect a long-term lack of fire related to 120 to 150 years of active fire suppression. Rocky Mountain juniper, silver sagebrush, and buckbrush in particular have invaded areas that should be dominated by native graminoid species.

### **Soils**

The soil resource is affected by runoff erosion, particularly where roads and facilities have altered overland hydrology and concentrated runoff.

Soils are also adversely affected in those riparian areas where cattle congregate. Moist soils are readily compacted by cattle hooves. Dry soils are far more resilient and generally unaffected by hoof action.

Excess alkalinity and salt accumulation is locally problematic, especially where rangeland moisture is poorly conserved and allowed to move through shallow soils and discharge in or near riparian areas. This problem can be partially or completely alleviated by promoting more vigorous plant growth to better use and conserve soil moisture.

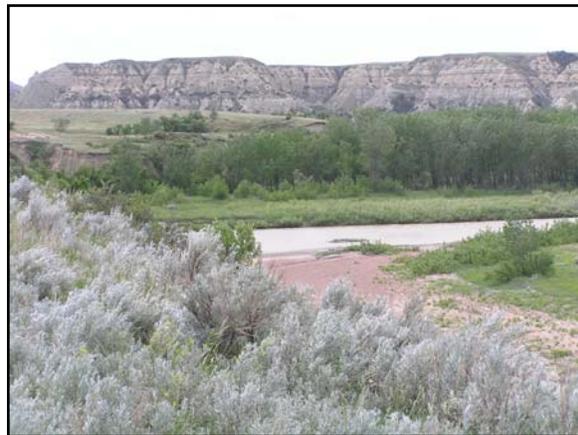
## **Wildlife and Fishery Resources**

### **Characterization**

The Elkhorn Ranchlands and surrounding National Forest System lands supports a wide variety of wildlife and fish species. That variety is due to the diversity of habitats present, ranging from the rimrock of sparsely vegetated clay buttes, to the main channel of the Little Missouri River. Because of this complexity, the following discussion will be subdivided as: mammals, birds, fish, and other.

### ***Figure 4***

Little Missouri National Grassland. Photo courtesy of Brett Wiedmann, North Dakota Game and Fish Department.



### **Current Conditions**

#### **Mammals**

From a statewide perspective, the Elkhorn Ranchlands and surrounding National Forest System lands support a relatively complex and intact mammalian community. Big game species, a favorite quarry of Theodore Roosevelt, are particularly numerous. White-tailed and mule deer, as well as pronghorn, are regularly seen. Bighorn sheep habitat does occur within this project area, albeit to a limited extent. No bighorn sheep regularly use the Elkhorn Ranchlands or adjacent grazing allotments. Extensive, and occupied, bighorn sheep habitat is available just outside the project area (Brett Wiedmann, North Dakota Game and Fish biologist, pers. comm.). Elk too are occasionally present, in and near the Elkhorn Ranchlands.

The Elkhorn Ranchlands and surrounding areas are known, or suspected to support mountain lion, bobcat, coyote, red fox, badger, raccoon, long-tail and short-tail weasels, and whitetail jackrabbit; as well as desert, mountain, and eastern cottontail rabbits (Sovada and Seabloom 2005). The bulk of the Elkhorn Ranchlands' mammal species, however, are rodents (Seabloom et al. 1978, Leonhart and Sweitzer 2005). Both beaver and porcupine can be found here, as can thirteen-lined ground squirrel, northern pocket gopher, and bushytail woodrat. Relatively little is known of the project area's bat community, but recent surveys conducted elsewhere in the Little Missouri badlands suggest that a greater variety of species may be present than previously believed (Tigner 2006).

No threatened or endangered mammals occur on or near the Elkhorn Ranchlands (Hagen et al. 2005, Sovada and Seabloom 2005). Black-tailed prairie dogs, a sensitive species, do not currently

reside on or near the Elkhorn Ranchlands, although at least half of the total acreage on the Elkhorn Ranchlands and adjacent grazing allotments are suitable habitat for prairie dogs (Svingen 2006), especially along the drainage bottoms. Other than the prairie dog, the only mammalian species of conservation priority that might be present in the project area are: western small-footed myotis, long-eared myotis, long-legged myotis, and sagebrush vole (Hagen et al. 2005). Potential habitat is also available for both swift fox and river otter.

## **Birds**

Approximately 300 bird species have been recorded on the Little Missouri National Grassland (Svingen and Martin 2004). The majority of these species are known or suspected to occur on the Elkhorn Ranchlands and vicinity. Turkey vulture, golden eagle, prairie falcon, red-tailed hawk, and great horned owl all nest here. Other nesting raptors present include: Northern harrier, American kestrel, Swainson's hawk, and Cooper's hawk. Additional migrant raptors include: peregrine falcon, rough-legged hawk, and bald eagle. Of particular note are popular gamebirds such as ring-necked pheasant, gray partridge, wild turkey, and sharp-tailed grouse. Recent surveys on the Elkhorn Ranchlands property revealed the presence of a "lek" or "dancing ground", which is used by the grouse for courtship displays, each spring.

No threatened or endangered birds occur on or near the Elkhorn Ranchlands, but several species of conservation priority do (Svingen and Martin 2004, Hagen et al. 2005). In addition to many of the birds already mentioned, these include: Northern pintail, canvasback, redhead, upland sandpiper, black-billed cuckoo, red-headed woodpecker, loggerhead shrike, lark bunting, grasshopper and Baird's sparrows, chestnut-collared longspur, dickcissel, and bobolink. The Sprague's pipit, which is both a sensitive species and a species of conservation concern, is also present.

## **Fish**

Fish habitat is limited on and near the Elkhorn Ranchlands, being comprised mostly of the mainstem Little Missouri River, as well as perennial stretches of Whitetail and Blacktail creeks. Habitat quality, however, is relatively high, particularly on the Little Missouri River. Approximately 42 fish species have been documented in the Little Missouri River within North Dakota (Brooks 2005), including such game species as: black bullhead, black crappie, bluegill, northern pike, orange-spotted sunfish, sauger, and yellow perch (ibid). Flathead chub, plains minnow, sand shiner, creek chub, lake chub, fathead minnow, and northern redbelly dace are among the non-game species found within the Whitetail drainage. The fish community in the Blacktail drainage has not been sampled, though incidental observations confirm the presence of fish there (Dr. Mark Gonzalez, hydrologist, pers. comm.).

No threatened or endangered fish occur on or near the Elkhorn Ranchlands. One species, the northern redbelly dace is listed as sensitive. Species of conservation priority include both the northern redbelly dace, and the flathead chub.

## **Other**

This section covers amphibians, reptiles, and invertebrates. The Elkhorn Ranchlands and surrounding area do not contain any threatened or endangered species within these categories. The project area does, however, provide occupied or potential habitat for several species of

conservation priority, some of which are also designated as sensitive species by the US Forest Service.

Species of conservation priority that might be present include: plains spadefoot, common snapping turtle, northern sagebrush lizard, short-horned lizard, and western hognose snake (Seabloom et al. 1978, Leonhart and Sweitzer 2005).

The only local systematic investigations of the project area’s invertebrates have focused on butterflies. Tawny crescent and Ottoe skipper (both sensitive species) are known to occur elsewhere on the Little Missouri National Grasslands (Royer 2004), and likely could be found on the Elkhorn Ranchlands as well. It is less likely, though still possible, that regal fritillary or Dakota skipper (both sensitive species) are present there.

### **Reference Conditions**

#### **Mammals**

The Elkhorn Ranchlands and surrounding National Forest System lands support a relatively complex and intact mammalian community. Nevertheless, several species have been extirpated, or greatly reduced, since Euro-American settlement. Extirpated species include: black-footed ferret, river otter, grizzly bear, gray wolf, swift fox, black-tailed prairie dog, bison, and bighorn sheep.

**Figure 5**

Bighorn sheep, Little Missouri National Grassland. Photo courtesy of US Forest Service, Dakota Prairie Grasslands.



Mountain lion, beaver, and elk are present on the Elkhorn Ranchlands, albeit at likely much lower numbers than what would have occurred historically.

#### **Birds**

It is unlikely that many bird species have been extirpated from the Elkhorn Ranchlands or vicinity. The most likely candidates would be those associated with black-tailed prairie dog colonies, such as the burrowing owl and mountain plover.

Bird habitat quality on and near the Elkhorn Ranchlands is a function, in part, of the variety of vegetative communities and structural stages that are present. Currently, much of the Elkhorn Ranchlands is grazed only during the non-growing season. As a result, large tracts of relatively dense, undisturbed cover are available during the summer months. This contrasts with the adjacent National Forest System lands that have been grazed during the growing season every year for over

a century. In those areas, little residual cover is available to ground-nesting birds in the spring, or to ground-dwelling birds in the autumn and winter.

Arguably the most critical bird habitat on the Elkhorn Ranchlands is the cottonwood gallery forest along the Little Missouri River. This type of habitat has been greatly reduced in many portions of the western United States due to agricultural and urban development, riparian channelization, stream diversion, and reservoir creation. In addition, recruitment of new cottonwood gallery forest is often hampered by annual livestock grazing during the growing season.

### **Fish**

Fish habitat quality on and near the Elkhorn Ranchlands has undoubtedly changed since Euro-American settlement, though the extent of those changes is difficult to assess. Overall, the greatest limiting factors for the project area's fish communities are likely the habitat quality along Whitetail and Blacktail creeks. Reaches that are not in proper functioning condition are not meeting their potential for fish habitat. Specific concerns include: absence of beaver, loss of bank storage, historic and current overgrazing, simplification of instream structure, and downcutting. Please see the Soils/Watershed section for additional details.

### **Other**

Little is known of the quality of amphibian, reptile, and invertebrate habitat on and near the Elkhorn Ranchlands. The greatest restoration issues are likely those that impact hydrological function, and vegetative diversity and composition.

## **Synthesis and Interpretations**

### **Mammals**

General restoration efforts on and near the Elkhorn Ranchlands would undoubtedly benefit the mammalian community. Reestablishment of native grassland habitat and improvements in riparian habitat would be particularly effective. Specific actions might include: interseeding native grasses, control of invasive vegetation, incorporation of rest periods into grazing rotations, establishment of native riparian trees and shrubs, and juniper cutting and burning.

There is little or no potential to reintroduce black-footed ferret, grizzly bear, gray wolf or swift fox. River otter reintroduction would have to be part of a larger, coordinated effort throughout the Little Missouri River drainage, if not statewide. Mountain lion and elk may well expand in this area on their own. There is also potential for bighorn sheep reoccupancy, particularly if the North Dakota Game and Fish Department continues with its recent bighorn sheep transplant and augmentation program. Black-tailed prairie dogs would be relatively easy to reestablish through transplants. Similarly, beaver may be encouraged to expand and colonize new areas through transplants and creation of “starter dams.” Bison could conceivably be reintroduced, most likely as domestic livestock.

### **Birds**

Management efforts intended to benefit birds on and near the Elkhorn Ranchlands should focus on: 1) diversifying vegetative structure that remains after the grazing season, 2) restoring riparian woodland diversity and density, and 3) limiting the impact of invasive plants.

Increasing vegetative structure diversity would be especially beneficial to ground-nesting species, such as sharp-tailed grouse, wild turkey, Sprague’s pipit, and Baird’s sparrow. These species would also benefit from invasive plant reductions. Riparian woodland enhancement would increase habitat quality for a wide variety of birds, including wild turkey, black-billed cuckoo, and black-headed grosbeak. Other potential actions might include planting of woody draw mast producers (such as chokecherry, American plum, etc.) and creation of prairie falcon nests.

### **Fish**

The greatest potential for habitat enhancement is to focus on improving conditions along Whitetail and Blacktail creeks. In particular, management should focus on reducing or even reversing downcutting, as well as establishing deep-rooted riparian vegetation along these stream courses.

### **Other**

As noted above for mammals, general restoration efforts on and near the Elkhorn Ranchlands would undoubtedly benefit the amphibian, reptile, and invertebrate communities. Reestablishment of grassland habitat and improvements in riparian habitat would be particularly effective.

## **Paleontology Resources**

### **Characterization**

The Elkhorn Ranchlands and adjacent project assessment area contain potential for the occurrence of numerous fossils in the Tertiary Period, Paleocene Epoch rock strata. These rocks are composed of layers of sand, silt, clay and lignite interbedded with more resistant layers of shale, sandstone, siltstone and baked clay or clinker. These sedimentary rocks offer excellent fossil preservation and relatively easy excavation.

There are no exposures of Cretaceous Period rocks in the study area, therefore, a very remote probability of recovering dinosaur fossils such as *Tyrannosaurus rex*, *Triceratops*, *Dromaeosaurus* and *Edmontosaurus* exists.

### **Current Conditions**

There have been no inventoried paleontology surveys for the Elkhorn Ranchlands or the adjacent project assessment area. However, numerous species of Tertiary Period fossils have been identified and collected from nearby NFS lands paleontology surveys.

### **Reference Conditions**

The potential for occurrence of fossils in an area is based on the Probable Fossil Yield Classification (PFYC).

### **Synthesis and Interpretations**

The Elkhorn Ranchlands and adjacent project assessment area contain tremendous potential for the occurrence of significant vertebrate fossils (crocodiles, turtles, et.) and non-vertebrate fossils (plants, snails, etc.). The deciding factor will be the inventory of the area to assess its potential. Only after the inventory will the full potential be known.

## **Minerals (Oil & Gas)**

### **Characterization**

This minerals assessment includes all or portions of forty sections of National Forest System lands, two sections of State of North Dakota lands, and nine segments of private property for approximately 24,617.62 acres, including the 5201.13 acres of the Elkhorn Ranchlands Acquisition. The information regarding the state and private lands is general in nature, as the Forest Service does not have any authority or jurisdiction on those lands.

## **Current Conditions**

### **General**

Oil and gas exploration and development has been occurring throughout the area since the early 1970s. Wells have been permitted under several management plans over the years, and the leases as issued cannot be altered or changed to meet current plans. We must honor all valid existing rights. There have been approximately 121 wells drilled with 74 wells still producing.. New wells have been approved to be drilled and others are planned. All but portions of three sections are within four existing oil field boundaries. All of the federal minerals are currently 100 percent leased.

With the exception of the Elkhorn Ranchlands acquisition, all of the remaining oil and gas, coal, and common minerals are owned by the federal government.

There are access roads to every well site and most sites have various types of buried pipelines and buried power lines. As more and more wells are developed, the major producing areas could experience production consolidation where wells are connected to central tank batteries through a network of pipelines.

The Elkhorn Ranchlands acquisition involved 5201.13 acres, of which there are 640.85 acres of federal minerals and 4,560.28 acres of private outstanding mineral ownership. The private mineral estates (oil & gas, coal, and the common surface minerals) were not acquired during the acquisition and are held by third parties. The Forest Service agreed to honor all valid existing mineral rights. The holders of those mineral rights may explore for and develop those minerals any time they choose. The Forest Service cannot deny those rights.

The District is currently working on negotiating surface use plans of operations on all existing wells within the acquisition. Any future activity, regardless of type, must involve the Forest Service since the Forest Service is the new surface management agency.

We have received one notice of staking for a new well location since the property was acquired and it is likely that additional applications will be received given the high prices for oil and the success of the existing wells. There are 6 producing wells and 2 disposal wells within the acquisition, and 14 plugged and reclaimed well sites.

The common surface variety minerals such as scoria/clinker and gravel are also privately owned. They may be extracted or sold by the holder at their choosing. The holder would have to submit a plan of operations if they did choose to extract these types of minerals. The Forest Service cannot deny these activities.

The entire assessment area contains approximately 23,832.2 acres of which 1,660 surface acres are under private ownership, 1,260 acres under State ownership, and the remaining 20,912.2 surface acres under federal Forest Service ownership.

The mineral ownership beneath the federal surface includes 10894.33 acres of federally acquired minerals, 6098.06 acres of federal public domain minerals, and 3919.81 acres of private outstanding minerals. There are no private reserved minerals beneath the surface.(See map 6)

All of the federal acquired and public domain minerals are currently leased. The outstanding private minerals are held by a third party with rights to enter and develop as they choose.

There are 118 wells sites within the entire assessment area. 79 of the wells are still in production and 39 well sites have been plugged and abandoned.

## **Fire and Fuels Management**

### **Characterization**

The fire and fuels issues are similar for the Elkhorn Ranchlands and surrounding National Forest System lands. Fuel type, general fuel loading, topography and weather are the same across the landscape of the central North Dakota badlands. Fire will be discussed as suppression and protection issues. Fuels will be discussed as Wildland Urban Interface (WUI) and non Wildland Urban Interface issues.

### **Current Conditions**

Its been suggested that the historic fire return interval in the badlands geographic area is 15-20 years, with low to moderate severity, based on landscape, climate and fuel types. This area is predominantly Condition Class 2, where fire regimes have been moderately altered from their historic range due to missed return intervals. This has resulted in moderate changes to fire size, intensity and severity, and landscape patterns. Vegetation attributes have also been moderately altered from their historical range.

### **Fuels Management**

Fire management efforts for hazardous fuel reduction should focus on:

- 1) Wildland Urban Interface where fuel treatment actions reduce or maintain fire behavior that is consistent with Firewise objectives. This includes infrastructure such as minerals, grazing, recreation and other infrastructure.
- 2) Wildland acres where fuel treatment actions reduce or maintain fuel conditions so that wildland fire behavior is consistent with land management objectives.

Some of the infrastructure is very defensible and relatively safe from wildfire threats. Other infrastructure is in need of fuels treatments to reduce or eliminate fuel buildups that prevent successful defense of the area.

The current condition of the wildland acres is not significantly different than the surrounding area. There are opportunities to reduce some areas of hazardous fuel buildups or maintain current conditions so they do not build to dangerous levels.

As with the surrounding National Forest System lands, there are areas that have a significant influx of fuels that accelerate the speed and intensity of wildfires. These areas include sagebrush encroachment into the prairie flats and Rocky Mountain juniper and hardwood encroachment out of the various draws and off of the north slopes to the nearby flats and slopes.

## **Fire Suppression and Protection**

### Recent Fire History

The Eberts Ranch and surrounding national grasslands have had numerous significant wildland fires over the past 10 years. In 2004, the Whitetail fire burned 400 acres within ½ mile of the ranch and the 1,900 acre Magpie fire burned within 2 miles. In 2001, the Elkhorn fire occurred just across the Little Missouri River, burning 160 acres. The Blacktail fire burned over 450 acres within less than a mile of the ranch during the 2000 fire season.

Not much is known about the specific fire history in this area before 2000. The fire return interval has been determined to be an average of 15-20 years. Many of the tree species are not fire resistant and die after a major wildfire passes through the area. This eliminates traditional fire history determination methods such as core samples, tree ring counts, etc.

### Fuels Management

No management specifically for fuels has occurred in the Elkhorn Ranchlands area. A history of grazing has reduced much of the grass fuels in the winter, helping to reduce the risk to all infrastructure.

## **Synthesis and Interpretations**

### **Fire Suppression and Protection**

At this time, there are no plans to change the way fire protection is enacted. Billing County Volunteer Fire Department and the USFS will still respond to suppress all fires. Additional resources will be called in as needed from surrounding departments, the State of North Dakota and other federal agencies.

Incorporating Firewise planning practices near the houses and structures on the ranch will identify conditions that may improve or hamper emergency response, assess the vulnerability of structures to ignition, and identify the actions required to mitigate and reduce risk. This will also include

**Figure 6**  
Magpie Fire, August, 2004



defensible/survivable space planning around the various oil locations that are present on the property.

There are many opportunities for fuels management. This may or may not include the use of mechanical fuel reduction, burning, and grazing rotations. Wildland fuel treatments should focus on Rocky Mountain juniper and sagebrush where encroachment and expansion has resulted in high fuel loadings that can contribute to extreme wildland fire behavior.

## **Existing facilities/Boundary line**

### **Characterization**

The Elkhorn Ranchlands has facilities and roads that are common to most badlands ranches. It includes buildings used in the ranching enterprise and a network of roads used to access the fields and livestock management facilities on the ranch. There is also a road network associated with oil and gas development that has occurred in the area.

### **Current Conditions**

#### **Transportation System**

##### *Trails*

A short segment, 0.15 miles, of the Maah Daah Hey trail is located on the acquired land. This is a multi use trail open to hiking, horseback riding and mountain bikes. Currently there are no safety and health issues are evident on this segment of trail.

##### *Roads*

The assessment area contains fifty (50) miles of existing roads. Twenty-three (23) miles of roads exist on the recently acquired parcels. An additional twenty-seven (27) miles of road exist inside the Elkhorn Ranchlands assessment area.

On the recently acquired lands, Billings County holds a Right of Way (ROW) on four (4) miles of NFSR 719C. This route has various road standards from graded and drained gravel, to a two track road. The remaining nineteen (19) miles consist of FS roads, seven miles that are graded and drained are used for farming and oil and gas activity, the other twelve (12) miles vary in standards; portions are graded with no surfacing and minimum drainage with the remainder being two track native surface roads.

There are an additional twenty-seven (27) miles of road inside the remaining portion of the Elkhorn Ranchlands assessment area. Billings County holds a Right of Way (ROW) on four (4) miles of NFSR FH2. This route is graded and drained gravel. The State of North Dakota has jurisdiction over two (2) miles of road. These routes provide access to oil and gas wells and are graded and drained scoria. Private individuals have jurisdiction over two (2) miles of road. These routes provide access to oil and gas wells and are graded and drained scoria. Nineteen (19) miles of FS road are inside the Elkhorn Ranchlands assessment area. Sixteen (16) miles that are graded and

drained are used for oil and gas activity. The other three (3) miles are two-track native surface roads.

There are recurrent safety issues with the roads and trail, normal maintenance will be necessary to solve these issues.

### **Buildings**

There are nineteen buildings varying from two houses to steel grain bins, garages, and other out buildings within the assessment area. One old cabin and a pit storm cellar are also on the acquired land. All buildings have been tested and no hazardous materials exist on the site. Recent OSHA inspections show numerous safety and accessibility issues exist on the buildings.

### **Boundary Lines**

There are approximately 20+ miles of new property line that will have to be surveyed. Eleven miles of existing property boundary signs and posts have been removed since the ownership is now contiguous after the acquisition.

### **Synthesis and Interpretations:**

#### **Transportation System**

An assessment of the current condition and need for the existing road network will need to be done. Input from the public is needed on the transportation system to determine which roads will be open to travel and what standard of road/trail is needed.

#### **Buildings**

The old Eberts house has many safety and health issues that would need to be corrected if it was to be used as a public facility. The current electrical system is out of date and will need to be replaced. Accessibility issues inside and out need to be addressed. The current water source is an artesian well that needs to be tested. A cistern in the basement also needs to be removed. The drain field and septic tank need to be inspected. Fire extinguishers along with interconnecting smoke detectors need to be installed. Exit routes need to be clearly marked. Ground fault interrupters (GFI's) also need to be installed in the kitchen and bathroom.

The other buildings also have some health, accessibility and safety issues. A determination needs to be made on what buildings should be maintained and for what purposes. This determination will indicate what changes need to be made to the structures to meet safety and health standards.

#### **Boundary Lines**

Surveying the boundary lines will ensure that any improvements are on Forest Service lands and that the public will know where the boundaries of the publicly owned lands are.

## **Water Rights**

### **Current Conditions**

There are two existing water rights that are to be transferred to the Forest Service. One is for irrigation of 52 acres in T. 144 N., R. 102 W., section 21 and the other is for the irrigation of 132 acres located in Section 33. Both of these rights are for surface water out of the Little Missouri River.

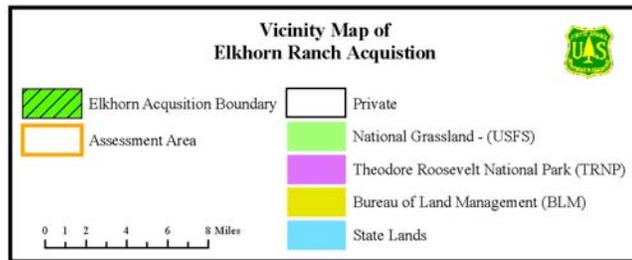
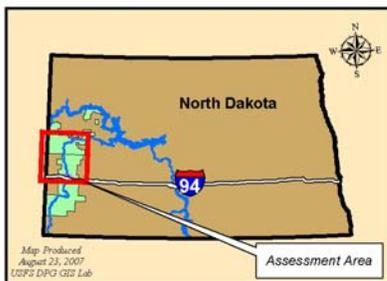
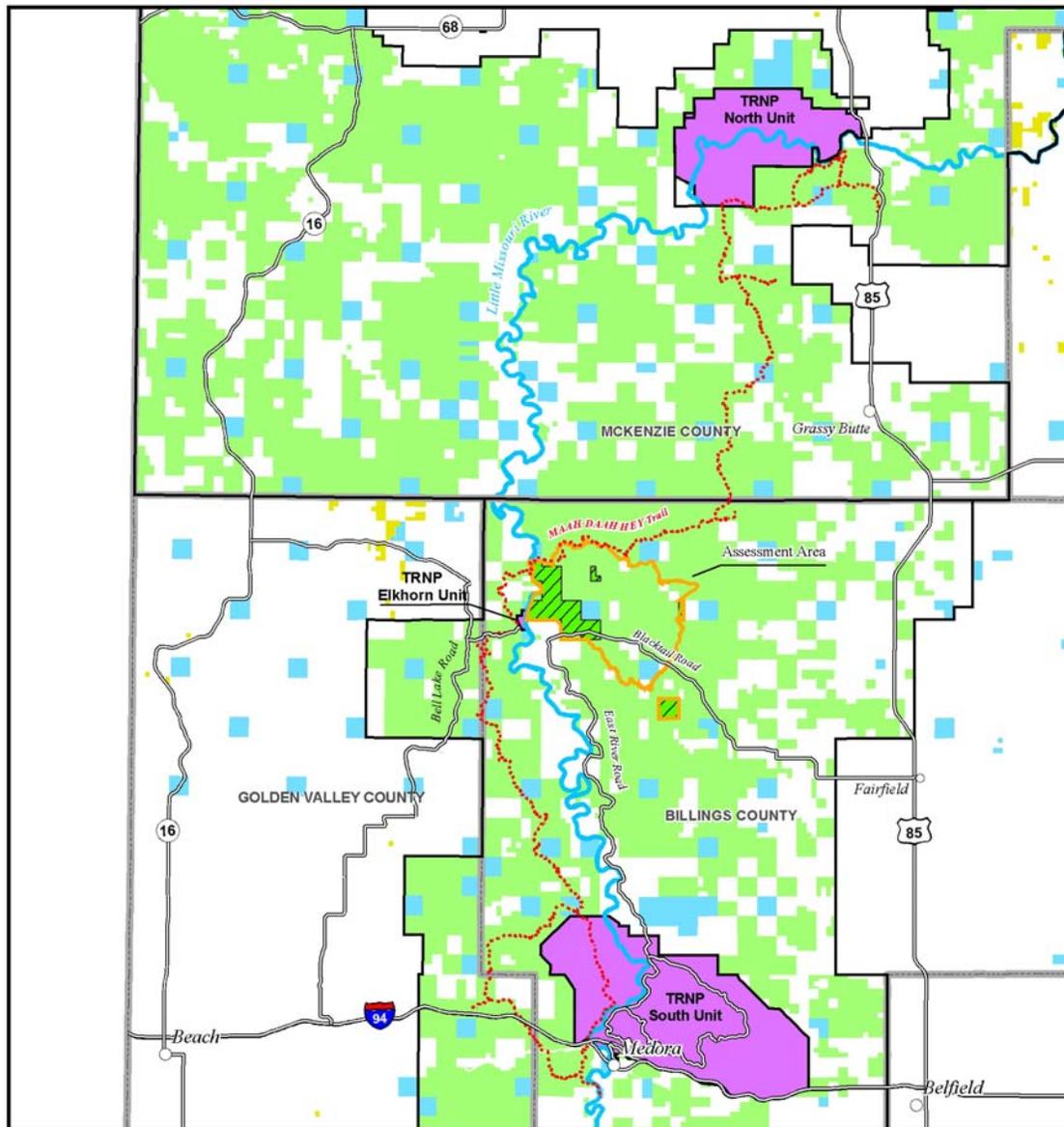
### **Characterization**

The information available on water quality in the Little Missouri River indicates that the salinity of the water, based on electrical conductivity readings, will limit the use of these rights to times when flows are above 50 CFS in the river. When flows are lower, only salt tolerant species would benefit from irrigation with water from the river.

### **Synthesis and Interpretations:**

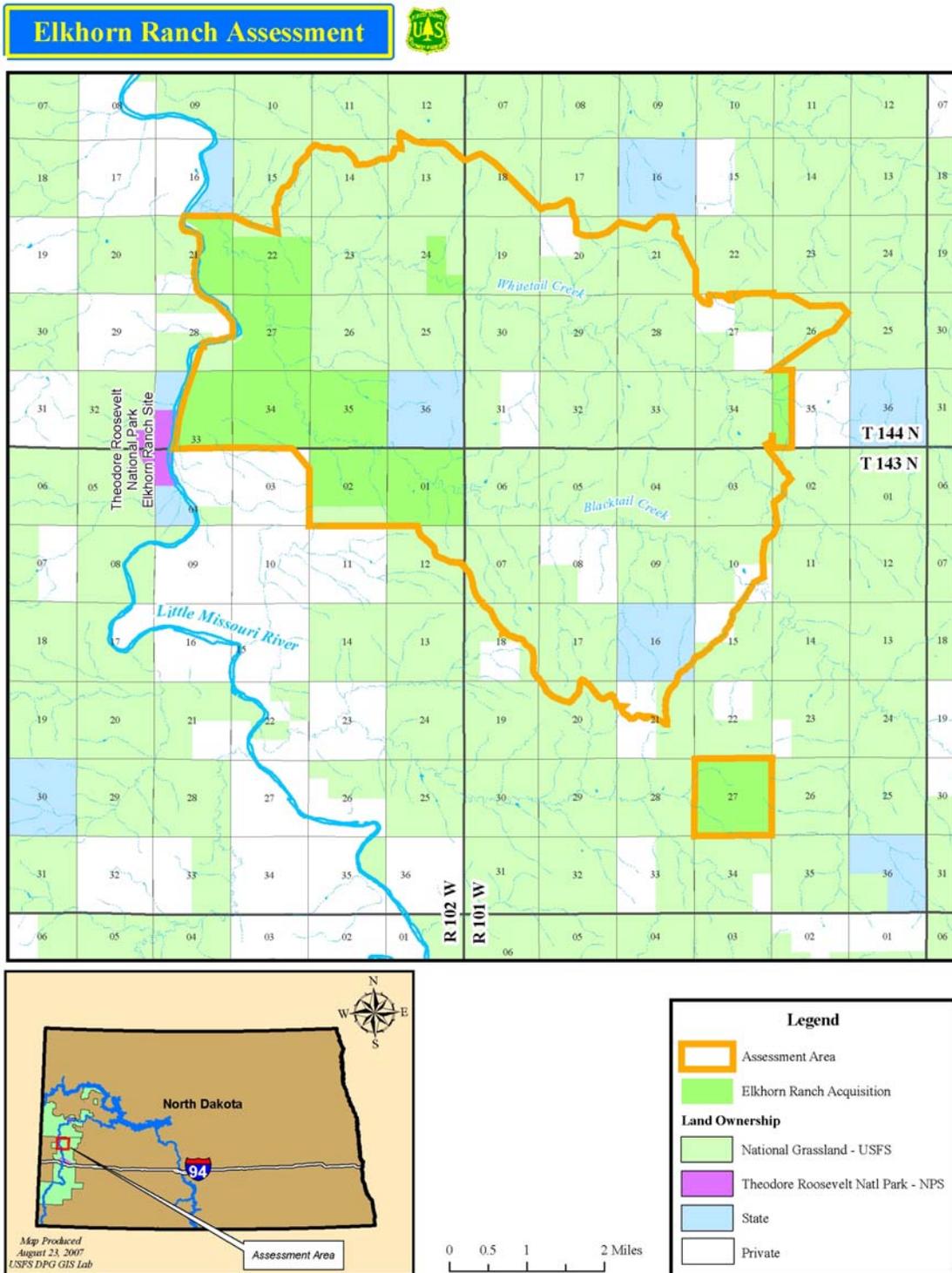
These water rights should be maintained for irrigation purposes until the restoration of the fields that they service is completed. Following restoration, the need for these water rights should be evaluated and a determination made on whether the rights should be assigned to a different use, maintained or abandoned.

Map 1



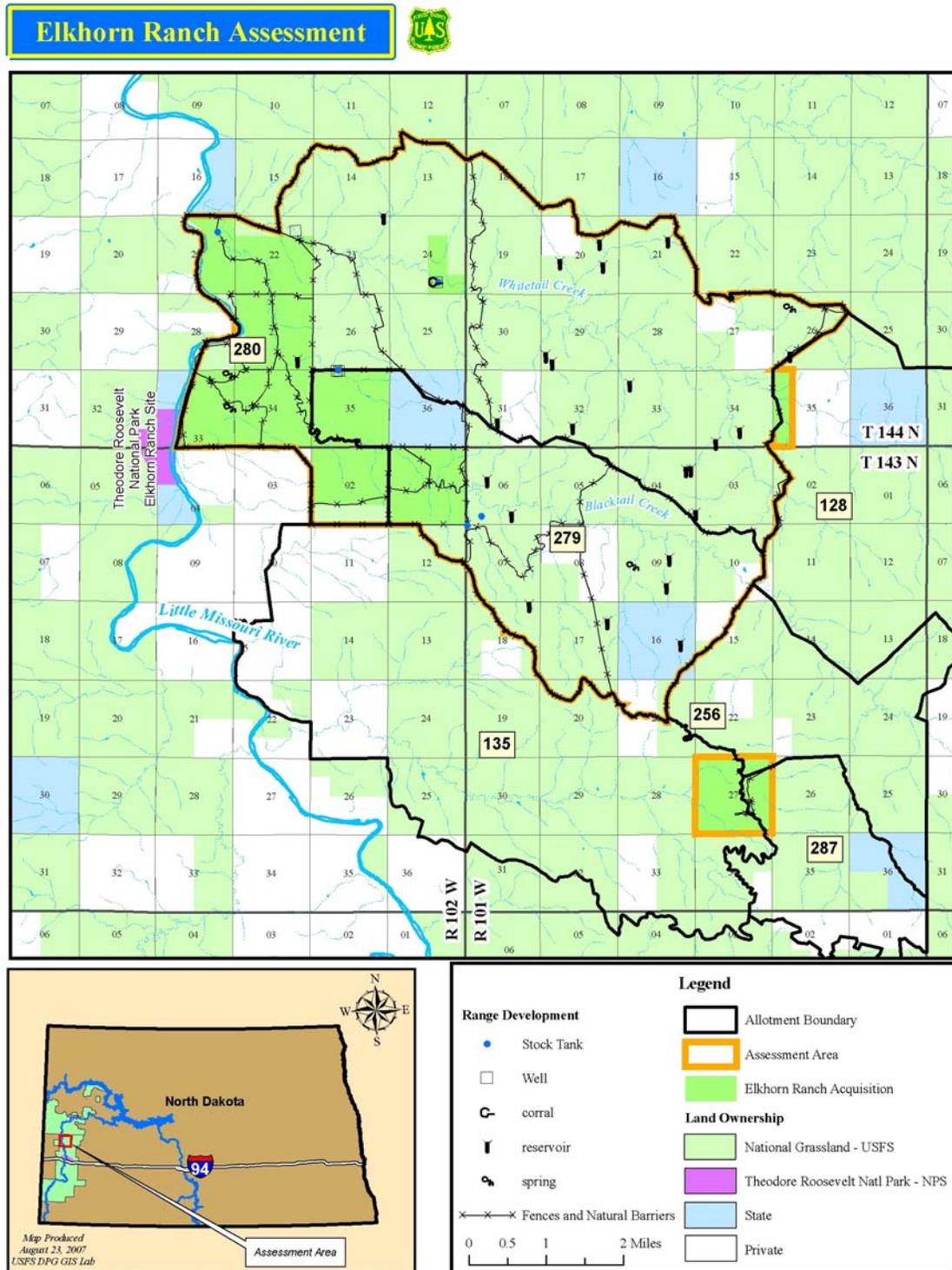
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Map 2



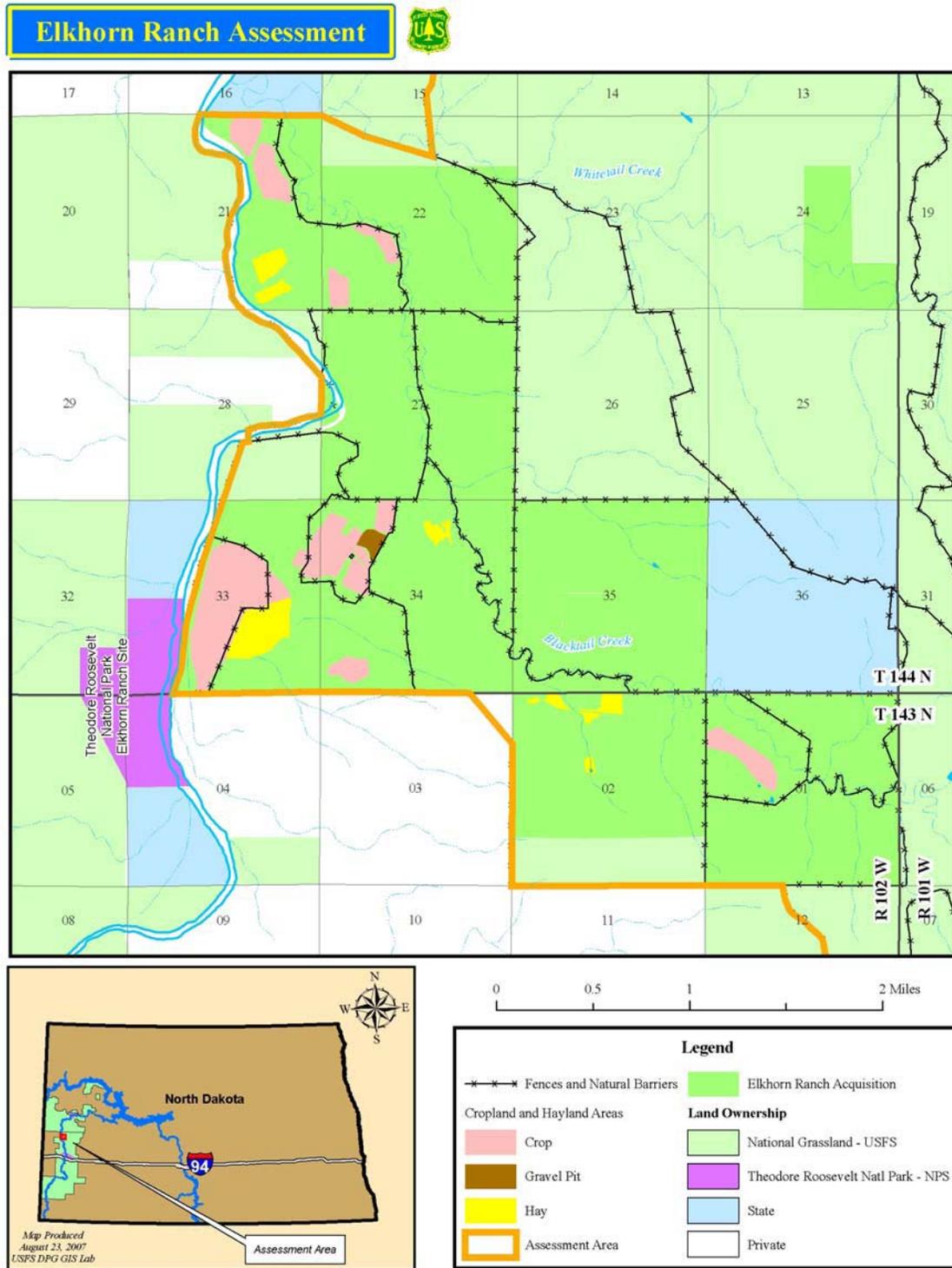
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Map 3



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Map 4



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Map 5

