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Watershed Specialist Report

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

Environmental Impact Statement Analysis

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Cibola National Forest and National Grasslands

Specialist Report

Introduction

This report discloses and evaluates the potential environmental consequences on the water resources that may result with the adoption of a revised land management plan. It examines, in detail, three different alternatives for revising the management direction from the 1985 Cibola National Forest Land Management Plan (only that which is relevant to the National Grasslands).

Relevant Laws, Regulations, and Policy that Apply

- Organic Administration Act of June 4, 1897, as amended. This act contains the first authority for watershed management on National Forest system Lands. The purpose for the establishment of National Forest, as stated in the Act, includes securing favorable conditions of water flow.
- National Forest Management Act 1976, which ensures that forest planning and management activities provide for the conservation and sustained yield of soil and water resources.
- Federal Water Pollution Control Act of July 9, 1956, as Amended. This purpose of this act is improve the quality and value of the water resource, to establish a national policy for the prevention, control, and abatement of water pollution. Provision included the authority for state and federal government to establish water quality standards, grants for water pollution study, construction of treatment works, and provision for the control of pollution by oil, hazardous substances, or sewage from vessels. The Act has been amended many times, most recently through the Clean Water Act of 1977 (Pub.L. 83-566). This Act also regulates discharge of dredged or fill material into navigable waters (waters of the U.S.) through Section 404.
- Executive Order 11990, 1977; (Wetlands Management) requires federal agencies to follow avoidance, mitigation, and preservation procedures with public input before proposing new construction in wetlands. To comply with Executive Order 11990, the federal agency would coordinate with the ACOE, under Section 404 of the Clean Water Act, and mitigate for impacts to wetland habitats. .
- Executive Order 11998, 1977; (Floodplain Management) requires all federal agencies to take actions to reduce the risk of flood loss, restore and preserve the natural and beneficial values in floodplains, and minimize the impacts of floods on human safety, health, and welfare. There are no stream channels with floodplain characteristics that would be affected by this project. All channels that cross or are immediately adjacent to project activities are intermittent streams and do not have floodplain features.
- The Safe Drinking Water Act (SDWA) is the main federal law that ensures the quality of Americans' drinking water.

Methodology and Analysis Process

The spatial analysis is based on the Forest Service lands within the proclaimed boundary of the Black Kettle, Kiowa, McClellan Creek, and Rita Blanca National Grasslands. The timeframe extends to the next planning period. The timeframe of past activities that have contributed to current conditions depends on the resource and effect being analyzed. For example, riparian conditions are the result of influences that have occurred at least over the last 100 years. Surface water quality is the result of shorter time frame – within the last 20 years. Surface water and groundwater quantities have been impacted over a longer timeframe to result in current conditions – at least 80 years. Existing conditions and environmental consequences were evaluated using existing forest data, satellite imagery, and data from other sources as cited.

Each alternative was evaluated for its ability to meet the desired condition for soil resources.

Assumptions

In the analysis for this resource, the following assumptions have been made:

- The land management plan provides a programmatic framework for future site-specific actions.
- Land management plans do not have direct effects. They do not authorize or mandate any site-specific projects or activities (including ground-disturbing actions).
- Land management plans may have implications, or environmental consequences, of managing the forests under a programmatic framework.
- The plan decisions (desired conditions, objectives, standards, guidelines, management areas, monitoring) will be followed when planning or implementing site-specific projects and activities.
- Law, policy, and regulations will be followed when planning or implementing site-specific projects and activities.
- Monitoring will occur and the land management plan will be amended, as needed.
- We will be funded similar to past budget levels (past 5 years).
- The planning timeframe is 15 years.
- Soil and Water Conservation Practices will be applied to all management activities as described in FSH 2509.22.

Revision Topics Addressed in this Analysis

While there were no issues specific to water resources, there are some related topics which require attention. Climate change was not addressed in the 1985 Plan for any resource. Information from the Southwest Region Climate Change Trends and Forest Planning (USDA, 2010) was used to consider climate change effects to water resources. Issues identified in the Notice of Intent (Federal Register, 2010) include the effect of human influences of the grasslands from livestock grazing, energy development, mining reclamation, miscellaneous forest products, mineral materials, and fire management.

Summary of Alternatives

Alternative A is the 'no action' alternative, meaning there is no change from the current management direct as found in the existing plan (USDA, 1985). For water resources, emphasis was placed on inventory and monitoring for watershed condition, using Best Management Practices to mitigate adverse effects, restoring impaired riparian areas, and incorporating water and soil improvement into projects where watershed condition is unsatisfactory. The desired condition for riparian areas is specified in relation to natural conditions using seven parameters, including crown cover and shade. Riparian areas determined to be impaired are scheduled for improvement activities. Alternative A does not include specific direction for climate change, fire, energy development, mining reclamation, miscellaneous forest products, and mineral materials. Currently, each of these activities is managed through existing policies that are not directly part of the Forest Plan or require updating.

Alternative B is the preferred alternative. Alternative B includes guidance for effect of human influences of the grasslands from livestock grazing, energy development, mining reclamation, miscellaneous forest products, mineral materials, and fire management. Livestock grazing would be directed by adaptive management. New recreation areas would be limited with existing site maintained and rehabilitated. The Mills Canyon Management Areas would be designated to preserve its wild, scenic, and recreational qualities. The desired condition for surface water features is for these features to be in properly functioning condition. The desired condition for watershed is Class I condition.

Alternative C is similar to alternative B in all ways except that it recommends that Canadian River Inventoried Roadless Areas be designated as the Canadian River Wilderness Area.

Description of Affected Environment (Existing Condition)

The existing condition for water resources includes watershed condition, surface water features, and groundwater. Water quality is an aspect of both surface water and groundwater. Riparian and wetland condition is an aspect of surface water features.

Watershed Condition

The Grassland units are located within twenty six 10-digit hydrologic unit code watersheds. Most of the Grasslands fall within eight of the twenty six watersheds. The Ecological Sustainability Report (USDA 2008, pages 11-13) lists the watersheds including acres, percent ownership, percent of streams by stream type in each watershed, and percent of the acreage of lakes and ponds in each watershed.

All of the watersheds in the Grasslands Units were assessed as being in Class II Condition using the current direction found in Forest Service Manual (FSM) 2521.1. Watershed condition is the state of a watershed based upon physical and biological characteristics affecting hydrologic and soil functions. It is determined through the synthesis of information including vegetation types and condition, streambank conditions, range conditions and trend, soil conditions and erosion potential and remotely sensed and field observations. All of the watersheds on the Grassland Units are in Class II Condition. This means these watersheds exhibit moderate geomorphic, hydrologic, and biotic integrity relative to their natural potential condition. Portions of these watersheds may exhibit an unstable drainage network as evidenced by gullies. Physical, chemical,

and biological conditions suggest that soil, aquatic, and riparian systems are at risk of being able to support beneficial uses. The watersheds on the four National Grasslands are listed in Table 1.

Table 1. Watersheds on the Kiowa, Rita Blanca, Black Kettle and McClellan Creek National Grasslands including total watershed area and area of National Forest System land within each watershed. Hydrologic unit codes are in italics – total hydrologic unit code for watersheds is achieved by tacking on the 2 digits to the end of a given sub-basins 8 digit code to get the full 10 digit code.

Sub-Basin	Watershed	Watershed Area (acres*)	NFS Area (*acres)
Upper Canadian (11080003)	Sauz Creek-Canadian River (03)	223,900	12,400
	Carrizo Creek-Canadian River (05)	221,700	26,700
Ute (11080007)	Alamocita Creek-Ute Creek (02)	247,200	1,300
	Carrizo Creek (04)	96,500	17,800
	Tequesquite Creek (05)	168,200	20,800
Rita Blanca (11090103)	East Rita Blanca Creek (01)	104,600	8,300
	Sand Draw (02)	121,100	19,300
	Perico Creek (03)	178,900	15,900
	Aqua Fria (12)	44,100	10,200
Carrizo (11090104)	Trabajo Creek-Carrizo Creek (04)	162,900	3,300
Middle Canadian-Spring (11090106)	Boggy Creek (08)	225,700	600
Lower Canadian-Deer (11090201)	Ant Hill Laurels (20)	204,700	600
Upper Beaver (11100101)	Seneca Creek (02)	186,300	7,000
	Seneca Creek-Corrupta Creek (03)	194,300	13,500
	Town of Kerrick-Beaver River (06)	28,400	200
	Town of Texhoma-Beaver River (08)	75,100	10,900
	Conrad Laterals (25)	276,100	500
Coldwater (11100103)	Headwaters Coldwater Creek (01)	142,600	40,000
	Upper Coldwater Creek (02)	248,100	24,800
	Frisco Creek (04)	200,100	2,900
	No Name-Dry (24)	33,900	4,500
Upper North Fork Red (11120301)	McClellan Creek (02)	242,400	1,400
Washita Headwaters (11130301)	Quarter Master Creek (00)	121,500	100
	Upper – Washita River (02)	76,700	0
	Upper Washita River (16)	173,700	23,300
	Broken Leg (20)	11,500	200
	Sergeant-Major (30)	19,900	700
	Dead Indian-Wildhorse (40)	63,500	3,500
	Nine Mile (50)	53,100	1,200
	Beaver Dam (60)	28,000	1,100

* area rounded to nearest 100 acres

Surface Water Features

There are many different kinds of surface water features in the Grassland Units. These include streams, reservoirs, lakes, wetlands, and playa lakes. Streams include perennial and intermittent channels. There are 409.5 miles of stream channels on the Grassland Units. 234.8 miles are located in New Mexico, 137.6 are in Oklahoma, and 37.1 miles are in Texas. Of these, 33.2 miles flow continuously and are perennial. 19.8 miles of perennial stream are in New Mexico, 11.5 miles are located in Oklahoma, and 1.8 miles are in Texas. Playas are intermittent waterbodies where water collects in depressions. Water persists in these depressions due to a layer of less permeable material such as accumulated silt which slows infiltration. There are 113 playas and alkali lakes located on the Grassland Units, totaling 947 acres as shown on the waterbody GIS layer. Texas and New Mexico account for 59 and 51 of these respectively. The remaining 3 are located in Oklahoma. Reservoirs and lakes on the Grassland Units are mostly associated with dams or berms designed to pond water behind them. The largest reservoirs are Lake McClellan and Lake Marvin on the Black Kettle Unit. There 5003 acres of riparian areas as calculated using Terrestrial Ecosystem Unit Inventory (TEUI) (USDA, 2007) data. The Canadian River floodplain on the grasslands comprises 894 acres of the riparian total. 2980 acres are located on the Kiowa Rita Blanca Unit while 2023 acres are located on the Black Kettle and McClellan Creek Unit. Wetlands occur throughout the Grassland Units.

Stream and riparian condition analyses conducted during the environmental analysis process for continuation of current cattle grazing strategies, oil-gas operations and other authorized activities on Grasslands units have not indicated large-scale impacts to water quality or riparian conditions. Many projects were specifically designed to improve water, riparian and soil conditions (NEPA Summary Database). There are 20- to 50-year-old oil and gas wells in riparian areas on the Lake Marvin and McClellan units; however, they are not violating existing environmental protection laws. For current and future oil-gas operations, the Forest Service requires oil-gas wells to be located outside the riparian corridor.

Management trends are improving the Canadian River's water quality and riparian conditions. Over the past 10 years the Forest Service initiated improvement actions along the River including closing off-road vehicle trails and moving camping units away from the floodplain, removing cattle grazing on the largest riparian unit (K-91) and limiting grazing in other parts of the riparian area (K-136, K-135, and K-87), allowing fallen trees to create pools in the stream, and proposing salt-cedar control treatments as part of the interagency Canadian River salt-cedar control program. There are currently 40-50 miles of road in riparian areas on the Grasslands, including unauthorized user-created roads. Thus, the main risk to water quality on Grasslands units is expected to be from those roads located along streams and in riparian areas.

The Grasslands are located within three states, New Mexico, Oklahoma, and Texas. In each state, there are general water quality standards which apply to all waters and there are standards linked to designated uses of the waterbody, whether it is a stream, lake, or pond. Very few streams on the Grassland Units have been assessed by the States. Over the past 20 years, water quality on the Grasslands has been relatively good. Some surface water has been polluted to a certain extent, most notably the Washita River that runs through a portion of the Black Kettle and is on the most recent list of water quality impaired streams in Oklahoma. Those reaches of the Washita are below water quality standards for pathogens (E. coli, enterococcus and fecal coliform), sulfates and turbidity (Oklahoma Department of Environmental Quality 2004). The source of impairment is not yet known. Of the approximately 51 miles of the Washita River that run in the Black Kettle

Grassland's administrative boundary, less than two miles go through Grasslands units. The water quality in the reservoirs on Black Kettle Grasslands is not tested by the Forest Service, but none are on the impaired water lists for New Mexico, Oklahoma, or Texas. Drinking water at developed sites is tested routinely and meets water quality standards.

Lake Marvin, Lake McClellan, Coldwater Creek, and Rita Blanca Creek are the major surface waters located in Texas within the Grassland Units. Lake McClellan is in the North Fork of the Red River watershed, while Lake Marvin is in the Canadian River Watershed, below Lake Meredith. Coldwater Creek and Rita Blanca Creek are mostly intermittent tributaries of the Canadian River. These types of streams in Texas are considered to support minimal aquatic life use and primary contact recreation. They have not been assessed for water quality by the state of Texas. As such, these streams have the standards that apply to unclassified intermittent water bodies. McClellan Creek was assessed from the confluence with the North Fork of the River upstream to the Lake McClellan dam in 2010 by Texas Commission on Environmental Quality (TCEQ, 2010). This portion of McClellan Creek was classified with a high aquatic life use based on its perennial flow.

The 17 miles of the Canadian River on the Kiowa Grassland is not listed as water quality impaired according to New Mexico state standards (New Mexico Water Quality Control Commission 2004). However, a recent Stream Health Assessment noted that the reaches on the Grassland were degraded primarily due to the effects of tamarisk invasion, including lack of down woody debris in the riparian area and stream channel (Haan and Thornton 2004). Additionally the report noted that watershed conditions upstream of the Grasslands were degraded and likely affecting the reaches of the Canadian River on the Grasslands primarily through increased sedimentation. Additionally several of the numerous user-created roads and trails created by visitors to Mills Canyon are along and across the river, contributing to stream sedimentation, chemical pollution, and other unacceptable riparian and water quality impacts.

Groundwater Resources

Groundwater, which is stored in water-bearing underground formations called aquifers, is an important factor in contributing to social, economic, and ecological conditions. On Grasslands units it is mostly used to provide water for livestock and wildlife, and on private lands it is additionally used for drinking water and irrigation. The High Plains aquifer system covers the plains portions of eight states (CO, KS, NE, NM, OK, SD, TX, WY) and includes parts of all four Grasslands (McGuire 2004). Data on groundwater quality in the High Plains aquifer system is currently being collected by the USGS National Water-Quality Assessment Program. Although the studies are still in progress, to date it does not appear that groundwater quality is being negatively impacted by the activities that occur on the Grasslands units.

Groundwater depletion and drawdown are an on-going concerns in the prairie grasslands eco-region. Within the Grasslands administrative boundary, approximately 1500 water wells (80%) are on state and private land and 380 water wells (20%) are on Forest Service-managed land. Most of the Grasslands are on the Ogallala aquifer, except for the Mills Canyon portion of Kiowa Grassland which is over the Canadian River aquifer and a small portion of Black Kettle units over the Washita Alluvium aquifer. There is minimal data available on the conditions of the smaller aquifers, but data on the Ogallala aquifer indicates that it has experienced extreme draw down over the last 50 years (McGuire 2004). Pumping water for irrigation, municipal water supplies and other uses far exceeds the recharge ability of the aquifer (McGuire 2004).

Environmental Consequences

The land management plan provides a programmatic framework that guides site-specific actions but does not authorize, fund, or carryout any project or activity. Because the land management plan does not authorize or mandate any site-specific activities or ground-disturbing actions there can be no direct effects. However, there may be implications, or longer term environmental consequences, of managing the forests under this programmatic framework.

Watershed Condition

The desired condition for watershed condition is for all watersheds to be in Class I watershed condition. This means watersheds are properly functioning and support beneficial uses.

The no action alternative (A) includes management direction to improve watershed condition class to satisfactory. Satisfactory watershed condition is analogous to the current Class I condition. Specific practices to improve watershed condition were listed as standards and guidelines in the existing Plan (1985). These included road management, revegetation, scheduling watershed improvements, and incorporating watershed improvement into projects.

Moving watersheds towards Class I condition is a goal in Alternatives B and C. These two alternatives would continue to use adaptive management practices to improve watershed condition. These adaptive management practices will utilize research and address potential issues related to a changing climate. Alternatives B and C would continue to work towards improving watershed condition, much like the current Plan does. New information would be incorporated into management activities, projects will be designed to improve watershed condition, and other resources will be managed so that watershed conditions are not further impaired. As a result, alternatives B and C are expected to move watersheds towards the desired condition of Class I in much the same way and at the same rate as alternative A.

Surface Water Features

The desired condition for surface water features is properly functioning in order to support higher ecological functions such as habitat and support clean water which meets State standards.

The no action alternative (A) includes management direction to for surface water features to be in a reference state relative to a natural condition. This condition includes shade, bank cover, streambed sedimentation, plant composition, plant structure, crown cover, and ground cover. Management direction in alternative A is aimed at ensuring the components of riparian areas are within a range of natural conditions. Riparian improvement is directed at impaired and unsatisfactory area. Preferential consideration is given to resources dependent on riparian areas when there are irresolvable conflicts among uses.

Keeping surface water features, including riparian areas, in proper functioning condition is the goal for alternatives B and C. This means these features have the physical attributes of stable systems within their capability. Properly functioning condition consider three aspects; soil, vegetation, and hydrology (USDI, 1998). This method includes more than the seven attributes used in alternative A. This also applies to more areas than just riparian areas. All surface water features, including wetlands, playas, and intermittent stream have a proper functioning condition. Because of this, alternatives B and C would help to move surface water features towards their desired condition better than alternative A.

Cumulative Environmental Consequences

For watershed condition, the cumulative effects area is the watersheds listed in table 1.

A watershed cumulative impact can be defined as the total impact, on runoff, erosion, sediment or water yield, riparian areas and/or water quality that results from the incremental impact of an action, when added to other past, present and reasonably foreseeable future actions occurring within the same natural drainage basin, or watershed (CEQ, 1997). By definition, cumulative effects occur if, when added to past, present, and future actions, the action affects the current situation either negatively or positively. This effect can most accurately be assessed by using the condition of the watersheds in the assessment unit. Watershed condition is an appropriate indicator of cumulative effects because it combines the effects of multiple activities and integrates their overall impacts to the proper functioning condition of the streams, soil, and other physical properties resulting in an overall rating for the watershed condition. This includes all activities within the watershed including those off National Forest System (NFS) Lands. The effect of the alternatives and potential future activities will be assessed when combined with past and present activities in these watersheds. The analysis area is the watersheds in table 1 that include lands within the project boundary. The timescale for watershed condition is fifteen years since within this time; it will be possible to discern the effects of the proposed actions on watershed condition.

Currently, the watershed condition for the watersheds on the grassland units is Class II – functioning at risk. This indicates these watersheds are currently supporting beneficial uses but there are conditions (physical, biological and /or chemical) that put the watershed at risk of not supporting those beneficial uses. This condition class is the result of past and present activities occurring in these watersheds. Activities which have contributed to this condition include grazing, farming, roads, groundwater withdrawals, fire, and military uses. The results have been soil loss, especially during the Dust Bowl era, changes in vegetation, gully formation, lowered groundwater tables, decreased stream flows, and decreased infiltration rates. Lands within the project boundary have experience large gains in recovery since becoming part of the NFS. Conditions outside National Forest system lands are expected to continue to improve as programs are implemented through NRCS and State and local agencies to improve watershed conditions.

Implementation of any of the alternatives will result in gradual improvement in watershed condition as activities continue to work to improve watershed conditions.

For surface water features, the cumulative effects area is the surface water features within the proclamation boundary of the Grassland Units. The cumulative effect to the proper functioning condition of surface water features is related to the incremental impact of activities which effect runoff, erosion, sediment, and ground cover when added to other past, present and reasonably foreseeable future actions occurring within the same natural drainage (CEQ, 1997). By definition, cumulative effects occur if, when added to past, present, and future actions, the action affects the current situation either negatively or positively. For surface water features, the cumulative effects related to the alternatives are assessed by calculating the amount of acres within the proclamation boundary currently located within National Forest system lands compared to the acres within NFS lands. This measure is appropriate since surface water features on NFS lands will be managed using management direction from the Forest Plan while surface water features outside of NFS lands are not managed with a single management direction since there are numerous land owners involved. State regulations do not provide similar protections for these lands. For surface water features on the grassland units, the percent of acres on NFS lands varies from 7% to 100%. These percentages reflect the portion of surface water features which can be improved

through the proposed alternatives. The percentage of surface water features located within the grassland units does not change by alternative. The marsh associated with Lake Marvin is completely on NFS lands. For surface water features which are not located on NFS lands, it is uncertain as to what condition these features will be in the future. There are more protective policies directed at perennial lakes and rivers, so these features are likely to improve outside NFS lands as state and local agencies and groups monitor these systems. It is more uncertain as to the condition of intermittent features, improved due to the lack of ownership and uncertain management activities off NFS lands. Table 2 lists the percentage of the acres of surface water features located within NFS ownership.

Table 2. Percent of Surface Water Features Located on National Forest system Lands

Feature	percent on NFS
alkali lake	12%
flood prone area	32%
intermittent lake	7%
perennial lake	26%
marsh	100%
playa	31%
perennial river	70%
tank	22%

Given this information, the alternatives will provide for the improvement of surface water features located within NFS lands. However, due to uncertain protections and activities affecting surface water features outside of NFS lands, there may be impacts. The overall health of features with higher percentage outside NFS lands means these features may not be at proper functioning condition making those features located on NFS more important to the overall system of surface water features. This has ramifications for other resources such as wildlife.

Unavoidable Adverse Impacts

The land management plan provides a programmatic framework that guides site-specific actions but does not authorize, fund, or carryout any project or activity. Before any ground-disturbing actions take place, they must be authorized in a subsequent environmental analysis. Therefore none of the alternatives cause unavoidable adverse impacts.

Irreversible and Irretrievable Commitment of Resources

The land management plan provides a programmatic framework that guides site-specific actions but does not authorize, fund, or carryout any project or activity. Because the land management plan does not authorize or mandate any ground-disturbing actions, none of the alternatives cause an irreversible or irretrievable commitment of resources.

Adaptive Management

All alternatives assume the use of adaptive management principles. Forest Service decisions are made as part of an on-going process, including planning, implementing projects, and monitoring

and evaluation. The land management plan identifies a monitoring program. Monitoring the results of actions will provide a flow of information that may indicate the need to change a course of action or the land management plan. Scientific findings and the needs of society may also indicate the need to adapt resource management to new information. The Forest Supervisor annually evaluates the monitoring information displayed in the evaluation reports through a management review and determines if any changes are needed in management actions or the plan itself. In general, annual evaluations of the monitoring information consider the following questions:

- What are the effects of resource management activities on the productivity of the land?
- To what degree are resource management activities maintaining or making progress toward the desired conditions and objectives for the plan?
- What changes are needed to account for unanticipated changes in conditions?

In addition to annual monitoring and evaluation, the Forest Supervisor reviews the conditions on the land covered by the plan at least every 5 years to determine whether conditions or demands of the public have changed significantly. The forest plan is ordinarily revised on a 10-year cycle and the Forest Supervisor may amend the plan at any time.

Consistency with Law, Regulation, and Policy

All alternatives are designed to guide the Kiowa, Rita Blanca, Black Kettle and McClellan Creek National Grasslands' management activities in meeting federal law, regulations, and policy.

List of Preparers

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