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Grasslands Plan Revision Comprehensive Evaluation Report

Kiowa, Rita Blanca, Black Kettle, and McClellan Creek National Grasslands

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Executive Summary

This Comprehensive Evaluation Report for the Kiowa, Rita Blanca, Black Kettle and McClellan Creek National Grasslands presents a summarized discussion of the needs for change in the current Land and Resource Management Plan direction regarding these Grasslands. This discussion was extracted from evaluations on the ecological, social, and economic sustainability of the Grasslands, and sets the stage for developing and implementing much-needed Plan revisions.

The "Need for Change" described in this report can be synthesized into a set of key, integrated themes, or needs:

Include More Adaptive Management Approaches

Invasive species, climate change, and wildland fire are perhaps the three most pressing emerging issues faced by all land managers. These dynamic and complex issues and others that will surely come in future years, combined with other factors that are not easily predicted point to the need for management strategies that allow for decision-making processes that incorporate new and emerging information.

Better Address the Unique, Local Conditions of the Grasslands

The ecological, social and economic conditions found in the Grasslands are unique to the southern Great Plains. However, the current Plan includes little or no direction that addresses this. These features and opportunities call for specialized assessments and management strategies.

Address Recreational Opportunities and Challenges

The Grasslands contain many recreational opportunities that are not addressed in the current Plan. It is expected that interest in recreation on the Grasslands will increase over time; therefore, there is a need to develop clear recreation management objectives and strategies.

Better Define Short and Long Term Energy Development Objectives

Oil and gas development on the Grasslands is important to both the nation's energy needs and the local and regional economies of the grasslands. However, as the energy needs of our nation shift towards more sustainable resources and oil and gas productivity on some parts of the Grasslands decrease, there is a need to describe the long-term expectations, objectives and management strategies for energy development on the Grasslands. Moreover, there is a need to provide direction for the sustainable management of the wood products and other special resources found on the Grasslands that are important to the local economy.

Introduction

This "Comprehensive Evaluation Report for the Kiowa, Rita Blanca, Black Kettle and McClellan Creek National Grasslands" (CER) presents a summarized discussion of the need for changes in the current Plan direction regarding the Grasslands[1]. The Report is divided into three revision topics: Ecosystem Diversity, Managed Recreation and Human Influences on the Grasslands. For each of these topics, there will be a description of current conditions and trends, information about how those trends have changed or are expected to change over time, areas of management concern and what needs to change in the existing plan to meet the future needs of Grassland management.

The Kiowa, Rita Blanca, Black Kettle, and McClellan Creek National Grasslands (Grasslands) comprise approximately 262,000 acres of public land and are among the twenty National Grasslands managed by the Forest Service. They are administered as part of the Cibola National Forest, headquartered in Albuquerque, NM, with district offices in Clayton, NM and Cheyenne, OK.

Although the Grasslands are subject to numerous federal laws, regulations and policies, the Bankhead-Jones Farm Tenant Act (7 USC §1010) and associated Forest Service regulations (36 CFR 213) provide the specific framework for managing Grasslands. The Act and regulations require:

> [A] program of land conservation and utilization to correct maladjustments in land use and thus assist in controlling soil erosion, reforestation, preserving natural resources, protecting fish and wildlife, developing and protecting recreational facilities, mitigating floods, preventing impairment of dams and reservoirs, developing energy resources, conserving surface and subsurface moisture, protecting the watersheds of navigable streams, and protecting the public lands, health, safety, and welfare, but not to build industrial parks or establish private industrial or commercial enterprises.
>
> [To] promote development of grassland agriculture and sustained-yield management of the forage, fish and wildlife, timber, water, and recreation resources; and to demonstrate sound and practical principles of land conservation and use.

The Land and Resource Management Plan (Plan) for the Cibola National Forest and Grasslands is scheduled to be revised in accordance with the National Forest Management Act of 1976 and associated Forest Service Planning regulations. Revising the Plan will include dividing it into one Plan for the Grasslands and a separate Plan for the Forest. The goal of Plan revision is to provide management direction that balances the social, economic, and ecological demands on the grassland resources so that the resources can be sustained in perpetuity. The social, economic, and ecological systems are interrelated and need to be considered together.

Area of Analysis

This report analyzes current conditions and trends for the two districts that administer the Grasslands: the Kiowa-Rita Blanca District (which includes the Kiowa and Rita Blanca National Grasslands) and the Black Kettle District (which includes the Black Kettle and McClellan Creek National Grasslands). The four Grasslands are spread out across portions of New Mexico, Texas, and Oklahoma, as displayed on the Vicinity Map (Figure 1).

Within each of the four designated Grasslands are small, scattered parcels of Forest Service-managed land called "Grassland units" that are surrounded by mostly private farm and ranch lands. The Forest Service land ownership is less than 24% of the land within the Grasslands administrative boundaries. Seventy-

[1] The current Cibola National Forest Land and Resource Management Plan is available at: http://www.fs.fed.us/r3/cibola/plan-revision/national_grasslands/index.shtml

three percent of the land with the administrative boundary is private and the remaining 3% represents State-owned land (see Land Jurisdiction Map, Appendix A). These Grassland units are where plan components will apply; however, to assess how the Grasslands contribute to social, economic and ecological sustainability, larger areas are analyzed.

The larger area of analysis for the ecological section varies depending on the scale of information being analyzed. Current conditions and trends for the Grasslands were analyzed using Grassland units within the administrative boundaries. The historical data and comparison of the Grasslands to the surrounding landscape were analyzed using Subsection boundaries from the National Hierarchical Framework of Ecological Units. All four Grasslands are part of the larger Great Plains grassland ecosystem.

The analysis area for social and economic conditions and trends is primarily the counties that overlap with the Grassland units (Grassland counties) with a few exceptions. In some cases, the evaluation compares social and economic conditions and trends for Grasslands counties to state and regional trends. The Grassland units cover very small proportions of the land within each county (Table 1). Mora, Gray, Hemphill, and Colfax Counties contain minor proportions of Grasslands acreage. However, the large Forest Service recreation areas in Hemphill and Gray Counties make important contributions to the social and economic well-being of local communities. The Wagon Mound community in Mora County also has important ties to the Mills Canyon area of the Kiowa National Grassland. Colfax County is excluded from further evaluation because it only contains 320 acres of general rangeland on the Kiowa National Grassland, which does not contribute significantly to the county economy or lifestyle. In addition, the demographics and economic conditions of Colfax County are substantially different from those of other Grassland counties because of its proximity to Taos and the recreation and tourism activities associated with that area.

Table 1: Percent of County under Grasslands Management

Forest Service Ranger District	County, State	Percent of County which is in a Grassland Unit
Kiowa & Rita Blanca	Dallam, TX	8
Kiowa & Rita Blanca	Harding, NM	5
Black Kettle	Roger Mills, OK	4
Kiowa & Rita Blanca	Union, NM	2
Kiowa & Rita Blanca	Cimarron, OK	1
Kiowa & Rita Blanca	Mora, NM	<0.5
Black Kettle	Gray, TX	<0.2
Black Kettle	Hemphill, TX	<0.1
Kiowa & Rita Blanca	Colfax, NM	<0.1

Source: US Department of Agriculture, Forest Service

Figure1: National Grasslands Administered by the Cibola National Forest

Historical Context

Beginning about 12,000 years ago, various Indian groups began to occupy and adapt to the harsh conditions of the Great Plains. The western portion of the Kiowa National Grassland along the Canadian River was an area of significant prehistoric occupation, as was the Washita River corridor on the Black Kettle National Grassland. A prolonged drought in the 1400s caused many Indian and Spanish groups to leave the area, although populations returned with the milder climate of the 1500s. From 1500-1700, bands of Apache, Comanche, Navajo and Kiowa Indians periodically occupied the area, along with the Spanish. In the 1600s, white settlers moved in from the eastern United States, causing unrest among native populations. In the 1700s and early 1800s, the trade economy greatly expanded, large-scale buffalo hunts became common, and the Spanish herded sheep in various parts of the Grasslands. There was an accelerated settlement period in the late 1800s, resulting in creation of businesses, towns and counties. Hispanic sheepherders withdrew from the area as the cattle industry grew. An open-range cattle industry thrived from 1866-1886 and then the land was fenced into smaller-tracts of cattle ranches and family farms.

Figure 2: Dust storm approaching Stratford, TX
NOAA's National Weather Service Collection

In the 1930s, cultivated food crops were in high demand. As a result of the combination of deeply plowed tracts of marginal lands in some parts of the region and over-grazing by cattle and sheep herds in other areas, much of the Great Plains was stripped of native vegetation. This loss of native grass cover, combined with a severe drought, set the stage for an enormous loss of soil. Huge dust storms (Figure 2) blew the topsoil throughout the Plains and Midwest as far as Washington D.C. There were 72 regional storms in 1937 before they began to drop off.

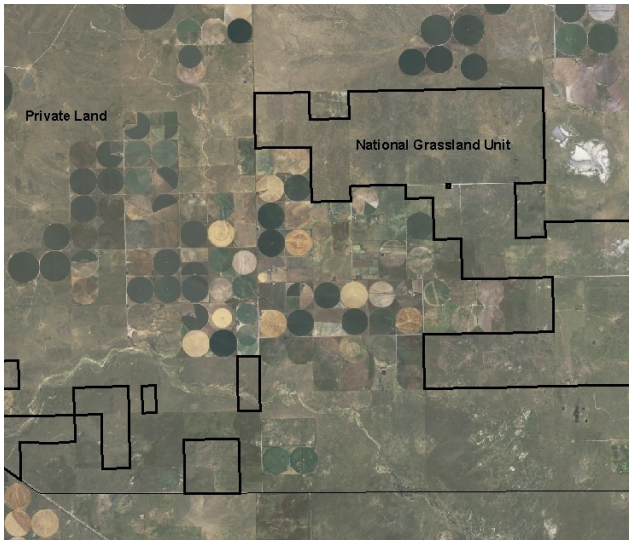

Figure 3: Contrast between National Grasslands and surrounding private land.

Strong measures were needed to restore lands that were severely denuded in the Dust Bowl. Federal conservation programs began to acquire the devastated farmlands to rehabilitate the area and replace outdated farming methods with seeding, rotating crops, using contour and strip plowing, terracing and planting trees as wind breaks. The 1937 Bankhead-Jones Farm Tenant Act required the Soil Conservation Service to transform severely eroded farmlands into demonstrations of good land conservation and utilization. In 1954, some of these lands were transferred to various federal agencies. In 1960, these same lands were transferred from the various agencies to the Forest Service and put into a National Grasslands System.

The Grasslands are nearly the only public lands within

a region dominated by private agricultural croplands and ranches (Figure 3). Grasslands management provides for the diversity of plant and animal communities, productive soils, high-quality water and riparian resources, and native prairie ecosystems. The Grasslands also demonstrate successful ecosystem restoration of lands.

The Kiowa, Rita Blanca, Black Kettle and McClellan Creek National Grasslands are four of the twenty National Grasslands established to demonstrate on-going ecosystem restoration. The legacies from numerous cultural and ethnic groups that adapted to the harsh life on the prairie form the rich social, economic and ecological make-up of the Grasslands today.

Roles of the Grasslands

Ecosystems and wildlife habitat. The Grasslands significantly contribute to the sustainability of diverse, native Great Plains grassland ecosystems and associated wildlife. The Grasslands demonstrate successful ecosystem restoration of lands that were degraded during the Dust Bowl era. Grasslands management contributes to the sustainability of productive soils, high-quality water and riparian resources, native prairie habitat and species. The Grasslands also include rare shinnery oak and playa lake ecosystems not found in other regions. The public values how Grasslands management demonstrates the coexistence of complimentary land uses such as cattle grazing, hunting, and oil and gas production without compromising the ecological integrity of grasslands habitat.

Recreation. Recreation opportunities on the Grasslands greatly contribute to the quality of life enjoyed by residents and visitors alike. The Grasslands provide outstanding opportunities for hunting, fishing, camping, hiking, viewing birds and wildlife, driving to enjoy the scenery and open spaces, and visiting historic sites. The developed recreation sites, particularly the lake-based recreation complexes on the Black Kettle and McClellan Creek National Grasslands, and the developed sites in Mills Canyon area, offer unique and significant features available for both residents and visitors to enjoy within this region.

Livestock grazing. Livestock grazing on the Grasslands contributes to maintaining the ranching culture and lifestyle of these rural areas, improves the fiscal sustainability of local ranching operations, and helps to achieve plant community desired conditions. Over 96% of the Grassland units are used by permit-holders to graze their cattle. This use of the Grasslands contributes to the social and economic well-being of this area while sustaining native prairie ecosystems.

Oil and gas. A small portion of the Grasslands contain rich oil and natural gas resources that contribute to meeting the nation's energy needs. The Grasslands may also play an important future role for alternative energy developments such as wind.

Scenic, heritage, and paleontological resources. The Grasslands contain significant scenic, heritage (historic and prehistoric) and paleontological (fossil) resources. These offer opportunities for the public to learn about the past and appreciate the resources and beauty of the Grasslands. These important resources provide opportunities to base tourism businesses on bird-watching, hunting, wildlife viewing, and visiting historic and cultural sites.

Areas of Interest: Three features on the Grasslands are formally designated as 'Special Areas' to highlight and preserve their unique historic and scenic characteristics. These Special Areas include the Santa Fe National Historic Trail, and two scenic byways: The Santa Fe Trail National Scenic Byway, and La Frontera del Llano Scenic Byway (State). Other areas of interest include the Canadian River Inventoried Roadless Area (IRA) and the Canadian River eligible Scenic River corridor which attracts visitors for its remarkable historic, geologic, scenic, and recreation features.

Wildfire prevention. The Forest Service plays a vital role in working with volunteer rural fire departments and others in preventing wildfires that threaten human life and property. Without the active support of well-trained federal fire-fighting resources, preventing catastrophic wildfires in this remote and

rural region would be substantially more challenging. Thus, Grasslands management contributes to protecting valuable natural resources along with private properties and communities.

Determining the Need to Change the Current Management Plan

The main responsibility of administering the Grasslands includes managing and monitoring the health and status of the natural resources (e.g. vegetation and wildlife) while balancing the many human uses of the Grasslands (e.g. camping, hunting, livestock grazing). This CER examines the social, economic, and ecological conditions and trends in and around the Grasslands, as detailed in the Socio-Economic Sustainability Report and the Ecological Sustainability Report for the Kiowa, Rita Blanca, Black Kettle, and McClellan Creek National Grasslands. The sustainability reports evaluated ecological models, social and economic statistics, monitoring data, public comments and the results of the Forest Service Southwestern Region's Attitudes, Values, and Beliefs Report to describe the current conditions and trends on the Grasslands. This report summarizes those findings and uses them to identify where these trends generate a need to change direction in the current Plan.

Even though the Need for Change identified in this report is the primary driver of the development of a revised Plan, they do not represent a comprehensive list of needed changes. There are some areas of the current Plan that are still adequate and timely; that direction will be carried forward into the revised Plan. Most objectives and guidelines from the existing Plan may be modified or removed, for one of the following reasons:

- They describe a purely administrative function, such as budgeting rather than the management of land and resources;
- They duplicate of direction that can already be found in Forest Service handbooks and manuals; or
- They are based on outdated policies, science or information and would therefore be updated or removed as appropriate.

Schedules of activities in the Plan have been outdated for more than a decade and will be removed as well. There are also issues that have emerged since the Plan was developed or that were not as great of a threat to social, economic and ecological sustainability at that time. The Plan is silent or may have very little direction on such issues. These issues will be considered in the development of the revised Plan.

Revision Topic 1: Ecosystem Diversity

Current Conditions and Trends

Using the National Hierarchical Framework of Ecological Units, an analysis of the distribution of current vegetation types across the landscapes surrounding the Grasslands was completed using the Section and Subsection units. Collectively, the four sections within which the Grasslands are located total over 65 million acres. The Grasslands make up less than 2% of these total acres. The majority of the land within these sections is privately-owned agriculture or crop land. Irrigated agriculture areas used for cropland are used mainly to farm soybeans, corn, or alfalfa. The main crops grown through dry-farming are winter wheat, beans, small grains, or sorghum. Much of the remaining vegetation is either shortgrass or mixed grass prairie; however, as the majority of the land ownership is private, most of these acres are used as rangeland for grazing cattle.

Figure 4: Great Plains Region

The Grasslands are part of the larger Great Plains grassland ecosystem (Figure 4); however, each Grassland has unique characteristics. Analysis of these unique ecosystems was conducted using Potential Natural Vegetation Types (PNVTs) and existing mid-scale vegetation types found on the Grasslands. PNVTs are coarse-scale groupings of ecosystem types that share similar geography, vegetation, and historical disturbances such as fire, drought, and native herbivory. The PNVTs used for this analysis were summarized from the Terrestrial Ecological Unit Inventory (TEUI) data for the Grasslands. There are seven PNVTs found on the Grasslands. A comparison between PNVTs and existing vegetation was used to show the departure from reference conditions.[2] Existing dominant vegetation and PNVT maps can be found in Appendix A.

Vegetation[3]

There are seven distinct PNVTs (ecosystem types) found across the Grasslands: Mixed Grass Prairie, Shortgrass Prairie, Shinnery Oak, Cottonwood Willow, Mixed Hardwood Riparian and Sand sagebrush. A broad-scale analysis of the departure of current conditions from reference condition for each PNVT was done to set the context for the contributions the Grasslands make to ecological sustainability. Reference conditions, as described, in this document are referencing conditions of ecosystems in terms of vegetation composition and structure only. Reference conditions do not describe the extent or distribution of the PNVT across the landscape because these ecosystems would have historically covered millions of contiguous acres across the southern Great Plains. Due to settlement, landownership patterns across the landscape have become highly fragmented. As a result, four out of the seven PNVTs found on the

[2] Mid-scale vegetation type description is structural, not compositional. Description of existing species composition was inferred by relating remotely sensed data (mid-scale) to ground-based data (TEUI). Comparison of existing vegetation to reference condition is therefore limited to plant community structure (not species composition).

[3] USDA 20011a p. 15-30 and 65-75

Grasslands (Shinnery Oak, Pinyon-Juniper, Mixed Hardwood Riparian, and Sand sagebrush) have greater representation on the Grasslands than they do in the surrounding landscape.

When looking to identify resource management opportunities and constraints, two key factors should be considered: the current status and trend of an ecosystem and the effects of current management activities on that status and trend. Using these considerations and recognizing the importance of other ecosystem characteristics (i.e., soil, water, air and habitat) each PNVT and habitat feature found on the Grasslands was reviewed to identify general management opportunities and constraints for the Grasslands.

Historically, natural disturbance was a regular component of all of the PNVTs found on the Grasslands. These disturbances, including wildfire, grazing, climatic events, and invasive species, had notable effects on the Grasslands vegetation (including composition and structure). In addition to these events, hardwood riparian areas were periodically affected by flooding. Though their frequency and intensity have shifted as a result of settlement and management, these historical natural disturbances continue to influence the composition and structure of the Grassland PNVTs. In addition to these historical natural disturbances, invasive species and motorized and off-road travel are now recognized as having disturbance-like effects on the Grasslands vegetation. Both have the potential to significantly modify ecological systems and processes.

Mixed Grass Prairie

Condition: Mixed grass prairie covers approximately 11,300 acres or 35% of the Black Kettle and McClellan Creek National Grasslands. The mixed grass prairie PNVT is characterized by mixed grass to tall grass prairie found on moderate to gentle slopes and is dominated by one or some of the following species: big bluestem; little bluestem; western wheatgrass; sideoats grama and blue grama. This PNVT may also include areas that are dominated by low structure grasses and forbs. In the early stage, 1-3 years post-fire, there are more forbs and diversity of species before little bluestem regains dominance. After approximately three years, the grasses become the dominant species. Perennial grasses on the red-shale soils are primarily blue grama, hairy grama, little bluestem, and purple three awns. About 10% of the areas are covered in forbs and 10% in woody species.

Trends: Prescribed fire and livestock grazing are used to increase the amount of forbs within the mixed-grass prairie to maintain the reference condition or to move the PNVT toward reference condition.

Departure from Reference: The mixed grass prairie that occurs on soils that are a loamy, red-shale type and are currently near reference condition.

Contribution to Sustainability and Management Opportunities and Constraints: Currently, The Subsections, Canadian-Cimarron Breaks and Red Prairie, have disproportionate total percentages of mixed grass prairie compared to the percentage of mixed grass prairie on the Grasslands within those Subsections. The McClellan Creek boundary overlaps the Canadian-Cimarron Breaks Subsection and the disproportionately larger percentage of mixed grass on McClellan Creek is due to the small size of this unit and the lack of PNVT diversity considering the topography and overall landscape constraints. The disproportionately small percentage of mixed grass prairie within the Red Prairie Subsection and Black Kettle boundary overlap is largely due to the soil types in this area of the Grasslands that are more conducive to other PNV types. While it may appear that management of the mixed grass prairie on the Grasslands is not a priority due to its overrepresentation on private land, much of all mixed grass prairie off of the Grasslands is highly departed from its reference condition due to historical agricultural practices and land use. This makes the native mixed grass prairie located on the Black Kettle and McClellan Creek National Grasslands important, as it has a high contribution to the overall ecological sustainability.

Shortgrass Prairie

Condition: Shortgrass prairie covers approximately 181,900 acres or 79% of the Kiowa and Rita Blanca National Grasslands. The shortgrass prairie PNVT typically occurs on plains and draws, or on gently rolling uplands of the southern Great Plains. Vegetation is mainly shortgrass dominated by blue grama, needle-and-thread, buffalograss, and little bluestem, with intermingled forbs and scattered half-shrubs. Post-fire early-successional stages are dominated by resprouts and seedlings of grasses and post-fire associated forbs covering approximately 2% of this PNVT. Species include blue grama and buffalograss. The mid-open stage covers approximately 90% of the PNVT with less than 35 percent herb cover that is low to medium height. The main grasses are blue grama and buffalograss. The mid-closed stage covers about 8% of this PNVT with greater than 35 percent herb cover. Again the main grass species are blue grama and buffalograss. Livestock grazing is conducted in accordance with most recent environmental analyses utilizing an adaptive management approach taken by monitoring use and conditions on the ground, then adjusting as conditions change. Prescribed fire is applied, but on a small scale and generally not within the historical fire regime of 5-10 years. Removal of shrubs and trees encroaching onto the shortgrass prairie is occurring where access is adequate.

Trends: Current management trends are stable and will keep this PNVT near reference condition.

Departure from Reference: Currently, the shortgrass prairie is in low departure from reference condition as a whole for the PNVT.

Contribution to Sustainability and Management Opportunities and Constraints: Currently, there is less shortgrass prairie across the landscape than found historically. These areas of shortgrass prairie located off the Grasslands are highly departed from the reference condition. Therefore, the shortgrass prairie located within the National Grassland units is important and has a high contribution to the overall ecological sustainability. There is a management opportunity to create a greater proportion of late-structural stage conditions, which may require more rest or grass-banking. Likewise, prescribed fire may be used to create a greater proportion of early successional stage conditions.

Shinnery Oak

Condition: This ecosystem covers approximately 18,900 acres (or 59%), of the Black Kettle and McClellan Creek National Grasslands. The composition and structure of shinnery oak areas varies across the landscape due to historical agricultural practices of deep plowing. About 45% of the shinnery oak PNVT is in the early-mid-open, post-fire to three years post-fire regime and dominated by tallgrasses in shallower and more stable sandsheet areas. Grass cover is dominant with rapid recovery of shinnery oak resprouts. The late-closed successional class structure and composition stage occurs in the 3 to 10 year post-fire time frame. Shinnery cover is mostly dominant although grasses remain co-dominant on about 55% of the PNVT. Most shinnery oak stands on the unplowed areas are burned on a 2 to 9 year cycle with the intent to maintain grass cover within the oak for wildlife habitat diversity and to mimic historical conditions. Structurally, the areas of deep plowed shinnery oak are close to the reference condition of shinnery oak but the composition of plants is different. These areas are dominated by little bluestem and have a small shrub and forb component with little or no shinnery oak present. Current livestock grazing within the shinnery oak system is relatively light, with utilization levels retaining at least 50% of the current year’s growth of vegetation, by weight, of forage species.

Trends: Under current management, the areas of unplowed shinnery oak are expected to remain close to the current condition. Prescribed burning and controlled grazing move this PNVT toward reference conditions that have the shinnery oak composition fully recovering its vertical structure within 2 to 4 years after a fire. The deep plowed areas of shinnery oak will trend to meet structural reference conditions but the shrub component will be represented by sand sagebrush, Oklahoma plum, and yucca.

Departure from Reference: The current condition of shinnery oak has more in the early/mid-open stage and less in the late/closed stage than occurred historically.

Contribution to Sustainability and Management Opportunities and Constraints: The Subsections, Red Prairie and Southern South Central and Red Bed Plains, have overlapping boundaries with Black Kettle Grasslands. Both Subsections have disproportionate total percentages of shinnery oak compared to the Black Kettle Grassland due to agricultural practices that removed the shinnery oak species component. Currently, there is a much larger amount of the shinnery oak PNVT on Grasslands than in the surrounding landscape. This makes the contribution of the shinnery oak located within the Grasslands important to the overall ecological sustainability.

The horizontal expanse or range of shinnery oak does not fluctuate by current management, and the areas of the shinnery oak PNVT will remain fairly constant on the Grasslands with the composition and structure trends toward reference. Grassland managers will continue to manage with livestock grazing and prescribed fire to select for shrubs and woody plants including shinnery oak, sand sagebrush and Oklahoma plum and yucca to move the deep plowed areas as close as possible to a historical shinnery oak structure conditions.

Pinyon-Juniper

Condition: This vegetation type covers approximately 21,700 acres or 10% of the Kiowa and Rita Blanca National Grasslands. The current condition includes the early-successional stage that occurs post-fire and covers about 12% of the PNVT with open areas of grasses, forbs, seedlings less than 4.5 ft. in height and saplings. The mid-late successional stage covers about 88% of the PNVT and includes a mix of Pinyon and juniper trees in a variety of classes with varying canopy cover. Mid-development classes averages 10% of the PNVT in relative abundance and have dense canopy cover (31-70%) of pole size trees (5-9” in diameter) and very little understory. 25% of the PNVT will have pole size trees with a mixed shrub/herbaceous understory and canopy cover ranges from 0-30%. 35% of the PNVT will have late development with medium size trees (9-21” in diameter) and canopy cover of 0-40%. 10% of the PNVT will have dense, old growth characteristics with medium size trees and canopy cover of 41-70%. Stands of Pinyon-juniper that are overstocked and encroaching onto the shortgrass prairie are being treated using thinning and prescribed burning. Currently, the level of treatment is approximately 500-900 acres of thinning a year, followed by 1,000 to 1,800 acres of burning.

Trends: Through the continued use of prescribed burning and thinning projects, woodland areas have become more open although they have retained their mid-to late-seral stage structure including old growth characteristics of large-diameter trees, snags, and down logs. Continuation of current management trends is expected to keep the Pinyon-juniper PNVT in its current state, which is near reference conditions.

Departure from Reference: The Pinyon-juniper PNVT is near reference condition.

Contribution to Sustainability and Management Opportunities and Constraints: There is approximately the same amount of Pinyon-juniper across the landscape as was historically, in terms of relative abundance. Continued (and increased, where appropriate), burning will help encourage this PNVT toward reference condition. Since the majority of the Pinyon-juniper found off the Grasslands is highly departed from the reference condition, the contribution the Grasslands make to ecological sustainability for the Pinyon-juniper PNVT is important.

Cottonwood Willow

Condition: This vegetation type covers approximately 1,370 acres or 1% of the Kiowa and Rita Blanca National Grasslands. The early-successional class is represented on about 16% of this PNVT and is typically shrub/seedling dominated, but grasses may co-dominate. The mid- and late-successional class covers about 84% of this PNVT. The mid-vegetation composition includes tall shrubs and small trees

(willows & cottonwoods). Late-successional class represents the mature, large cottonwood and willow riparian woodlands. Current management activities are targeting non-native, invasive species in riparian areas (specifically, salt-cedar). These activities are encouraging establishment of needed mid-successional conditions.

Trends: By removing salt-cedar from the Canadian River system in Mills Canyon, more of the PNVT will move into the mid-successional class. This will increase vegetation on stream banks and stabilize slopes. Areas along Perico and Sauz Creeks periodically flood which helps keep some of this PNVT within the early successional class. Under current management, this PNVT is expected to remain near reference condition.

Departure from Reference: The cottonwood-willow areas located within the Kiowa and Rita Blanca National Grasslands are near reference condition.

Contribution to Sustainability and Management Opportunities and Constraints: Currently, there is much less cottonwood-willow across the landscape than appeared historically and those areas present on the landscape that do have cottonwood-willow are highly departed from the reference condition. The cottonwood-willow areas located within the Kiowa and Rita Blanca National Grasslands are within the reference condition, making it an important ecosystem and important to sustaining ecological sustainability. On-going non-native invasive species control will benefit regeneration and establishment of native cottonwood and willows. However, flood control and impoundments upstream of Grassland units can reduce flooding and in turn negatively effect cottonwood and willow recruitment. Current management trends of treating invasive species within the riparian systems, specifically saltcedar, will help reduce the amount of invasives found in the cottonwood-willow PNVT.

Mixed Hardwood Riparian

Condition: This vegetation type covers approximately 1,946 acres or 6% of the Black Kettle and McClellan Creek National Grasslands. The early-successional stage represents approximately 13% of this PNVT with pioneer tree and shrub species of cottonwoods and willows with an herbaceous understory of sedges in wet areas. In this early stage, most of the area is bare sand dominated by a young canopy of tree saplings and shrubs. Species would include indigo bush and various grass, sedges, and rushes. The mid- and late-successional stage covers the remaining 87% of this PNVT. In the mid-stage developing stands start to mature. This community tends to be partially open with scattered cottonwoods and willows. The shrub layer is poorly developed and often consists of widely scattered patches of dogwood. The understory vegetation is highly variable with wild rye, and muhlies. In wetter, more shaded areas, Virginia creeper, nettles, and poison ivy are present. In the late class is a mature, late seral, closed canopy cottonwood floodplain forest. Overstory is dominated by cottonwood, box elder, hackberry, walnut and elm. Understory species include Virginia creeper and poison ivy found along the upper terrace that has been protected from most flood events except for rare high intensity flooding.

Trends: Under current management, this PNVT is expected to remain in its current state.

Departure from Reference: The mixed hardwood riparian areas that are found on the Black Kettle and McClellan Creek National Grasslands are there due to soil movement during the Dust Bowl area. Topsoil blew into these low-lying areas followed by upstream damming, creating areas that would not have been present historically. Consequently there is not an appropriate reference condition or a departure from reference condition determination.

Contribution to Sustainability and Management Opportunities and Constraints: Currently, areas off of the National Grasslands that represent the mixed hardwood riparian PNVT are outside of mixed hardwood riparian structure and composition ideals. The Black Kettle and McClellan Creek National Grasslands hold a fairly large portion of this PNVT within the Canadian-Cimarron Breaks subsection, making this an important ecosystem. The most important management activity occurring within the

mixed hardwood riparian is the removal of invasive species eastern red cedar and black locust. Management activities are limited by the conditions currently found within the mixed hardwood riparian. Overcrowded, thicket like conditions, compounded with stream impoundments are preventing large disturbance events (i.e. fire and flooding) that would have led to early-successional stage classes and regeneration of woody species. The removal of invasive woody species (e.g., eastern red cedar and black locust) would help with the re-establishment of native hardwood species, such as cottonwood, willow, elm, hackberry, and ash. However, as this PNVT is present now, current management is conducted in ways conducive to keeping this PNVT intact.

Sand sagebrush

Condition: The sand sagebrush PNVT vegetation type covers approximately 22,651 acres or 8 % of the Grasslands. One percent of this PNVT is a post-fire successional class dominated by resprouts and seedlings of grasses and forbs with low to medium height having a variable canopy cover. This class typically occurs where fires burn relatively hot. The mid-open successional stage represents 69% of this PNVT that has less than 35% herb cover, medium to tall in height. Mid-closed stage represents about 39% of the PNVT area with greater than 35% herb cover, medium to tall in height. Prescribed burning is currently being used at a rate of approximately 500 acres every three-five years. Livestock grazing occurs during the winter months to limit the impact to soils and no livestock grazing occurs during the growing season.

Trends: Continuation of current management trends will maintain sand sagebrush near reference condition.

Departure from Reference: The sand sagebrush PNVT is near reference condition.

Contribution to Sustainability and Management Opportunities and Constraints: Currently, there is much less of the sand sagebrush PNVT across the landscape than was historically present due to massive soil movement that occurred during the dust bowl. These areas of the surrounding landscape that are sand sagebrush are highly departed from the reference condition. Sand sagebrush keeps the soil stable and helps prevent further soil movement; therefore, it is important on the Grasslands. This makes the sand sagebrush PNVT on the Kiowa and Rita Blanca National Grasslands an important ecosystem and important to ecological sustainability. Management activities will continue to maintain these areas. An increase in prescribed burning activities would help move more of the area into needed early- and mid-successional classes.

Soil Resources[4]

Condition: In terms of soil productivity, 52% of the soils on the Grasslands are in satisfactory soil condition, 48% are impaired, and 0% in unsatisfactory condition. In terms of soil loss[5], about 90% of the soils on the Grasslands are in satisfactory condition; the remaining 10% are considered unsuited (inherently unstable). All of the mixed hardwood riparian, Pinyon-juniper, cottonwood-willow riparian, sand sagebrush, and shinnery oak vegetation types are in satisfactory soil loss condition. This indicates that on-site soil loss is within threshold limits and is not reducing the ability of the soil to maintain long-term soil productivity. Conversely, the greatest areas of unsuited soil loss conditions are found in the shortgrass prairie vegetation type. Proportionally, the mixed grass prairie vegetation type has the most area in an unsuited soil loss condition, about 35 percent. Soil erosion may be occurring beyond its threshold and the soil is at risk of not maintaining long-term soil productivity.

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[4] USDA 2011a. p. 35-43 and p. 75

[5] Ratings used for Soil Loss are Satisfactory, Unsatisfactory, and Unsuited. A Satisfactory rating denotes that the current erosion rate is less than the soil erosion rate tolerable threshold (T) and that a low level of erosion is occurring, representing maintenance of soil productivity. An Unsatisfactory rating denotes a high level of erosion (more than T), representing continued loss of soil productivity. An Unsuited rating represents inherently unstable soil types that, even with optimal ground cover, soil loss would exceed T.

Trends: Restoration management practices over the past several decades have resulted in tremendous improvement in soil stability and vegetative recovery. A few units on the Black Kettle National Grassland that were heavily plowed in the past do not appear capable of recovering their productivity potential, although the soils are grass-covered and stabilized. A few units on Kiowa and Rita Blanca National Grasslands adjacent to towns or other private developments are heavily impacted by invasive plant populations that are seriously reducing soil productivity and vegetative diversity. These too are not likely to be fully restored to full productivity and native grassland vegetation due to continued spread of invasive plants and other impacts from adjacent lands.

Departure from Reference: Soils found on the Grasslands are altered due to soil movement during the Dust Bowl area creating areas that would not have been present historically. Consequently there is not an appropriate reference condition or a departure from reference condition determination.

Contribution to Sustainability and Management Opportunities and Constraints: There are no management activities occurring on the Grasslands that are targeted specifically to soil productivity or soil loss. However, all management activities that are implemented must be conducted in a manner that does not contribute to loss of long-term soils productivity there are activities or conditions off of the Grasslands that affect Grassland soils. If populations of invasive species off of Grassland units are not controlled, they will continue to spread onto the Grasslands, posing management problems.

Water Resources[6]

Condition: The following surface water and riparian vegetation occurs on the Grasslands units and additional water and riparian resources occur on adjacent private and state lands (based on Terrestrial Ecological Unit Inventory data):

- 32 miles of perennial (mostly year-round) streams, with 60% on the Kiowa and Rita Blanca National Grasslands and 40% on the Black Kettle and McClellan Creek National Grasslands
- 3,400 acres of riparian area and 40 acres of playa lakes (shallow depressions that remain dry between rain events)
- 1,300 acres of water in reservoirs, lakes, ponds and rivers (at normal pool levels)

Water quality conditions were extremely degraded during and immediately following the Dust Bowl era. These conditions have been dramatically improved by intentionally minimizing or avoiding any adverse effects from Grassland management activities. Impoundments are maintained and inspected for safety. Recreation surrounding the reservoirs, lakes and ponds does cause some minor erosion and contribute some sediment into the water bodies. Likewise roads contribute some sediment into streams. Typically grazing activities are managed to limit erosion and trampling along perennial streams, but watering of livestock does contribute some sediment into waterways.

Trends: Conditions of most streams, reservoirs, lakes, and ponds are trending toward reference conditions.

Departure from Reference: Though there were no standards historically all streams would have met current water quality standards. There were lower peak flow events, even on un-dammed reaches, compared to current conditions due to better watershed conditions. These conditions encouraged infiltration and groundwater recharge rather than fast runoff and overland flow. Higher ground water levels resulted in streams running longer into the growing season. No significant departure from current conditions relationship to reference or future conditions to reference was determined for perennial streams, reservoirs, lakes, and ponds under forest service control.

[6] USDA 20011a p. 43-46 and 76

Contribution to Sustainability and Management Opportunities and Constraints: On the Black Kettle and McClellan Creek National Grasslands, unmanaged off highway vehicle use currently poses a risk to watershed conditions. The patchwork land ownership limits the ability of land management activities on the National Grasslands to have a large effect on water quality and stream flow. Benefits to stream health on Grasslands units can be negated by poor management on nearby private land. The mixed land ownership also presents an opportunity to work with partners and local land owners to address water quality and stream channel issues.

On the Kiowa and Rita Blanca National Grasslands, invasive species (salt-cedar) and unmanaged off highway vehicle use currently pose risks to watershed conditions. Invasive species are being controlled when and where they are found to be affecting stream flow and water quality. Grazing activities are altered when playa lakes have water. Likewise playa lakes are protected from "pitting," an activity that modifies the water holding capacity of a playa. Land management on adjacent private property could allow invasive species to re-invade riparian areas being treated. Additionally, impoundments can affect flooding which limits recruitment of riparian vegetation.

Overall, the Grasslands are similar to the surrounding landscape in respect to miles and acreage of water bodies. Groundwater depletion is occurring; though this depletion is outside of the agency's control, it has the potential to affect Grasslands management.

Air[7]

Condition: None of the three states containing the Kiowa, Rita Blanca, Black Kettle and McClellan Creek National Grasslands (New Mexico, Texas and Oklahoma) has air quality monitoring in the area of the National Grasslands. Nonetheless the air quality data that has been collected in these areas, usually by national monitoring networks or at regional airports, indicates that there is not a concern for air quality conditions in these areas except from dust storms and wildland fires.

Trends: The management trend affecting air quality is prescribed burning. The Forest Service is required to meet State air quality standards during implementation of these burns and all management activities that are implemented must be conducted in a manner that does not lead to long-term non-attainment.

Departure from Reference: Currently, the Grasslands are meeting the air quality standards as outlined for each state. Since the reference and current conditions are the same, the Grasslands are within the reference conditions for air quality. The increases in facilities listed on the EPA AirData Facility Emissions Reports especially in Roger Mills County, Oklahoma may indicate that in the future off-site emissions may have increase effects on the Grasslands' ecosystems (US EPA 1999). However, given the current superior air quality in the area these increases in emissions may not have substantial effects on the ecosystems.

Contribution to Sustainability and Management Opportunities and Constraints: Prescribed burning must be done with respect to state and national air quality standards and appropriate burn permits must be obtained prior to implementation. There are potential threats to air quality that occur off of the Grasslands and outside of Forest Service control; however, they do not affect management of the Grasslands.

Climate Change

Climate change and extremes in weather patterns are expected to continue. Changes to vegetation that may occur will have pronounced effects on soil productivity, water-holding capacity and carbon storage on the Grasslands soils. Predictions for a drying climate trend and increases in irrigation use on private land may additionally reduce water levels and availability.

[7] USDA 20011a p. 47-53 and 77

Climate change effects may take years to manifest themselves and the correct actions to address them may not be apparent, however, climate change is considered a "reasonably foreseeable" effect. While there is scientific uncertainty about extent and timing of climate change there are also effects that are beginning to be observed. Extent and intensity of fires, insect and disease events are increasing. Drought is increasing as is the intensity of flood events.

Species Diversity[8]

Analysis of ecological sustainability must include consideration of both ecosystem and species diversity. To better capture the ecological sustainability of the Grasslands, a hierarchical approach was used to analyze species diversity on the Grasslands. A comprehensive list of species (including plant, macro-lichen, bird, insect, and animal species) that have population or habitat concerns and that are found in Texas, New Mexico, and Oklahoma was developed using:

- Lists maintained under the Ecological Services Agency of the U.S. Fish and Wildlife
- Species ranks maintained by NatureServe
- New Mexico, Texas, and Oklahoma State T& E lists
- New Mexico, Texas, and Oklahoma priority Comprehensive Wildlife Conservation Strategy, (CWCS) species
- Species for which there are local concerns resulting from declines in habitat, population, and/or distribution
- Species that are of high public interest, and
- Species that have emerging issues (such as invasive species).

Using this comprehensive list as a starting point, research was conducted to determine those species that currently have:

- population and/or habitat within the Plan area
- population and/or habitat concerns (e.g., small or decreasing population, degrading habitat or habitat loss, etc.)
- or may be affected by Forest Service management actions

Species and Habitat Associations

The species included in (Table 2 Species for Consideration in Plan Revision and Habitat Association) were organized according to their associated Vegetation Types and the Grasslands on with they occur Some species, however, are not associated with a vegetation type, but rather, are dependent on unique habitat features (such as Playa Lakes, aquatic or riverine wetlands, etc. The species habitat associations were used to assess the status of species and severity of risk to ecosystem characteristics.

Table 2 Species for Further Consideration in Plan Revision and Habitat Association

#	Common Name	Ranger District	Habitat or Vegetation Type
1	Lesser prairie-chicken	Black Kettle	Mixed Grass Prairie and Shinnery Oak
1	Lesser prairie-chicken	Kiowa-Rita Blanca	Sand sagebrush
2	Plains Leopard Frog	Kiowa-Rita Blanca	Ponds and Playas, Cottonwood-Willow Riparian

[8] USDA 20011a p. 55-57

#	Common Name	Ranger District	Habitat or Vegetation Type
2	Plains Leopard Frog	Black Kettle	Aquatic Lakes
3	Black-tailed prairie dog	Kiowa-Rita Blanca	Shortgrass Prairie
4	Mountain plover	Kiowa-Rita Blanca	Shortgrass Prairie
5	Swift fox	Kiowa-Rita Blanca	Shortgrass Prairie
6	Bald eagle	Kiowa-Rita Blanca	Shortgrass Prairie, Cottonwood-Willow Riparian,
6	Bald eagle	Black Kettle	Aquatic Lakes
7	Dotted Checkerspot	Kiowa-Rita Blanca	Sand sagebrush, Shortgrass Prairie
8	Conchas Crayfish	Kiowa-Rita Blanca	Rivers
9	Arkansas River Shiner	Black Kettle	Rivers
10	Suckermouth minnow	Kiowa-Rita Blanca	Rivers
11	Largemouth bass	Black Kettle	Rivers, Aquatic Lakes
12	Interior least tern	Black Kettle	Rivers
13	American avocet	Kiowa-Rita Blanca	Ponds and Playas
14	Arid Land Ribbon Snake	Kiowa-Rita Blanca	Cottonwood-Willow Riparian
15	Great Plains narrow-mouth toad	Kiowa-Rita Blanca	Cottonwood-Willow Riparian
16	Hobomok Skipper	Kiowa-Rita Blanca	Cottonwood-Willow Riparian
17	Red-headed woodpecker	Kiowa-Rita Blanca	Cottonwood-Willow Riparian
17	Red-headed woodpecker	Black Kettle	Mixed Hardwood Riparian
18	Spellenberg's Groundsel	Kiowa-Rita Blanca	Shortgrass Prairie, Pinyon-Juniper
19	Alpine Fever-few	Kiowa-Rita Blanca	Shortgrass Prairie
20	Greene milkweed	Kiowa-Rita Blanca	Shortgrass Prairie
21	One-flowered Milkvetch	Kiowa-Rita Blanca	Shortgrass Prairie, Pinyon-Juniper
22	Burrowing Owl	Kiowa-Rita Blanca	Shortgrass Prairie
23	Rhena Crossline Skipper	Kiowa-Rita Blanca	Shortgrass Prairie
24	Ferruginous hawk	Kiowa-Rita Blanca	Shortgrass Prairie
25	Andean prairie-clover	Kiowa-Rita Blanca	Shortgrass Prairie
26	Grasshopper sparrow	Kiowa-Rita Blanca	Shortgrass Prairie, Sand sagebrush
27	Scaled quail	Kiowa-Rita Blanca	Shortgrass Prairie, Sand sagebrush
28	Long-billed curlew	Kiowa-Rita Blanca	Shortgrass Prairie, Ponds and Playas
28	Long-billed curlew	Black Kettle	Mixed Grass Prairie
29	Panhandle Spurge	Kiowa-Rita Blanca	Sand sagebrush
30	Panhandle Spurge	Kiowa-Rita Blanca	Pinyon-Juniper
31	Zone-tailed hawk	Kiowa-Rita Blanca	Pinyon-Juniper
32	Greene milkweed	Kiowa-Rita Blanca	Pinyon-Juniper
33	Northern bobwhite	Black Kettle	Shinnery Oak, Mixed Grass Prairie
34	Rio Grande turkey	Black Kettle	Shinnery Oak, Mixed Hardwood Riparian, Mixed Grass Prairie
35	Grasshopper sparrow	Black Kettle	Shinnery Oak, Mixed Grass Prairie
36	Bell's vireo	Black Kettle	Mixed Hardwood Riparian
37	Rocky Mountain Dagger	Kiowa-Rita Blanca	Caves-Cliffs-Rock Outcrops

#	Common Name	Ranger District	Habitat or Vegetation Type
38	Horrid Herrickia	Kiowa-Rita Blanca	Caves-Cliffs-Rock Outcrops
39	Ambersnail	Kiowa-Rita Blanca	Other Wetlands

Summary of major findings

Initially, 1,654 species with population or habitat concerns in Texas, Oklahoma, and New Mexico were considered for Grasslands Plan revision. This list was then narrowed down to just those species that occur on the Cibola National Grasslands and then screened further to a list of 39 species that includes only those that have known populations or habitat within the Plan area, have known population or habitat concerns, and may be affected by Forest Service management. These species were sorted according to the PNVT or unique habitat feature with which they are associated. Each of the PNVTs on the Grasslands, along with some unique habitat features (e.g., wetland or riverine), have adequate representation from species on the List of Species for Consideration in Plan Revision to warrant management consideration.[9]

Ecosystem and Species Diversity Risk Assessments[10]

The determination of ecological sustainability of the Grasslands is a culmination of assessing ecosystem characteristics (including PNVT, soil, water and air) departure from reference conditions and status of species diversity. Based on the ecosystem and species risk assessment findings described above, the Kiowa, Rita Blanca, Black Kettle and McClellan Creek National Grasslands contribute to the ecological sustainability within each resource analyzed in this report.

Ecosystem characteristics for the Grasslands were analyzed to determine if the sustainability of these characteristics are at risk. This assessment was based on the ecosystem characteristics current condition, deviation away from reference conditions, and projected future trends. If the ecosystem characteristic is projected to move away from its reference condition, then the characteristic was determined to be at risk. If the characteristic is significantly departed from its reference condition and is stable (i.e., not trending further away or towards the reference condition) then it was determined to be at risk (this scenario was not found for any of the ecosystem characteristics on the Grasslands). If current management activities are resulting in the ecosystem characteristic trending towards its reference condition, the characteristic was determined not to be at risk. None of the ecosystem characteristics on the Grasslands is projected to trend away from reference conditions, therefore, it was determined that there are no risks to the ecosystem diversity on the Grasslands[11]. The Shinnery Oak PNVT is near reference condition, and the remaining six PNVTs (Mixed Grass Prairie, Pinyon-Juniper, Cottonwood-Willow, Mixed Hardwood Riparian, Shortgrass Prairie, and Sand sagebrush) are moving towards their reference conditions. The conditions of the unique habitat features found on the Grasslands (playa lakes, riverine and wetland associations on the Kiowa and Rita Blanca Grasslands and aquatic or riverine and wetland associated habitats on the Black Kettle Grasslands) have been dramatically improved, especially compared to the extremely degraded condition they were in during the 1940s and 1950s following the Dust Bowl era. Given these conditions, there are no risks to the ecosystem diversity on the Grasslands.

A species risk assessment was conducted by processing each species on the list of Species for Further Consideration in Cibola Grasslands Plan Revision through an assessment of various habitat and

[9] USDA 20011a Appendix B

[10] *Ibid*. p. 57-69

[11] In some instances, an ecosystem characteristic (for example, ground water quantity) was identified as being outside of, and trending away from, its reference condition. However, the causes for this condition and trend were found to be outside of the Forest Service's control (for example, due to aquifer drawdown).

population factors and threats[12]. Natural history and population information was gleaned from the references used in the screening process and from Cibola National Grasslands biologists; State of OK, TX, and NM biologists; and the US Fish and Wildlife Service biologists. The results of this process provided a numerical ranking of the risk to a species. Those species found to be at high risk were further assessed for their likelihood of being affected by four population and distribution scenarios. Of the species identified for further consideration in Plan Revision, lesser prairie-chicken, plains leopard frog, black-tailed prairie dog, mountain plover, and swift fox were assessed to be at high risk on shinnery oak, ponds and playa lakes, sand sagebrush, shortgrass prairie, and cottonwood/willow riparian PNVTs (respectively). The risks to these species were found to be the threats derived from fragmentation, disease, predation, and invasive species.

Ecosystem Diversity Concern Areas

Due to disruption from settlement and agriculture production on adjacent private lands, the vegetative characteristics found on the Grasslands are largely unique in comparison to the surrounding landscape. Because the Grasslands exist to provide for ecological diversity, it is critical that the ecosystem characteristics contained within them be restored and maintained. There are several areas of ecosystem diversity concern:

- Four of the seven PNVTs (Shinnery Oak, Pinyon-Juniper, Mixed Hardwood Riparian, and Sand sagebrush) have a reduced range across the Section and Subsection. Therefore, management of these vegetation types on the Grassland units is important for the protection of their associated species.
- Of the seven vegetation types found on the Grasslands, all depart to some degree from their respective reference condition structure and disturbance regime. The degree of this departure varies across each of the seven PNVTs.
- The introduction, presence and spread of invasive species have the potential to significantly modify ecological systems and processes.
- The potential effects of climate change are far-reaching: changes to vegetation structure and composition, soil condition, and water availability are reasonably foreseeable.

Need for Change: Ecosystem Diversity

The Plan does not clearly and specifically address many of the concerns related to ecosystem restoration and maintenance specific on the Grasslands. The revised Plan should provide direction that is more specific to the Grasslands in relation to ecosystem management:

- The ecosystems found on the Grasslands represent remnant pieces of the historical extent in which they were found across the southern Great Plains. Maintaining reference conditions on the Grasslands is, therefore, important to the future survival of species associated with these vegetation types. Current Plan direction does not focus on management activities (fire and grazing) that could be used to achieve plant community desired conditions. Most of the ecosystems found on across the landscape are outside their reference condition in terms of extent, vegetative composition and structure, or disturbance processes; however, the areas of these ecosystems that remain on the Grasslands are near or trending toward their reference condition. There is a need to identify management activities (i.e. prescribed burning, adaptive management strategies) in the Plan that will maintain, or accelerate restoration of, reference conditions, recognizing past events that limit the ability of full restoration.

[12] To assess the habitat, population and threat factors for each species, the Forest Service's Southwestern Regions' Ecological Sustainability guidance was followed and tables were adapted to reflect assessment and ranking processes (Ecological Sustainability Version 5.1, 10/10/2006, Status of Species, Table 6, Table 7).

- Each ecosystem type is unique; however, the current Plan provides no specific direction for the majority of the ecosystems found on the Grasslands. Adaptive management techniques would provide managers with the flexibility to implement activities as conditions fluctuate. The revised Plan needs to have management direction to recognize the particular management objectives of each ecosystem (i.e. descriptions of different prescribed burning timeframes for each ecosystem).
- There are invasive species (plants) present on the Grasslands that have the potential to affect ecosystem structure, composition, and processes. The current Plan has little direction on the management of invasive species. The revised Plan needs to provide management direction addressing the introduction, spread and control of invasive plants and animals, with increased emphasis on adaptive management (i.e. inventory, monitor, and adjust treatments accordingly).
- The concept of climate change is not reflected in the current Plan. The revised Plan needs to address adaptive management of ecosystems with consideration that there may be changes in the climate.

Revision Topic 2: Managed Recreation

The recreation opportunities on the Grasslands that contribute the most to social satisfaction, quality of life, and the local tourism economy include hunting, fishing, camping, hiking, horseback riding, viewing birds and wildlife, driving to enjoy the scenery and open spaces, and visiting historic sites. The local public has expressed satisfaction with the recreation opportunities provided on the Grasslands, however, the demand for updated or improved amenities at some recreation sites is slowly and modestly increasing. This reflects the fact that while the populations in communities around the Grasslands are declining, visitation from cities outside the area is gradually increasing and producing a gradual change in recreational needs. Camping, often in association with hunting or fishing, is one of most prevalent recreation activities on all four Grasslands.

Current Conditions and Trends

Some of the key findings identified during evaluation of the Grasslands current conditions and trends follow.

Hiking and Camping[13]

Based on survey data, day hiking, developed camping, and primitive camping (mostly undeveloped sites within a short distance of a road) are the most frequent outdoor recreation activities in the area. While hiking and camping opportunities are important to the overall experience of Grassland visitors, they may be a secondary or complimentary activity to hunting, fishing, or other recreation opportunities. Camping occurs at developed and primitive sites throughout the Grasslands. On the Black Kettle National Grasslands, camping most often occurs at developed sites or one of the 32 designated-dispersed sites[14] that are accessed from designated roads. On the Kiowa and Rita Blanca National Grasslands, camping occurs at developed sites and people also may drive off of the roads to camp. With the implementation of the 2005 Forest Service Travel Management Rule (36 CFR 294),and associated Motor Vehicle Use Maps that will designate the motorized trail system, accessibility for primitive motorized camping may be reduced in some areas of the Kiowa and Rita Blanca National Grasslands. Because of this, increased use of developed recreation sites is projected to occur. Otherwise, the future trend for camping is expected to remain fairly stable across the Grasslands. Changes in users and uses on the District have recently spurred

[13] USDA 2011b p. 21-22

[14] Designated-dispersed sites are places designated (and usually mowed) to provide for parking, camping and day use activities in a natural setting without toilets, tables, and other constructed facilities. The National Survey on Recreation and the Environment would consider these to be primitive camping.

management to install a new developed campground at the top of Mills Canyon and improve the site at the bottom of the Canyon. The District will continue to be responsive to recreation changes as resources and management allow.

The Black Kettle and McClellan Creek National Grasslands currently contain a total of about 13.7 miles of short, non-motorized hiking trails around the major recreation sites, each of which is less than 2 miles in length. Short trails are planned for some recreation sites on the Kiowa National Grassland, particularly around Mills Canyon. The 2.4-mile portion of the Santa Fe National Historic Trail on the Kiowa National Grassland is becoming more popular for hikers even though it is maintained as a historic site rather than a trail. Because of the flat terrain and fragmented and fenced land ownership pattern, there are currently no areas on the Grasslands which provide backpacking or long trail riding opportunities and none are expected to be developed. Instead, hiking trails provide a mix of day-use opportunities and some provide cultural, historical, or ecological information (interpretation) as well. It is projected that demand for day-hiking and particularly for interpretive trails will continue to rise on the Grasslands.

Off-Highway Motorized Use[15]

Driving motor vehicles off-road (cross country) is currently allowed on the Kiowa and Rita Blanca National Grasslands and prohibited on the Black Kettle National Grassland (since 1990). McClellan Creek National Grassland has an 8-mile trail system that is quite popular for motorbike and all-terrain vehicle use. Several locations on the Grasslands have been identified by the public as areas where off-road driving conflicts with other land use activities. These Grasslands will soon undergo a planning process in accordance with the 2005 Travel Management Rule (36 CFR 294) and designate a system of motorized roads, trails, and areas. Once the Motorized Vehicle Use Map (MVUM) is finalized, driving outside designated routes or areas will be prohibited, unless specially authorized.

Off-road driving and the resulting user-created roads in Mills Canyon and a few other areas on the Kiowa and Rita Blanca National Grasslands have removed important vegetation cover, accelerated soil erosion and stream sedimentation, and degraded riparian ecosystems, wildlife habitat, scenic quality, and historic sites. Uncontrolled motorized use in Mills Canyon has also impacted the Inventoried Roadless Area characteristics, and contributed to the introduction and spread of invasive plants.

McClellan Creek National Grassland currently provides the only motorized trail system in the area for dirt-bikes and small all-terrain-vehicles. While off-highway vehicle (OHV) use is increasing nationally, it is uncertain if it will significantly increase on the Grasslands due to the fences, land ownership pattern, and lack of terrain typically desired by OHV enthusiasts. And while visitation to the Grasslands is expected to increase, local populations are expected to continue to decline. The Grasslands may only be able to meet a portion of the demand for this activity due to the fragmented ownership pattern and multiple-use management objectives. The implementation of the 2005 Travel Management Rule is expected to address conflicts and resource impacts associated with unmanaged motor vehicle use.

Hunting and Fishing[16]

Hunting occurs throughout the Grasslands, with the exception of recreation and administrative sites, though data indicates that there may be more hunting in the Grasslands areas of Texas and Oklahoma compared to New Mexico. It is a major activity on the Black Kettle National Grassland, attracting as many as 3,000 hunters from across the nation during the spring Rio Grande turkey season. The Black Kettle is one of the best public hunting areas in the nation for Rio Grande turkey and northern bobwhite quail, although deer and small game hunting is also very popular. Hunting on the National Grasslands in New Mexico occurs with a lesser degree of public influx due to limits on permits issued. Hunting

[15] USDA 2011b p. 23
[16] *ibid*. p. 23-25

activities on the Grasslands rarely create significant conflicts with other land uses. Fishing is very popular on the lakes and ponds of the Black Kettle National Grassland, on McClellan Creek National Grassland, and on the Kiowa National Grassland's Canadian River. The Forest Service works with the state agencies that stock the water bodies with fish. The projected future trend is that hunting and fishing on the Grasslands will remain a stable and continuously popular activity on the Grasslands, with the highest densities of activity taking place on Black Kettle National Grassland in Oklahoma.

Other Recreation Activities[17]

Bird and wildlife watching are developing into very popular activities on the Grasslands. This activity includes observing and photographing birds and wildlife. According to a national survey of all wildlife and bird watching, bird watching attracted the biggest following. There is a potential to work with partners to expand these activities on the Grasslands as tourism and rural economic development opportunities (see *Developed Recreation Sites* section for more detail).

Developed Recreation Sites[18]

The Grasslands provide many developed recreation sites that are important to sustaining positive social and economic conditions in local and regional communities. Developed recreation sites typically include facilities such as restrooms, picnic tables, grills, trash containers, parking barriers, and bulletin boards. These sites range in development levels from those with a greater amount of amenities to those with very few facilities. There are site structures that accommodate large groups of people sometimes for extended periods of time, sites where smaller numbers of people can camp or picnic, and sites that serve as day use.

All developed recreation sites are open year-round and operate well without a fee program. Drinking water is provided at all campgrounds other than Mills Canyon and Rim campgrounds, and is monitored to ensure it meets standards for public safety. Drinking water is not provided at any of the day use sites, although demand for this service has increased, particularly on the Kiowa and Rita Blanca National Grasslands. Reconstruction upgrades have partially occurred at all of the sites, with toilets and other facilities brought up to meet current Americans with Disabilities Act and Forest Service standards, including accessibility. No major maintenance issues exist, although regular maintenance and upgrades to replace facilities at the end of their service life and as needed to meet accessibility standards should continue to occur. Visitor use does not exceed the design capacity at these sites, meaning they generally do not exceed 70% of their capacity, except during hunting seasons. While the sites are popular and highly-valued in sustaining local communities, they do not have serious over-crowding or overflow problems. Under current management, the projected trend is that all the developed recreation sites on the Grasslands will continue to make a contribution to the quality of life for local residents and visitors, help stimulate the local rural economy, and continue to adequately satisfy, through regular maintenance, updates, and some expansion, the public demand for different types of developed sites.

The Forest Service is increasingly working to develop and improve interpretive services by laying out objectives aimed at increasing coordination with other programs and agencies, increasing professional training, and developing a means of working with others to provide interpretive programs. To meet these and other objectives, the Grasslands are developing interpretive sites and wildlife and bird watching areas which help improve public awareness and appreciation of natural and cultural resources. Public access to important natural and cultural resource sites provides an important opportunity to promote tourism and local economic growth. Overall, demand for interpretive services is expected to increase and therefore an expansion of current partnerships and a locating of new partnerships to aid in their development is necessary.

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[17] *ibid*. p. 25-27

[18] USDA 2011b p. 28-30

Areas of Interest[19]

The Grasslands provide many unique and remarkable scenic, historic, and ecological features that attract visitors and stimulate the local economy. Grasslands scenery is characterized by pastoral agricultural landscapes including vast open grasslands and rolling hills. Views from Grassland units often include homes, barns, tractors, trucks, windmills, cattle, stock tanks, and other private ranchland features, in addition to some oil and gas wells. Grasslands residents are accustomed to viewing these features and consider them a highly-valued part of the traditional landscape. Many visitors also have a deep appreciation of the rural character of the plains grasslands landscapes. The presence of farms and ranches contribute to the "sense of place" or "cultural identity" for residents and visitors alike.

Actions taken by the Grassland's managers help contribute to scenic quality or mitigate negative effects of other uses that may detract from it. For instance, some closed oil and gas sites on the Black Kettle National Grassland were rehabilitated to minimize evidence of the past operation. In the past 20 years, Grasslands managers have created some trails to improve the public's opportunity to view scenic landscapes and wildlife. Some areas on the Grasslands provide views that are uncommon in the surrounding area or are unique to this part of the plains grasslands. Examples of these areas include the lakes and riparian areas on the Black Kettle National Grassland, the "High Lonesome" area of the Rita Blanca National Grassland, and Mills Canyon on the Kiowa National Grassland.

The Kiowa and Rita Blanca Grasslands have several features that attract visitors because of their unique historic and scenic resources. These areas have the potential to encourage tourism and enhance rural development opportunities in an economically declining region. They are:

- Santa Fe National Historic Trail
- Santa Fe Trail National Scenic Byway
- La Frontera del Llano Scenic Byway (State)
- Canadian River eligible Scenic River
- Canadian River Inventoried Roadless Area

Kiowa National Grassland provides significant and well-preserved historic (heritage) resources, such as a section of the Santa Fe National Historic Trail, and Mills Orchard and Ranch, a historic homestead site. Two scenic byways traverse this part of the Grasslands and management along the viewsheds can have a significant impact on the recreational experience of drivers. The Canadian Inventoried Roadless Area in the Mills area provides the largest semi-primitive non-motorized recreation area on the Grasslands. It includes the Canadian eligible Scenic River corridor which is managed to retain the river's outstanding historic, scenic, geologic, and recreational features. Local communities are beginning to capitalize on the value of these resources; these features and scenery define resident's "sense of place" and have an intrinsic value in their quality of life. Visitation is projected to increase as the nationwide interest in historical and cultural tourism increases.

Managed Recreation Concern Areas

The recreational and tourism trends of the region are an important consideration in deciding which management strategies can be successfully implemented on the Grasslands. They also identify human caused threats or areas of concern that have the potential to affect the social, economic, and ecological sustainability of the Grasslands. Areas of concern for managed recreation on the Grasslands include:

- Continuation and maintenance of the opportunities for working with cooperators in the development and management of recreational activities.

[19] *ibid*. p. 27-28, 30-31

- Uncontrolled motorized vehicle use on the Grasslands.
- Interest in natural and cultural interpretation and education has been increasing among Grassland visitors. Development and maintenance of recreational facilities and activities must be commensurate with the demand for use.
- Thresholds for scenery management objectives are being exceeded in some areas of the Grasslands.

Need for Change: Managed Recreation

The current Plan does not clearly and specifically address the issues related to recreation and scenic resources that play a vital role in supporting social and economic sustainability in the Grasslands. The Plan needs to provide direction that is more specific to the Grasslands for providing these important rural economic development opportunities:

- The demand for day-hiking, particularly on scenic and interpretive trails, continues to rise on the Grasslands. The Plan needs to identify and place emphasis on implementing work with cooperators, including tribes, in managing and maintaining recreation sites, including interpretive trails, signs, and programs, to support day-hiking development opportunities. Plan focus on this recreational development can improve rural economic development and working relationships. However, current plan direction for dispersed recreation is largely silent aside from designations of specific acreages of ROS classifications. There are also parts of the 1985 Plan which duplicate existing FS Handbook and Manual direction on coordinating with other agencies which will be removed from the plan and incorporated by reference.
- Motorized vehicle use can damage important vegetation cover, contribute to the spread of invasive plants, accelerate soil erosion and stream sedimentation, and degrade riparian ecosystems, wildlife habitat, scenic quality, and historic sites. There is a need for the revised Plan to address the risks attributed to off-road motorized recreation in Mills Canyon including the incompatibility between OHV use and preservation of the outstanding scenic, historic, geologic, and recreational attributes found in Mills Canyon along the Canadian River.
- The revised plan should acknowledge the need to conduct appropriate project-level analysis to mitigate site-specific damage from on-going use of OHV trails at McClellan Creek Grassland.
- There is a need for the plan to reflect changes reasonably anticipated to occur when the Travel Management Rule is implemented, such as the expected change in dispersed sites; from those requiring off-road access to those that can be accessed from designated roads or walking distance from existing roads.
- There is a need for the revised plan to reflect and support direction from the implementation of the Travel Management Rule. The new Grasslands Plan is being developed concurrently with the Travel Management Study EA, but the new plan will not be pre-decisional to the finding of the EA or the resultant Motor Vehicle Use Map.
- Developed recreation sites on the Grasslands continue to adequately satisfy, through regular maintenance, updates, and some expansion, the public demand for different types of developed sites. There is a need to manage for recreation opportunities in a variety of different settings and levels of development, from large developed recreation settings with many facilities to primitive settings.
- There is a need for the new plan to provide direction that management of scenic resources be based on objectives for specific areas, particularly those areas identified as having high scenic quality.

- Areas of Interest have the potential to encourage tourism and enhance rural economic development. Opportunities for visiting, touring, and enjoying guided and interpretive activities related to scenery, historic/cultural sites, wildlife and birds, the Canadian eligible Scenic River, Canadian River Inventoried Roadless Area, and formally-designated sites including the Santa Fe National Historic Trail and two scenic byways.
- The development of the new plan will assess the need for additional special area designations such as potential wilderness, an eligible Scenic River, or Research Natural Areas.

Revision Topic 3: Human Influences on the Grasslands

Local community residents have expressed that the Forest Service is maintaining good relationships and open communications with interested residents. These positive relationships strengthen the social cohesion and satisfaction with Forest Service actions within local communities. In addition, partnerships with other agencies and organizations have increasingly been used to meet Grasslands management objectives. Most partnership projects on the Grasslands are aimed at improving wildlife habitat and native ecosystem functions, or recreation sites and tourism opportunities, which resulted in enhancing social and economic conditions in local communities.

Based on social demographic data, the area surrounding the Grasslands is considered rural with a few “urban clusters” of over 2,500 residents. Populations in all the rural areas around the Grasslands are declining and are projected to continue to decline while populations in the respective states and urban centers further from the Grasslands are increasing. Partly due to limited economic opportunities and low income levels, most Grasslands counties have more people moving out than in, particularly in the 20-35 year old age group. An aging population trend is influencing an increase in age-related income disbursements (i.e. social security, retirement account) that will continue to comprise the largest proportion of income for area residents.

Based on economic data, the employment rate and per capita income level in Grasslands counties is expected to remain stable with some periods of growth and decline. Job growth and income levels are expected to continue to lag behind the U.S. and the three states average. Figure 7 illustrates that, over the last 34 years, job growth in the Grasslands counties has been slower than job growth for the States of Oklahoma, Texas, and New Mexico, and slower than national job growth. Most new jobs will continue to be low-income, non-salary, farming and ranching jobs with incomes that fluctuate seasonally. Job opportunities are expected to continue the shift from agriculture and oil-gas toward service jobs in urban areas further away from the Grasslands. The primary “industry” or economic activity in the area will continue to be livestock-related operations run by small businesses with less than 10 employees. Some oil and gas industry jobs in the area are expected to decline over the next 50 years.

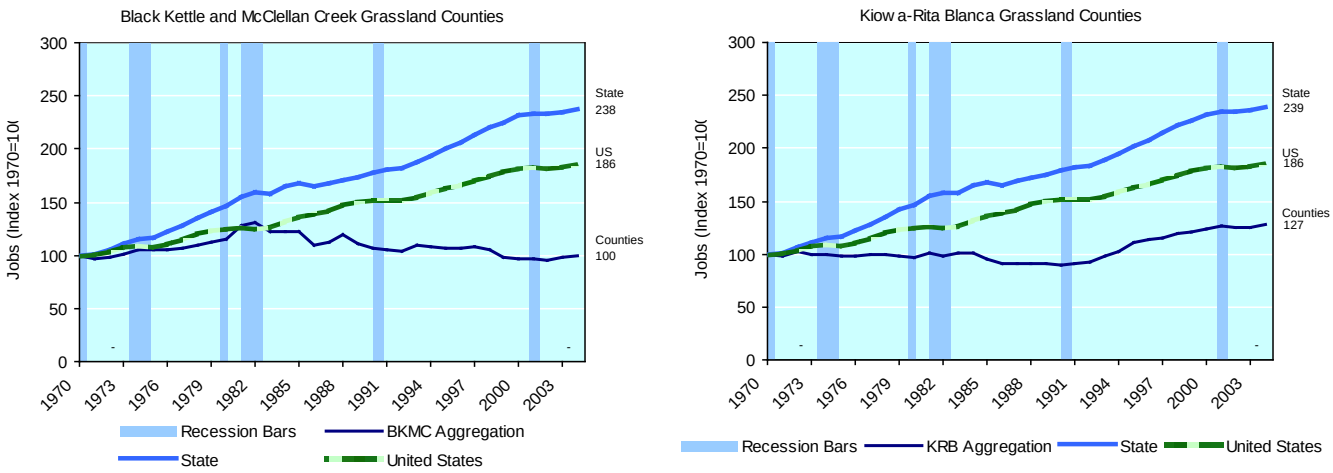

Figure 5: Employment Compared to State and Nation[20]

- Vertical Recession Bars show periods of national recession.
- "BKCo_Aggregation" and "KRB County Aggregation" are the aggregated Job indices for the counties that contain a part of the Grasslands.
- State data is aggregated for Texas and Oklahoma for the Black Kettle and for Texas, Oklahoma, and New Mexico for the Kiowa and Rita Blanca.

Economic opportunities in the local area that are supported by Grasslands management include:

- Land and forage for cattle grazing;
- Royalty payments from oil and gas;
- Habitat for game which attracts out of area hunters;
- Designated areas, recreation sites, and unique scenic, historic, and cultural features which attract tourists; and
- Forest Service employment opportunities.

Current Condition and Trends

Some of the key findings identified during evaluation of the Grasslands current conditions and trends follow.

Livestock and Range Management[21]

Over 96% of the Grasslands are used by permit-holders to graze their cattle excluding the areas where developed recreation, administrative, research sites and exclosures designed to protect resource values are designated.

Permittees typically integrate grazing on the Grasslands with a livestock management strategy that extends across the surrounding private lands. Livestock management on the Grasslands is managed based on environmental analyses, allotment management plans, annual operating instructions, and monitoring. There is no indication that there will be a major increase or decrease in grazing on the Grasslands over the

[20] Headwaters Economics, 2007.
[21] USDA 2011b p. 20-21

next 20 years; however, cattle numbers and strategies are expected to continue to fluctuate in response to drought, wildfire, prescribed fire, and other factors that change range conditions.

Livestock grazing on the Grasslands has generated few user conflicts. Ranchers occasionally express concerns about hunters and other Grasslands visitors cutting fences or leaving gates open, which impacts their grazing strategy and increases costs. Continuing current management should provide for affordable grazing on the Grasslands that contributes to the rural ranching lifestyle, culture, and economy while promoting ecosystem sustainability and trends toward reference conditions without compromising other land uses.

Relationships between the grazing permittees and Forest Service are necessarily close, as they work in partnership to maintain range facilities, monitor forage production and utilization, and determine appropriate stocking levels and the timing of allowable use. Adjustments to stocking levels or grazing management strategies continue to be made in Annual Operating Plans as needed based on site-specific conditions. These partnerships will remain vital to local communities and are projected to remain stable.

Oil and Gas[22]

Rich natural gas resources underlie some units of the Grasslands. This resource contributes to meeting the nation's energy needs while supporting the local and regional economy and maintaining a lifestyle in a rural area that has declining populations and limited economic opportunities. The Grasslands may also play an important future role in alternative energy developments such as wind and solar power.

There are currently 37 active oil-gas wells on Black Kettle and McClellan Creek National Grasslands, and none on the Kiowa or Rita Blanca National Grasslands. Geologic analyses recently completed indicate that while there may be increases in the number of oil-gas wells on the Black Kettle for a few more years, oil-gas development in the area is expected to decline over the next 20-50 years as the wells lose productivity.

There is very low potential for economically viable oil or gas development on Kiowa or Rita Blanca National Grasslands. Oil and gas well sites on the Grasslands require little land (1-3 acres each) and short access roads (less than 1 mile). Under current leasing stipulations and conditions of approval, these activities on the Grasslands must meet stringent environmental industry standards including restoring closed sites to native grasslands.

The projected long-term declines in oil-gas production on the Grasslands and the associated rehabilitation of oil and gas sites should improve vegetative cover and soil productivity in those localized areas, which in turn will improve ecosystem and wildlife habitat conditions in those areas. Continuing current management trends is expected to continue to contribute to rural economies and national energy demands without incurring conflicts with other land uses or risks to ecological sustainability.

Roads and Access[23]

Road systems play an integral role in social and economic land use opportunities and meeting ecological sustainability goals. Traffic volumes in and around the Grasslands are light and expected to remain fairly stable, due to the declining local populations and the slight expected increases in tourism-related traffic. The increase in tourism related traffic will be mostly concentrated in and around the Ports-to-Plains highway through Clayton, scenic byways, and the newly constructed Washita National Monument Visitor's Center.

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[22] USDA 2011b p. 18

[23] *ibid*. p. 32-34

In the past 10 to 20 years, road density on Black Kettle and McClellan Creek National Grasslands has remained relatively stable and has increased on the Kiowa and Rita Blanca National Grasslands due to the increase in user-created roads. No major Forest Service road construction projects have occurred on the Grasslands in the past 20 years and none are anticipated in the foreseeable future.

Road access to National Grassland units is currently a concern and about 50 units do not have access that meets public and management needs. These units on the National Grasslands are without legal public road access through private land (within ½-mile). Similarly, some private landowners do not have legal road easements to drive through Grassland units to access their land. The lack of legal road easements to certain Grassland units constrains opportunities to improve public recreation, expand tourism and rural economic development, cost-effectively manage certain ecosystems toward reference conditions, or reduce illegal access/trespass issues. Also, the lack of public road access to collect firewood generated from thinning in the Pinyon-juniper ecosystem limits achievement of ecosystem restoration objectives on those units.

Special Uses[24]

Over half of the special use permits on the Black Kettle and McClellan Creek National Grasslands are related to oil and gas operations, and most permits on the Kiowa and Rita Blanca National Grasslands are for power lines and road easements. The current Plan requires joint use of designated corridors for large-scale utilities, such as interstate pipelines and high voltage transmission lines. It is projected that the development of oil and gas and wind energy in the region may result in more requests for utility and pipeline easements.

It is also projected that the types of special use permits issued may vary over time as demand for certain services increases or decreases. For example, in the past few years, Grassland managers received requests for activities such as outfitter and guide hunts, ecotourism activities, large-group gatherings, and grass-seed harvest. Permit requests for guided outdoor recreation activities are not expected to substantially increase on the Grasslands (with the exception of hunting) because of the fragmented land ownership pattern. It is projected that demand for permits for educational or research purposes from universities will remain high throughout the region.

Common Minerals and Products[25]

There is no hard rock mining on the Grasslands and there is a prohibition on commercial or private use of mineral materials from the Grasslands, in accordance with the Bankhead-Jones Farm Tenant Act.

No major change in mineral materials extraction is expected. Continuing current management of mineral materials should continue to benefit local communities without land use conflicts or risks to ecological sustainability.

The Grasslands sell firewood to commercial operators from thinning operations in Pinyon-juniper woodlands and through removal of black locust or other invasive and non-native trees. The thinning and tree removal practices are designed to move the ecosystems closer to historical fuel loads, lessen the risk of uncharacteristic wildfire, and increase the diversity and population of understory vegetation. The public demand for wood from this remote area is generally low and expected to remain balanced with the amount of wood likely to be supplied from this area over the next 20 years.

Research[26]

There are several ongoing research projects on the Grasslands, conducted by universities and other research institutes. The successful partnerships between Grasslands managers and educational and

[24] USDA 2011b p. 17-18
[25] *ibid*. p. 18-19
[26] USDA 2011b p. 31 and 37

research institutions is expected to continue to support groundbreaking research. The results of these partnerships will continue to provide valuable public information and education about past life forms, evolution and ecological diversity. In addition, they will help develop trained environmental professionals who are well acquainted with grassland ecosystems. There is projected to be a fairly constant number of these activities under current management.

Two grassland vegetation types were identified in the 1985 Plan for evaluation as Research Natural Areas. As directed, Mixed Grass and Shortgrass prairie were evaluated; during the evaluation sand sagebrush-blue grama ecosystem was also found to be of interest. All three vegetation types failed to meet the criteria for recommendation.

In addition, paleontological (fossil) research on the Grasslands continues to contribute valuable information about past life forms and ecosystems. The fossils may continue to be affected by soil erosion, although the research site is expected to continue to be managed in partnership with educational institutes and museums to preserve this important resource.

Overall, management trends will continue to support education and research activities. The number of research activities on the Grasslands is expected to remain relatively stable although the type and location of projects is likely to change over time.

Fire Management and Law Enforcement[27]

Protecting the numerous structures on Grasslands units and surrounding private lands from wildfire impacts is critical to sustaining livestock grazing, hunting, and other critical land uses that these communities depend on. Even the loss of windmills and fences during a wildfire can have serious social and economic impacts to families who depend on grazing cattle on the Grasslands units. Partnerships to conduct prescribed burns across private land boundaries have improved the ability of the Grasslands managers to carry out prescribed burns in and around private lands. Some of the increase in this activity is related to the availability of funding for private land owners to complete habitat improvement and fuel reduction work on their lands. Because of these conditions, maintaining strong partnerships with local communities in these areas will continue to be an important component of meeting the Grasslands' wildfire management objectives.

Suppression of wildfires on the Grasslands is expected to continue as the wildfire response strategy needed to protect human life and property. Cooperative agreements and coordination with agencies and rural fire departments on effective wildfire responses is especially important due to the mixed land ownership pattern across three states, nine counties, and many municipalities. The Forest Service continues to provide technical assistance for local firefighting resources, assist landowners in protecting their property from wildfire damage, and give presentations to community groups and schools on wildfire protection measures.

Cooperation with private landowners will help facilitate cross boundary prescribed fire events. Agreements to conduct cross-boundary burns will improve the ability of the Grasslands managers to protect important structures, reduce excessive fuel loads and wildfire risk, and move ecosystems closer toward reference conditions.

Heritage Resources[28]

Many significant well-preserved heritage resources that represent American Indian, Hispanic, and European Americans' adaptations to the High Plains can be found on the Grasslands. Significant heritage resource sites include a 2.4 mile section of the historic Santa Fe Trail and the Mills Orchard and Ranch Site, a historic property on the New Mexico State Register of Cultural Properties. In addition, there are

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[27] *ibid*. p. 37-38

[28] USDA 20011b p. 30-31 and 35

numerous homestead sites, prehistoric and historic artifact scatters, and other archaeological sites. These types of sites have become an increasing source of tourism regionally and nationally.

Another important aspect of preserving heritage resources is the stabilization of historic structures. Priority heritage sites identified by the Grasslands have been targeted for such stabilization efforts because of their importance to local history. In 2005, several structures in the Mills Canyon Orchard and Ranch site were stabilized. It is projected that stabilization projects will continue to be used as a tool to protect heritage resources in the future.

There are seven tribes that historically used and may continue to use the Grasslands for traditional, cultural, or religious activities. Many of these tribes, after years of separation from their traditional homelands, have adapted their cultural practices to resources closer and more easily accessible to where they currently reside. Some tribes expressed a desire to increase their use of the Grasslands to collect plants or other natural resource materials. While no Traditional Cultural Properties have been identified to date on the Grasslands, several tribes acknowledge historical use of the Grasslands, and specifically the Canadian River/Mills Canyon area on the Kiowa Grassland. Certain tribes have expressed an interest in seeing interpretive sites on the Grasslands be more inclusive of tribal history and in being more involved in project-level decisions.

Human Influences on the Grasslands: Concern Areas

The social and economic trends of the region are an important consideration in deciding which management strategies can be successfully employed on the Grasslands. They also identify human caused threats or areas of concern that have the potential to effect social, economic and ecological sustainability of the Grasslands. Some areas of concern for human influences on the Grasslands are:

- The rate and type of energy development activities on the Grasslands is undergoing considerable change. Oil and gas wells are expected to decline in productivity and alternative energy sources are anticipated in the region (i.e. wind energy).
- The turnover of private land adjacent to Grassland units is a threat to public and administrative access because it makes informal agreement with current landowners more tenuous.
- The checkerboard pattern of land ownership within the Grasslands administrative boundary also makes management of fire more challenging because of the need to manage fire across a mix of property owners.
- Protecting historic structures from vandalism and deterioration is an area of concern because it is a resource with potential to contribute to the economic sustainability of the Grassland counties.

Need for Change: Human Influences on the Grasslands

The current Plan does not clearly and specifically address the issues related to social demographics and economic conditions and trends, or maintaining consumptive and non-consumptive land uses that play a vital role in supporting social and economic sustainability in the rural Grasslands area. The revised Plan should provide direction that is more specific to the Grasslands for providing these important land uses and economic opportunities:

- Livestock grazing is the most widespread use on the Grasslands. The current Plan's overall emphasis to promote and demonstrate grasslands agriculture, integrate grasslands management with units of other ownership, and to ensure that rangeland management is consistent with other resources, particularly wildlife habitat, is still applicable to the current conditions and trends on the Grasslands. However, the current Plan direction is focused on percentages of the Grasslands that should be in each condition class and to maintain a sustained yield of forage. This direction is outdated because it does not incorporate the adaptive management system principles that are

currently used by the Forest Service and therefore, needs to be changed as part of Plan revision. There are also many parts of the Plan which duplicate existing FS Handbook and Manual direction which will be removed from the Plan and incorporated by reference.

- Oil and gas development contributes to meeting the nation's energy needs while supporting the local and regional economy. For the most part, the current Plan (pp. 33-1, 34, 72) reiterates requirements found in the Forest Service Manual (FSM 2802-2803 and 2822). It also contains suitability criteria for No Surface Occupancy areas and direction for additional leasing stipulations for area greater that 16 degrees in slope (which is a rare topographical feature on grasslands). Because of the high density of oil and gas leasing on the Black Kettle and McClellan Creek National Grasslands and the growth of alternative energy enterprises such as wind farms, the revised Plan needs to facilitate energy development, while protecting natural resources, heritage sites and scenery.
- The current Plan has no direction related to oil and gas production site rehabilitation. Oil and gas productivity is declining in some parts of the Grasslands. There is a need to describe expectations for the rehabilitation of disturbed sites, such as oil and gas pads and roads, after operations have ceased in order to protect soil productivity and return vegetative cover.
- The checkerboard pattern of landownership across the grasslands make cooperating with private landowners essential to maintaining access to public lands. The current Plan is silent on road access but does prioritize consolidating ownership to improve management through land acquisition. The revised Plan needs to emphasize the importance of obtaining legal road access to National Grassland units that meets public, private land owner and management needs.
- The current Plan provides a map of utility corridors for each unit and does not allow large transmission utilities such as large electrical lines and major pipelines outside of these areas Because of the projected increase and changes in the type of energy developments in the region and the land ownership pattern of the Grasslands, the revised Plan needs to consider the best way to manage requests for utility easements and related special uses.
- There are many special uses of the Grasslands that provide economic support to local communities. The current Plan is silent on special uses other than utility corridors and oil and gas sites. The revised Plan needs to provide opportunities for extracting miscellaneous products for commercial, non-commercial and Tribal use, such as wood products, plants, grass seed, or other materials.
- The current Plan is silent on non-commercial mineral uses on the Grasslands. The Bankhead-Jones Act prohibits the extraction of common mineral materials for commercial uses; however, there is a need to manage non-commercial use of common mineral materials, so that resources can be adequately protected.
- The only direction in the current Plan related to firewood is that areas should be evaluated for their suitability for firewood gathering and that firewood gathering would not be allowed in Research Natural Areas (RNAs). Even though firewood gathering is less common on the Grasslands as in mountainous areas, it is still an important tool in managing vegetation. The revised Plan should identify what the goals of firewood gathering are on the Grasslands and support this important activity for local communities.
- Research on the Grasslands helps improve understanding of grassland ecosystems and provides educational opportunities for local communities. The current Plan only identifies that there should be an effort to establish RNAs on the Grasslands. It provides no other direction for how to manage other types of research activities on the Grasslands. There is a need for the revised Plan to provide opportunities to conduct research on the grasslands, regardless of whether a RNA is

established, and to make available areas with unique opportunities for research and educational use.

- The checkerboard pattern of the Grassland units and private land along with the types of fuels found on the Grasslands creates a fire environment which is very different from forests of the intermountain west. The current Plan provides no direction that assists in managing fire in an ownership pattern like the Grasslands; however, the overall goals of coordinating with other fire management agencies and preventing loss of life and property are applicable. The revised Plan needs to identify appropriate management strategies for responding to wildland fires on Grassland units to avoid loss of life or significant property damage.
- Even though landscape-scale prescribed burning is unrealistic due to existing landownership patterns, the revised Plan needs to address how prescribed fires can be managed across jurisdictional boundaries to improve ecological conditions and wildlife habitat on and around the Grasslands.
- Historic structures are an important feature of the cultural and scenic resources of the grasslands. All of the direction for heritage resources in the current Plan reference outdated Forest Service direction or repeat existing direction and it is silent on many management issues. There are several areas of management important to the overall goal of preserving heritage resources that the revised Plan needs to address, in particular, the stabilization and preservation of historic structures and Traditional Cultural Properties. The revised Plan should also address the role of heritage sites in economic development.

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