



Forest
Service

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Proposed Action and Additional Information for the North Zone Range 08 Project

**Bearlodge and Northern Hills Ranger
Districts**

Black Hills National Forest

**Crook County, WY,
Pennington County and Lawrence County, SD**

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INTRODUCTION

The Black Hills National Forest proposes to reauthorize grazing by domestic livestock on ten allotments within the North Zone Range 08 Project Area (NZR08) is located in Lawrence County, South Dakota and Crook County, Wyoming, respectively. The allotments are the Pettigrew, Griffith, Upper Elk and East Rapid allotments administered by the Northern Hills Ranger District and the Stearns Park, Grand Canyon, Willow Springs, Silver Creek, Black Haw and Huett Springs allotments administered by the Bearlodge Ranger District (see Figure 1). These allotments total 89,746 acres including 6,466 acres of private lands. A total of 8,510 AUMS would be authorized.

The purpose of this project is to improve livestock management so that it is consistent with the goals, objectives, standards and guidelines of the Black Hills National Forest Land and Resource Management Plan, as amended (Forest Plan). The Forest Service rangeland allotment management process calls for periodic reviews of allotment conditions and management practices. All of these allotments are due for environmental review, and if necessary, revision to current rangeland management practices. The underlying needs for this proposal include:

- 1) There is a need improve livestock management so that it is consistent with the goals, objectives, standards, and guidelines of the Forest plan.
- 2) There is a need to reduce soil disturbance (erosion and compaction), improve bank stability, and increase riparian vegetation diversity and abundance, including Region 2 sensitive species and BHNF species of local concern, in order to improve stream health and riparian ecosystem condition.
- 3) There is a need to reduce trailing and trampling by livestock in the Englewood Springs Botanical Area (MA 3.1) to protect and improve the values for which the botanical area was designated.
- 4) There is a need to reduce cheatgrass infestations within the Huett Springs Allotment to increase native grasses and improve rangeland health.

The action proposed by the Forest Service (Alternative A) to meet the purpose and need is to continue to permit livestock grazing by incorporating adaptive management strategies on all ten allotments within the NZR08 project area while meeting LRMP direction which provides for a wide range of values and uses. The Proposed Action is designed to maintain or improve resource conditions in rangeland health, vegetation, watershed conditions, designated Botanical Areas, and wildlife habitat relative to livestock grazing.

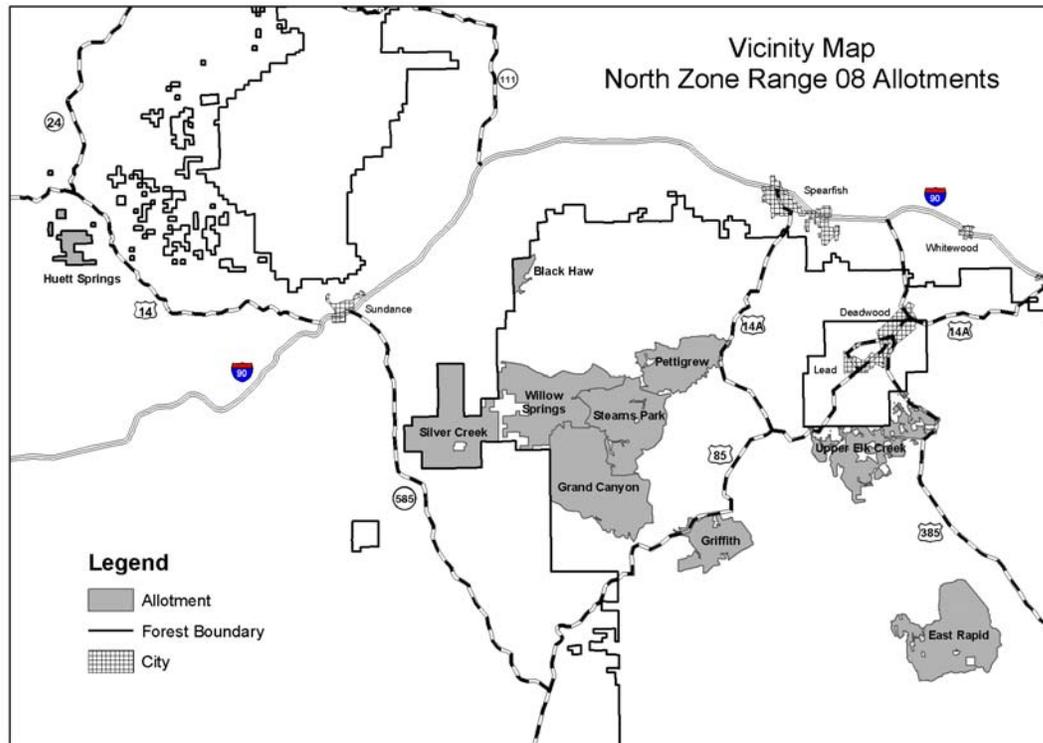


Figure 1. Vicinity map of the North Zone Range 08 allotments

Background

Livestock grazing has been occurring on the Black Hills since the initial explorations of the Custer Expedition. In fact, the 1874 Black Hills Expedition included a prodigious number of cattle, horses, and mules to sustain the expedition. This was in addition to the native grazers of the time: buffalo, elk, deer, and bighorn sheep.

The following history of grazing in the Black Hills is excerpted from “Historic and Contemporary Use and Occupation of the Black Hills” (USDA Forest Service 1994a) compiled during the 1997 Forest Plan revision process. This excerpt provides insight on the nature and intensity of historical grazing impacts in the Black Hills and provides a social perspective for the vegetative range conditions found in the Hills today:

“With the 1870s gold rush, needs for meat, vegetables, dairy products and fodder for people and animals moving in to the Hills heightened. Over the next two decades, industries grew out of cattle and sheep production, both within and outside of the Hills (Cassells et al. 1984).

By 1888, as many as 600,000 cattle were concentrated in the Black Hills region. Estimates from 1903 placed cattle at 300,000 head, sheep at 100,000, and horses at 7,000 head (Cassells

1984). Plains ranchers also brought cattle into the Hills in the summer in search of grazing lands. Livestock numbers for this era are phenomenal given the number of cattle allowed today. Currently 23,000 head of cattle graze on the Black Hills National Forest lands.

Like other parts of the West, “range wars” erupted between sheep and cattle interests. Although Belle Fourche and Rapid City supported a thriving wool industry with wool warehouses used as hubs for wool exports, cattlemen lobbied hard to drive sheep from the Hills.After holding public meetings, (Gifford) Pinchot opted to close the Forest to sheep. He did so in large part to protect the Forest’s timber reserves, which were being degraded by sheep that often destroy pine saplings. Sheep were again allowed on the Forest in 1916, “probably because the price of wool was up and the price of beef was down” (Geores 1993). Sheep grazing on Forest System lands in the Black Hills has occurred since, but not to the scale it had early this century and late last century.

At the turn of the century, Forest Reserve regulations were adopted that favored small grazing permittee over leases to large companies. The Forest’s administration felt that small operators would be better land stewards than large operators, who cared only for profits, and not the conditions their cattle operations created on the range (Geores 1993).

Homesteading ceased for a time in the Black Hills as a result of the creation of the Black Hills Forest Reserve in 1898. Those homesteads already established in the Hills were allowed to stay on. The Forest Homestead Act of 1906 dissolved the 1898 moratorium on homesteading on Forest Reserves. Homesteaders again arrived in the Hills.Since many of the lower-elevation areas had already been homesteaded, a number of people tried to homestead in the higher valleys and draws within the Black Hills. The usual pattern was to claim a homestead along a stream bottom, which included a long strip of land along the stream. This process along with those who filed mining claims, scattered parcels of private land in the public lands of the Black Hills National Forest.....In some instances, small grains were produced on meadows that were cleared of rocks. Hay was gathered from natural grasses. Nearly all of these early homesteads have been abandoned or subdivided. Because of the climate, successful homesteading above about 6,000 feet proved virtually impossible (Cassells et al. 1984).

A major effort was made in the Custer area to promote dairy farms...sometime in the 1930s the carrying capacity for grazing land was reached. As many applicants for grazing allotments were turned away as were accepted, so the grazing resource, which had seemed nearly endless a couple of decades before had finally reached an official saturation point.

By the early 1940s, some range land on the Forest was severely overgrazed.... As a result the Forest Service reduced the number of grazing permits to allow the land to recuperate.... Grass and forb species were in poor condition on many areas of the Forest and deciduous vegetation, like willows, berry bushes and aspen had been damaged by overgrazing. Big game, especially deer, were impacted.... Grazing permit cuts began again in 1951...Programs were implemented in the 1950s to improve range conditions, including rotational grazing systems and aerial spraying of weeds. These programs met with some success, and were undertaken cooperatively between the Forest Service and permittees.”

Heavy grazing and agricultural development weren’t the activities that have influenced vegetative components in the Black Hills. Other activities and programs have also contributed to the condition of uplands and riparian communities seen in the Hills today. The following excerpts

from *The Range of Natural Variability for the Black Hills: A First Step* (USDA Forest Service 1994) describes these effects over the last 100 years:

“Forest Service management has led to a dramatic shift in forest conditions over the past 120 years. Today mature ponderosa pine appears to be considerably more dense and extensive than what occurred prior to settlement.....”

“The area of non-forested land has decreased since 1874. Much of this change can be attributed to a decrease in fire frequency. This has allowed ponderosa pine to encroach into dry meadows and some historically wet meadows that have drier soils resulting from lower water tables in streams that historically supported beaver dam complexes....”

“Not only has forest maturation during the past century influenced tree species composition, but herbaceous and shrub species also have been affected. Herbaceous and shrub species as a group attain their best productivity in meadows, early forest seral stages, and the understory of aspen and open-canopy forests. In the Black Hills, the increase in the density and extent of mature ponderosa pine and, to a lesser extent, white spruce has resulted in a concomitant decline in herbaceous and shrub species abundance.”

“Riparian areas adjacent to low-gradient channels have probably been modified most since settlement began due to their accessibility. As described by early explorers, these ecosystems historically had saturated soils that supported phreatophytic (i.e. water dependent) plant communities. Beaver colonies were a critical link in maintaining the integrity of these wet-meadow systems.....Beaver were heavily trapped by early settlers leaving only a few in remote places far away from settlements by 1887 causing a break in the natural cycle. The residual dam complexes failed or in many cases were breached by local landowners. This decline in beaver populations, along with other impacts to wet meadows such as draining, grazing, decreased fire frequency, and herbicide spraying resulted in lower water tables and a compositional shift to drier-site plants.”

Thus over the last 100 years, there have been many social, economic, and ecological influences that have resulted in the vegetative communities that occur in the Black Hills today.

Livestock grazing is still an authorized use of National Forest System lands on the Black Hills (USDA Forest Service 1997). Goal 3 of the Black Hills National Forest Land and Resource Management Plan (the Forest Plan) states: “Provide for sustained commodity uses in an environmentally acceptable manner.” Commodities, including livestock, contribute to the economies of local and regional communities and support local people. Because sustained commodity production depends on sustainable ecosystems, the Forest Plan further directs that “...livestock grazing will occur without impairing the health of ecosystems and in a manner compatible with other Forest uses.” Therefore the management direction for the North Zone Range 08 project is to continue to authorize livestock grazing while ensuring that livestock use is consistent with the desired conditions in the Forest Plan. These allotments are managed in close cooperation with the range permittees.

Management Direction _____

The Revised Black Hills Land and Resource Management Plan (1997), as amended provides management direction for these allotments. Lands located within the allotments have been allocated to the following Management Area designations:

Table 1. Management Area designations within the North Zone Range 08 project area.

Management Area	Acres	Management Emphasis	Grazing allowed?
3.1	164	Botanical Areas	Yes, If no conflict with botanical values
3.32	227	Backcountry Non-motorized Recreation	Yes
4.1	6,142	Limited Motorized Use and Forest Products	Yes
4.2A	432	Spearfish Canyon	No
5.1	50,320	Resource Production	Yes
5.3A	1,631	Black Hills Experimental Forest	Yes
5.4	17,683	Big Game Winter Range	Yes
5.6	6,681	Forest Products, Recreation, Big Game	Yes

Suitable rangelands are those rangelands where there is no Forest Plan or other binding decisions to preclude the permitting of livestock grazing. Management area designations in the project area include those in Table 1. All of the Management Areas allow livestock grazing except MA 4.2A - Spearfish Canyon. About 432 acres of Pettigrew Allotment are mapped as within MA 4.2A. In fact, these acres are below the canyon walls and are neither accessible nor grazed by livestock.

Changes in management emphasis on the Black Hills NF occurred with the 1997 Forest Plan revision and the subsequent Phase II amendment in 2006. Botanical areas and sensitive plant populations were identified for protection. Monitoring for this project identified some isolated conflicts with management of these botanical resources related to livestock grazing.

Project Area Description

Wyoming Allotments

The Grand Canyon, Sterns Park and Willow Spring allotments are located south of the town of Beulah, Wyoming. The topography of these allotments is characterized by long, flat, open to semi-open, north sloping ridgelines surrounded by v-shaped to wider u-shaped floors. Elevations are generally higher than in other parts of the Bearlodge District of the Black Hills ranging from 5,000 to 6,784 feet. In 2005, the Cement Ridge Fire burned 3,013 acres; 1,409 acres of burn extended into the northwest portion of the Willow Springs Allotment.

The Silver Creek Allotment is located on the extreme southwest edge of the District in an area known as the Black Buttes. This area is characterized by narrow, north trending valleys and steep slopes. Elevations in the project area range from 4,700 to 6,010 feet above mean sea level.

The Black Haw Allotment is south of Beulah, Wyoming on the western periphery of the southern portion of the District. The area is characterized by a wide ridge top that drops steeply to the northwest; the eastern boundary is part of the Grand Canyon which is characterized by steep exposures of the Minnelusa Formation, which consists of cross-bedded sandstone and limestone at the top and inter-bedded sandstone, limestone and shale elsewhere in the profile. There are nearly continuous limestone outcrops with potential for rock shelters in the narrow canyon formed by Black Haw Gulch along the northwestern boundary of the allotment. Elevations in the project area range from 5,000 feet and 4,300 feet above mean sea level.

The Huett Spring Allotment is located on the far western edge of the Bearlodge Mountains, west and slightly north of the city of Sundance, Wyoming. The area is highly dissected with steep, narrow drainages below long, narrow finger ridges. The allotment is composed of a mixture of parcels of Forest Service administered lands and private land. Elevations in the allotment are between 4,200 and 4,600 feet.

South Dakota Allotments

The Pettigrew Allotment is on the western edge of the Northern Hills District in the historic Tinton Mining District. It is roughly 10 miles southwest of Spearfish, South Dakota, near the Wyoming State border and the ghost town of Tinton. Elevations range from 5,000 feet along Iron Creek to 6,100 feet on Old Baldy Mountain. Grazing has occurred in this area for over 100 years.

The Upper Elk Creek Allotment is located about three miles south of Lead, South Dakota. It is bound on the north by the Lead/Deadwood exemption area. Elevations range from 5,200 feet to 6,400 feet around Woodville Hills. Historically, much of this allotment was previously grazed by Dairy Cow herds.

The East Rapid Allotment is located approximately 15 miles south of Lead, South Dakota. This allotment overlaps the Northern Hills and Mystic Ranger Districts boundaries. Elevations range from 4,800 feet to over 6,100 feet. Historically this allotment grazed cattle, then converted to sheep and goats, then converted back to cattle in 1977.

The Pettigrew, Upper Elk Creek and East Rapid allotments are located in the Central Core area of the Black Hills. Soils in the central core are generally rocky, but well drained. The topography ranges from gently rolling hills with wide valley bottoms to steep narrow gulches bound by schist, shale and limestone.

The Griffith Range Allotment is located on the Northern Hills Ranger District of the Black Hills National Forest (BHNF) approximately 2 miles east of O'Neil pass. Elevations for the allotment range from 5,400 feet to over 7,000 feet near Crooks Tower.

Recent Management History

Allotment management plans (AMPs) have been in place on all of these allotments for many years. Prior to the 1970's many of the allotments were in poor to fair range condition (Wheeler et al. 2008). Grass species composition was dominated by naturalized non-native grasses such as timothy, Kentucky bluegrass and smooth brome. Bare ground was higher than desired and noxious weeds were present. However, the most recent set of AMPs completed in the 1990s instituted changes in management designed to improve range conditions. The most recent monitoring data indicate improvements in long-term trend including reductions in bare ground. There has also been a reduction in the amount of noxious weeds although some are still present.

Most upland sites are still dominated by non-native grasses. Vegetation inside range enclosures built in the 1940s on other allotments in the Black Hills demonstrates that these species are very stable. Elimination of grazing inside the enclosures has had little to no effect on species composition in the last 60 years. Species are essentially the same both inside and outside the enclosures (USDA Forest Service 2006).

Trend is determined where possible by comparing historical records (transects plots, inspection records, etc.) and photographs with current conditions and determining if conditions have improved, declined, or stayed the same. These trends are described as upward, downward, and static relative to the desired conditions for the specific area. Areas for which no historic data was available were described based on current knowledge.

Recent range monitoring has placed more emphasis on riparian conditions. Streams/Riparian areas were evaluated using “Proper Functioning Condition” (PFC) assessments and the “Riparian Characteristics Evaluations” R2-2200-RCS USFS from the Rangeland Analysis and Management Training Guide (USDA 1996b) by interdisciplinary teams, including botany, wildlife, hydrology, and rangeland management field personnel from the U.S. Forest Service. Inventory and monitoring efforts including PFC assessments conducted since 2000 have identified some localized areas of concern where streambank trampling appears excessive and riparian shrubs are decadent or not regenerating. In general these problems are localized in nature and many riparian areas are healthy and support diverse plant communities.

Purpose and Need for Action _____

The purpose of this project is to authorize livestock grazing on all or part of the project area and to ensure that livestock grazing occurs in an environmentally acceptable manner. The Forest Service rangeland allotment management process calls for periodic reviews of allotment conditions and management practices. All of these allotments are due for environmental review, and if necessary, revision to current rangeland management practices. The underlying need(s) for this proposal include:

- Improve livestock management so that it is consistent with the Goals, Objectives, Standards and Guidelines of the Forest Plan.
- Reduce soil disturbance (erosion and compaction), improve bank stability and increase riparian vegetation diversity and abundance, including Region 2 Sensitive Species and Black Hills National Forest Species of Local Concern, in order to improve stream health and riparian ecosystem condition.
- Reduce trailing and trampling by livestock, where needed, in botanical areas in order to improve the values for which botanical areas were designated.
- Reduce cheat grass infestations within the Huett Springs Allotment in order to increase native grasses and improve rangeland health.

These needs were developed by comparing the existing conditions on the allotments to the desired conditions for these areas.

Desired Condition

Desired condition is the specific condition of rangeland resources on a landscape scale that meets management objectives as identified in the Forest Plan. Desired condition is based on ecological, social, and economic considerations. Goal 2 of the Forest Plan describes the desired condition of lands and resources and also describes standards and guidelines for various resources that are intended to guide management into meeting or trending towards desired conditions. Appendix B includes all of the appropriate Forest Plan direction that helped define the desired conditions for the NZR08.

Desired plant community (DPC) selection is crucial to effective rangeland planning. DPC is part of the overall desired condition developed by the interdisciplinary team (IDT). They must currently exist in the general area in similar environmental settings, and are capable of occupying the site within a reasonable time period through management changes (R2 Rangeland Analysis and Management Training Guide, USDA Forest Service 1996c). Much of the primary grazing areas in the Black Hills have been converted to non-native graminoid species through historic management practices. For example, numerous meadows were planted with timothy and/or smooth brome and managed as hay grounds (Graves, 1899) (MacIntosh, 1928). These species have naturalized and easily spread to adjacent areas (Larson and Johnson 1999). It is not feasible for these areas to return to a “natural” state without major effort and expense. Many of these non-native species are acceptable for the current and proposed management of the project area. Non-native species such as Smooth Brome (*Bromus inermis*) provide valuable forage for wildlife and livestock, and also provide adequate watershed protection. Smooth brome has a resource value rating of “high” for elk and deer preference as well as for watershed protection (USDA Forest Service 1996c). The ratings are based on the relish and degree of use shown by livestock and wildlife for a plant or plant part. The high reading indicates the plant is highly relished and consumed to a high degree and the moderate rating correlates to a plant that is consumed or relished to a moderate degree. Watershed protection is based on the growth habit, structure, biomass, or root system characteristics or individual plant species to reduce soil erosion. A plant with a moderate rating would exhibit moderately aggressive growth, a moderate degree of persistent plant structure, potential biomass or a moderate soil-binding root rhizome runner system.

The overall desired condition for the project area that was developed by the interdisciplinary team is described below in Table 2.

Table 2. Desired conditions for vegetative communities within the project area

Community Type	Desired Conditions
Upland Grasslands	<p>Mixed native grass and forb communities provide a diverse mosaic of plant species, a variety of vegetative structures and effective ground cover (not more than 5-20% bare ground depending on soil type) to maintain soil stability and provide wildlife habitat. Maintain quality of desired plant communities by managing for native and desirable non-native species. Primary native graminoid species may include: <i>Stipa viridula</i> (green needlegrass), native wheatgrasses, <i>Carex filifolia</i> (threadleaf sedge), and <i>Koeleria macrantha</i> (prairie junegrass). Non-native species may include <i>Poa pratensis</i> (Kentucky bluegrass), <i>Bromus inermis</i> (smooth brome), and <i>Phleum pratense</i> (timothy). Forb species may include <i>Vicia americana</i> (American vetch), <i>Achillea millefolium</i> (common yarrow) <i>Trifolium</i> spp. (clovers), and <i>Taraxacum officinale</i> (dandelion). Noxious weeds should be less than 2% of the species composition. In high quality endemic Black Hills Montane Grassland communities, maintain diversity and canopy cover of native signature species which may include <i>Stipa richardsonii</i> (Richardson's needlegrass), <i>Sporobolus heterolepis</i> (prairie dropseed), <i>Geum triflorum</i> (prairie smoke), <i>Solidago</i> spp. (goldenrod), and <i>Potentilla</i> spp. (cinquefoil).</p>
Riparian Communities (Including Seeps & Springs)	<p>Maintain riparian plant communities that provide overhanging vegetation and effective ground cover (not more than 10% bare ground within the riparian area), to help trap sediment and dissipate energy during peak flows, protect soils from erosion processes, maintain stream bank stability and provide wildlife habitat. Plant species include <i>Carex</i> spp. (sedges), <i>Juncus</i> spp. and <i>Scirpus</i> spp. (rushes), and desirable riparian grass species (ex: <i>Glyceria</i> spp. (mannagrass), and <i>Calamagrostis canadensis</i> (bluejoint reedgrass)). In shrubland systems, plant species may include black hawthorn and <i>Salix</i> spp. (willows). Tree species may include <i>Betula papyrifera</i> (paper birch), <i>Betula occidentalis</i> (water birch), <i>Acer negundo</i> (boxelder), <i>Quercus macrocarpa</i> (bur oak) <i>Cornus sericea</i> (redosier dogwood), and <i>Picea glauca</i> (white spruce). Age class structure in willow communities should have the number of young/mature plants greater than the number of decadent/dead plants. New shrubs are establishing and are increasing in size and cover. Stream banks should be mostly stable consistent with the potential of the site. High quality habitat for sensitive species will be maintained.</p>

Community Type	Desired Conditions
Aspen	In landscapes with multiple aspen clones, maintain aspen communities with diverse age structures including old growth communities, regeneration, openings, standing snags and down woody debris across aspen areas: vigorous and diverse native grass and forb understory present. Aspen shoots are present and develop into saplings over time.
Ponderosa pine	Maintain diverse understory of native and desirable non-native grasses including <i>Nassella viridula</i> (green needle grass), native wheatgrasses, <i>Carex inops</i> ssp. <i>heliophila</i> (sun sedge), <i>Schizachyrium scoparium</i> (little bluestem), and <i>Koeleria macrantha</i> (prairie junegrass). Maintain effective ground cover (not more than 10% bare ground) to maintain soil stability and provide wildlife habitat. Non-native species may include Kentucky bluegrass, smooth brome, and timothy. Forb species may include <i>Vicia americana</i> (American vetch), <i>Achillea millefolium</i> (common yarrow), <i>Trifolium</i> spp. (clovers), and <i>Taraxacum officinale</i> (dandelion). Noxious weeds should be less than 2% of the species composition.
Botanical Areas (MA 3.1) & Sensitive and SOLC Plant Occurrences	Maintain current extent of known sensitive and SOLC plant occurrences. Impacts by livestock (utilization, trampling, trailing) on sensitive and SOLC plant species and suitable habitat will be incidental. In Botanical Areas, vegetation, habitat, soil productivity and water quality are usually unaffected by livestock.

Existing Condition

Existing conditions at benchmark areas for all allotments in the NZR08 are shown in Table 3. The table shows how the existing conditions for each key area compare to what is actually desired for that site or that pasture in terms of meeting the desired conditions, not meeting the desired conditions or moving toward the desired conditions.

Table 3. Existing range health, trends and status of benchmark areas in the NZR08 allotments

Allotment	Existing Condition*	Benchmark Area - Trend Toward Desired Conditions
Black Haw	Riparian – High percent bare ground, high level of trampling, limited extent of riparian vegetation. Stock tank located in riparian area.	Black Haw Gulch – Not meeting
Grand Canyon	Grassland – 57% perennial grasses, 1% grass-like sedges, 40% forbs, 1% noxious weeds, 3% bare ground	Smith Draw – Meeting

Allotment	Existing Condition*	Benchmark Area - Trend Toward Desired Conditions
	<p>Grassland – 44% perennial grasses, 52% forbs, 1% grass-like sedges, 3% shrubs, 1% noxious weeds</p> <p>Grassland – 49% perennial grasses, 1% grass-like sedges, 48% forbs, 2% shrubs, 0% noxious weeds, 3% bare ground</p> <p>Riparian – Trampling, hummocking, no willow regeneration, willows decadent</p>	<p>Rifle Pit - Meeting</p> <p>Scott Hardy - Meeting</p> <p>South Spring and seeps – Not meeting</p>
Huett Springs	<p>Grassland – 30-40% cheatgrass (ocular estimate), average 6-8% bare ground across the allotment</p>	<p>Lake Divide – Moving toward</p> <p>Kudlock – Moving toward</p>
Silver Creek	<p>Grassland – Bluegrass dominated but good species diversity, 51% perennial grasses, 2% grass-like sedges, 22% native forbs, 25% shrubs, 2% bare ground, 0% noxious weeds</p> <p>Riparian – Reduced trampling and hummocking, willows are regenerating</p>	<p>Meadow above Boardinghouse Spring – Meeting</p> <p>Pete Spring – Moving toward</p>
Stearns Park	<p>Grassland – 45% perennial grasses, 25% grass-like sedges, 28% forbs, 2% shrubs, 0% noxious weeds, 6% bare ground</p> <p>Grassland – 58% perennial grasses, 1% grass-like sedges, 39% forbs, 2% noxious weeds, 8% bare ground</p> <p>Riparian – Trampling evident in spring and wetland, willows are decadent with no regeneration</p>	<p>Buffalo Park – Meeting</p> <p>Sec. 16 – Not Meeting</p> <p>Three Willows Spring – Not meeting</p>
Willow Springs	<p>Grassland – 31% perennial grasses with 10% grass-like sedges, 29% forbs, 9% shrubs, 2% bare ground, 10% noxious weeds. Static trend. Seasonlong use.</p> <p>Grassland – 55% perennial grasses, 17% grass-like sedges, 17% forbs, 6% shrubs, 5% noxious weeds, 0% bare ground.</p> <p>Grassland – 47% perennial grasses, 10% grass-like sedges, 42% forbs, 1% noxious weeds, 10% bare ground but reduced from previous</p> <p>Riparian – Some trampling and streambank alteration occurring, willows and aspen are regenerating but older willows are decadent</p>	<p>Calvert/Sackett – Not meeting</p> <p>Katan Spring – Meeting</p> <p>Guidinger Meadow – Moving toward</p> <p>Guidinger Creek – Moving toward</p>

Allotment	Existing Condition*	Benchmark Area - Trend Toward Desired Conditions
<p>East Rapid</p>	<p>Grassland – 95% perennial grasses, 5% forbs, <1% bare ground, no noxious weeds</p> <p>Riparian – Less than 74% stable streambanks, extent of deep-rooted riparian species less than desired</p>	<p>Gimlet Meadow – Meeting</p> <p>Gimlet Creek – Moving toward</p>
<p>Griffith</p>	<p>Grassland – 45% perennial grass, 2% grass-like sedges, 53% forb, <5% bare ground, 0% noxious weeds</p> <p>Grassland - 43% perennial grasses, 57% forb, 3% bare ground, 0% noxious weeds</p>	<p>Moses pasture (NW ¼ Sec. 23) – Meeting</p> <p>Arnold pasture (SE ¼ Sec. 24) – Moving toward</p>
<p>Pettigrew</p>	<p>Grassland – 44% perennial grasses, 11% grass-like sedges, 32% forbs, 12% shrubs, 0% noxious weeds, <3% bare ground</p> <p>Grassland – 58% perennial grasses, 40% forbs, 2% aspen, 0% noxious weeds, <3% bare ground</p> <p>Riparian – Trampling and hummocking evident in riparian and springs, mostly decadent willow but with recent regeneration</p> <p>Sensitive Plants – <i>Carex alopecoidea</i> and habitat being impacted by livestock</p> <p>Sensitive Plants – <i>Carex alopecoidea</i> and habitat being impacted by livestock</p>	<p>Baldy pasture (NW ¼ Sec. 33) – Meeting</p> <p>Red Lake pasture (NE ¼ Sec. 35) – Meeting</p> <p>Baldy Lake – Moving toward</p> <p>Ladyfinger Gulch – Not meeting</p> <p>Pettigrew Gulch – Not meeting</p>
<p>Upper Elk</p>	<p>Grassland – 99% perennial grasses, trace forbs, trace shrub, <1% noxious weeds, <3% bare ground</p> <p>Grassland – 27% perennial grasses, 14% grass-like sedges, 26% forbs, 32% shrub/tree, <1% noxious weeds, <1% bare ground</p> <p>Sensitive Plants – Livestock may be accessing and impacting SOLC occurrences and suitable habitat</p>	<p>SW ¼ Sec. 29 – Meeting but lacks diversity</p> <p>SE ¼ Sec. 32 – Meeting</p> <p>Englewood Springs Botanical Area – May not be meeting; insufficient information</p>

* - Note: % for vegetation is based on species composition as estimated using cover-frequency index (CFI), % bare ground is based on ground cover and does not include rock, wood, or vegetation. Totals may exceed 100%.

To summarize Table 3, based on monitoring at the benchmarks in the project area, 42% currently meet the desired conditions, 29% are moving toward meeting the desired conditions and 29% are not meeting or moving toward the desired conditions in a satisfactory timeframe. Therefore, 71% of the benchmark areas in the project area are meeting or moving toward the desired conditions for the ecosystem types represented in those benchmark areas relative to factors associated with

livestock management. The remaining areas are in need of changes in management to meet or move toward desired conditions.

Proposed Action

This is the action proposed in the scoping letter dated October 23, 2007. The Black Hills National Forest proposes to reauthorize grazing by domestic livestock on the following allotments: the Pettigrew, Griffith, Upper Elk and East Rapid allotments administered by the Northern Hills Ranger District and the Stearns Park, Grand Canyon, Willow Springs, Silver Creek, Black Haw and Huett Springs allotments administered by the Bearlodge Ranger District.

The proposed action is designed to maintain or improve resource conditions in rangeland health, vegetation, and watershed conditions relative to livestock grazing. Some grazing practices would be changed to resolve grazing related resource issues. The proposed action also provides for alternate adaptive management actions to be taken if resource conditions do not move toward the desired conditions in an acceptable timeframe.

A maximum of 8,510 AUMs would be authorized on a total of 89,746 acres. Maximum allowable forage utilization would range from 40-50% depending on the vegetation type and the current range conditions. One allotment could be grazed up to 70% utilization to reduce cheat grass infestation. Three miles of fence would be built to split two pastures. One-half mile of fence would be relocated. About 4.5 miles of pipeline, six stock tanks, and one storage tank would be added to improve livestock distribution. One stock tank would be removed or relocated. Thirty-eight springs, ponds, or riparian areas would be protected with fences. Fences would be built over the 10-year permit period based on priority and as funds become available. A map of each allotment is included in Appendix A.

The proposal includes an adaptive management approach to livestock management that is based on monitoring resource conditions. The proposal includes a monitoring plan for each allotment designed to focus on specific areas with livestock related resource problems (see Appendix B). If monitoring results indicate that resource problems persist, adaptive management options are identified that would be implemented to effect improvement in resource conditions (see Table 5).

Decision Framework

Based upon the effects of the alternatives, the District Rangers will decide whether or not to continue to authorize livestock grazing on none, all, or portions of the ten allotments; and if so, what adaptive management actions and monitoring will be included, so as to meet or move toward meeting Forest Plan objectives.

Management on each allotment is implemented through an allotment-specific Allotment Management Plan (AMP) based on the alternative selected in the NEPA Decision. The AMP is the implementation document by which the Forest Service communicates to the permittee and others the management objectives and planned actions to accomplish those objectives. The allotments currently under permit in the analysis area are being operated under AMPs developed 10 to 15 years ago and are being proposed for revision.

Public Involvement

The proposal was listed in the Schedule of Proposed Actions on October 1, 2007. A scoping letter was sent to interested parties on October 23, 2007. The letter asked that comments on the proposed action be received by December 3, 2007. A Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS), for this North Zone Range 08 Project was published in the Federal Register on November 5, 2007 and subsequently withdrawn on March 21, 2008. Approximately eighteen comments on the proposed action were received.

Using the comments from the public and other agencies, the interdisciplinary team developed a list of issues to address.

Issues

The Forest Service separated the issues into two groups: significant and non-significant issues. Significant issues were defined as those directly or indirectly caused by implementing the proposed action. Non-significant issues were identified as those: 1) outside the scope of the proposed action; 2) already decided by law, regulation, Forest Plan, or other higher level decision; 3) irrelevant to the decision to be made; or 4) conjectural and not supported by scientific or factual evidence. The Council on Environmental Quality (CEQ) NEPA regulations require this delineation in Sec. 1501.7, "...identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)..." A list of non-significant issues and reasons regarding their categorization as non-significant may be found in the project record.

As for significant issues, the Forest Service identified 4 topics raised during scoping. These issues include:

Issue #1 - Vegetative Diversity: Some commentors felt that grazing was currently having adverse impacts to Botanical Areas and/or populations of sensitive plant species, hardwoods, willows, and wetland ecosystems by direct consumption or through trampling. Others were concerned that eliminating grazing could adversely impact certain sensitive plant populations by allowing competition from grasses. Some undesirable annual grass species (cheatgrass) are present. Changes to the Proposed Action were suggested including fencing, no grazing, or creating buffers to reduce or eliminate adverse impacts from grazing. This issue will be used to develop design criteria for all allotments, allotment-specific design criteria, and adaptive management actions. Effects to vegetative diversity will be analyzed in the EA.

Measures: Risk to known sensitive or SOLC plant populations, risk to values of Englewood Springs Botanical Area, effects to riparian shrubs, reductions in cheatgrass, and plant composition meeting or moving toward the desired conditions.

Issue #2 - Soil and Water Quality: Some commentors felt that livestock grazing under the Proposed Action grazing would have adverse impacts to soil and water conditions. They were concerned that livestock grazing would result in water quality impairments such as bacterial loads, sedimentation, turbidity, loss of streambed structure, loss of streambank vegetation, widening of channels, temperature increases, trampled vegetation and soils, flow alterations, and degradation of riparian dependent species. Changes to the Proposed Action were suggested to reduce or eliminate adverse impacts including fencing, water developments, herding, and/or changes in grazing systems/seasons. This issue will be used to develop design criteria for all

allotments, allotment-specific design criteria, and adaptive management actions. Effects to soils and water quality will be analyzed in the EA.

Measures: Compliance with State water quality standards, trend in bank alteration and stability, trend in bare ground, number of springs protected.

Issue #3 - Wildlife and Wildlife Habitat: Some commentors were concerned that livestock grazing under the Proposed Action would have adverse impacts to various management indicator species and TES species. Specifically, there were concerns regarding direct impacts to sensitive snail populations through trampling; indirect impacts to big game through competition for forage; indirect impacts to small mammals and birds through reduction of grassland and riparian vegetative structure; and indirect impacts to northern leopard frogs from sedimentation and reduced water quality. Others were concerned that proposed range improvements (fences) would have direct and indirect impacts on big game animals, and spring developments could adversely impact snail species and frogs by drying up wetlands. Changes to the Purposed Action were suggested to reduce or eliminate adverse impacts from livestock grazing or range improvements. This issue will be used to develop design criteria for all allotments, allotment-specific design criteria, and adaptive management actions. Effects to wildlife and wildlife habitat will be analyzed in the EA.

Measures: Effects to vegetative structure in grasslands and riparian areas, miles of fence to be constructed, and number of springs to be protected.

Issue #4 - Range Improvements: Several commentors disagreed with the use of range improvements as described in the Proposed Action. Some commentors felt that the proposed range fences would interfere with wildlife movements while others felt that the local elk population would render fences ineffective. One individual thought that the proposals for fencing in Lady Finger Gulch would not be effective in protecting *Carex sp.* Others were concerned that funding was not available to construct or maintain the improvements. Suggestions were made to make the proposals more effective while others disagreed with the use of any range improvements. Some commentors requested a timeline for implementation of proposed improvements. This issue will be used to develop design criteria for all allotments, allotment-specific design criteria, and adaptive management actions. Effects from range improvements, as well as effectiveness and costs of range improvements will be analyzed in the EA.

Measures: Miles of fence/pipeline to be constructed, number of springs to be protected, costs of range improvements, and effectiveness of range improvements.

ALTERNATIVES, INCLUDING THE PROPOSED ACTION

This chapter describes and compares the alternatives considered for the North Zone Range 08 project. It describes alternatives considered in detail as well as those eliminated from detailed evaluation. The end of this chapter presents the alternatives in tabular format so that the alternatives and a summary of their environmental impacts can be readily compared.

Alternatives Considered in Detail

Alternative A

Proposed Action

This is the action proposed in the scoping letter dated October 23, 2007. The Forest Service proposes to continue to authorize livestock grazing with some modifications on ten allotments on the Bearlodge (Cole, Farrall, Ogden, and Redwater Allotments) and Northern Hills Ranger Districts (Higgins Gulch, Hop Creek, Tollgate, and Wolff Allotments). The proposed action is designed to maintain or improve resource conditions in rangeland health, vegetation, and watershed conditions relative to livestock grazing. Some grazing practices would be changed to resolve grazing related resource issues. The proposed action also provides for alternate adaptive management actions to be taken if resource conditions do not move toward the desired conditions in an acceptable timeframe.

A maximum of 8,510 AUMs would be authorized on a total of 89,746 acres. Maximum allowable forage utilization would range from 40-50% depending on the vegetation type and the current range conditions. One allotment could be grazed up to 70% utilization to reduce cheat grass infestation. Three miles of fence would be built to split two pastures. Four and one-half miles of pipeline, 6 stock tanks and 1 storage tank would be added to improve livestock distribution. One-half mile of fence would be relocated. One stock tank would be removed or relocated. Thirty-eight springs, ponds, or riparian areas would be protected with fences. Fences would be built over the 10-year permit period based on priority and as funds become available. Maps of each allotment are provided in Appendix A.

Monitoring will occur over time with evaluation of the results being used by the IDT and the District Rangers to determine what adjustments are needed to ensure adequate progress toward desired conditions. A monitoring plan for each allotment is included (See Appendix B). All adaptive actions will be within the scope of effects described in this document, or a supplemental NEPA document and decision will be prepared as appropriate.

Design Criteria for All Allotments

Based on the issues identified through public comment on the proposed action, the Forest Service developed the following design criteria for all allotments under Alternative A.

- Acceptable type of livestock to be grazed is cattle. Acceptable classes of livestock are mature (cow/calf) and yearling.
- Allowable utilization will range from 0-50% based on Forest Plan guideline 2505 (except for the Huett Springs allotment which will allow 60-70% utilization to reduce cheatgrass infestation).
- Use salting to influence livestock distribution patterns. Do not salt within ¼ mile of water sources, eligible heritage sites, or developed recreation sites.
- Maintain existing range improvements as assigned in the term grazing permits.

- Reconstruct/replace existing range improvements as their useful life expectancy is amortized or to respond to natural disasters.
- Evaluate range readiness annually and adjust turn-on date as needed.
- Evaluate utilization and adjust pasture move dates and move-off dates to ensure meeting of allowable use standards. (FP standard 2505, 2506, and 2507)
- Roads providing access to rangeland improvements will be evaluated and maintained as needed on a case-by-case basis.
- Locate new livestock/wildlife water sites out of hardwood communities when feasible. (FP standard 2207)
- Implement the following Region 2 Watershed Conservation Practices (USDA Forest Service 2006) as they pertain to livestock grazing:
 - In each watershed containing a 3rd-order and larger stream, limit connected disturbed areas so the total stream network is not expanded by more than 10%. Progress toward zero connected disturbed area as much as practicable. In watersheds that contain stream reaches in diminished stream health class, allow only those actions that will maintain or reduce watershed-scale Connected Disturbed Area. (Management Measure 1, Design Criteria(a)) (FP standard 1116)
 - Maintain the organic ground cover of each activity area so that pedestals, rills, and surface runoff from the activity area are not increased. The amount of organic ground cover needed will vary by different ecological types and should be commensurate with the potential of the site. (Management Measure 2, Design Criteria (a)) (FP standard 1112)
 - Allow no action that will cause long-term change to a lower stream health class in any stream reach. In degraded systems (i.e. At-risk or diminished stream health class), progress toward robust stream health within the next plan period. (Management Measure 3, Design Criteria (a)) (FP standard 1301)
 - Allow no action that will cause long-term change away from desired condition in any riparian or wetland vegetation community. Consider management of stream temperature and large woody debris recruitment when determining desired vegetation community. In degraded systems, progress toward desired condition within the next plan period. (Management Measure 3, Design Criteria (b)) (FP standard 1301)
 - Locate new concentrated-use sites outside the water influence zone (WIZ) if practicable and outside riparian areas and wetlands. Armor or reclaim existing sites in the WIZ to prevent detrimental soil and bank erosion. (Management Measure 3, Design Criteria (e)) (FP standard 1301)

- Manage livestock use through control of time/timing, intensity, and duration/frequency of use in riparian areas and wetlands to maintain or improve long-term stream health. Exclude livestock from riparian areas and wetlands that are not meeting or moving towards desired condition objectives where monitoring information shows continued livestock grazing would prevent attainment of those objectives. (Management Measure 3, Design Criteria (f)) (FP standard 1301)
- Keep stock tanks, salt supplements, and similar features out of the WIZ if practicable and out of riparian areas and wetlands always. Keep stock driveways out of the WIZ except to cross at designated points. Armor water gaps and designated stock crossings where needed and feasible. (Management Measure 3, Design Criteria (g)) (FP standard 1301)
- Manage dry meadow and upland plant communities, including Kentucky bluegrass types, that have invaded into wetland/riparian areas in a manner that will contribute to their replacement over time by more mesic native plant communities to the extent practicable. Develop site-specific riparian stubble height standards or use the following default levels for *Carex* and *Juncus* species: 3-4 inches in spring-use pastures and 4-6 inches in summer or autumn use pastures; to leave adequate residual stubble height to retain effective ground cover. (Management Measure 3, Design Criteria (h)) (FP standard 2505 and 2507)
- Do not allow livestock grazing through an entire growing season in pastures that contain in riparian areas and wetlands. Apply short-duration grazing as practicable (generally less than 20 days) to minimize re-grazing of individual plants, to provide greater opportunity for regrowth and to manage utilization of woody species and reduce soil compaction. During the hot season (mid-to-late summer) manage livestock herds to avoid concentrating in riparian areas and wetlands. Apply principles of the Grazing Response Index to livestock management (USFS, 1996a). (Management Measure 3, Design Criteria (i)) (FP guideline 2502)
- Design grazing systems to limit utilization of woody species. Where woody species have been historically suppressed, or where the plant community is below its desired condition and livestock are a key contributing factor, manage livestock through control of time/timing, intensity, and duration/frequency of use so as to allow for riparian hardwood growth extension and reproduction. Manage woody species in riparian areas to provide for stream temperature, bank stability and riparian habitat. (Management Measure 3, Design Criteria (j)) (FP standard 2505)
- Maintain the extent of stable banks in each stream reach at 74 % or more of reference conditions. Consider degree of livestock trampling and riparian vegetation utilization on

or immediately adjacent to stream banks when timing livestock moves between units. (Management Measure 3, Design Criteria (k)) (FP standard 1301)

- Adjust management in riparian areas and wetlands to improve detrimental soil compaction whenever it occurs. (Management Measure 3, Design Criteria (l)) (FP standard 1103)
- Avoid any loss of rare wetlands such as fens and springs. (Management Measure 6, Design Criteria (e)) (FP standard 1302)
- Ground disturbing activities such as installation of water developments, pipelines, fences or enclosure will require both heritage resource and sensitive species surveys approval by a Forest Service archeologist, botanist, and wildlife biologist prior to construction.
- Tribes will be notified if culturally significant artifacts or burial sites are found during project implementation. (FP standard 1702)
- When long-term drought situations occur, range permittees will be notified in writing that reductions in season or livestock numbers may be anticipated.
- Grazing in post-wildfire situations will be evaluated by an IDT based on burn severity, vegetative regrowth, and management objectives. (FP standard 1103)
- Defer prescribed burn areas from livestock grazing for a portion or all of the following growing season to ensure regrowth of forage species. (FP guideline 4107)
- Do not construct or maintain range improvements located within ½ mile of active goshawk nests from April 1 through August 15 or until the nest has failed or fledglings have dispersed. (FP Standard 3111)
- Locate and design structural range improvements in MA 4.1 to meet Scenic Integrity Objectives. (FP Guideline 4.1-2502)
- Restrict access of domestic livestock to protect R2 sensitive and species of local concern occurrences in designated Botanical Areas. (FP Standard 3.1-2503)

Using the list of possible adaptive grazing management actions displayed in Table 4, the IDT developed a specific proposed action and other adaptive management actions for each allotment.

Table 4. List of possible grazing management actions used to develop the Proposed Action (Alternative A) for the North Zone Range 08 allotments

Possible Grazing Management Actions
Implement different grazing system, and/or change number of pastures (deferred rotation in 2, 3, 4, or more pastures, rest-rotation, short-duration spring grazing, etc.) to meet resource objectives on the allotment, (may include use of permittees private land in the rotation)
Use water to control livestock distribution (turn water on or off at existing spring developments).
Haul water to temporary tanks to influence livestock distribution and obtain use in areas that normally receive light to no use (location of tanks is moved around allotment)
Construct new permanent water development to influence livestock distribution (dugouts/ponds, wells, pipeline, tanks, pump, solar)
Remove existing water development to influence livestock distribution
Construct fence to exclude livestock from areas of concern (springs, seeps, riparian, R2 sensitive species sites, species of local concern, hardwoods, heritage site, or other)
Implement specific dates of use or nonuse to protect areas of concern
Construct permanent fence to influence livestock distribution
Use temporary electric fence for short-term control of livestock distribution
Remove (permanent or temporary) fence to influence livestock distribution
Use of range rider (herding) to control livestock movement (distribution)
Change class of animal (i.e. cow/calf to yearling) – do not exceed permitted AUMs (stocking rate)
Rest from livestock grazing for one or more seasons.
Change the permitted livestock number and season until demonstrated progress towards desired future condition is made (as evidenced by monitoring and inventory data)
Do not allow livestock grazing
Brush and clean cattle trails to improve livestock access and distribution
Rehabilitate areas with specific undesirable plants or noxious weeds back to native species (grass,

Possible Grazing Management Actions
shrub and forb species)
Restore or enhance hardwood regeneration by planting native hardwoods and/or shrubs
Split or combine allotments
Change allotment or pasture boundaries
Utilize forage reserve allotments or pastures
Construct brush barriers to protect sensitive resource area

The Proposed Action is based on the principle of applying adaptive management. A proposed course of action was selected as a starting point believed to best meet or move toward the desired condition. Some practices alone may not meet the desired condition, but in combination with other practices, desired conditions may be met or moved toward being met. For example, a 2-unit deferred grazing system alone may not provide the anticipated result, but when coupled with light grazing intensity and construction of additional water developments, desired conditions may be met. In some cases certain management actions were precluded from use due to other management concerns. Table 5 shows the grazing allotment, project-specific design criteria, and the adaptive options to be applied as a means of meeting the need for action and moving toward the desired condition.

Table 5. Allotment-specific descriptions of existing condition, desired condition, need for action, proposed action and adaptive options for the North Zone Range 08 allotments.

Benchmark or Area of Concern	Desired Condition (See Table 4)	Existing Condition	Need for Action	Proposed Action	Adaptive Management Options
Black Haw Allotment					
Black Haw Gulch	<p>Manage for Riparian Communities – Maintain diverse riparian plant community, achieve and maintain at least 74% stable stream banks.</p>	<p>High percent bare ground, high level of trampling, limited extent of riparian vegetation. Stock tank located in riparian area.</p>	<p>Reduce bare ground, reduce trampling in riparian, increase extent of riparian vegetation.</p>	<p>Maintain single pasture, season-long grazing system Remove or relocate existing stock tank and restore natural flow of spring.</p> <p>Max. AUMs “On” = 38 under 10-yr. On/Off term permit Max. 40% utilization, 40% on riparian shrubs.</p> <p>Proposed “On” date: 6/10 Proposed “Off” date: 10/15</p>	<p>Adjust grazing season between 6/1 and 10/30 not to exceed 38 AUMs OR: Shorten season of use between 6/1 and 10/30 not to exceed 38 AUMs OR: Fence riparian area OR: Reduce AUMs</p>

Benchmark or Area of Concern	Desired Condition (See Table 4)	Existing Condition	Need for Action	Proposed Action	Adaptive Management Options
Grand Canyon Allotment					
Smith Draw Benchmark	<p>Manage for Upland Grasslands – Provide for diversity of desirable plant species, <5% bare ground, < 2% noxious weeds</p>	<p>58% graminoids 40% forbs 1% noxious weeds 3% bare ground</p>	<p>Maintain existing condition</p>	<p>Implement 3-pasture deferred rotation grazing system Max. AUMs = 1,602 under 10-yr. term permit and 280 AUMs under 10-yr. term private permit Max. 50% utilization Proposed “On” date: 6/11 Proposed “Off” date: 9/30</p>	<p>If monitoring shows unacceptable impacts, any appropriate adaptive management option listed in Table 4 may be used OR: Adjust grazing season between 6/1 and 10/30 not to exceed 1,882 AUMs OR: Reduce AUMs</p>
Rifle Pit Benchmark	<p>Manage for Upland Grasslands – Provide for diversity of desirable plant species, <5% bare ground, < 2% noxious weeds</p>	<p>45% graminoids 52% forbs 3% shrubs 1% noxious weeds</p>	<p>Maintain existing condition</p>	<p>See above</p>	<p>See above</p>

Benchmark or Area of Concern	Desired Condition (See Table 4)	Existing Condition	Need for Action	Proposed Action	Adaptive Management Options
<p>South Spring and other springs</p>	<p>Manage for Riparian Communities – Maintain diverse riparian plant community, achieve and maintain <5% bare ground, <40% of current years willow leaders browsed.</p>	<p>Trampling and hummocking in riparian area, willows are browsed, the majority decadent with no regeneration</p>	<p>Reduce trampling and hummocking in riparian areas, decrease browsing on willows and allow regeneration, improve overall habitat quality of riparian areas</p>	<p>Exclude livestock from spring sources and associated riparian habitat at the following springs: South, Silver, Bear, West Ike, Twin, Dugout, Big Mud, Billie, Crowley, Paige, U. Williams, Smith, Meadow, Gooseberry, and Smith Draw seeps. High priority springs (Twin, Paige, Dugout) will be fenced first. Reconstruct existing spring developments No new spring developments allowed at this time.</p>	<p>Further protection for springs and associated riparian areas will be evaluated based on monitoring. Any appropriate adaptive management option listed in Table 4 may be used Additional protection will be designed by an ID team and the permittee Future proposals for spring developments will be evaluated by an IDT prior to approval. Any future spring developments will be approved under a separate NEPA document</p>

Benchmark or Area of Concern	Desired Condition (See Table 4)	Existing Condition	Need for Action	Proposed Action	Adaptive Management Options
Huett Springs Allotment					
<p>Lake Divide Benchmark</p>	<p>Manage for Upland Grasslands – Provide for diversity of desirable plant species, <25% bare ground, < 2% noxious weeds</p>	<p>30-40% cheatgrass 6-8% bare ground</p>	<p>Reduce cheat grass, increase perennial grasses</p>	<p>Continue 2-pasture deferred rotation grazing system</p> <p>Max. AUMs = 202 “On” under 10-yr. On/Off grazing permit</p> <p>Allow 60% utilization on cheatgrass</p> <p>50% utilization in riparian areas</p> <p>Proposed “On” date: 5/10</p> <p>Proposed “Off” date: 9/30</p>	<p>If the frequency of desirable species is not increased in 5 yrs, allow livestock to begin grazing as early as April 15.</p> <p>OR</p> <p>Allow 70% utilization on cheatgrass while protecting riparian areas</p> <p>OR</p> <p>Allow up to 70% utilization on cheatgrass from 9/15 to 10/31 during years cheatgrass is actively growing</p> <p>OR</p> <p>Use herbicide to reduce cheatgrass, plant native species</p>

Benchmark or Area of Concern	Desired Condition (See Table 4)	Existing Condition	Need for Action	Proposed Action	Adaptive Management Options
Kudlock	<p>Manage for Upland Grasslands – Provide for diversity of desirable plant species, <25% bare ground, < 2% noxious weeds</p>	<p>30-40% cheatgrass 6-8% bare ground</p>	<p>Reduce cheatgrass, increase perennial grasses</p>	<p>Same as above</p>	<p>Same as above</p>
Silver Creek Allotment					
Meadow above Boardinghouse Spring	<p>Manage for Upland Grasslands – Provide for diversity of desirable plant species, <5% bare ground, < 2% noxious weeds</p>	<p>Bluegrass dominated but good species diversity 53% graminoids 22% forbs 25% shrubs 2% bare ground 0% noxious weeds</p>	<p>Maintain existing condition</p>	<p>Continue 2-pasture deferred rotation grazing system in both the Vore and Smith units; single-pasture season-long grazing in the Meisner unit Max. AUMs = 921 under term, private, and On/Off permits 50% utilization Proposed “On” date: 6/11 Proposed “Off” date: 10/15 for Smith and Moskee units; 10/25 for Vore unit; 10/30 for Meisner unit</p>	<p>Adjust grazing season between 6/1 and 10/30 OR: Shorten season of use between 6/1 and 10/30 OR: Reduce AUMs</p>

Benchmark or Area of Concern	Desired Condition (See Table 4)	Existing Condition	Need for Action	Proposed Action	Adaptive Management Options
<p>Pete Spring</p>	<p>Manage for Riparian Communities – Maintain diverse riparian plant community, achieve and maintain at least 74% stable stream banks.</p>	<p>Some trampling and hummocking is occurring, willows are regenerating</p>	<p>Continue to protect spring source and riparian vegetation</p>	<p>Exclude livestock from spring source and riparian habitat</p>	<p>Further protection for springs and associated riparian areas will be evaluated based on monitoring. Any appropriate adaptive management option listed in Table 4 may be used</p> <p>Additional protection will be designed by an ID team and the permittee.</p>
<p>Stearns Park/Willows Springs Allotments</p>					
<p>Buffalo Park Benchmark</p>	<p>Manage for Upland Grasslands – Provide for diversity of desirable plant species, <5% bare ground, < 2% noxious weeds</p>	<p>45% perennial grasses 25% grass-like sedges 28% forbs 2% shrubs 0% noxious weeds, 6% bare ground</p>	<p>Maintain existing condition</p>	<p>Continue 7-pasture deferred rotation grazing system</p> <p>Use temporary or permanent fence to split the East pasture</p> <p>Extend the existing Rattlesnake, Miller Spring and Wagon Canyon Pipelines and add stock tanks to improve livestock distribution.</p>	<p>If monitoring shows unacceptable impacts, any appropriate adaptive management option listed in Table 4 may be used</p> <p>OR:</p> <p>Adjust grazing season between 6/1 and 10/30 not to exceed 2,768 AUMs</p>

Benchmark or Area of Concern	Desired Condition (See Table 4)	Existing Condition	Need for Action	Proposed Action	Adaptive Management Options
				Max. AUMs = 2,768 under 10-yr. term and private grazing permits Allow 50% utilization Proposed “On” date: 6/1 Proposed “Off” date: 10/30	OR: Reduce AUMs
Sec. 16 Benchmark	Manage for Upland Grasslands – Provide for diversity of desirable plant species, <5% bare ground, < 2% noxious weeds	58% perennial grasses 1% grass-like sedges 39% forbs 2% noxious weeds 8% bare ground	Reduce bare ground	See above	See above
Calvert/Sackett Benchmark	Manage for Upland Grasslands – Provide for diversity of desirable plant species, <5% bare ground, < 2% noxious weeds	31% perennial grasses 10% grass-like sedges 29% forbs 9% shrubs 2% bare ground 10% noxious weeds	Reduce noxious weeds, improve species diversity	See above	See above

Benchmark or Area of Concern	Desired Condition (See Table 4)	Existing Condition	Need for Action	Proposed Action	Adaptive Management Options
<p>Katan Spring Benchmark</p>	<p>Manage for Upland Grasslands – Provide for diversity of desirable plant species, <5% bare ground, < 2% noxious weeds</p>	<p>55% perennial grasses 17% grass-like sedges 17% forbs 6% shrubs 5% noxious weeds 0% bare ground</p>	<p>Maintain existing condition (Note: recent noxious weeds are due to timber management activity and are currently being treated)</p>	<p>See above</p>	<p>See above</p>
<p>Guidinger Benchmark</p>	<p>Manage for Upland Grasslands – Provide for diversity of desirable plant species, <5% bare ground, < 2% noxious weeds</p>	<p>47% perennial grasses 10% grass-like sedges 42% forbs 1% noxious weeds 10% bare ground</p>	<p>Continue downward trend in bare ground</p>	<p>See above</p>	<p>See above</p>
<p>Guidinger Creek</p>	<p>Manage for Riparian Communities – Maintain diverse riparian plant community, achieve and maintain at least 74% stable stream banks.</p>	<p>Some trampling and stream bank alteration occurring, older willows are decadent but willows and aspen are regenerating</p>	<p>Continue improvement in willow condition and age class distribution. Reduce stream bank alteration</p>	<p>Limit livestock use at Guidinger Spring until banks are stable and revegetated Once banks are stable and revegetated, determine if livestock grazing is appropriate in this area</p>	<p>Modify timing and duration of grazing OR: Reduce AUMs OR: Install permanent or temporary fence.</p>

Benchmark or Area of Concern	Desired Condition (See Table 4)	Existing Condition	Need for Action	Proposed Action	Adaptive Management Options
<p>Simmons Spring</p>	<p>Manage for Riparian Communities – Maintain diverse riparian plant community, achieve and maintain <5% bare ground.</p>	<p>Some trampling and hummocking are still occurring, but willows are regenerating</p>	<p>Continue to protect spring source and riparian vegetation</p>	<p>Reconstruct existing fence at Simons Spr.</p>	<p>Further protection for springs and associated riparian areas will be evaluated based on monitoring. Any appropriate adaptive management option listed in Table 4 may be used</p> <p>Additional protection will be designed by an ID team and the permittee.</p>
<p>Three Willow Spring and other springs</p>	<p>Manage for Riparian Communities – Maintain diverse riparian plant community, achieve and maintain <5% bare ground.</p>	<p>Trampling evident in spring and wetland, willows are decadent with no regeneration</p>	<p>Reduce livestock impacts to spring source and wetland community, regenerate willows</p>	<p>Exclude livestock from spring sources and associated riparian habitat at the following springs: Three Willow, WY stateline, Hillside, Andy, No Name, Sandpit, SD stateline, Wagon Canyon, Corwood, Lost, Two-way, Junius, and East Riflepit</p>	<p>If utilization in area along FDR 105 exceeds standards, exclude livestock through fencing or other means</p>

Benchmark or Area of Concern	Desired Condition (See Table 4)	Existing Condition	Need for Action	Proposed Action	Adaptive Management Options
				Reconstruct existing fences at Balm of Gilead Spring, and Anderson Spr. Reconstruct and expand fence at Deer Spr. No new spring developments allowed Monitor riparian area along FDR 105.	
East Rapid Allotment					
Gimlet Meadow Benchmark	Manage for Upland Grasslands – Provide for diversity of desirable plant species, <5% bare ground, < 2% weeds	95% perennial grasses 5% forbs <1% bare ground No noxious weeds	Maintain existing condition	Continue 2-pasture deferred grazing system Max. AUMs = 455 under 10-yr. term grazing permit Allow 50% utilization Proposed “On” date: 6/1 Proposed “Off” date: 10/15	If monitoring shows unacceptable impacts, any appropriate adaptive management option listed in Table 4 may be used

Benchmark or Area of Concern	Desired Condition (See Table 4)	Existing Condition	Need for Action	Proposed Action	Adaptive Management Options
Gimlet Creek	<p>Manage for Riparian Communities – Maintain diverse riparian plant community, achieve and maintain at least 74% stable stream banks.</p>	<p>Less than 74% stable stream banks, extent of deep-rooted riparian vegetation less than desired</p>	<p>Reduce stream bank alteration, reduce livestock impacts on riparian vegetation</p>	<p>Exclude livestock from Gimlet Creek downstream of the pond through use of temporary fencing until banks are at least 74% stable</p>	<p>Remove temporary fence when desired conditions are met OR Construct permanent fence OR Change grazing system</p>
Keloran Spring	<p>Manage for Riparian Communities – Maintain diverse riparian plant community, achieve and maintain <5% bare ground.</p>	<p>The spring source was trampled and riparian species were heavily utilized</p>	<p>Reduce trampling, reduce utilization on riparian species</p>	<p>Exclude livestock from Keloran Spring and riparian area. Reconstruct existing spring and stock tank</p>	<p>Further protection for springs and associated riparian areas will be evaluated based on monitoring. Any appropriate adaptive management option listed in Table 4 may be used Additional protection will be designed by an ID team and the permittee.</p>

Benchmark or Area of Concern	Desired Condition (See Table 4)	Existing Condition	Need for Action	Proposed Action	Adaptive Management Options
Griffith Allotment					
Moses Pasture Benchmark	<p>Manage for Upland Grasslands – Provide for diversity of desirable plant species, <5% bare ground, < 2% weeds</p>	<p>45% perennial grasses 2% grass-like sedges 53% forbs < 5% bare ground No noxious weeds</p>	<p>Maintain existing condition</p>	<p>Continue 5-pasture deferred rotation grazing system Max. AUMs = 729 under 10-yr. term and private grazing permits Allow 50% utilization Proposed “On” date: 6/16 Proposed “Off” date: 10/15</p>	<p>If monitoring shows unacceptable impacts, any appropriate adaptive management option listed in Table 4 may be used</p>
Arnold Pasture Benchmark	<p>Manage for Upland Grasslands – Provide for diversity of desirable plant species, <5% bare ground, < 2% weeds</p>	<p>43% perennial grasses 57% forbs < 1% bare ground No noxious weeds</p>	<p>Continue upward trend by increasing native species</p>	<p>See above</p>	<p>If monitoring shows unacceptable impacts, any appropriate adaptive management option listed in Table 4 may be used</p>

Benchmark or Area of Concern	Desired Condition (See Table 4)	Existing Condition	Need for Action	Proposed Action	Adaptive Management Options
Lander Spring	Manage for Riparian Communities – Maintain diverse riparian plant community, achieve and maintain <5% bare ground.	Trampling in spring source, unacceptable level of ground disturbance	Reduce bare ground and soil compaction	Extend Lander Spring enclosure downstream to the meadow	If bare ground exceeds 5%, fence wet areas of meadow OR Develop spring and pipe water to earthen tank
Clayton Draw	Manage for Riparian Communities – Maintain diverse riparian plant community, achieve and maintain at least 74% stable stream banks.	Lack of willow regeneration	Reduce livestock impacts on willows	Extend Clayton Draw riparian enclosure fence	Further protection for riparian areas will be evaluated based on monitoring. Any appropriate adaptive management option listed in Table 4 may be used Additional protection will be designed by an ID team and the permittee.
Pettigrew Allotment					
Baldy Pasture Benchmark (NW ¼ Sec. 23)	Manage for Upland Grasslands – Provide for diversity of desirable plant species, <5% bare ground, < 2% weeds	44% perennial grasses 11% grass-like sedges 32% forbs 12% shrubs < 3% bare ground	Maintain existing condition	Continue 2-pasture deferred rotation grazing system Max. AUMs = 1,034 under 10-yr. term grazing permit	If monitoring shows unacceptable impacts, any appropriate adaptive management option listed in Table 4 may be used

Benchmark or Area of Concern	Desired Condition (See Table 4)	Existing Condition	Need for Action	Proposed Action	Adaptive Management Options
		No noxious weeds		Allow 50% utilization Proposed “On” date: 6/16 Proposed “Off” date: 9/30	
Red Lake Pasture Benchmark (NE ¼ Sec. 33)	Manage for Upland Grasslands – Provide for diversity of desirable plant species, <5% bare ground, < 2% weeds	58% perennial grasses 40% forbs 2% aspen < 3% bare ground No noxious weeds	Maintain existing condition	See above	See above
Baldy Lake	Manage for Riparian Communities – Maintain diverse riparian plant community, achieve and maintain at least 74% stable stream banks.	Trampling and hummocking evident in riparian area and springs above Baldy Lake, mostly decadent willow but some recent willow regeneration	Reduce trampling and hummocking, reduce livestock impacts to willows	Exclude livestock from riparian area above Baldy Lake	Further protection for riparian areas will be evaluated based on monitoring. Any appropriate adaptive management option listed in Table 4 may be used Additional protection will be designed by an ID team and the permittee.

Benchmark or Area of Concern	Desired Condition (See Table 4)	Existing Condition	Need for Action	Proposed Action	Adaptive Management Options
<p>Prospect and Pettigrew Springs</p>	<p>Manage for Riparian Communities – Maintain diverse riparian plant community, achieve and maintain 74% stable stream banks.</p>	<p>Trampling and hummocking evident in riparian area and springs, tank at Pettigrew spring #3 is located in riparian area.</p> <p>Heavy browsing occurring on willows at Ladyfinger Seep and Prospect Spring.</p> <p>Streambank at and below Prospect Spring <74% stable</p>	<p>Reduce trampling and hummocking in riparian areas</p> <p>Decrease browsing on willows at Ladyfinger Seep and Prospect Spring.</p> <p>Increase streambank stability at and below Prospect Spring.</p>	<p>Exclude livestock from Pettigrew Spring #1.</p> <p>Extend exclosure at Pettigrew Spring #3 to better protect spring source and surrounding wetland habitat</p>	<p>Move stock tank at Pettigrew Spr. #3, if livestock use is moving away from desired conditions</p> <p>If livestock use exceeds 5% bare ground at Prospect Spring and Lady Finger Seep, or if streambank alteration exceeds 26%, then exclude livestock from spring and riparian area</p>
<p>Ladyfinger Gulch</p>	<p>Manage for Riparian Communities – Maintain diverse riparian plant community, achieve and maintain 74% stable stream banks.</p>	<p>Excessive trampling and stream bank alteration is occurring due to livestock use</p>	<p>Reduce trampling and stream bank alteration</p>	<p>Annually monitor area and remove livestock from the affected area if trigger points have been reached.</p>	<p>Limit livestock use through felling of some spruce trees to limit livestock access to localized areas</p> <p>OR</p> <p>Limit livestock use of riparian areas through fencing</p> <p>OR</p> <p>Reconstruct water source at Lady Finger Seep</p>

Benchmark or Area of Concern	Desired Condition (See Table 4)	Existing Condition	Need for Action	Proposed Action	Adaptive Management Options
					OR Eliminate livestock grazing from entire area by connecting existing fences
Ladyfinger Gulch	Manage for R2 sensitive and SOLC plant species – Livestock will be restricted from all or a portion of <i>Carex alopecoidea</i> (foxtail sedge) site CAAL8-19	<i>Carex alopecoidea</i> and habitat being impacted by livestock	Protect sensitive plant population and habitat	Maintain existing exclosure, annually monitor area and remove livestock from the affected area if trigger points have been reached	Limit livestock use through felling of some spruce trees to limit livestock access to <i>Carex alopecoidea</i> OR Further limit livestock use of <i>Carex alopecoidea</i> by extending existing exclosure OR Eliminate livestock grazing from entire area by connecting existing fences.
Pettigrew Gulch	Manage for R2 sensitive and SOLC plant species – Livestock will be restricted from all or a portion of <i>Carex alopecoidea</i> (foxtail	<i>Carex alopecoidea</i> and habitat being impacted by livestock	Protect sensitive plant population and habitat	Construct and maintain riparian exclosure designed in 2007 to protect <i>Carex alopecoidea</i>	If livestock use results in unacceptable impacts to <i>C. alopecoidea</i> site outside the exclosure, then extend exclosure

Benchmark or Area of Concern	Desired Condition (See Table 4)	Existing Condition	Need for Action	Proposed Action	Adaptive Management Options
	sedge) site CAAL8-20				
Upper Elk Allotment					
Benchmark in SW ¼ Sec. 29	Manage for Upland Grasslands – Provide for diversity of desirable plant species, <5% bare ground, < 2% weeds	99% perennial grasses Trace - forbs Trace – shrubs <3% bare ground No noxious weeds	Continue upward trend by increasing native species	Continue season long grazing system Max. AUMs = 481 under term and private grazing permits Allow 45% utilization Proposed “On” date: 6/7 Proposed “Off” date: 9/1 for 260 AUMs 9/30 for other 221 AUMs	Implement a deferred rotation grazing system. If monitoring shows unacceptable impacts, any appropriate adaptive management option listed in Table 4 may be used
Benchmark in SE ¼ Sec. 32	Manage for Upland Grasslands – Provide for diversity of desirable plant species, <5% bare ground, < 2% weeds	27% perennial grasses 14% grass-like sedges 26% forbs 32% shrub/tree < 1% bare ground <1% noxious weeds	Maintain existing condition	See above	See above

Benchmark or Area of Concern	Desired Condition (See Table 4)	Existing Condition	Need for Action	Proposed Action	Adaptive Management Options
<p>Upper Elk Spring #2</p>	<p>Manage for Riparian Communities – Maintain diverse riparian plant community, achieve and maintain 74% stable stream banks.</p>	<p>Livestock are causing unacceptable levels of trampling in area below the spring</p>	<p>Reduce trampling by livestock</p>	<p>Extend enclosure below spring</p>	<p>If City of Lead abandons spring, then the fence maintenance will be assigned to the permittee</p>
<p>Englewood Spring Botanical Area (MA 3.1)</p>	<p>Manage for R2 sensitive and SOLC plant species – Livestock use in Englewood Spring Botanical Area will be minimal, and livestock access to R2 sensitive and SOLC plant occurrences and suitable habitat will be restricted.</p>	<p>SOLC plant occurrences are being impacted by unknown grazers and other actions</p>	<p>Eliminate impacts to SOLC plant occurrences</p>	<p>Monitor impacts to <i>Listera convallarioides</i> population and suitable habitat to determine nature and source of impacts</p>	<p>If use by livestock exceeds “minimal” level, then restrict livestock access to populations of R2 sensitive species of SOLC species and suitable habitat by fencing or other means</p>

Alternative B

No Action

Under the No Action/No Grazing alternative, no livestock grazing would be permitted on any of the allotments. This alternative would require the cancellation of all grazing permits upon implementation of the decision and resolution of any appeals. Pursuant to Forest Service Handbook R2 ID 2209.13, Section 16.13, this alternative could not be implemented until one year after the notification of each affected permittee (36 CFR 222.4(a)(7)(8)).

According to direction given in the Forest Service Handbook (FSH) 2209.13, Chapter 90, section 94.1, R2 ID of 12/19/2005 “the “no grazing” alternative will always be fully developed and analyzed in detail.” “No action” is synonymous with “no grazing” and means that livestock grazing would not be authorized within the project area. Improvements such as stock tanks, spring developments and other water features used by wildlife would not be removed. Other funding sources would be used to maintain the water improvements left in place. Other improvements such as fences, gates, and cattleguards not needed for management of allotments sharing common boundaries would eventually be removed as time and funding allows. This alternative provides an environmental baseline for evaluation of the action alternatives as well as providing a viable alternative in its own right.

Alternatives Not Considered in Detail

Federal agencies are required to rigorously explore and objectively evaluate all reasonable alternatives developed in detail (40 CFR 1502.14). Public comments received in response to the Proposed Action provided suggestions for alternative methods for achieving the purpose and need. Some of these alternatives may have been outside the scope of the need for the proposal, duplicative of the alternatives considered in detail, or determined to be components that would cause unnecessary environmental harm. Therefore, a number of alternatives were considered, but dismissed from detailed consideration for reasons summarized below:

Current Management – Current management is not meeting the purpose and need in areas of several allotments. Where current management is meeting the stated purpose and need, those management practices have been incorporated into the Proposed Action.

Grass banks – One commentor suggested that grazing not be reauthorized these allotments but instead be used for replacement forage (grass banks) for livestock from other allotments displaced by fire, drought, or other circumstances. Currently all of the allotments are allocated to permittees. Should any of the current permittees, give up their permit then this option could be considered at that time. At this time this alternative is not feasible.

Graze wild horses – One commentor suggested that these allotments be used to provide forage for wild horses instead of cattle. Currently all of the allotments are allocated to permittees. Grazing allotments are administered in cooperation with permittees based on the nature of their ranching operations. None of the current permittees have requested

grazing wild horses; nor has the Forest received any requests from the Bureau of Land Management for grazing of wild horses on the Forest.

Culling herd prior to grazing – One commentor suggested that herds be culled prior to grazing on National Forest system lands to reduce the number of grazing animals and reduce grazing impacts. This alternative is outside the scope of this analysis. The Forest Service does not have jurisdiction over how cattle are managed while on private lands.

Weaning calves earlier – One commentor suggested that calves be weaned earlier to reduce the number of grazing animals and reduce grazing impacts. This alternative is outside the scope of this analysis. Grazing permits are issued for a maximum number of animal months for any given type and class of livestock based on forage utilization. Removing livestock earlier is an option available to the Forest Service once proper utilization is achieved under the terms of the grazing permit. Weaning calves earlier is an option the permittees can choose at any time.

Leasing additional pasture – One commentor suggested that permittees lease additional pasture to reduce grazing impacts on these allotments. This alternative is outside the scope of this analysis. The Forest Service does not have jurisdiction over how cattle are managed while on private lands although permittees often do lease additional pasture

Using irrigated pastures with improved forage species – The same commentor suggested that the Forest Service consider grazing irrigated pastures with improved forage species. This alternative is not feasible; there are no irrigated pastures on these National Forest System lands. Irrigating and planting non-native species are not authorized practices under the Black Hills National Forest Plan.

Focus on grazing areas least grazed years before – This is included in the Proposed Action as part of any deferred rotation grazing system.

Make all on and off dates the same – One commentor suggested that the Forest Service should standardize the dates for turning livestock onto the allotments and for removing livestock from the allotments. This alternative is not considered appropriate range management. Actual “On” dates are determined by range readiness and actual “Off” dates are determined by percent utilization.

Prohibit livestock grazing in Botanical Areas (MA 3.1) – Another commentor suggested that livestock grazing be prohibited in Botanical Areas (MA 3.1). The Forest Plan allows livestock grazing in Botanical Areas as long as there is no conflict with the values for which the Botanical Area was designated. One small area in Englewood Springs Botanical Area was initially identified as being impacted by livestock. Upon further investigation, there are other impacts occurring from an improperly functioning road culvert and from heavy use of the area by deer and elk. The actual impacts from livestock appear to be minimal and not in conflict with the values of the Botanical Area designation. Alternative A includes monitoring for this site and adaptive management actions to reduce impacts from livestock in the future, if necessary. Thus prohibiting livestock use in this Botanical Area is not warranted at this time. Livestock grazing would be prohibited under Alternative B, the No Grazing alternative.

Use buffers around Botanical Areas to eliminate cattle straying into the areas – This alternative is not considered necessary or feasible. Other adaptive management options are included in the Proposed Action to protect Botanical Areas.

Do not allow new water developments – The Proposed Action does not include any new spring developments. It only includes repairs and pipeline extensions. No new water development would be allowed under Alternative B, the No Grazing alternative.

Require mandatory range riders – One commentor suggested that range riders be required on all allotments. The use of range riders was considered as an adaptive management option for all allotments. This adaptive option may still be used on any allotment if monitoring indicates unacceptable impacts.

Uses deferred rotation grazing on all allotments – One commentor suggested that deferred rotation grazing systems be used on all allotments. It was not deemed feasible for some of the allotments. Deferred rotation grazing was considered as an adaptive management option for all allotments. This adaptive option may still be used on any allotment if monitoring indicates unacceptable impacts.

Discontinue grazing on any lands that would support more wildlife if cattle grazing were ceased – This proposal is included in Alternative B, the No Action/No Grazing alternative.

Do not allow grazing within 200 meters of northern leopard frog breeding ponds – Another commentor suggested that livestock grazing not be allowed within 200 meters of northern leopard frog breeding ponds. This alternative was not considered necessary or feasible, because the Proposed Action includes other adaptive management actions to protect northern leopard frogs.

Move grazing allotments so they don't overlap with hiking trails – This proposal is not necessary. The only hiking trail in these allotments is the Old Baldy trail system, which was established largely on historic cow trails because cow trails made for easy trail placement and construction. Postings are placed at the Old Baldy trail head informing recreationists that livestock may be in the area. No incidents of hiker conflicts have been reported.

Monitoring

Monitoring and evaluation are key elements of adaptive management. Monitoring helps determine how LRMP and NEPA decisions are being implemented, whether implementation is achieving the desired outcome, or whether changes in management are needed. Through monitoring, the Forest Service can measure whether or not, desired conditions are being achieved in an appropriate timeframe. Through adaptive management, allotment management plans can remain dynamic, relevant, and useful documents over many years.

Two types of monitoring are associated with allotment management plans (AMPs): implementation monitoring and effectiveness monitoring. Implementation monitoring (short-term) will measure whether or not LRMP standards and guidelines are being met, while effectiveness monitoring (long-term) will evaluate how effective management actions are at moving toward or achieving the desired conditions.

Budgets, personnel and resource condition will determine the scope and degree of rangeland monitoring activities. A realistic implementation monitoring strategy will be to monitor all of the allotments using both Forest Service and permittee monitoring. Much of the implementation monitoring is actually the responsibility of the permittee. However, Forest Service range managers and other specialists, such as botanists, wildlife biologists, and archeologists, also monitor compliance with LRMP standards and guidelines. Upland and riparian monitoring areas will be the focus of effectiveness monitoring which is primarily the responsibility of the Forest Service personnel. However range permittees are always welcome to participate in effectiveness monitoring.

Rangeland Implementation (Short-term) Monitoring

Short-term range monitoring techniques will vary depending on the resources being monitored. Monitoring will take place annually at key areas of livestock use on each allotment. All agency monitoring methods can be used in monitoring efforts. The following monitoring techniques will generally be used alone or in combination:

- **Range Readiness:** Indicators used to determine rangeland readiness are soils and vegetation conditions. Rangelands are generally ready for grazing when soils have become firm after winter and spring precipitation, and when plants have reached the defined stage of growth at which grazing many begin under the specific management plan without long-lasting damage.
- **Ocular Utilization Estimate:** Ocular estimates provide a visual estimate of utilization of riparian and upland herbaceous or browse species. Estimates are based on a description representing a broad range (class) of utilization rather than a precise amount (U.S. Forest Service 1996b).
- **Stubble Height:** Adequate stubble height on streamside areas is needed at the end of the grazing period or at the end of the grazing season, for maintenance of plant vigor and stream bank protection and to aid in holding sediments for rebuilding degraded stream banks. Measurements of the residual amount of *Carex* spp. are taken along the greenline. Specifically, 3-4 inches of residual *Carex* spp. are required for spring pastures and 4-6 inches for summer and fall pastures (U.S. Forest Service 1996b).
- **Stream Bank Alteration:** Measuring stream bank alteration consists of walking the green line in a riparian area and determining the percentage of stream bank altered by livestock during the current grazing season. The overriding concept behind the procedure is ensuring the continuum of stream bank integrity. Physical alteration of the bank by trampling results in widening of the stream channel, and eventually leads to a loss of riparian function (U.S. Forest Service 1996b).

- Photographs and Photo-points: Photographs are extremely useful in documenting change on the landscape. Photos should capture the essence of the plot, point or transect, including important characteristics and features of the site. Photos need to include enough of the horizon-line to allow the photographer to easily repeat the photograph from the same angle at a different time.

Rangeland Effectiveness (Long-term) Monitoring

Probably the most important role of monitoring is to determine whether management is successful at maintaining or moving rangeland resources towards desired conditions. Determining trend toward or away from allotment objectives allows rangeland managers to accurately determine the relative success of the management system and to adjust management to speed the accomplishment of objectives. Trend for a variety of rangeland resource parameters may need to be monitored.

The long-term condition of riparian and upland grass and forb resources will be monitored at benchmark areas on each allotment. All agency monitoring methods can be used in monitoring efforts. The following monitoring techniques will generally be used as needed:

- Cover-Frequency Index (CFI): The Cover-Frequency transect is commonly used to provide quantitative measurements of canopy cover and frequency by plant species, ground cover, and production by life form for inventory and monitoring purposes (U.S. Forest Service 1996b).
- Photographs and Photo-points: Photographs are extremely useful in documenting change on the landscape. Photos should capture the essence of the plot, point or transect, including important characteristics and features of the site. Photos need to include enough of the horizon-line to allow the photographer to easily repeat the photograph from the same angle at a different time.
- Green Line/Cross Section: Green Line/Cross Section's are used to describe and quantify the distribution of riparian communities within the riparian area. A series of paced transects are established both perpendicular and parallel to the stream in order to measure the intercept of plant communities within the riparian area (U.S. Forest Service 1996b).
- Stream bank Stability: Stream bank stability refers to long-term bank structure, expressed as a percentage of the stream bank in one of six stability classes (Cowley and Burton 2005b). It is intended for long-term trend monitoring and is read on 3-5 year intervals. This method includes disturbance from natural processes, such as floods, and human caused impacts, such as mining or recreation vehicle crossings, as well as from livestock.

- **Multiple Indicator Method (MIM):** This protocol combines observations of up to ten indicators (including greenline, streambank stability, livestock use on woody plants, woody species regeneration, stubble height and streambank alteration) along the same transect. These indicators provide quantitative data to assess the current condition and trend of the streambanks, channels and vegetation as well as provide data needed to refine and make annual changes to livestock management in order to meet long-term management objectives. (Burton, Cowley, and Smith 2007)
- **Presence/absence:** Presence or absence of R2 sensitive species is monitored at known sites to determine whether management actions are being effective in maintaining sensitive habitat and populations.

A specific monitoring plan for each allotment is included in Appendix B. Documentation of rangeland monitoring results will be maintained in the allotment files at the respective District Office.

Water Quality Monitoring:

WCP effectiveness monitoring will be conducted in allotments where necessary. This will act as monitoring for water quality. If WCPs are properly implemented, then water quality should be protected.

Currently, there is little indication that grazing has degraded beneficial uses in any of the project area watersheds. With this said, the Black Hills National Forest will use a method developed on the Medicine Bow National Forest-Thunder Basin National Grassland to monitor WCP effectiveness. If WCPs are being implemented properly then they are, in theory, not degrading water quality. If they are not being implemented properly, then water quality degradation may be occurring and a management change is needed. This strategy eliminates the time and expense of water quality sampling in favor of correcting known problems and thereby minimizing potential effects to water quality.

This is the water quality monitoring approach that will be carried out with the North Zone Range 08 Project.

Other Resource Monitoring:

The following methods will be used to ensure that livestock grazing is compatible with other resource objectives in accordance with Forest Plan direction and other laws:

- **Heritage site monitoring:** All National Register of Historic Places eligible sites will be monitored on a 1-5 year basis in accordance with the SHPO concurrence letters for livestock grazing to verify that management practices are being implemented.

Comparison of Alternatives

This section provides a summary table of the effects of implementing each alternative. Information in Table 6 is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives.

Table 6. Comparison of alternatives and their environmental effects for the North Zone Range 08 project

	Alternative A	Alternative B
Compliance with State water quality standards	Yes	Yes
Trend in stream bank stability	Upward slowly	Upward more quickly
Trend in bare ground	Static to upward	Upward
Effects to vegetative structure	Up to 50% utilization on grasses Up to 40% utilization on shrubs Trend upward	Some utilization by wildlife Trend upward initially, then downward
Frequency of cheatgrass	Reduced but not eliminated	Not reduced, may increase
Risks to R2 sensitive plants and BHNH plant species of local concern	Low to Moderate; Existing populations and habitat would be maintained	Low; Habitat and populations may expand
Number of springs/riparian areas to be protected	38	None, but protection not needed
Risk to values for which Englewood Spring Botanical Area was designated	Low	Low
Miles of fence to be built	4.5	None
Costs of range improvements	\$213,787	None

	Alternative A	Alternative B
Maximum number of AUMs to be authorized	8,510	None

Summary of Preliminary Effects

The preliminary effects of Alternative A (Proposed Action) and Alternative B (No Grazing) are discussed below for various resources that might be affected by the North Zone Range 08 project. These effects are based on draft resource specialist reports. These reports are not finalized and the preliminary analysis may be modified to better inform the decision maker and the public. The complete environmental effects analysis will be provided in the Environmental Analysis (EA) at the time the Decision Notice (DN) is signed. Effects on resources are expected to be within Forest Plan standards and guidelines.

Watershed Resources

Overall, water quality within the project area is acceptable based on both the South Dakota and Wyoming 303(d) and 305(b) reports. Four streams are listed as impaired for temperature from an unknown source in the Upper Elk allotment. These streams are: North Fork Rapid Creek, Elk Creek, Bear Butte Creek, and West Strawberry Creek. West Strawberry Creek is also listed for fecal coliform from an unknown source. The contribution from grazing on the Upper Elk Allotment to the temperature impairments is expected to be non-detectable since the stream reaches on NFS lands are either in accessible to cattle or have a well developed riparian corridor providing shade to the streams. Only about 0.25 miles of West Strawberry Creek lie within the allotment, limiting any contribution to the fecal coliform impairment to slight to non-detectable.

Stream geomorphology in the project area shows mixed conditions. Although there are impacted streambanks and degraded riparian and wetland conditions in localized areas throughout the project area, the majority of sites show acceptable trends based on PFC monitoring. It appears that overall current stream health conditions are in an upward trend.

All allotments are well within the 15% detrimental soil disturbance guideline established in the BHNF LRMP and the WCP Handbook. Less than 1% of the soils in the NZRPA are considered to be sensitive to soils compaction due to their clay content. Lastly, ground cover within all allotments appears to be at acceptable levels to protect soils from excessive erosion.

Under Alternative A, long-term aquatic/riparian ecosystem health and ecological function will be provided by compliance with Standards 1201, 1301, 1302, 1304, 2502c, 2505d, and 2507. Stream bank alteration is expected to be maintained below 26% helping to improve long-term bank stability and water quality. Bare ground will be reduced to or maintained at 5-20% on all allotments to help protect water quality. Detrimental soil disturbance will continue to be maintained at levels of less than 15% on all allotments to protect soil productivity. Alternative A would limit grazing impacts to aquatic and

riparian vegetation, allowing for continued aquatic/riparian improvement. Stream reaches and riparian areas impacted by livestock grazing would be enhanced.

Under Alternative B, livestock grazing would not be permitted; therefore there would be no impacts from grazing. This alternative would provide the most protection for watershed resources. Alternative B will fully protect stream channels, wetlands and riparian areas from the effects of livestock grazing on NFS lands and have less impact on the soil resource.

Both alternatives proposed for this project would move watershed conditions closer to desired conditions, although at different rates. Implementation of either alternative will not further degrade watersheds. Water quality is expected to continue to support assigned beneficial uses. No cumulative effects are expected under any alternative because both alternatives would reduce impacts from livestock grazing.

Range Resources

Most upland and riparian areas are at the desired conditions with about 28% of benchmark areas not meeting desired conditions. Some springs and associated riparian areas are being impacted by livestock. Under Alternative A, the condition and trend of the rangelands are expected to improve in areas that are not currently at the desired condition and be maintained in areas that are at desired condition. Alternative B is expected to be beneficial to rangeland conditions initially, and then would have either neutral or detrimental effects afterwards due to a build up of accumulation of dead plant material. This could cause a decrease in plant productivity, palatability and overall plant health. However, Alternative B would have the most beneficial effects on streambanks and riparian vegetation. Under all alternatives rangelands are expected to meet the Forest Plan definition of satisfactory range condition by meeting or moving toward desired conditions.

Alternative A is expected to maintain the existing native plant communities in the Huett Springs Allotment. Early spring grazing at higher levels is not likely to reduce annual brome species, but is expected to provide an interruption to its life cycle providing a competitive advantage to native species. Literature suggests that Alternative B would not meet desired conditions for this allotment. No grazing would promote the accumulation of dead plant material that would deny native species sunlight and nutrients over time. However, annual brome species are known for their ability to grow in litter. It may actually increase the competitive ability of these undesirable species.

Wildlife and Wildlife Habitat

Existing conditions within the allotments are generally in satisfactory condition. Impacts to wildlife and wildlife habitat due to livestock grazing are site-specific and are mostly within acceptable limits. The ID Team identified certain areas (primarily riparian habitats) that were not meeting desired conditions and these areas are targeted for protective adaptive management techniques to alleviate unacceptable resource impacts including impacts to wildlife species and their habitats.

Under Alternative A, direct and indirect impacts may be expected for some wildlife species, particularly those dependent on riparian habitats. Direct impacts include possible mortality and indirect impacts include loss of suitable habitat. Impacts are greatest in

riparian habitats. Up to 50% of annual herbaceous growth may be grazed, but adherence to this utilization standard should provide adequate cover for species persistence. Impacts are negligible for upland species.

Wildlife would generally benefit from implementation of Alternative B (No Grazing). Adverse direct and indirect impacts would not occur. More water would be available for wildlife. Prey species may be harder to detect, but may also be more abundant in the absence of grazing. The quantity of forage and hiding cover would increase. However, the quality of forage may decrease without livestock grazing. Riparian shrub habitat would increase under the no grazing alternative.

Under both alternatives, there will be adequate habitat to support all Region 2 Sensitive Species, Management Indicator Species and Species of Local Concern in compliance with Forest Plan standards and guidelines. Impacts to sensitive species are not expected to result in a loss of viability in the Planning Area, nor cause a trend to federal listing. No effects are expected to federally listed species, as no listed species occur within these allotments.

Fisheries Resources

Suitable fish habitat, as defined by perennial streams/lakes and assigned beneficial uses, occurs in about 26.7 miles of stream in Upper Elk, East Rapid, Pettigrew, and Stearns Park allotments. Suitable fish habitat is not present in the Black Haw, Grand Canyon, Griffith, Huett Springs, Silver Creek or Willow Springs allotments.

Limited fisheries surveys have been completed in the project area due to the limited amount of suitable fish habitat. The mountain sucker (R2 sensitive species and MIS) has been documented in Rapid Creek within the East Rapid Allotment and in Bear Butte and Elk creeks adjacent to or downstream of the Upper Elk Allotment. There are no natural lakes in the Black Hills but several impoundments within the project area provide recreational fishing opportunities. Other native fish species in the analysis area include the fathead minnow, longnose dace and white sucker. Non-native fish species include brook, brown and rainbow trout.

Alternative A is expected to have a positive indirect benefit to fisheries through improved water quality and habitat conditions upon implementation of the proposed action and adaptive management particularly at localized sites on Gimlet Creek, headwaters of Iron Creek, Ladyfinger Gulch, Pettigrew Gulch, Upper Elk Spring #2 and the unnamed stream in the Englewood Botanical Area that currently are not at the desired condition. Direct effects (mortality/injury) to fish, primarily to eggs and fry, are expected to be minimal.

Alternative B would provide the quickest and most permanent attainment of the desired condition, specific to riparian vegetation and aquatic conditions at a few localized sites where the desired condition is currently not being achieved.

Under either alternative, improved riparian vegetation condition and reduced bank alteration would have a positive, but minor incremental impact to fisheries on the East Rapid, Pettigrew, Stearns Park and Upper Elk allotments. Given the localized area of these improvements, this incremental impact would not be of a magnitude or intensity to noticeably affect fish numbers or distribution when added to past, present or reasonably foreseeable actions.

The effect determination for the mountain sucker is may adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing. There are no federally threatened or endangered fish species known to occur or likely to be affected by management activities in Crook, Weston, Lawrence or Pennington Counties nor any designated critical habitat.

Botanical Resources

The project area was surveyed specifically for R2 sensitive plant species and plant Species of Local Concern (SOLC) as well as, suitable plant habitat. Twelve occurrences of five R2 sensitive plant species and seven occurrences of three SOLC species were located. For the majority of species analyzed, suitable habitat can be summarized as moist forested and/or riparian communities. For two species, *Botrychium campestre* and *Botrychium lineare*, suitable habitat can be generalized as grasslands, openings in forested areas and old (15-25 years) disturbances.

Under Alternative A, monitoring of a known plant SOLC occurrence in Englewood Springs Botanical Area will take place in order to determine the nature and extent of impacts. Monitoring would occur at R2 sensitive plant and plant SOLC sites at highest risk of being impacted by livestock grazing. The five plant Species of Local Concern and the three R2 sensitive plant species with known occurrences or suitable habitat in the project area are likely to persist within the North Zone Range 08 project area based on implementation of site-specific design criteria, compliance with Forest Plan Standards and Guidelines, monitoring, and use of adaptive management options including fencing.

Alternative B would eliminate the direct and indirect effects associated with livestock grazing and would likely be beneficial to all rare plant species. The quality of habitat for riparian or wetland dependent R2 sensitive plant species and SOLC plant species is expected to improve with the removal of livestock. The improvement of habitats degraded by livestock grazing could thereby increase the extent of suitable R2 sensitive and SOLC plant habitat across the project area.

Under both alternatives, rare plant species are likely to persist and effects to R2 sensitive species are not likely to result in a loss of viability in the planning area, nor cause a trend toward federal listing. No effects are expected to federally listed species, as no listed species occur within these allotments.

Heritage Resources

Heritage resource inventories for the North Zone Range 08 allotments were completed between 1997 and 2007. A total of 258 sites are located within the boundaries of the ten allotments. The most current information available indicates that no effects from grazing or grazing activities were noted on any National Register of Historic Places eligible heritage resource properties in any of the allotments. All NHRP eligible sites will be protected and avoided during construction of proposed range improvements. There will be no direct effects to heritage resources from implementation of either Alternative A or Alternative B. However, the cumulative effects from not grazing vegetation under Alternative B may lead to more intense burning in the event of a wild land fire. Intense wild land fire can affect both historic and prehistoric properties.

Cumulative Effects

No cumulative effects are expected to any resource because no additional livestock grazing will be authorized. Both alternatives are expected to reduce impacts from livestock grazing below current levels.

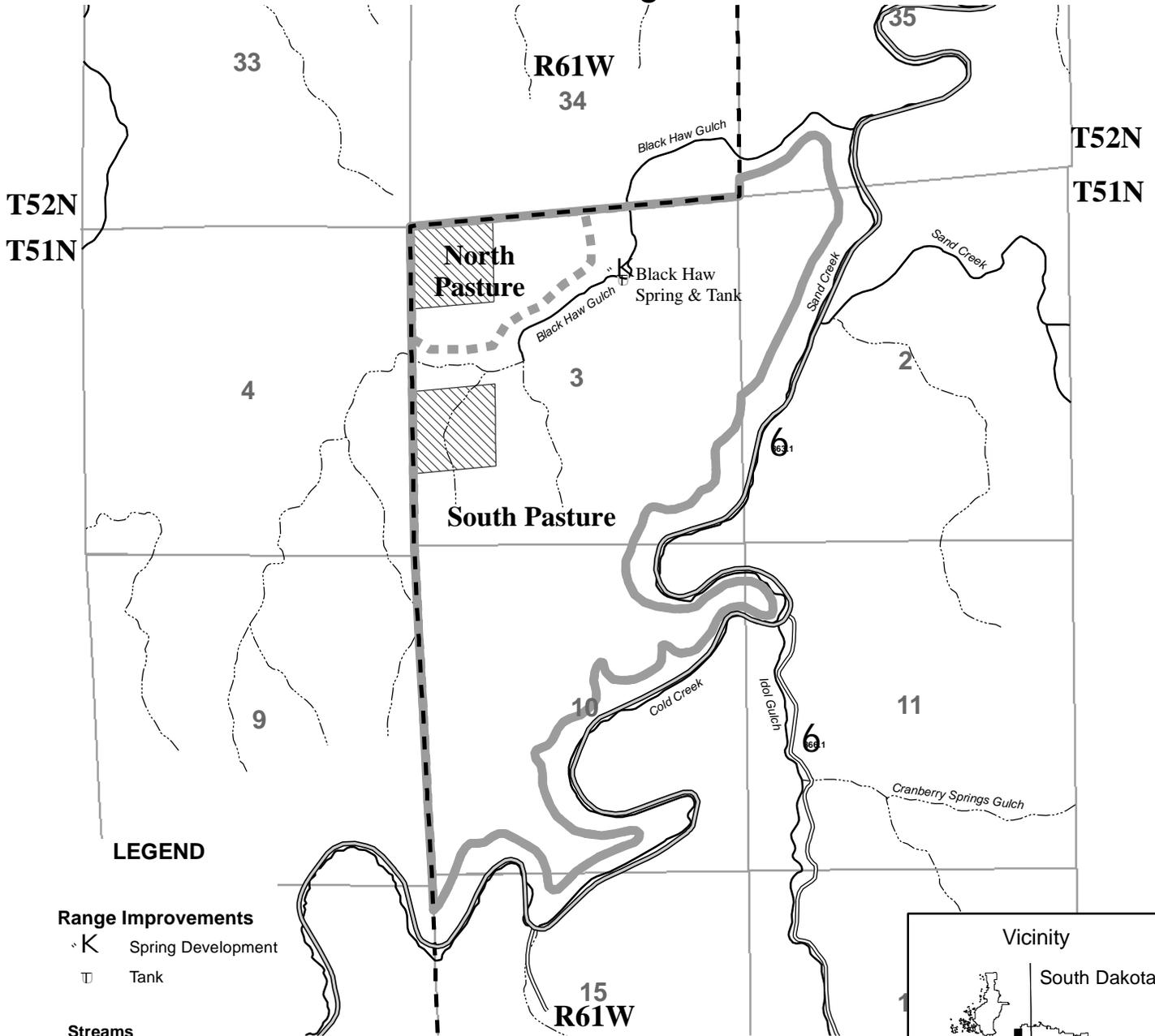
APPENDIX A - MAPS



Black Hills National Forest Bearlodge Ranger District



Black Haw Range Allotment



LEGEND

Range Improvements

- ◊ K Spring Development
- ⊠ Tank

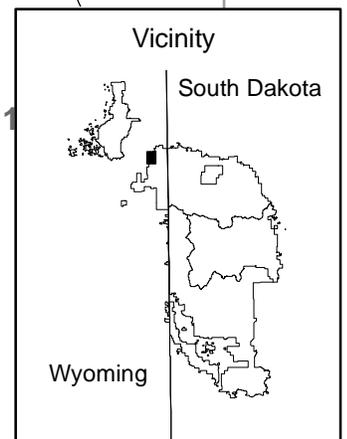
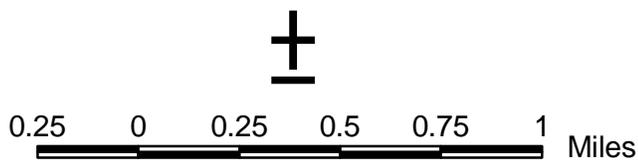
Streams

- Perennial
- - - Intermittent

Boundary Lines

- - - Forest Boundary
- Allotment Boundary
- ▣ Pasture Boundary

- ▨ Private Land (Waved)
- ▤ Private Land





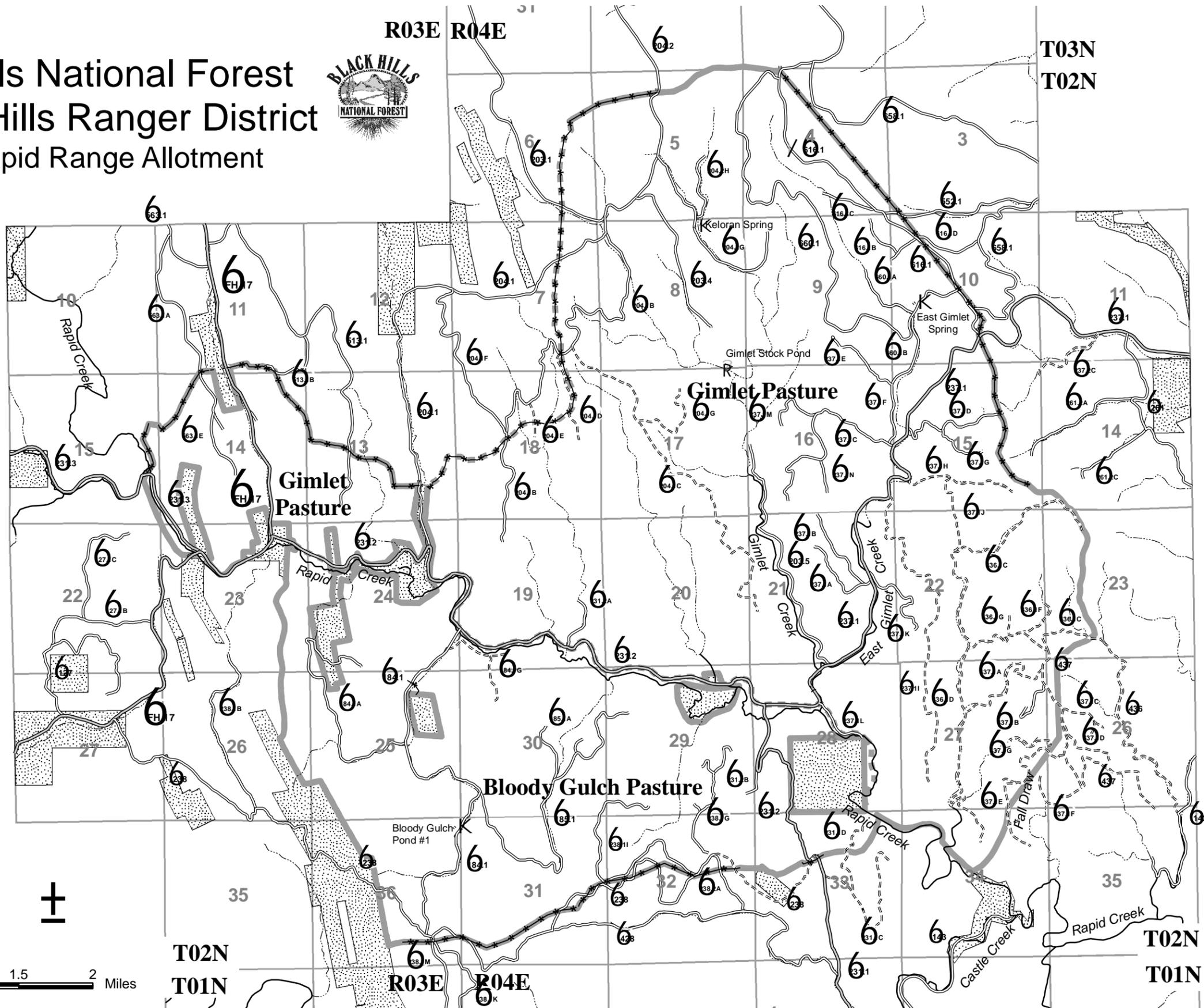
Black Hills National Forest Northern Hills Ranger District East Rapid Range Allotment



- LEGEND**
- Range Improvements**
- ∩ Reservoir
 - / Dugout
 - K Spring
 - +— Fence
 - R Transect
 - Cattle Guard

- Boundary Lines**
- Allotment Boundary
 - - - Pasture Boundary

- Streams**
- Perennial
 - - - Intermittent
 - ▨ Private Land

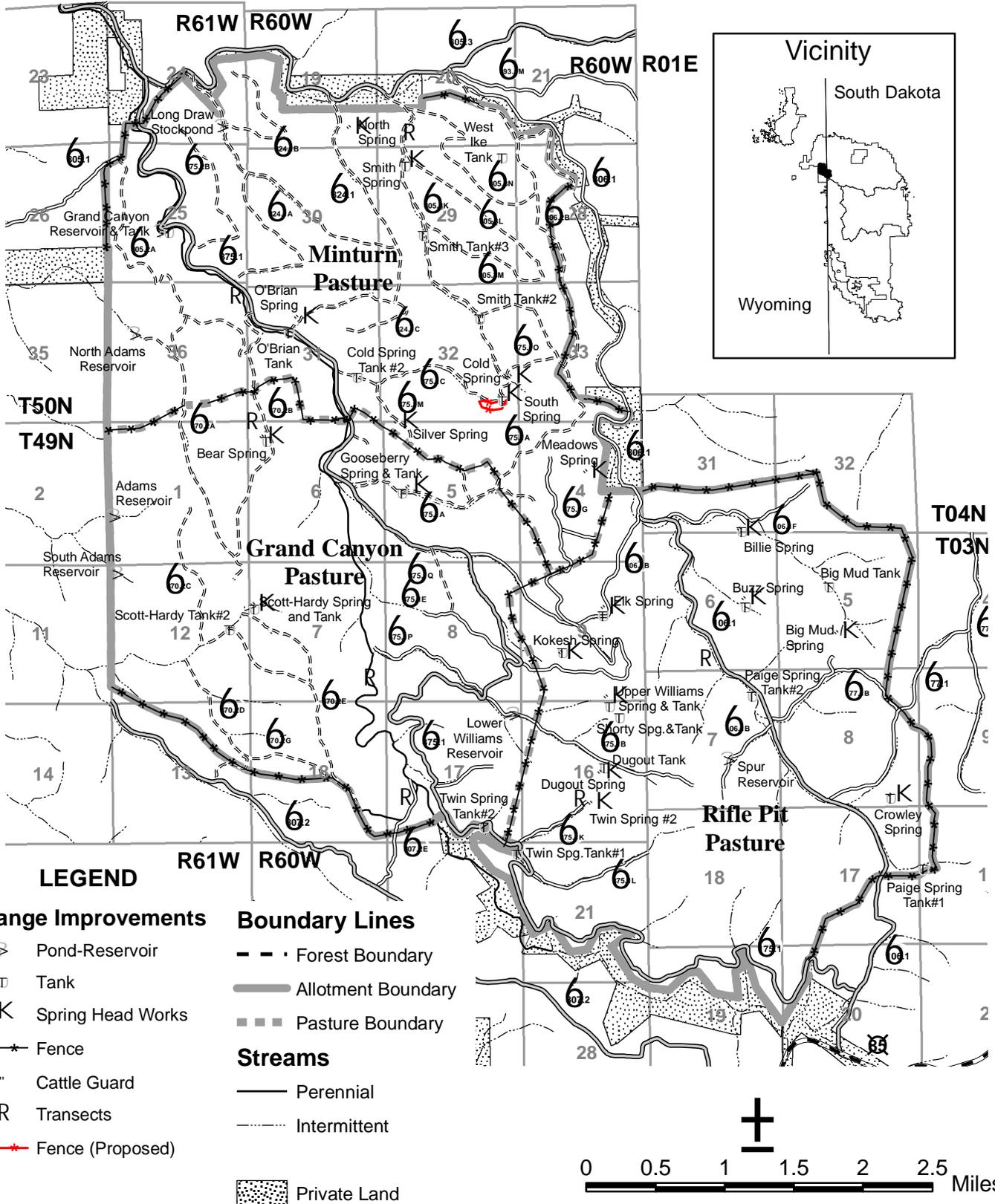




Black Hills National Forest Bearlodge Ranger District



Grand Canyon Range Allotment



LEGEND

Range Improvements

- ⊃ Pond-Reservoir
- ⊡ Tank
- ⋈ Spring Head Works
- *— Fence
- Cattle Guard
- R Transects
- *— Fence (Proposed)

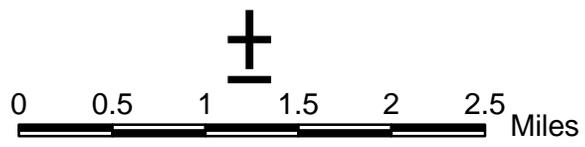
Boundary Lines

- - - Forest Boundary
- Allotment Boundary
- ▣ Pasture Boundary

Streams

- Perennial
- - - Intermittent

▨ Private Land





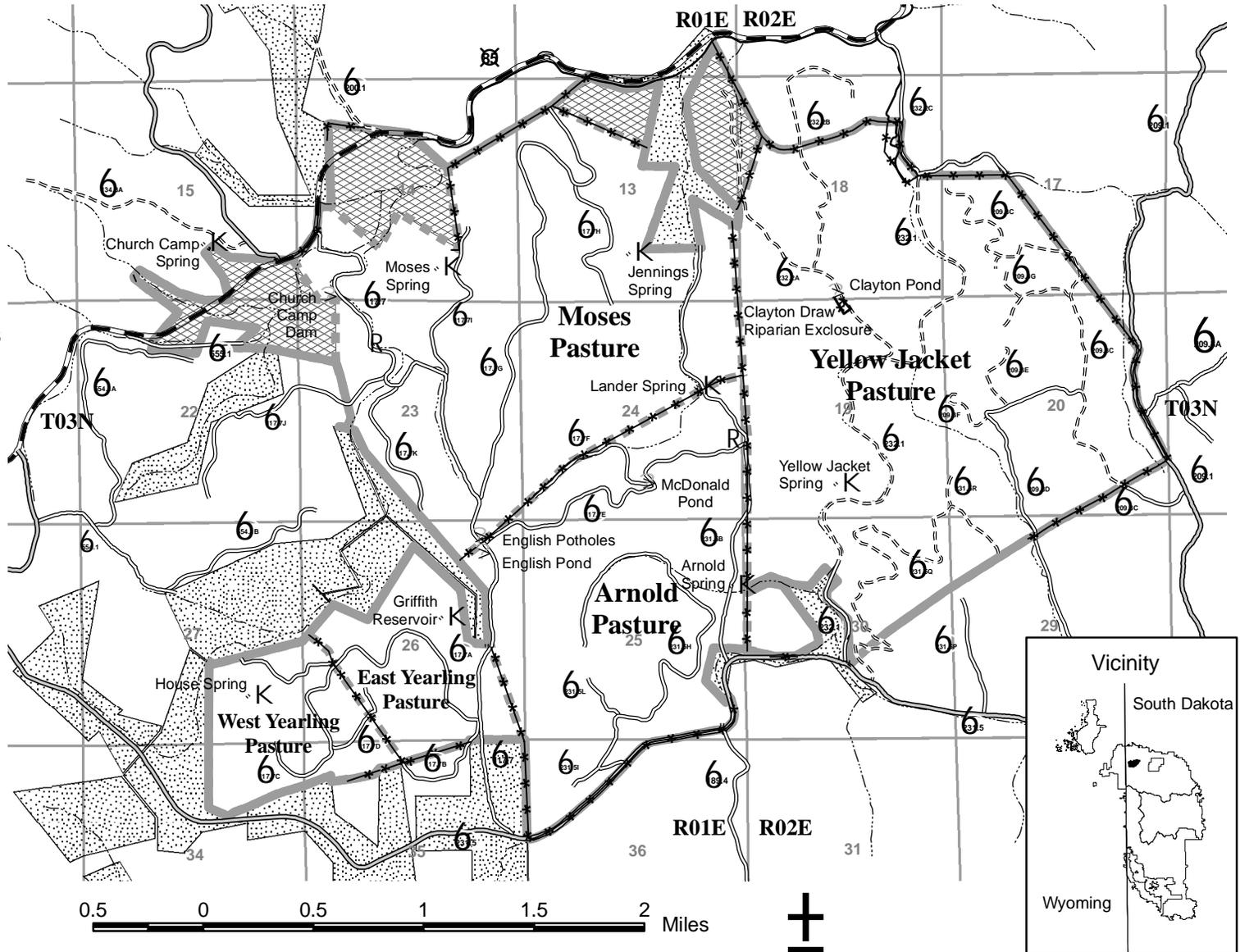
Black Hills National Forest

Northern Hills Ranger District

Griffith Range Allotment



- LEGEND**
- Range Improvements**
- ∇ Pond
 - K Spring
 - +— Fence
 - Cattle Guard
 - R Transect
- Boundary Lines**
- Allotment Boundary
 - - - Pasture Boundary
 - ▨ NFS Ungrazed
- Streams**
- Perennial
 - · - · - Intermittent
 - ▨ Private Land

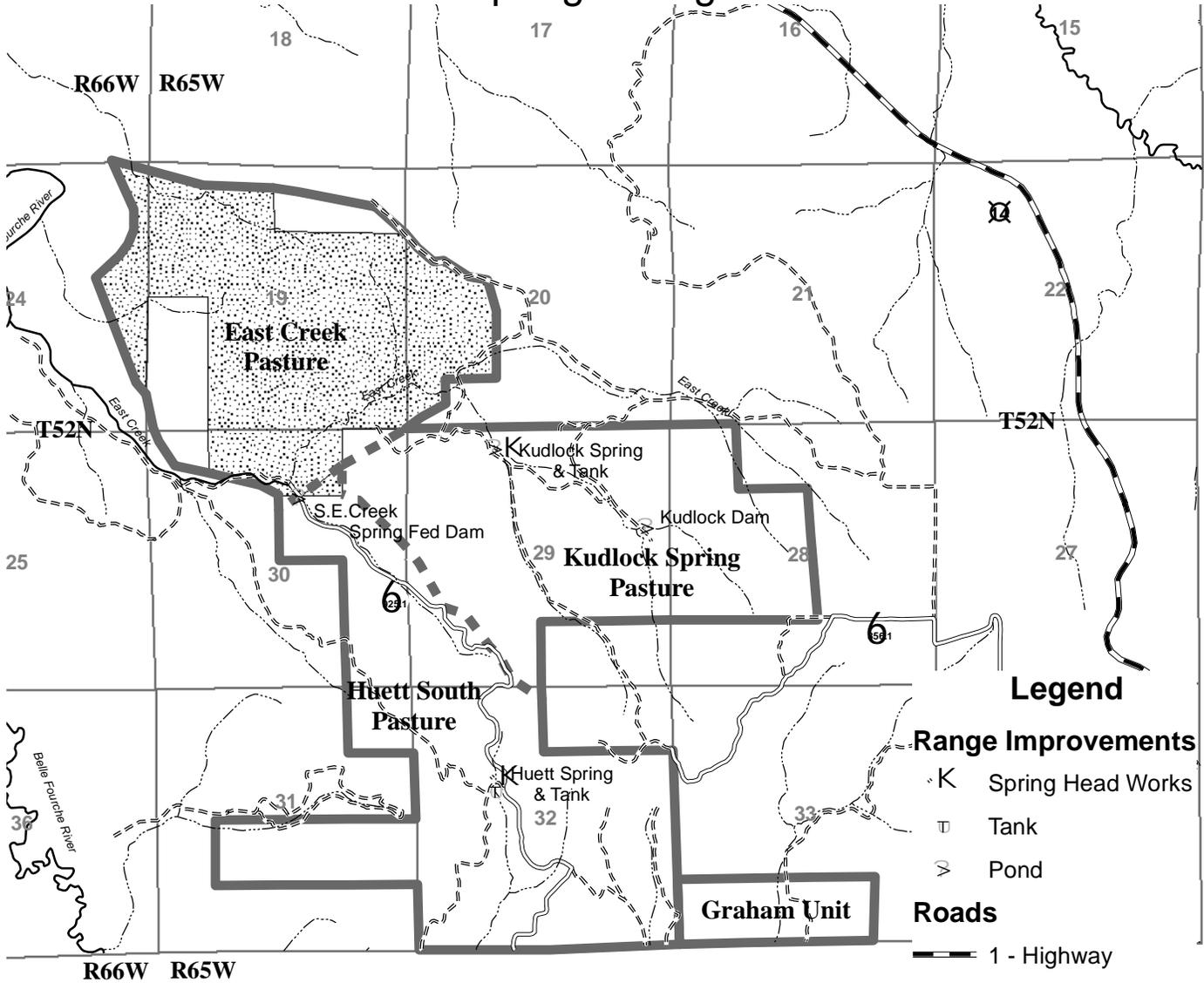




Black Hills National Forest Bearlodge Ranger District



Huett Springs Range Allotment



Legend

Range Improvements

- K Spring Head Works
- T Tank
- P Pond

Roads

- 1 - Highway
- 4 - High Clearance
- 7 - Other

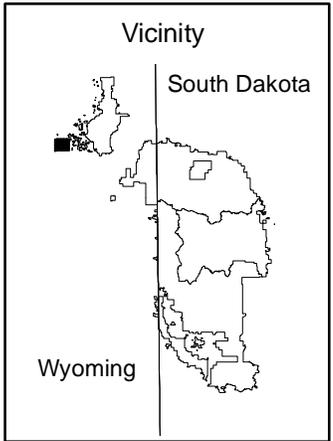
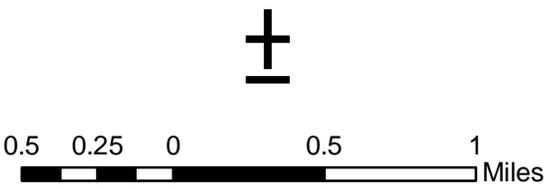
Boundary Lines

- Allotment Boundary
- - - Pasture Boundary
- ▨ Private land

Streams

CFF_CODE

- Perennial
- - - Intermittent





Black Hills National Forest

Northern Hills Ranger District

Pettigrew Range Allotment



LEGEND

Range Improvements

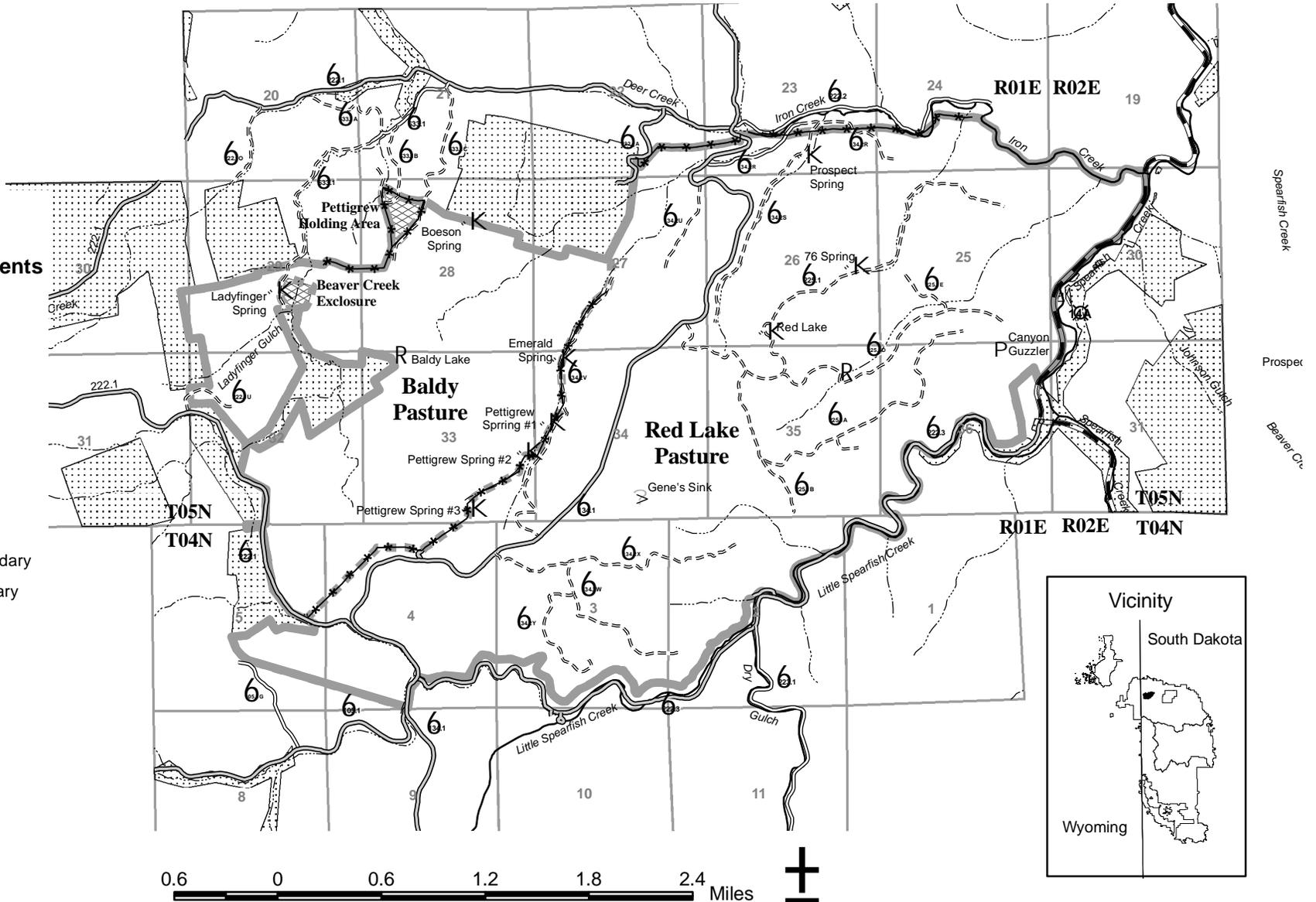
- ∩ Pond
- ⌘ Spring
- P Guzzler
- +— Fence
- Cattle Guard
- R Transect

Boundary Lines

- Allotment Boundary
- Pasture Boundary
- ▨ Exclosure

Streams

- Perennial
- - - Intermittent
- ▨ Private Land





Black Hills National Forest

Bearlodge Ranger District

Silver Creek Range Allotment



LEGEND

Range Improvements

- Pond-Reservoir
- Tank
- Fence
- Cattle Guard
- Fence (Proposed)

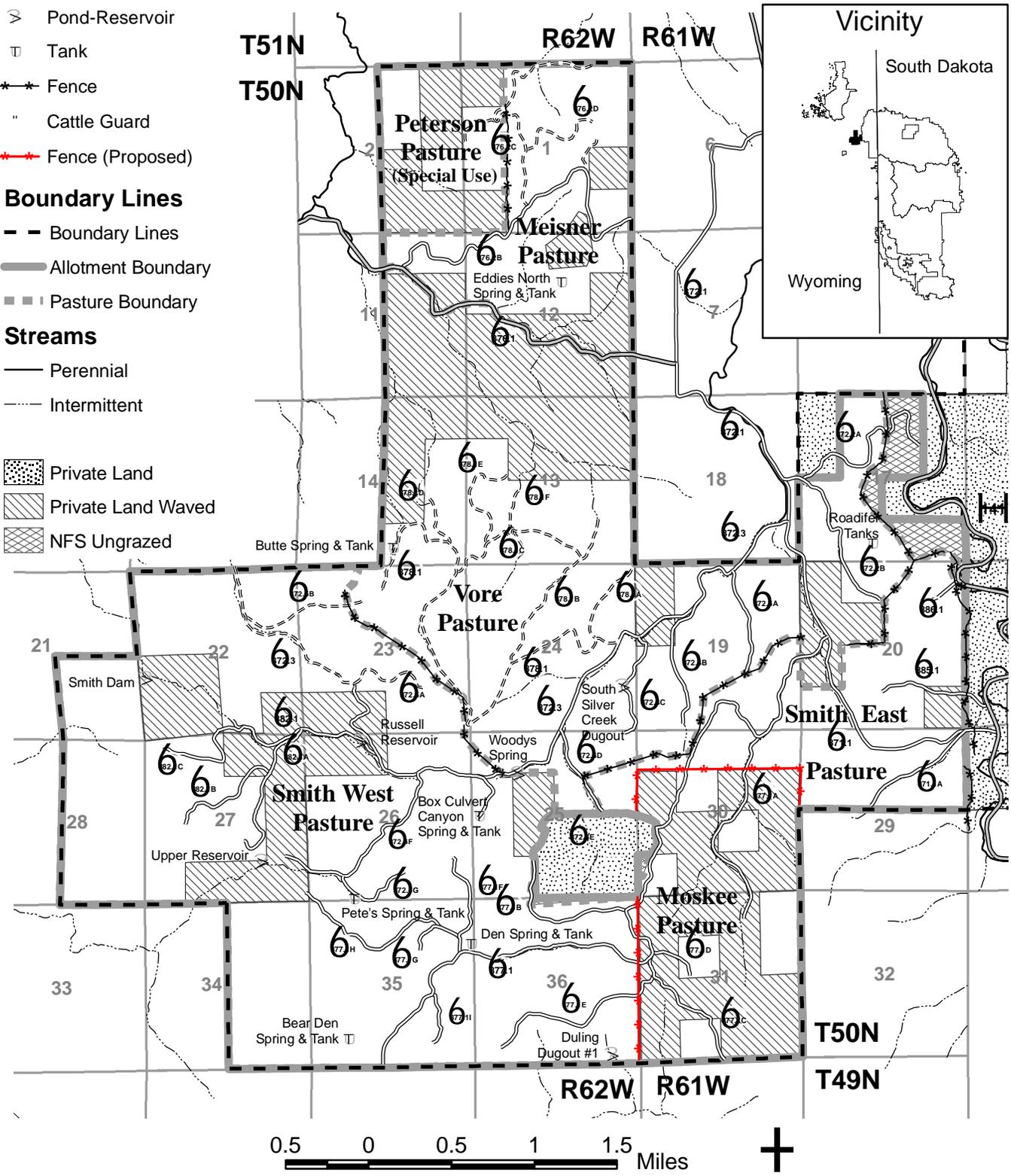
Boundary Lines

- Boundary Lines
- Allotment Boundary
- Pasture Boundary

Streams

- Perennial
- Intermittent

- Private Land
- Private Land Waved
- NFS Ungrazed

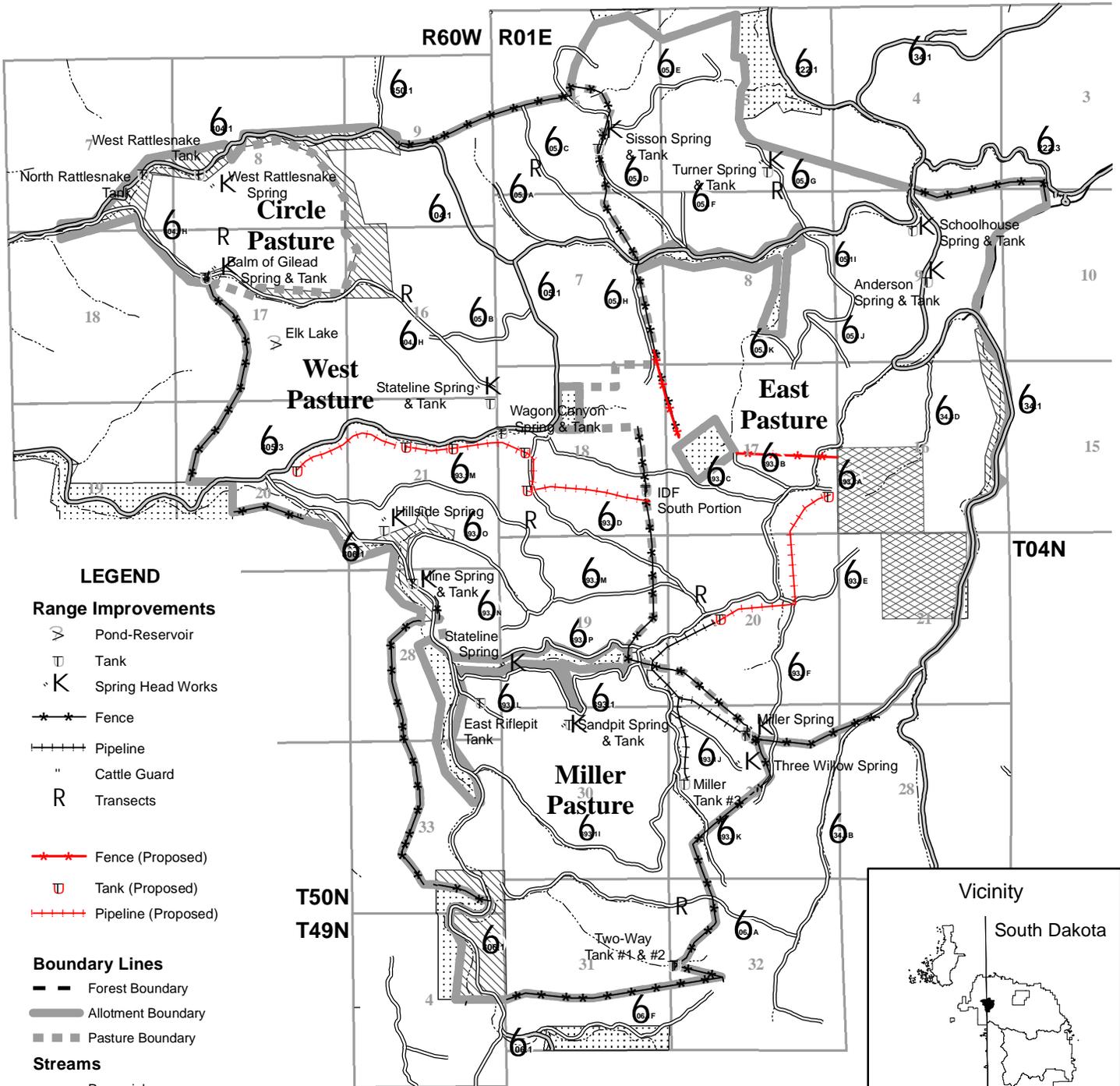




Black Hills National Forest Bearlodge Ranger District



Stearns Park Range Allotment



LEGEND

Range Improvements

- Pond-Reservoir
- Tank
- Spring Head Works
- Fence
- Pipeline
- Cattle Guard
- Transects
- Fence (Proposed)
- Tank (Proposed)
- Pipeline (Proposed)

Boundary Lines

- Forest Boundary
- Allotment Boundary
- Pasture Boundary

Streams

- Perennial
- Intermittent

Private Land

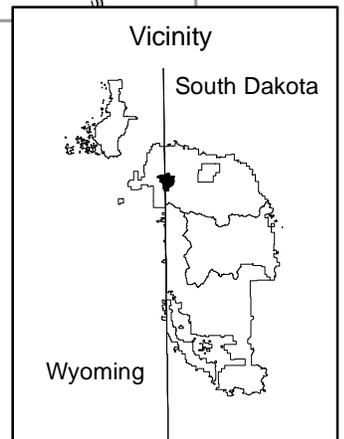
- Private Land (Not Waved)
- Private Land (Waved)
- Private Land

T50N
T49N

T04N



0 0.5 1 1.5 2 2.5 Miles

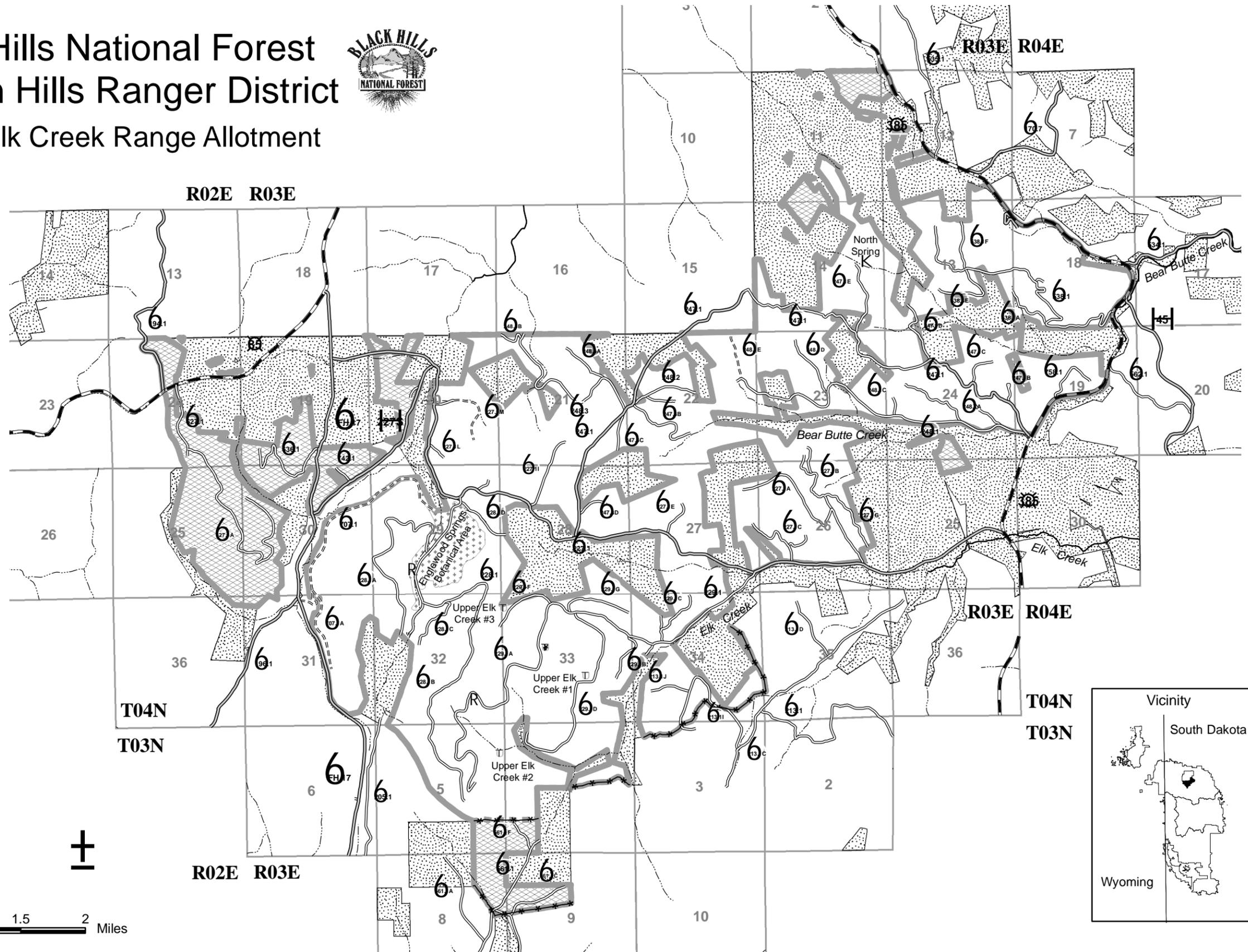




Black Hills National Forest

Northern Hills Ranger District

Upper Elk Creek Range Allotment



LEGEND

Range Improvements

- Storage Tank
- ◻ K Spring
- *- Fence
- ⋄ Cattle Guard
- R Transect

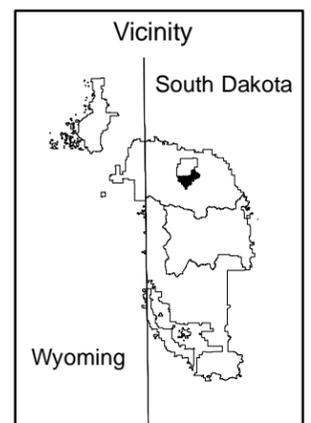
Boundary Lines

- Allotment Boundary
- - - Pasture Boundary
- ▨ NFS Ungrazed

Streams

- Perennial
- - - Intermittent

- ▨ Botanical Area
- ▩ Private Land

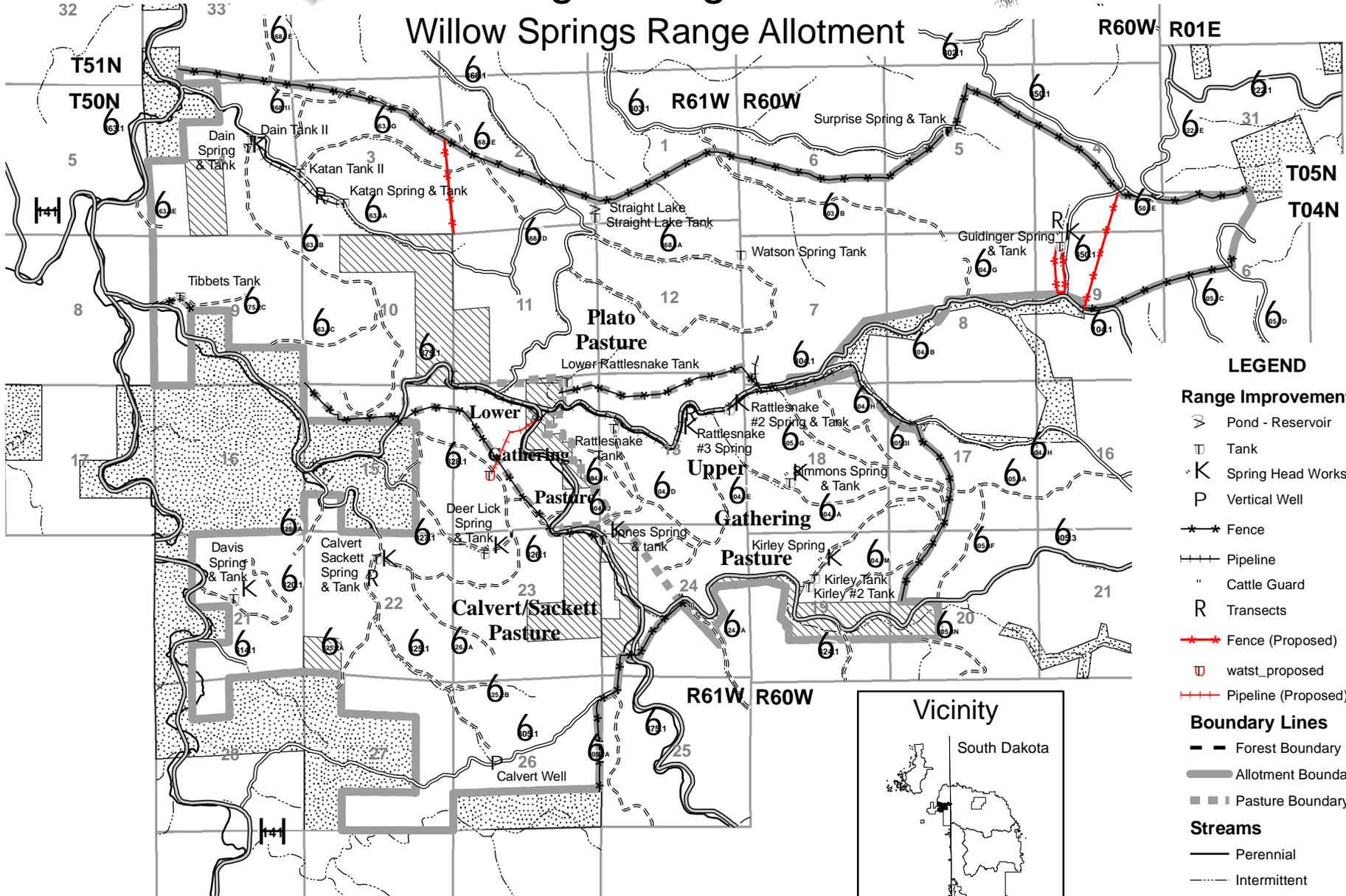




Black Hills National Forest Bearlodge Ranger District



Willow Springs Range Allotment



LEGEND

Range Improvements

- Pond - Reservoir
- Tank
- Spring Head Works
- Vertical Well
- Fence
- Pipeline
- Cattle Guard
- Transsects
- Fence (Proposed)
- watst_proposed
- Pipeline (Proposed)

Boundary Lines

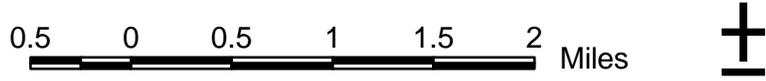
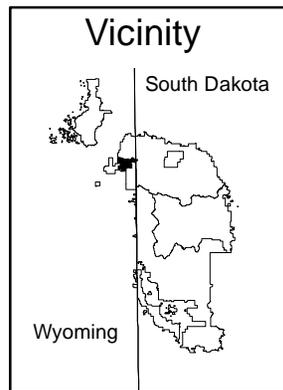
- Forest Boundary
- Allotment Boundary
- Pasture Boundary

Streams

- Perennial
- Intermittent

Private Land

- Private (Waved)
- Private Land



APPENDIX B - MONITORING PLANS

Black Haw Allotment Monitoring Plan					
Monitoring Site	Desired Conditions	Method	Frequency	Trigger Point	Change Needed
Key Upland Grazing Areas	≤45% utilization	Ocular Utilization	Annual	45% utilization	Remove livestock from affected area
Key Riparian Grazing Areas	4-6” stubble height	Stubble height	Annual	4-6” stubble height	Remove livestock from affected area
Key Riparian Grazing Areas	Maintain at least 74% stable stream banks	Stream bank alteration; Photo-point	Annual	>26% stream bank alteration	Remove livestock from affected area
Black Haw Gulch	Maintain diverse riparian plant community, achieve and maintain 74% stable stream banks.	Cover-Frequency Streambank stability; Photo-point	5-10 years	Loss of species diversity, or >74% stable stream banks	Implement adaptive management option

Grand Canyon Allotment Monitoring Plan					
Monitoring Site	Desired Conditions	Method	Frequency	Trigger Point	Change Needed
Key Upland Grazing Areas	≤50% utilization	Ocular Utilization	Annual	50% utilization	Remove livestock from affected area
Key Riparian Grazing Areas	4-6" stubble height	Stubble height	Annual	4-6" stubble height	Remove livestock from affected area
Key Riparian Grazing Areas	Maintain 74% stable stream banks	Stream bank alteration	Annual	>26% stream bank alteration	Remove livestock from affected area
South Spring	Maintain diverse riparian plant community, achieve and maintain <5% bare ground	Photo point	5-10 years	>5% bare ground	Implement adaptive management option
Rifle Pit	Maintain plant diversity, <5% bare soil	Cover-Frequency	5-10 years	Loss of species diversity, or >5% bare ground	Implement adaptive management option
Smith Draw	Maintain plant diversity, <5% bare soil	Cover-Frequency	5-10 years	Loss of species diversity, or >5% bare ground	Implement adaptive management option

Huett Springs Allotment Monitoring Plan					
Monitoring Site	Desired Conditions	Method	Frequency	Trigger Point	Change Needed
Key Upland Grazing Areas	≤50% utilization	Ocular Utilization	Annual	50% utilization	Remove livestock from affected area
Key Riparian Grazing Areas	4-6” stubble height	Stubble height	Annual	4-6” stubble height	Remove livestock from affected area
Key Riparian Grazing Areas	Maintain 74% stable stream banks	Stream bank alteration	Annual	>26% stream bank alteration	Remove livestock from affected area
Lake Divide	Maintain plant diversity, increase frequency of native plants, 15-25% bare soil	Cover-Frequency	5-10 years	Loss of species diversity, or >15-25% bare ground	Implement adaptive management option
Kudlock	Maintain plant diversity, increase frequency of native plants, 15-25% bare soil	Cover-Frequency	5-10 years	Loss of species diversity, or >15-25% bare ground	Implement adaptive management option

Silver Creek Allotment Monitoring Plan					
Monitoring Site	Desired Conditions	Method	Frequency	Trigger Point	Change Needed
Key Upland Grazing Areas	≤50% utilization	Ocular Utilization	Annual	50% utilization	Remove livestock from affected area
Key Riparian Areas	4-6" stubble height	Stubble height	Annual	4-6" stubble height	Remove livestock from affected area
Key Riparian Grazing Areas	Maintain 74% stable stream banks	Stream bank alteration	Annual	>26% stream bank alteration	Remove livestock from affected area
Meadow above Boardinghouse Spring	Maintain plant diversity, <5% bare soil	Cover-Frequency	5-10 years	Loss of species diversity, or >5% bare ground	Implement adaptive management option
Pete Spring	Maintain diverse riparian plant community, achieve and maintain <5% bare ground.	Photo point	5-10 years	>5% bare ground	Implement adaptive management option
Fish Canyon <i>Botrychium campestre</i> R2 sensitive plant site BOTR-40	Maintain R2 sensitive <i>Botrychium campestre</i> site BOTR-40	Documented field visit/ocular estimation of habitat condition	3 years	Unacceptable impacts (such as trailing or trampling) to sensitive plants and habitat	In consultation with botanist, implement adaptive management to reduce impacts.

Stearns Park/Willow Springs Allotments Monitoring Plan					
Monitoring Site	Desired Conditions	Method	Frequency	Trigger Point	Change Needed
Key Upland Grazing Areas	≤50% utilization	Ocular Utilization	Annual	50% utilization	Remove livestock from affected area
Key Riparian Grazing Areas	4-6" stubble height	Stubble height	Annual	4-6" stubble height	Remove livestock from affected area
Key Riparian Grazing Areas	Maintain 74% stable stream banks	Stream bank alteration	Annual	>26% stream bank alteration	Remove livestock from affected area
Buffalo Park Benchmark	Maintain plant diversity, <5% bare soil	Cover-Frequency	5-10 years	Loss of species diversity, or >5% bare ground	Implement adaptive management option
Sec. 16 Benchmark	Maintain plant diversity, <5% bare soil	Cover-Frequency	5-10 years	Loss of species diversity, or >5% bare ground	Implement adaptive management option
Calvert/Sackett Benchmark	Maintain plant diversity, <5% bare soil	Cover-Frequency	5-10 years	Loss of species diversity, or >5% bare ground	Implement adaptive management option
Katan Spring Benchmark	Maintain plant diversity, <5% bare soil	Cover-Frequency	5-10 years	Loss of species diversity, or >5% bare ground	Implement adaptive management option
Guidinger Meadow Benchmark	Maintain plant diversity, <5% bare soil	Cover-Frequency	5-10 years	Loss of species diversity, or >5% bare ground	Implement adaptive management option

Stearns Park/Willow Springs Allotments Monitoring Plan					
Guidinger Creek	Maintain diverse riparian plant community, utilization on willows <40%, achieve and maintain at least 74% stable stream banks.	Willow regeneration; streambank stability	5-10 years	≥74% stable streambanks and obvious willow regeneration	Decide whether grazing is appropriate in this area, if so, how it should be grazed
Three Willows Spring and other springs	Maintain diverse riparian plant community, achieve and maintain <5% bare ground	Photo point and ocular estimation of bare ground	5-10 years	>5% bare ground	Implement adaptive management option
<i>Calochortus apiculatus</i> (Black Hills Species of Insufficient Info) site 07SP03/04M039	Maintain <i>Calochortus apiculatus</i> site 07SP03/04M039	Documented field visit/ocular estimation of habitat condition	3 years	Unacceptable impacts (trailing or trampling) to plants and habitat	In consultation with botanist, implement adaptive management to reduce impacts.

East Rapid Allotment Monitoring Plan					
Monitoring Site	Desired Conditions	Method	Frequency	Trigger Point	Change Needed
Key Upland Grazing Areas	≤50% utilization	Ocular Utilization	Annual	50% utilization	Remove livestock from affected area
Key Riparian Grazing Areas	4-6" stubble height	Stubble height	Annual	≤4-6" stubble height	Remove livestock from affected area
Key Riparian Grazing Areas	Maintain 74% stable stream banks	Stream bank alteration	Annual	≥26% stream bank alteration	Remove livestock from affected area
Gimlet Meadow Benchmark	Maintain plant diversity, <5% bare soil	Cover-Frequency	5-10 years	Loss of species diversity, or >5% bare ground	Implement adaptive management option
Gimlet Creek Benchmark	Maintain diverse riparian plant community, achieve and maintain at least 74% stable stream banks.	Photo-point of temporary exclosure and benchmark sites	3-5 years	Loss of species abundance and/or diversity	Implement adaptive management option
		Stream bank stability at temporary exclosure and benchmark sites	3-5 years	<74% stable stream banks	Implement adaptive management option
		Streambank alteration at benchmark site	Annual	≥26% stream bank alteration	Remove livestock from affected area

Griffith Allotment Monitoring Plan					
Monitoring Site	Desired Conditions	Method	Frequency	Trigger Point	Change Needed
Key Upland Grazing Areas	≤50% utilization	Ocular Utilization	Annual	50% utilization	Remove livestock from affected area
Key Riparian Grazing Areas	4-6" stubble height	Stubble height	Annual	4-6" stubble height	Remove livestock from affected area
Key Riparian Grazing Areas	Maintain 74% stable stream banks	Stream bank alteration	Annual	>26% stream bank alteration	Remove livestock from affected area
Moses Pasture Benchmark	Maintain plant diversity, <5% bare soil	Cover-Frequency	5-10 years	Loss of species diversity, or >5% bare ground	Implement adaptive management option
Arnold Pasture Benchmark	Maintain plant diversity, <5% bare soil	Cover-Frequency	5-10 years	Loss of species diversity, or >5% bare ground	Implement adaptive management option
Lander Spring	Maintain diverse riparian plant community, achieve and maintain <5% bare ground.	Ocular estimation	Annual	Loss of species diversity, or >5% bare ground	Implement adaptive management option

Pettigrew Allotment Monitoring Plan					
Monitoring Site	Desired Conditions	Method	Frequency	Trigger Point	Change Needed
Key Upland Grazing Areas	≤50% utilization	Ocular Utilization	Annual	50% utilization	Remove livestock from affected area
Key Riparian Grazing Areas	4-6” stubble height	Stubble height	Annual	4-6” stubble height	Remove livestock from affected area
Key Riparian Grazing Areas	Maintain 74% stable stream banks	Stream bank alteration	Annual	>26% stream bank alteration	Remove livestock from affected area
Baldy Pasture	Maintain plant diversity, <5% bare soil	Cover-Frequency	5-10 years	Loss of species diversity, or >5% bare ground	Implement adaptive management option
Red Lake Pasture	Maintain plant diversity, <5% bare soil	Cover-Frequency	5-10 years	Loss of species diversity, or >5% bare ground	Implement adaptive management option
Prospect Spring and Lady Finger Seep	Maintain diverse riparian plant community, achieve and maintain <5% bare ground.	Documented field visit of species diversity and bare ground	Annual	Loss of species diversity, or >5% bare ground	Implement adaptive management option
Ladyfinger Gulch	Protect <i>Carex alopecoidea</i> site CAAL8-19	Documented field visit/ocular estimation	Annual	Unacceptable impacts (trailing, trampling, grazing) to <i>C. alopecoidea</i> plants and/or habitat	Implement adaptive management option

Pettigrew Allotment Monitoring Plan					
Monitoring Site	Desired Conditions	Method	Frequency	Trigger Point	Change Needed
	Maintain at least 74% stable stream banks	Streambank alteration Streambank stability	Annual 3-5 years	>26% stream bank alteration <74% stable stream banks	Move livestock Implement adaptive management option
Pettigrew Gulch	Protect <i>Carex alopecoidea</i> site CAAL8-20	Documented field visit/ocular estimation of habitat condition	Annual	Unacceptable impacts (trailing, trampling, grazing) to <i>C. alopecoidea</i> plants and/or habitat	Implement adaptive management option
Pettigrew Gulch <i>Viburnum opulus</i> R2 sensitive plant site VIOPA2-6	Maintain R2 sensitive <i>Viburnum opulus</i> site VIOPA2-6	Documented field visit/ocular estimation of habitat condition	Annual	Unacceptable impacts (>40% browsing, trampling) to sensitive plants and habitat	In consultation with botanist, implement adaptive management to reduce impacts.
Boeson Spring <i>Viburnum opulus</i> R2 sensitive plant site VIOPA2-29	Maintain R2 sensitive <i>Viburnum opulus</i> site VIOPA2-29	Documented field visit/ocular estimation of habitat condition	Annual	Unacceptable impacts (>40% browsing, trampling) to sensitive plants and habitat	In consultation with botanist, implement adaptive management to reduce impacts.

Upper Elk Allotment Monitoring Plan					
Monitoring Site	Desired Conditions	Method	Frequency	Trigger Point	Change Needed
Key Upland Grazing Areas	≤45% utilization	Ocular Utilization	Annual	45% utilization	Remove livestock from affected area
Key Riparian Grazing Areas	4-6" stubble height	Stubble height	Annual	4-6" stubble height	Remove livestock from affected area
Key Riparian Grazing Areas	Maintain 74% stable stream banks	Stream bank alteration	Annual	>26% stream bank alteration	Remove livestock from affected area
SW ¼ Sec. 29	Maintain plant diversity, <5% bare soil	Cover-Frequency	5-10 years	Loss of species diversity, or >5% bare ground	Implement adaptive management option
SE ¼ Sec. 32	Maintain plant diversity, <5% bare soil	Cover-Frequency	5-10 years	Loss of species diversity, or >5% bare ground	Implement adaptive management option
Englewood Springs Botanical Area, including <i>Listera convallarioides</i> SOLC site LICO5-2	Maintain current extent of known R2 sensitive and SOLC plant occurrences. Impacts by livestock on sensitive and SOLC plant species and suitable habitat will be incidental.	Documented field visit/ocular estimation	Annual	Adverse impacts to R2 sensitive or SOLC plant occurrences or suitable habitat; OR use by livestock is adversely affecting values for which Botanical Area was designated	Implement adaptive management option

Upper Elk Allotment Monitoring Plan					
Upper Bear Butte Creek	Maintain SOLC <i>Listera convallarioides</i> site (LICO5-3)	Documented field visit/ocular estimation	Annually for 3 years; if no impacts, monitor every 3 years	Unacceptable impacts to SOLC	Exclude livestock from SOLC population in consultation with botanist