

# Kiowa National Grassland Wilderness Evaluation Report

Canadian River Potential Wilderness Area

PW-03-03-01G

October 17, 2008, Revised March 2011



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## Introduction

As part of the Land and Resource Management Plan (the Plan) revision process for the Kiowa, Rita Blanca, Black Kettle and McClellan Creek National Grasslands (the Grasslands), the Forest Service has prepared this Wilderness Evaluation Report for the Canadian River Potential Wilderness Area (PWA) numbered PW-03-03-01G (See Map 1).

### *Purpose*

The Forest Service must evaluate all lands possessing wilderness characteristics for potential wilderness during plan revision (1982 Rule provisions section 219.17). Completion of a potential wilderness inventory and evaluation is an essential step in the plan revision process. Wilderness is just one of many special area designations that the Forest Service will consider during plan revision but it is one of only two special area evaluations that are mandatory. If an area is recommended for wilderness designation, then the revised plan will contain plan components that protect its wilderness characteristics.

### *The Process*

A wilderness evaluation began with an inventory of potential wilderness, which includes areas of federal land over 5,000 contiguous acres or other areas that meet the criteria in FSH 1909.12 Chapter70, Section 71, and then determines if those areas meet the definition of wilderness<sup>1</sup>. The Canadian River Potential Wilderness Area is the only potential wilderness area on the Kiowa, Rita Blanca, Black Kettle and McClellan Creek National Grasslands based on criteria in FSH 1909.12, Chapter70, Section 71. We also evaluated the High Lonesome area of the Rita Blanca National Grassland during the inventory phase and eliminated it based upon the criteria for wilderness inventories on grasslands; which states that potential wilderness areas may have no more than one mile of interior fence per section. Hence, only the Canadian River PWA was evaluated for capability, availability and need. These evaluation factors are described in more detail within this report in the introductions to each evaluation step and in Appendix A. The purpose of this report is to summarize the findings of the wilderness capability, availability and need evaluations based on the best available data.

The Cibola National Forest and Grasslands will use this report to determine whether or not to make a preliminary administrative recommendation for wilderness designation of the Canadian River PWA. The Deciding Official's (Regional Forester) recommendation will be documented in the final Plan and the Plan Approval Document. Public comments on this report will be accepted and considered throughout the plan revision process. If the PWA is recommended for wilderness, the recommendation will receive further review by the Chief of the Forest Service and the Secretary of Agriculture. If the Chief of the Forest Service intends to move forward with a wilderness recommendation, the Forest Service will complete a detailed analysis of the trade-offs and impacts in accordance with the National Environmental Policy Act, including further public review and comment.

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<sup>1</sup> Areas smaller than 5,000 acres may also be included if they are adjacent to an existing wilderness area or east of the 100<sup>th</sup> meridian.

Ultimately, only Congress has the authority to make final decisions on wilderness designation.<sup>2</sup>

## Area Overview

*Acres, Location, Topography:* The Canadian River PWA is 6,028 acres, of which 5,448 acres are National Grassland and 584 are State Trust Lands.<sup>3</sup> It is located in northeast New Mexico on the Canadian River above Conchas Reservoir. The area is defined geographically by the Canadian River canyon gorge with elevations ranging from 6,100 feet at the river to 6,800 feet at the canyon rim. Nearby population centers, include Las Vegas, NM (population 14,565 in 2000) to the southwest and Raton, NM (population 7,282 in 2000) to the northwest. The PWA is located approximately 40 miles east of Interstate 25 (see Map 2). The boundary of the PWA is similar to the boundary of the Canadian River Inventoried Roadless Area.

*Vegetation:* Along the canyon bottom, within the river floodplain, vegetation is dominated by riparian species, including willow and cottonwood. Much of the native riparian vegetation has been replaced by salt cedar. The dominant vegetation on canyon slopes varies depending on aspect, with piñon pine, juniper and gambel oak being the principal tree species. The vegetation on cooler, moister side drainages and the edge of the canyon rim is generally comprised of ponderosa pine stringers.

*Surroundings and Land Ownerships:* The vegetation above the canyon rim is characterized by shortgrass and mixed-grass prairie on rolling hills. The non-Forest Service lands adjacent to the PWA boundary are parcels of private ranchlands and lands managed by the State of New Mexico and the Bureau of Land Management (BLM). There are 584 acres of State land inside the PWA Area boundary. Lands not included in the National Forest System are not being considered as part of the Wilderness Evaluation Report area but they will be analyzed for their effects on the canyon's wilderness characteristics (See Map 1).

*Access and Boundaries:* The Canadian River PWA can be accessed north of Roy, NM on National Forest System Road (NFSR) 600. This road extends from NM Hwy 39 near Mills, NM above the canyon to the Mills Canyon Campground at the canyon bottom. To reach NM Hwy 39, one must exit I-25 at Wagon Mound and drive 45 miles east to Roy, NM. The only public access to the Canadian River PWA is from NFSR 600. There are also roads across private ranch lands on either side of the Canadian River Canyon PWA.

The PWA boundary follows the canyon rim line to include the canyon bottom, except where it intentionally excludes road corridors for NFSR 600 through the center of the

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<sup>2</sup> Forest Service Handbook (FSH) 1909.12, Chapter 70, Section 73

<sup>3</sup> There is nearly a section of State land within the PWA. A recommendation of wilderness would not affect the management of State lands within the PWA boundary. If Congress were to designate the area as wilderness, it would not prevent any activity or development from taking place on adjacent State or private land. Non-federal lands surrounded by wilderness are ensured adequate access to their property in accordance with FSM 2326.13. Non-federal lands that have access available from outside the wilderness area will not be entitled to access to their properties through a wilderness area.

canyon, NFSR 601 and 602 in the canyon bottom.<sup>4</sup> The boundary around these roads is set back 100 ft on either side of the right-of-way line, which is the standard width for archeological clearance for road maintenance and reconstruction. The only exception is where that distance would exclude a portion of the Canadian River channel from the PWA. For instance, if the channel is within 60 feet of the road, then the boundary would be off-set from the right-of-way by 60 ft not 100 ft. The boundary also excludes the Mills Canyon Campground at the bottom of the canyon (with a 50 ft buffer for drainage and hazard tree removal), the Melvin W. Mills Orchard and Ranch House interpretive site off of NFSR 602, and the borrow pit (where natural materials are extracted for road reconstruction and maintenance), which is approximately ¼ mile north of NFSR 600 on the east side of the river (see Map 1).

*Current Uses and Appearance:* The PWA is dominated by canyon terrain. Recreational use levels are light to moderate with horseback riding, fishing and hiking the most common summer activities. This area does not have any designated motorized trails and only a very short hiking trail at the Mill house ruins. Most of the horseback riding occurs on the roads or the undesignated routes off of NFSR 600. This reach of the Canadian River is predominately warm-water fishery that receives light to moderate fishing activity. At this time there are no special use permits authorizing recreation use for activities such as guided tours or big game hunting. This portion of the National Grassland is a very popular deer hunting area, which results in dispersed camping sites occupied primarily during hunting seasons. Between the rim and the river bottom, there are two small two-track roads that access camping spots in the mid-canyon. It is open year round, when there is not enough snow to close the road. Users find this area a very attractive recreation spot. Local users, in particular, have a strong attachment to the camping and picnicking spots within the PWA.

The Canadian River PWA and surrounding areas appear mostly natural other than the user-created two track roads, invasive plants growing along the river, historic adobe structures located in the canyon, developed campground facilities, fences, vehicle barriers, signs, hardened low water crossings, forest development roads and bridges.

*Key Attractions:* The area's key attractions stem mostly from the scenic river gorge and canyon topography that differs from the surrounding grasslands landscape. Attractions include diverse vegetation types, native plants and wildlife, geologic rock features, standing historic structures, and the opportunity to hike, fish and camp in a relatively large, semi-primitive, forested environment near water.

## Wilderness Capability

Wilderness capability describes the basic characteristics that make the area appropriate and valuable for wilderness designation, regardless of the area's availability or need. Five sets of factors are used to determine capability: naturalness, level of development, opportunities for solitude, special features, and the ability of the Forest Service to manage the area as wilderness (manageability). The first four of these factors consider how the

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<sup>4</sup> These roads are also commonly referred to as K600, K601, and K602 as shown on the attached maps.

current conditions of the PWA fit the definition of wilderness. Manageability is slightly different because it evaluates features of the area that would make it more or less difficult to manage the area as wilderness, such as size, shape and juxtaposition to external influences. Evaluating manageability also involves determining if there are mitigation measures that might improve the manageability of the area without affecting wilderness character. Each factor is rated as high, medium or low based on the criteria shown in Appendix B.

### *Natural*

The woody vegetation within riparian areas of the Canadian River PWA has a component of saltcedar, a non-native invasive species. The saltcedar trees dominate some riparian reaches of the river, and non-native Barbary sheep were introduced into the canyon decades ago.

The Canadian River flows from its headwaters in the Sangre de Cristo Mountains in far southern Colorado and meanders through the semi-arid landscape in the central part of Northeastern New Mexico. Snow melt and seasonal rains are the major flow sources: both of which are diverted for irrigation and other uses before the waters reach the Canadian River PWA.

The Canadian River PWA is remotely located within areas with 500 feet tall or more canyon walls. The night sky quality has little or no light pollution throughout the year. The Canadian River PWA is remotely located in a natural setting that is enhanced by steep canyon walls. The cliffs and canyon walls are key features that serve as a backdrop for diverse vegetation that varies from woody riparian areas, grassy meadows, pinyon-juniper woodlands, and oak scrub shrub areas, to stringers of ponderosa pine trees. The canyon hosts some rare plants species such as horrid herrickia, (an aster species), that cling to the base of talus slopes adjacent to the cliff side riparian edges of the river.

The reach of the Canadian River within the PWA is free-flowing and is not on New Mexico's Impaired Waters list. Segments to the north and south of the canyon have constructed impoundments and are listed on the State's Impaired Water list due to the effects from heavy sedimentation and adjacent non-point source pollution (NMWQCC, 2007).

The vegetation types within the Canadian River PWA are all within the Historical Range of Variability that describes viable ecosystems with the canyon lowlands, woodland pinyon-juniper on canyon steep slopes, and cottonwood-willow riparian areas.

The upstream water diversion, described above, has altered seasonal base flows of the Canadian River, thereby reducing normal flooding and water availability for adjacent riparian area vegetation. Human activity, including the use of various types of motorized vehicles, is evident throughout the canyon. User-created roads and trails exist along the river and at user-created crossings. Vehicle tracks across meadows and up steep slopes further detract from natural ecosystem integrity and appearance. The Canadian River PWA has had a long history of human use and settlement as evident in the historic site and structures in Mills Canyon. Developments include access roads, interpretive

(historic) site, borrow pit, and campground although these features do not appear to have affected ecological conditions other than the motorized use described above.

### *Undeveloped*

Because of the access roads, interpretive site, borrow pit, and campground in Mills Canyon, the PWA appears to be highly developed. Technically, there are no developed structures within the PWA because of an exclusion in the boundary. The Canadian River PWA has had a long history of human use and settlement as evident in the historic and prehistoric sites and structures. Additional facilities planned at developed locations will include constructing interpretive kiosks and additional signing. The south part of NFSR 600 crosses the Canadian River and is inside the boundary of the Canadian River PWA. User-created roads and trails are visible in the canyon and there is a concrete water crossing south of the campground. Vehicle barriers are prominent and were constructed to protect a key historic site.

### *Opportunities for Solitude*

A person could experience short-term solitude, self-reliant hiking and climbing away from the main roads, campground, and interpretive sites, within the PWA. However, the roads, trails, and developed facilities in the canyon detract from the primitive and challenging nature of recreation in the area. Historical and more modern roads and trails are in great evidence, especially on the bottom of the canyon. NFSR 600, 601, and 602 are less than half the road and trail network that is found in the canyon. The older travel route from NFSR 602 up across Canon Vercere is still viable and being used by a few OHV enthusiasts to access the canyon from Mora County, even though the road has been closed to protect public health and safety. The small size of the area and the presence of the developed campground limit opportunities for long primitive back-packing trips. Sounds from the developed campground, the excluded roads and adjacent land uses also have the potential to impact the experience of solitude within the PWA.

### *Special Features*

The high scenic quality of the canyon is important as a wilderness characteristic. The red sandstone cliffs contrast against the forested canyon slopes to provide a dramatic setting. The free-flowing Canadian River is a prominent feature on the Kiowa National Grassland and the segment within the PWA is classified as an Eligible Scenic River.

The area is important to several Native American tribes. The standing historic adobe structures within the PWA have been stabilized and will likely require future maintenance to retain their integrity.

The canyon hosts some rare plants species such as horrid herrickia, an aster species that cling to the base of talus slopes adjacent to the cliff side riparian edges of the river.

## *Manageability*

The boundary of the Canadian River PWA is irregular due to the exclusion of the campground, the interpretive site, the borrow pit and NFSR 600, 601 and 602. Public passenger vehicle access into the bottom of the canyon is only possible on these roads. Once a vehicle is in the canyon there are few natural features that prevent vehicles from driving into unroaded portions of the PWA.

The relatively open terrain along the boundary, combined with the surrounding roads and private land uses, makes it very difficult to prevent motorized and mechanized vehicles from entering the area. Off highway vehicle (OHV) access is possible both upstream and downstream from the PWA boundary. The area is also accessible from the west side of the canyon by an old trail system, using an OHV.

Given these conditions, the area holds several challenges in management for wilderness characteristics. Closure of NFSR 600 to the Campground and closing the Canyon to vehicle access would be very difficult; physically, socially, and politically. The road and bridge have been improved and reconstructed over the last three years to address public health and safety concerns. However, retaining the main access roads in the canyon (NFSR 600, 601, 602) would make the area difficult to manage as wilderness. Constructing fences and barriers to prevent motor vehicle use outside of developed sites would detract from wilderness characteristics, but would improve manageability of the area.

Because of the access roads, interpretive site, borrow pit, and campground; the middle portion of the PWA appears highly developed. Even though there are technically no developed structures within the PWA boundary. The western boundary of the campground (which is part of the excluded area) is approximately 250 feet from the private land boundary to the west. This narrow strip in the center of the PWA essentially cuts off the northern portion from the southern portion of the canyon and disrupts the wilderness experiences of visitors. Likewise, the area to the south of the State Trust land parcel included within the boundary would be cut off from the PWA area to the north if the State land parcel were excluded from the PWA boundary (See Map 1).

A GIS analysis using viewpoints along the road at every half mile and at the campground in the excluded area estimates that 36% of the PWA is visually impacted by the presence of the road and developed features. In other words, in approximately one-third of the PWA, a visitor might see a car on the road, or see people in the campground or at the interpretive site. This drastically reduces the opportunities for solitude and a primitive experience in an area this small (See Map 3).

Several recommendations for additional boundary exclusions and inclusions to the PWA boundary were suggested by the public after review of the Draft Wilderness Evaluation Report, released in October 2007. PWA boundary selection should be made to enhance wilderness characteristics. Boundary manageability considers whether or not a wilderness boundary can separate incompatible activities from wilderness characteristics. An addition to the PWA of the upland areas adjacent to the canyon do not contribute

much to the capability of the PWA and would greatly decrease the manageability of the area because of the flat open terrain of the adjoining landscape. Likewise, a boundary change that extends the excluded road system to the very popular cottonwood grove south and west of Mills Canyon Campground would also further diminish the opportunities for solitude and wilderness characteristics. The same logic follows that the exclusion of roads accessing Ship Rock point and the rock slab table from the PWA would make the area less manageable. The only boundary change that would improve manageability of the area is the exclusion of the road segment that crosses the river at the low-water crossing. This exclusion will prevent cars from impacting the river channel and would use the river as a natural barrier to motor vehicles.

*The Canadian River Potential Wilderness Area was rated medium for wilderness capability (See Appendix B).*

## Availability for Wilderness

Availability criteria indicate the availability of a potential wilderness area for wilderness designation by describing other resource and land use potentials for the area. Availability examines the potential impact of designating an area as a wilderness to both the current and future land uses and activities. In essence, it is a summary of the trade-offs between wilderness and other uses. Factors are rated as high, medium or low based on the criteria shown in Appendix C.

In the Canadian River PWA, most of the current recreational uses other than motorized could continue if the area was designated as wilderness. The canyon's developed campground and interpretive facilities are not included within the boundary of the PWA because they are inconsistent with wilderness characteristics, but their presence there demonstrates the potential of the area for developed recreation activities. Interpretive facilities currently being built to provide public information and protect historic properties would also not appear compatible with wilderness area scenic characteristics. The area included in the Canadian River PWA is part of the economic development strategy for Harding County, which promotes the area as a developed recreation opportunity along La Frontera del Llano Scenic Byway.

Several prescribed burns and wildlife restoration projects are planned for the PWA, which would require the use of mechanized equipment. Riparian restoration projects are also planned following invasive plant control activities. These projects will include replanting cottonwood, willow, and other native species. This activity may require the use of mechanized equipment. These projects would improve habitat conditions for wildlife species including mule deer, Merriam's wild turkey, and numerous bird species such as flycatchers, chats, buntings, wrens and tanagers. Frequent fire activity has occurred in this part of the Kiowa National Grassland. Prescribed burning has been conducted within the canyon to reduce fuel loading, improve wildlife habitat and reduce woody vegetation within the river floodplain. Additional prescribed fire projects are

planned in the foreseeable future for areas within the canyon and along the rim vicinity, to maintain the canyon vegetation communities with the natural range of variability and to reduce the risk of fire escaping to adjacent private lands.

If designated a wilderness area, water improvements or impoundments would not need modification. While there are State and municipal impoundments along the river upstream from the PWA and an irrigation water diversion and pump station a short distance from the boundary, there is no foreseeable need for additional water impoundments or diversions within the PWA.

The area is unencumbered by contracts or permits except for livestock grazing permits. There are three active grazing allotments within the PWA boundary with seasonally controlled grazing in the canyon. Historical livestock grazing would continue even if the area were designated as wilderness.

The area has a low potential for commercial timber harvest. Wood gathering in the canyon for recreational use within the campground and at dispersed camping sites is allowed.

There is little or no potential for extraction of locatable minerals, low potential for oil-gas production, and the area is designated as “No Surface Occupancy” for any future oil-gas drilling.

The standing historic adobe structures within the PWA have been stabilized and will likely require future maintenance to retain their integrity. Movement of the materials for site stabilization would require motorized vehicles because the type and quantity of material needed cannot be found in the canyon.

Foreseeable permits for recreation or education groups, plant gathering, research or similar uses would not require use of motorized or mechanized equipment or detract from wilderness qualities.

Some ecosystem management activities limit this area’s availability for wilderness. The spread of salt cedar in the canyon has led to a decrease in the native riparian vegetation along the river. There is an interagency agreement and Forest Service decision to eliminate salt cedar and restore native riparian vegetation along the Canadian River. The Riparian Restoration Project has mapped 8,560 acres along the Canadian River and 23,175 acres of its tributaries in preparation of treating salt cedar in New Mexico. This landscape-scale program would need on-going maintenance treatments over an indefinite period of time. A decision was signed on May 29, 2007 that approved multiple entry treatments for salt cedar eradication in the Canadian River PWA using, aerial (helicopter) and backpack herbicide application as well as the use of chainsaws or tractors. These activities are expected to be repeated for the next five to ten years due to the timeframe required to control re-sprouting of salt cedar. Carrying out these treatments is essential to restoring and maintaining ecosystem and watershed functions, but would limit the ability to concurrently manage the area as wilderness.

Land ownership and management concerns reduce the availability of the area for wilderness. There are several adjacent private land holdings and a block of State trust land, along with BLM land, some of which use roads through the PWA for access. The State Trust Lands have a moderate potential for future development for economic purposes. Private lands may also be developed for multiple purposes, some of which may be incompatible with wilderness characteristics. If the area were managed as wilderness, the type of road access that the Forest Service would permit to these parcels could be affected.

Management and use of NFSR 600, 601 and 602, which are technically excluded from the potential wilderness, reduce the area's availability as they detract from the wilderness characteristics as a whole. If these roads were to be closed and obliterated in order to manage the area more effectively for wilderness, it would limit the ability to control wildfires as there would not be safe escape routes for firefighters due to the canyon-confined topography. This same concern about lack of escape routes and the need for firefighter safety would also limit the Forest Service's ability to manage prescribed fires that are necessary to sustain desired ecosystem conditions and protect adjacent private properties. Limiting our ability to control wildfires would increase the risk to damage of private property and natural resource attributes located in the area.

*The Canadian River Potential Wilderness Area was rated medium for availability (See Appendix C).*

## Need for Wilderness

The evaluation criteria below indicate how the PWA might fit into the National Wilderness Preservation System (NWPS), which includes all of the wilderness areas in the United States. Need is considered at the regional level and must incorporate public participation. The criteria used to evaluate need include consideration of other wilderness and non-wilderness areas that provide opportunities for unconfined outdoor recreation or preservation of certain ecosystems characteristics. Assumptions and methodology for this evaluation are briefly summarized in this report, with further detail contained in the Grasslands Plan Revision record.

### **Wilderness and Non-wilderness Lands in the Vicinity**

The Forest Service evaluated comparable public lands within a 250 mile radius of the PWA, which is assumed to be approximately one day's drive (see Appendix D).

Within 250 miles of the Canadian River PWA, there are 43 designated wilderness areas totaling about 1.4 million acres. Most of these wilderness areas are in New Mexico and Colorado. In the late 1990s, 2006 and in the fall of 2007, local residents, governments, and other interested parties were asked to comment on the need or desire for the Canadian River to be designated as wilderness. Most respondents expressed the opinion

that the area should not be designated as wilderness. Some expressed concern that wilderness designation would attract more people and degrade the features that make it special. Some expressed opposition to additional federal government control and regulation that would potentially accompany Congressional designation and others were concerned with possible effects to adjacent private land. On the other hand, representatives from wilderness advocacy groups and some members of the public expressed the view that attracting more people to the area through wilderness designation could contribute to the local tourism economy while protecting the special natural features in the canyon (USDA Forest Service 2006).

Within 250 miles of the Canadian River PWA there are 60 to 70 non-wilderness areas over 5,000 acres in size that are specially-designated federal or state public lands likely to offer a similar unconfined recreation experience. Of these areas, about 30 are Wilderness Study Areas managed by BLM to protect wilderness characteristics, which offer a primitive or semi-primitive recreation setting similar to those provided by wilderness. Similar non-wilderness areas include large national wildlife refuges, recreation areas, conservation areas, and monuments. In addition, there are many semi-primitive backcountry areas within national forests and grasslands that were not included in these calculations.

Since this evaluation and report were prepared, President Obama signed the Omnibus Public Lands Management Act of 2009, adding two million acres of wilderness in nine states. One of those recently designated areas is the 16,030-acre Sabinoso Wilderness located approximately 25 miles south of the Canadian River Potential Wilderness Area. Sabinoso is managed by the Bureau of Land Management (BLM).

### **Visitor Pressure**

In order to consider the degree to which regional population centers are already served by wilderness, the evaluation looked at four metropolitan areas within 250 miles (approximately a day's drive) of the Canadian River PWA: Albuquerque, Santa Fe, and Las Vegas, New Mexico, and Amarillo, Texas. All three New Mexico cities have access to over 30 designated wilderness areas within 250 miles, and Amarillo had six wilderness areas within 250 miles as of 2008.

Albuquerque and Santa Fe both had estimated population growth of 10% and 12.4% respectively between 2000 and 2005 (US Census 2006). These cities have approximately 3.5 million acres of designated wilderness areas within 250 miles. This means there are 54 acres of wilderness per capita within a reasonable driving distance of Santa Fe and 7 acres per capita for Albuquerque. Some of these wilderness areas provide primarily day-use recreation (e.g., the Sandia Mountain Wilderness); others are large enough to accommodate multiple day backcountry trips (e.g., Pecos Wilderness). Of the 45-48 wilderness areas within 250 miles of these cities, some are not heavily used. For example, the 2006 National Visitor Use Monitoring survey for the Cibola National Forest estimated that there were only 2,300 wilderness visitors for the Forest's wilderness areas

(excluding the Sandia Mountain Wilderness), an area of approximately 100,000 acres in that year.<sup>5</sup>

Forest Service direction<sup>6</sup> allows for several assumptions in evaluating wilderness need, among them, that public demand for wilderness may increase with proximity to population centers, trends in use, and population expansion factors. However, research has found that not all population increases are equally likely to result in an increase in wilderness use. Minority populations, as found in the Southwest, have a negative correlation with wilderness and primitive area visitor use (Bowker et al. 2006). When population increases are primarily among minority populations, this demographic shift is forecasted to result in stable or declining in wilderness use per capita. As a result, even areas with increasing populations can have lower rates of increase in wilderness and primitive area visitation (Bowker et al. 2006). Taking these findings into account, the expected population growth of Albuquerque and Santa Fe may not necessarily generate a proportionate increase in wilderness use, particularly because both cities are comprised of approximately 50% racial and ethnic minorities (US Census 2000). The current supply of wilderness, the percent of the local population that are likely to be wilderness users and the general population growth of these cities suggests that the demographic conditions do not create an increasing demand for more designated wilderness areas.

Unlike larger northern New Mexico cities, the population of Las Vegas, NM is estimated to have declined 4% between 2000 and 2005 (US Census, 2006). The Pecos Wilderness (220,088 acres) is the most easily accessible wilderness area from Las Vegas, NM. In 2005, it's estimated that Las Vegas had 256 acres of designated wilderness per capita. The declining population and large availability of wilderness opportunities does not suggest that the population trend of Las Vegas generates a need for more designated wilderness.

The city of Amarillo estimates that the city had 184,941 residents in 2006 and shows that the average annual growth rate from 2000 to 2005 has only been 1.1% (US Census, 2006). This stable growth rate does not indicate that the wilderness need for the Amarillo area is increasing or expected to increase.

Most of the public land within 250 miles of Amarillo is in State and local ownership. For this reason, there are only 6 wilderness areas within a day's drive of the city. A large and very active segment of recreation users in Texas enjoys either lake-based recreation or hunting and fishing, which are not necessarily wilderness-dependant activity (Huggins, 2003). In fact, the Noble Foundation found in a 2001 survey that hunting, fishing and other recreation was the primary driver of the rural Texas real estate market, and the natural integrity of private land has been shown to improve property values (Huggins, 2003). The large amount of private land available for relatively unconfined outdoor recreation uses in the surrounding areas and the value placed on its natural integrity may further contribute to a reduced need for designated wilderness in this region.

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<sup>5</sup> The 2006 National Visitor Use Monitoring Report was made available to the public in 2008.

<sup>6</sup> FSH 1909.12 Chapter 70, Section 72.31

The large number of wilderness areas available to these population centers and the demographic characteristics of these cities indicate that they are adequately served by existing wilderness. Even though the wilderness areas closest to these cities, such as the Sandia Wilderness, may be experiencing over-crowding, there is no evidence that the capacity of wilderness areas to serve these populations is likely to be exhausted.

### **Primitive Sanctuary for Plants and Wildlife**

As part of the Grasslands Plan revision process, the Forest Service has developed a list of species that warrant consideration in the Grasslands Plan revision<sup>7</sup>. Appendix E displays those species from this list that are known to occur in the Canadian River PWA. Though all of these species would benefit from reduced disturbance, none require a primitive wilderness environment to survive.

Some members of the public suggested that the PWA may be appropriate habitat for species such as peregrine falcon and southwest willow flycatcher. However, these species do not occur in the PWA, except during migration.

### **Potential to Increase Capacity of Established Wilderness**

There are no established wilderness areas on these National Grasslands. There would be no opportunity to increase capacity on any other designated wilderness in consideration of this factor.

### **Wilderness with Similar Landform and Vegetation**

#### *River Canyons with Similar Vegetation Composition*

In order to consider how the landform and ecological condition of the Canadian River PWA might be similar to existing wilderness areas within the NWPS, all designated wilderness areas west of the Mississippi River were compared to the Canadian River PWA, using landform, vegetation cover type (ecosystems) and other data from the National Atlas. Wilderness areas located east of the Mississippi were considered to be too dissimilar for this comparison. The Canadian River PWA's landform is largely defined by a major river and canyon topography. Therefore, wilderness areas without a major river canyon were eliminated from further comparison, including wilderness areas containing a major river but lacking in hills or canyon topography, such as river areas in deserts or broad flat plains. Next, the percentages of major vegetation cover types in each wilderness area was compared to general percentages in the Canadian River Potential Wilderness Area, which is approximately 20% evergreen trees, 45% shrubs and 35% grasses. Areas with less than 5% in any of these major vegetation components were eliminated. Also, areas that did not contain these major cover types were eliminated, like those entirely dominated by deciduous or alpine forest or entirely lacking in evergreen trees, shrubs or grasses. It was assumed that a riparian ecosystem type would occur in all these wilderness areas, along the major river system. Results of this evaluation show that

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<sup>7</sup> This list includes species that have known population or habitat concerns, are present or have habitat within the Plan area, and may be affected by Forest Service management activities. The complete list may be found in the Plan revision record.

there are over 90 designated wilderness areas with major river canyons with vegetation similar to the Canadian River PWA (See Appendix D). Thus, these areas would likely provide a similar type of recreation experience.

*Ecoregions and Subregions*

Another way of examining the representation of landforms and vegetation types in NWPS is to overlay existing wilderness with the USDA Forest Service National Hierarchical Framework of Ecological Units. To narrow the discussion to the regional scale, this analysis will examine how many wilderness areas exist at the province and section scale<sup>8</sup> of the framework and how similar these are to the Canadian River PWA.

The Canadian River PWA is unique because it is in a transition zone between two provinces: the Great Plains-Palouse Dry Steppe Province (331) and the Southwest Plateau and Plains Dry Steppe and Shrub Province (315). There are 11 designated wilderness areas in Province 331, totaling 251,284 acres and 7 designated wilderness in Province 315, totaling 142,689 acres (see Tables 1 and 2). Both of these provinces are primarily grasslands with shrubs and low-lying trees present; both provinces’ landforms are characterized by rolling plains and mesas or plateaus with canyons, buttes and valleys as an occasional landscape feature. Province 331 has a temperate climate which is formed by the rain shadow of the Rocky Mountains, while Province 315 is semiarid. The Canadian River PWA falls within the range of landforms and climate that are found within both of these provinces; however, the potential natural vegetation type in the canyon is uncharacteristic because the area is dominated by juniper woodland with ponderosa pine stringers and cottonwood-willow riparian vegetation. There are no areas with a potential natural vegetation type of grassland within the PWA boundary.

Table 1: Wilderness Areas within the Great Plains-Palouse Dry Steppe Province

<b>Wilderness</b>	<b>State</b>	<b>Acres</b>	<b>Responsible Agency</b>
Sangre de Cristo Wilderness*	CO	32,180	FS
Sangre de Cristo Wilderness*	CO	42,518	NPS
Greenhorn Mountain Wilderness	CO	23,624	FS
Great Sand Dunes Wilderness	CO	32,950	NPS
Medicine Lake Wilderness	MT	2,547	FWS
UL Bend Wilderness	MT	22,934	FWS
Lostwood Wilderness	ND	6,235	FWS
Theodore Roosevelt Wilderness	ND	13,796	NPS
Chase Lake Wilderness	ND	4,688	FWS
Soldier Creek Wilderness	NE	8,637	FS
Badlands Wilderness	SD	61,175	NPS
<b>Total Acres</b>		<b>251,284</b>	

\*Contiguous Wilderness managed by different federal agencies

Table 2: Wilderness Areas within the Southwest Plateau and Plains Dry Steppe and Shrub Province

<sup>8</sup> For definitions of the various scales within the USDA Forest Service National Hierarchical Framework of Ecological Units, see Appendix F.

<b>Wilderness</b>	<b>State</b>	<b>Acres</b>	<b>Responsible Agency</b>
Bandelier Wilderness*	NM	25,053	NPS
Dome Wilderness*	NM	4,189	FS
Salt Creek Wilderness	NM	10,968	FWS
Carlsbad Caverns Wilderness	NM	31,138	NPS
Guadalupe Mountains Wilderness	TX	44,131	NPS
Ojito Wilderness	NM	11,178	BLM
Sabinoso Wilderness	NM	16,030	BLM
<b>Total Acres</b>		<b>142,689</b>	

\*Contiguous Wilderness managed by different federal agencies

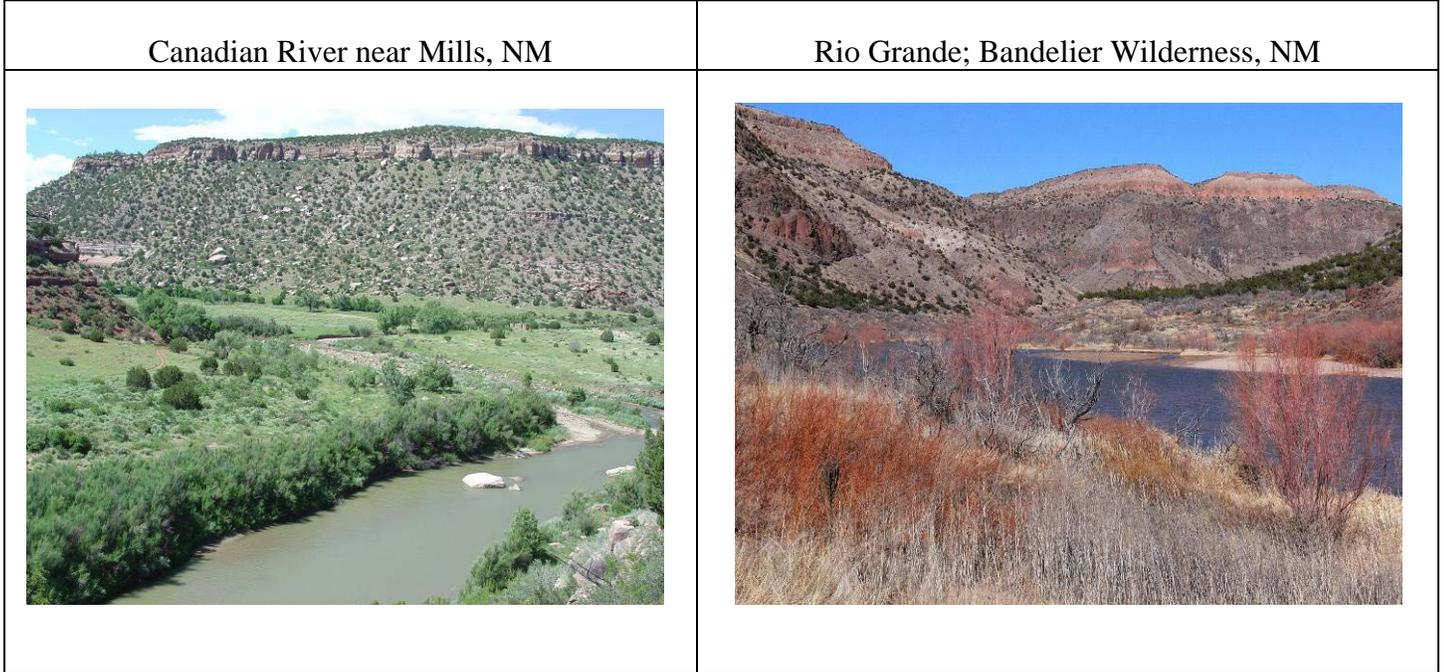
### *Ecoregion Sections*

The Canadian River PWA falls within two ecoregion-sections, the Southern High Plains and the Texas High Plains. There are no wilderness areas in the Southern High Plains section, however the Sabinoso Wilderness which was designated in 2009 (BLM) is situated approximately 25 miles south of the Canadian River PWA. The Sabinoso contains approximately 16,030 acres and is part of the Canadian River Basin and the Texas High Plains section (315B). The Sabinoso Wilderness contains a larger proportion of the grassland vegetation types and land features common to its subregion; however, it does not include a segment of the Canadian River.

The Texas High Plains are described as “a high plateau with flat terrain. Soils formed in eolian silts and fine sands; playa lakes are present. Predominant vegetation is Great Plains grasslands and pinyon-juniper cover types.” The Canadian River PWA is not representative of either of these descriptions and therefore its addition to the NWPS would not add to the representation of the vegetation types and landforms associated with this subsection.

At the same time, the Bandelier Wilderness, which is also located in northern New Mexico, also includes similar river canyon topography, is partially within the Province 315 and has a vegetative cover type mix nearly identical to the Canadian River PWA (See Figure 1). The photos in Figure 1 show that both the southern canyon of the Bandelier Wilderness and the Canadian River canyon have similar topography and vegetation cover. The description for the Central Rio Grande Intermontane Section (315H) is a large intermountain riverine basin with valleys, lowland and outwash plains, and alluvial fans and terraces. Bedrock is mainly sedimentary formations with some volcanics. Vegetation is mostly sagebrush, piñon-juniper, and ponderosa pine cover types” (McNab 2007). This description describes the landscape and vegetation of the Canadian River PWA with the exceptions that the area is located in a plains environment and not in an intermountain area and the parent materials of the two canyons are different. Despite the differences in surroundings and location, the Bandelier Wilderness is an existing wilderness in the same state and province which represents the ecosystem and landform of the Canadian River PWA.

**Figure 1: Photo Comparison of Canadian River and Bandelier Wilderness**



*The evaluation of need shows that the Canadian River Potential Wilderness Area generates a low degree of need as a new wilderness area.*

## Effects of Recommendations

The following section provides a summary of potential effects of the two possible outcomes of the wilderness evaluation process: a recommendation to designate the area as wilderness or a recommendation to manage the area as a non-wilderness (FSH 1909.12 Ch 74). This analysis is not intended to replace an analysis of effects and is not sufficient to meet the requirements of the National Environmental Policy Act. It is only intended to provide a summary and discussion of possible outcomes that will be further considered as part of the plan revision process. A final decision on whether or not to recommend the area as a wilderness will be made in the Plan Approval Document, in accordance with 1982 Planning Rule provisions. If the area is recommended for designation in the Grasslands Plan, a separate NEPA analysis will be completed before the recommendation is sent to Congress by the Secretary for a final decision.

For each possible management decision, the following section describes the direction that may be included in the revised plan and the potential effects of moving towards those desired conditions. In both possible scenarios, protection of the Outstanding and Remarkable Values of the Eligible Scenic River segment are retained.

## **Recommendation: Wilderness**

**Management Direction:** The Canadian River Potential Wilderness Area is managed to protect its wilderness characteristics. Vegetation is managed within the range of natural variability. Natural processes, such as fire, insects, drought, disease, and grazing, control vegetation composition and structure. The area is managed to promote an open, natural or natural-appearing landscape with an emphasis on the health of the riparian habitat and prevention of invasive plant re-introduction. Generally, opportunities for primitive recreation are provided, with a moderate degree of solitude available.

There is some evidence of past and present human use, such as fences, barriers, trails, old buildings, water developments and primitive roads. Existing two-track roads and old roads are evident but will diminish through lack of use. Some of these routes may become designated trails. Bridges or other structures may exist to protect resources or provide safe stream crossings during normal water flow.

Use of mechanized equipment for administrative purposes will continue, until the area is designated by Congress. When mechanized equipment is used in the interim, it will be done in a manner that does not have a long term impact on the wilderness character of the area. Opportunities to remove or relocate structural range improvements (fences and water developments), to achieve resource management goals and objectives, will be pursued. Both directional and resource protection signs may be present. Physical barriers to motor vehicle intrusion are present along the boundary and particularly along NFSR 600 and 601. Invasive plant eradication is carried out along the river corridor and native vegetation is reestablished.

### **Effects:**

- Salt cedar treatments will go forward in the short term (5 to 10 years). In the long term, re-introduction of invasive plants along the river will not be easily contained or eliminated because of the difficulty in removing the seed source. Reintroduction of salt cedar could lead to the spread of salt cedar or other invasive species throughout the riparian area and onto adjacent nonfederal lands.
- Motorized recreation will be terminated and non motorized recreation will dominate the area.
- The economic effects of wilderness designation are difficult to predict. The substitution of one type of recreation user group for another has unclear impacts on local tourism. The effects of marketing and gas prices are more likely to result in changes to the local economy than wilderness designation.
- Unobligated grazing allotments, at the time of designation, will not be available for use in the future.
- The community will lose motorized access to the dispersed recreation sites along the river and at the cottonwood grove picnic and camping area on the west side of the Canadian River.

- The river crossing will be closed and the riparian vegetation in that area will improve.
- The recreation experience in the canyon will be quieter because motorized vehicles will be limited to a restricted area.
- The area will have a more natural appearance as roads begin to disappear from lack of use.
- Managing prescribed fire will be unsafe without the use of motorized equipment and is unlikely to continue to occur on a regular basis. This may result in the area having a less natural vegetation structure and composition, additional fuel loading and an increase in potential for high intensity wildfires.
- Typical wilderness users have a certain expectation of self-reliance and challenge. The road access to the area and the disjointed land ownership pattern will limit the areas ability to fulfill these expectations.
- Access into the area by the NFSR 600 will be used to assist in emergency extraction by motorized means.
- The State will continue to use motorized and mechanized equipment on State Trust lands within the canyon but may have limited motorized access through the adjacent federal land.

**Recommendation: Non-wilderness/Unroaded Backcountry Area**

Management Direction: A variety of un-crowded, non-motorized, recreation opportunities are provided in a natural or natural-appearing setting. Concentration of users outside of developed recreation facilities is low, but there is often evidence of other users. These areas may offer unique hunting opportunities away from motorized vehicles.

Improvements such as trailheads, trails, signs, bridges, fences, primitive shelters, and water developments may be present. Existing two-track roads and old roads may be evident but will diminish over time or may become designated trails. The number of structures and facilities to support management activities is limited.

A natural landscape with unobtrusive structural developments is maintained. Livestock grazing is managed to prevent conflicts with recreation activities. Vegetation management activities will reflect the colors, lines, forms, and patterns of the surrounding canyon landscapes. Invasive plant eradication activities are carried out along the river corridor and native vegetation is reestablished for a proper functioning riparian system.

**Effects:**

- Salt cedar treatments and prescribed fires activities will continue, as planned, and will improve the functioning of natural systems within the canyon.
- Trails and recreation developments may be constructed but will be designed to maintain the integrity of the natural and scenic setting.
- New non-motorized trails may be constructed to facilitate recreation uses in the canyon.

- Grazing will be used strategically to manage fuels and to support overlapping grazing allotment management.
- Off-road use will be eliminated by a Travel Management decision. Most unauthorized roads currently occurring within the canyon will not be brought into the official Forest Service Road System.
- A backcountry experience will be the focus of future management. Some wilderness characteristics may be compromised to reduce the impacts of recreation uses on the riparian area and other sensitive habitats.
- The cottonwood picnic area will continue to be accessible by motor vehicle until it is evaluated through the Travel Management process and a final determination is made as to its status.

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## Appendix A: Process Consistency

The Wilderness Act of 1964 defines wilderness as:

A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this chapter an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historic value.

The Forest Service directives (FSH 1909.12, Chapter 70) describe the process and documentation for identifying and evaluating potential wilderness in the National Forest System.

### **Inventory**

The Canadian River Potential Wilderness Area is the only potential wilderness area on the Kiowa, Rita Blanca, Black Kettle and McClellan Creek National Grasslands based on criteria in FSH 1909.12, Chapter 71. The High Lonesome area of the Rita Blanca National Grassland was evaluated during the inventory phase and eliminated based on the criteria for wilderness inventories on grasslands which states that potential wilderness areas may have no more than one mile of interior fence per section<sup>9</sup>.

### **Capability**

In 1996 and 1997, an interdisciplinary planning team conducted a preliminary wilderness evaluation of all potential wilderness areas on the Cibola National Forest and Grasslands. Documents from this evaluation qualitatively described capability characteristics such as size (acres), access, remoteness, natural integrity, apparent naturalness, solitude and other values. In December 2006, a new interdisciplinary team reviewed the original wilderness capability analysis and updated it, considering new information, changed conditions and new evaluation criteria. The 2006 review process included ranking the potential wilderness area as having high, medium, or low wilderness potential based on capability factors (from 1992 wilderness evaluation directives). Those factors and ratings were updated by the ID Team in March 2007 to consider criteria in FSH 1909.12, Chapter 70 (2007).

### **Availability**

In December 2006, an interdisciplinary team ranked the area as high, medium or low for wilderness availability, based on a set of factors adapted from 1992 directives, they were subsequently updated to be consistent with the 2007 directives and Regional guidance.

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<sup>9</sup> FSH 1909.12, Chapter 70, Section 71.11 (5)(b)

Availability characteristics evaluated include recreation, including tourism; wildlife species populations and management needs; water availability and use; livestock operations; timber; minerals; cultural resources; authorized and potential land uses; management consideration including fire, insects and disease, and presence of non-Federal lands.

### **Need**

FSH 1909.12, Chapter 70, Section 72.31 requires that the evaluation of need consider, at a minimum the following factors:

1. The location, size, and type of other wildernesses in the general vicinity and their distance from the proposed area. Consider accessibility of areas to population centers and user groups. Public demand for wilderness may increase with proximity to growing population centers.
2. Present visitor pressure on other wildernesses, the trends in use, changing patterns of use, population expansion factors, and trends and changes in transportation.
3. The extent to which non-wilderness lands on the NFS unit or other Federal lands are likely to provide opportunities for unconfined outdoor recreation experiences.
4. The need to provide a refuge for those species that have demonstrated an ability to survive in less than primitive surroundings or the need for a protected area for other unique scientific values or phenomena.
5. Within social and biological limits, management may increase the capacity of established wildernesses to support human use without unacceptable depreciation of the wilderness resource.
6. An area's ability to provide for preservation of identifiable landform types and ecosystems. Consideration of this factor may include utilization of Edwin A. Hammond's subdivision of landform types and the Bailey-Kuchler ecosystem classification. This approach is helpful from the standpoint of rounding out the National Wilderness Preservation System and may be further subdivided to suit local, subregional, and regional needs.

These directives also require the Forest Service to demonstrate need through the public involvement process, including input on the evaluation report. Public participation began in October 2007.

# Appendix B: Capability Evaluation and Rankings for the Canadian River PWA

## Capability Characteristics

### *Natural*

#### 1. Presence of non-native species

High - Non-native species are not evident

Medium – Non-native species are evident in isolated spots.

Low - Non-native species are common or scattered throughout the area.

Rating: Low – Tamarisk or salt cedar dominates most of the riparian vegetation. and non-native Barbary sheep were introduced into the canyon decades ago.

#### 2. Rivers within the Potential Wilderness Area are in free-flowing condition

High - Rivers within the area are considered free-flowing

Medium – Some rivers have impoundments or other issues that affect their free-flowing character.

Low – Rivers within the area are seasonal or heavily impacted by impoundments.

Rating: High – The only river within the area is an eligible Scenic River and meets the criteria of free-flowing. A major water impoundment to the north of the canyon could affect the amount of natural flow in the area.

#### 3. Quality of night-sky as affected by light pollution

High – The night sky is clear with little to no interference from light pollution.

Medium – Some stars are visible and there is moderate degradation from light pollution

Low – Few stars are visible at night and the presence of light pollution is evident

Rating: High – lights from Las Vegas and other nearby towns are not evident in the canyon.

#### 4. Presence of pollutants that degrade water

High – All rivers have been sampled and there are no water quality issues.

Medium – There are no known water quality issues within the area but the entire river has not been sampled.

Low – There are rivers within the area that are listed on the State Impaired Waters List (303d)

Rating: Medium- The segment within the potential wilderness boundary is not listed but the segments up and downstream from the area are listed as impaired for nutrients, air to water deposition of mercury, and eutrophication possibly caused by phosphorous levels. The segment of the Canadian River within the PWA has not been tested for the pollutants for which the adjacent segments are impaired, which makes Medium the highest possible rating of the PWA.

5. Area provides elements of biological diversity and naturalness, including unique habitats, threatened or endangered species, or rare plants and wildlife,

High - Has critical or unique habitats and diverse ecological conditions.

Medium - Has a mix of habitats and ecological conditions.

Low - Has limited ecological conditions and habitats.

Rating: Medium - Based on the supporting ecological conditions and the mix of habitats including; riverine, riparian, wetland, grassland, woody scrub shrub, and forest, the Canadian PWA is host to a diversity of wildlife. A unique habitat found between the riparian area and the talus slopes supports the rare plant, horrid herrickia.

6. Area contains a variety of natural resources, including a variety of tree species and structures; for example, intermingled grasslands or meadows, numerous recreation opportunities, diversity of wildlife habitats, and wildlife, etc.

High - Diverse amount of natural resources

Medium - Mixed amount of natural resources

Low - Limited amount of natural resource diversity

Rating: High – This area is unique to the southern Great Plains area but may not be unique for river canyons of the Southwest. Diversity of vegetation is the key natural feature. It varies from riparian areas, grass meadows, mountain shrub, piñon-juniper, cottonwood and willow galleries, and ponderosa pine. Fishing hunting, wildlife viewing, photography, and hiking are the available recreation opportunities. Combination of riparian, upland and aquatic including forested areas is unique to the Great Plains. Cliff and caves habitat provides bat roosting, raptor nesting. Rare plants are present.

*Undeveloped*

7. Area has current or past evidence of human activity

High - Little or no evidence of human activity

Medium - Unnoticeable or unobjectionable human activity

Low - Obvious evidence of human activity

Rating: Low – There are many user-created roads and standing structures in the canyon. There is a campground, interpretive sites and structures to control motorized use. Although these features are technically outside of the PWA boundary, they are prominent. There is a bridge and a concrete ford river-crossing. There is a high density of roads per square mile which are used for access for camping, boating, livestock management, forest product retrieval and general recreation. Chainsaws and motorized vehicles can be clearly heard when used in the canyon or near the rim. There is little opportunity for primitive and unconfined recreation opportunities.

*Outstanding Opportunities for Solitude or Primitive and Unconfined Recreation*

8. Area provides physically and mentally challenging recreation opportunities that promote adventure and self-reliance

High – Most of the area provides challenging recreation opportunities

Medium- Only some parts of the area has the potential for challenging recreation opportunities.

Low – Few parts of the area can provide challenging recreation opportunities.

Rating: Medium - The sides of the canyon may provide opportunities but the canyon bottom does not provide challenge.

9. Opportunity to experience solitude and isolation from human activities while recreating in the area

High - Feeling of being alone or remote from civilization

Medium – Feeling of being alone is possible but signs of civilization are likely.

Low – Little opportunity of feeling alone.

Rating: Medium – It is possible to find areas of the canyon upstream which provide a sense of solitude. In general, the remoteness of the canyon from highways and major cities contributes to its opportunities for solitude. However, the central part of the canyon has several developed activities which, though excluded from the potential wilderness boundary, are likely to affect the experience of visitors. In the downstream portion of the area, there are several adjacent private land in-holdings and uses that impact the visitor experience.

10. Opportunity to engage in primitive and unconfined recreation such as back-packing, kayaking, hunting, fishing, etc.

High – There are many opportunities for engaging in primitive recreation

Medium – There are some opportunities for engaging in primitive recreation

Low – There are few to no opportunities for engaging in primitive recreation

Rating: Medium - A person could experience short-term solitude, self-reliant hiking and climbing away from the main roads, campground, and interpretive sites, within the PWA. However, the roads, trails, and developed facilities in the canyon detract from the primitive and challenging nature of recreation in the area. The small size of the area and the presence of the developed campground limit opportunities for long primitive back-packing trips. Sounds from the developed campground, the excluded roads and adjacent land uses also have the potential to impact the experience of solitude within the PWA.

### *Special Features and Values*

11. Area contains outstanding or distinct features like rock formations, panoramic views, etc.

High - Many distinct features

Medium - Some distinct features

Low - One or no distinct features

Rating: High - Unique to the southern Great Plains area but may not be unique for river canyons of the Southwest. High scenic quality with high red sandstone cliffs, rock cliffs, caves and panoramic views of the canyon along the rim are notable.

12. Area has potential for scientific research, environmental education, or historic/cultural opportunities.

High - Good potential for two or more opportunities

Medium - Potential for one type of opportunity

Low - Little or no potential for this type of opportunity

Rating: Medium - The area rates low for education and research but high for historic and cultural resources. The area is important to Native American tribes. There are historic and prehistoric archaeological sites that are important to the local history. Mills Orchard and Ranch structures are eligible for the National Register, although they are technically outside the PWA.

13. Area contains unique rare species of plants and/or animals.

High – area has several unique or rare plants and/or animals

Medium – area has a few unique or rare plants and/or animals

Low – area has no unique or rare plants and/ or animals

Rating: Medium – Based on the supporting ecological conditions and the mix of habitats including; riverine, riparian, wetland, grassland, woody scrub shrub, and forest, the Canadian PWA is host to a diversity of wildlife. A unique habitat found between the riparian area and the talus slopes supports the rare plant, horrid herrickia.

### *Manageability*

14. Ability to manage the area in an unroaded condition, including distance and influence from outside activities; opportunity to access the area; and resource conflicts or encumbrances.

High - Isolated from areas of activity; controlled or limited access; no encumbrances or resource conflicts

Medium - Somewhat isolated from areas of activity; adequate access opportunities; some resource conflicts and/or encumbrances

Low – Areas of activity are nearby; many access opportunities; many resource conflicts and/or encumbrances

Rating: Low - Managing the PWA in an unroaded condition that protects the wilderness character would require closing existing and frequently used roads and dealing with access issues from the private and State Trust Lands adjacent to and within the area. The shape of the PWA creates three portions of the canyon that are not large enough to be a stand alone PWA and which are divided by areas heavily impacted by human activities. There is also a historic pattern of motorized use that would have to be changed. The area has a fragmented land ownership pattern.

15. Motorized use within the area

Yes - Has motorized vehicle use

No - Does not have any motorized vehicle use

Rating: Yes – There is an average density of 2.8 miles per square mile of road in the canyon, most of which are user-created roads. OHV use is common within the Potential Wilderness Area.

<b><i>Overall Capability: Medium</i></b>
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## Appendix C: Availability Evaluation and Rankings for the Canadian River PWA

The determination of availability is conditioned by the value and need for the wilderness resource compared to the value and need for other resources.

### Availability Characteristics

#### *Recreation, including Tourism*

1. Areas having such unique recreational characteristics or natural phenomena that general public access should be developed to facilitate public use and enjoyment.

High - Does not exist or minimal development will be provided.

Medium - Requires minor development or improvement that does not qualify as a developed recreation site but is a higher development level than is normally found within wilderness.

Low - Has a developed recreation site or features that warrant construction of developed recreation site.

Rating: Low - Has developed recreation site and other developed features. There is an interpretive site as well. There has been a developed campground in the canyon that pre-dates FS acquisition. Major facility reconstruction projects (camp and picnic sites) were completed in 2009, however interpretive work is ongoing. As stated previously these developments are technically outside the PWA boundary. The area included within the PWA is part of the economic development strategy for Harding County, which promotes the area as a developed recreation opportunity along La Frontera del Llano Scenic Byway.

#### *Wildlife Species, Populations and Management Needs*

2. Areas needing management for wildlife or aquatic animals that might conflict with wilderness management.

Low - Intense management (motorized equipment: helicopters, chainsaws, broadcast burning) and frequent entries (= or <5 yrs).

Medium - Management requiring helicopters but no motorized equipment on the ground and frequency is generally less than 10 years.

High - Low management requirements with no motorized equipment required to meet objectives and infrequent entries.

Rating: Low - Large equipment is needed to restore wildlife habitat including the implementation of broadcast burns and the removal of exotic trees (salt cedar) using chainsaws and large mechanized equipment to restore riparian habitat.

#### *Water Availability and Use*

Areas that are of high value for water yield; or on-site storage where installation and maintenance of improvements may be required.

Low - Identified impoundment that will have an effect on wilderness characteristics.

Medium - Minor improvements will have an affect.

High - No impoundment needed.

Rating: Medium - There are State municipal impoundments along the river but no impoundments are needed within the Potential Wilderness Area boundary.

#### *Livestock Operations*

4. Areas used for livestock grazing that would conflict with wilderness management.

Yes – Livestock grazing would have an effect on wilderness characteristics.

No – Livestock grazing is consistent with wilderness values.

Rating: No - There are three grazing allotments within the PWA boundary. Livestock grazing is considered consistent with wilderness values. Some allotments are currently un-obligated (2011).

#### *Timber*

5. Areas containing commercially valuable (harvestable) timber.

Yes - There is commercially valuable timber within the boundary.

No - There is no commercially valuable timber within the boundary.

Rating: No - There is no commercially suitable timber within the PWA boundary

#### *Minerals*

6. Areas of high value mineral deposits of economic or strategic importance.

Yes - There are high value mineral deposits within the boundary.

No - There are no known high value mineral deposits within the boundary.

Rating: No – The Reasonably Foreseeable Development Scenario for the Kiowa-Rita Blanca National Grasslands shows that the area has no potential for mineral extraction in the foreseeable future.

#### *Cultural Resources*

7. Cultural resources requiring protection or maintenance that might conflict with wilderness values.

Low – location, access and routine maintenance of historical structures will have an effect on wilderness characteristics

Medium – Minor improvements will have an effect because of

High – No maintenance required

Rating: Low - The area contains the remaining historic structures from the Melvin W. Mills Orchard and Ranch, which is technically outside the PWA boundary. The standing historic adobe structures within the PWA have been stabilized and will likely require future maintenance to retain their integrity.

*Authorized and Potential Land Uses*

8. Lands committed through contracts, permits, or agreements that would be in conflict with wilderness management. Foreseeable permits for recreation, education or similar uses would not detract from wilderness qualities.

High - Current authorizations do not conflict with potential wilderness.

Medium - Current authorization but can be terminated or there is long term authorization or commitment but does not require motorized equipment for access or maintenance.

Low - Currently exists, must be retained (long term commitment), and requires motorized equipment for access or maintenance.

Rating: High – Currently, there are range permits only and they do not conflict.

*Management Considerations including Fire, Insects, and Disease, and Presence of Non-federal Lands*

9. Area needing active vegetative restoration activity due to specific species survival (such as White Bark Pine restoration), or identifiable fuel reduction activity to reduce the risk of catastrophic wildfire, or known areas of severe insect infestation that will lead to heavy tree mortality. Forest Service does not have sufficient control to prevent development of irresolvable, incompatible uses that would lessen wilderness character and potential.

Low - The need for vegetation restoration is a higher priority and requires long-term management and mechanized or motorized equipment

Medium - Areas needing high intensity management activities for a short time period (< or = 5 yrs). These areas could be available for wilderness after those activities are completed (like fuel reduction activities). Some intense restoration work over small areas could be accomplished without conflicting with wilderness management (species conservation work not requiring motorized equipment).

High - The area needs little vegetative restoration.

Rating: Low - In the canyon bottom, burning is needed to mimic natural fire regimes to reduce fuel loads and restore the hydrological function by reducing piñon juniper and cholla intrusion onto the flood plain. The area's topography makes it unsafe for firefighters to conduct a prescribed fire without mechanized equipment and motorized access. Management of fires in the canyon is essential to protect adjacent private land. Salt cedar management along the river is also an

important vegetative treatment. The Forest Service needs to obliterate and rehab existing roads for watershed protection, which requires motorized vehicles and machinery. There are State and private in-holdings, and very little federal land surrounding the area.

**Overall Availability Rating: Medium**

## Appendix D: Need Evaluation

### Designated Wilderness Areas within 250 miles of Canadian River Potential

#### Wilderness Area

<b>Wilderness Area</b>	<b>Acres</b>
Apache Kid Wilderness	44,887
Bandelier Wilderness	25,060
Bisti/De-Na-Zin Wilderness	41,363
Bosque del Apache Wilderness	31,753
Buffalo Peaks Wilderness	40,650
Capitan Mountains Wilderness	35,698
Cebolla Wilderness	66,514
Chama River Canyon Wilderness	49,253
Collegiate Peaks Wilderness	175,357
Cruces Basin Wilderness	18,946
Dome Wilderness	4,191
Fossil Ridge Wilderness	31,443
Great Sand Dunes Wilderness	32,846
Greenhorn Mountain Wilderness	23,545
Holy Cross Wilderness	128,752
Hunter-Fryingpan Wilderness	76,408
La Garita Wilderness	128,726
Latir Peak Wilderness	21,706
Lizard Head Wilderness	42,599
Lost Creek Wilderness	117,557
Manzano Mountain Wilderness	35,050
Maroon Bells-Snowmass Wilderness	185,271
Mesa Verde Wilderness	8,611
Mount Evans Wilderness	76,716
Mount Massive Wilderness	24,828
Mount Sneffels Wilderness	16,928
Pecos Wilderness	220,088
Powderhorn Wilderness	61,092
Raggeds Wilderness	71,088
Sabinoso Wilderness	16,030
Salt Creek Wilderness	10,981
San Pedro Parks Wilderness	41,107
Sandia Mountain Wilderness	36,768
Sangre de Cristo Wilderness	162,310
South San Juan Wilderness	171,364
Spanish Peaks Wilderness	19,339
Uncompahgre Wilderness	103,835
Weminuche Wilderness	477,877
West Elk Wilderness	181,871
West Malpais Wilderness	37,878
Wheeler Peak Wilderness	20,385
White Mountain Wilderness	45,779
Withington Wilderness	18,996

**Designated Wilderness Areas with Similar Topography and Vegetative Cover to Canadian River Potential Wilderness Area**

<b>Wilderness Area</b>	<b>Agency</b>	<b>State</b>	<b>Acres</b>
Absaroka-Beartooth Wilderness	FS	MT-WY	899,562
Aldo Leopold Wilderness	FS	NM	206,904
Alpine Lakes Wilderness	FS	WA	392,440
Anaconda Pintler Wilderness	FS	MT	146,146
Ansel Adams Wilderness	FS	CA	227,911
Arc Dome Wilderness	FS	NV	118,341
Bandelier Wilderness	NPS	NM	25,060
Black Canyon of the Gunnison Wilderness	NPS	CO	15,857
Black Canyon Wilderness	FS	OR	11,683
Black Canyon Wilderness	NPS	AZ-NV	43,687
Black Ridge Canyons Wilderness	BLM	CO-UT	75,577
Bob Marshall Wilderness	FS	MT	996,589
Boulder River Wilderness	FS	WA	50,352
Bridger Wilderness	FS	WY	423,874
Buffalo Peaks Wilderness	FS	CO	40,649
Cabinet Mountains Wilderness	FS	MT	87,001
Cache La Poudre Wilderness	FS	CO	11,184
Carlsbad Caverns Wilderness	NPS	NM	28,147
Carson-Iceberg Wilderness	FS	CA	190,295
Cedar Bench Wilderness	FS	AZ	16,604
Colonel Bob Wilderness	FS	WA	32,502
Comanche Peak Wilderness	FS	CO	74,287
Desolation Wilderness	FS	CA	64,590
Dinkey Lakes Wilderness	FS	CA	101,475
Domeland Wilderness	FS-BLM	CA	98,260
Eagle Cap Wilderness	FS	OR	354,490
Eagles Nest Wilderness	FS	CO	139,392
Emigrant Wilderness	FS	CA	111,877
Encampment River Wilderness	FS	WY	11,846
Flat Tops Wilderness	FS	CO	242,018
Four Peaks Wilderness	FS	AZ	60,558
Frank Church-River of No Return Wilderness	FS	ID	449,878
Gila Wilderness	FS	NM	559,118
Glacier Peak Wilderness	FS	WA	558,938
Golden Trout Wilderness	FS	CA	333,980
Gospel-Hump Wilderness	FS	ID	199,406
Granite Chief Wilderness	FS	CA	25,824
Great Bear Wilderness	FS	MT	256,070
Greenhorn Mountain Wilderness	FS	CO	23,545
Gros Ventre Wilderness	FS	WY	281,131
Gunnison Gorge Wilderness	BLM	CO	17,665
Hells Canyon Wilderness	FS-BLM	ID-OR	226,620
Henry M. Jackson Wilderness	FS	WA	103,097
High Uintas Wilderness	FS	UT	423,974
Hunter-Fryingpan Wilderness	FS	CO	76,408

<b>Wilderness Area</b>	<b>Agency</b>	<b>State</b>	<b>Acres</b>
Jarbridge Wilderness	FS	NV	110,541
John Muir Wilderness	FS	CA	521,771
Kalmiopsis Wilderness	FS	OR	178,552
Lake Chelan-Sawtooth Wilderness	FS	WA	151,494
Lee Metcalf Wilderness	FS-BLM	MT	131,003
Lizard Head Wilderness	FS	CO	42,598
Marble Mountain Wilderness	FS	CA	221,167
Maroon Bells-Snowmass Wilderness	FS	CO	185,270
Mazatzal Wilderness	FS	AZ	249,157
Mesa Verde Wilderness	NPS	CO	5,310
Mission Mountains Wilderness	FS	MT	72,096
Mokelumne Wilderness	FS	CA	88,592
Monarch Wilderness	FS	CA	45,875
Monument Rock Wilderness	FS	OR	20,139
Mount Baker Wilderness	FS	WA	121,624
Mount Skokomish Wilderness	FS	WA	13,608
Mount Timpanogos Wilderness	FS	UT	10,320
Mount Zirkel Wilderness	FS	CO	165,646
Norse Peak Wilderness	FS	WA	54,476
North Fork Wilderness	FS	CA	7,978
Opal Creek Wilderness	FS	OR	34,937
Paiute Wilderness	BLM	AZ	89,596
Pasayten Wilderness	FS	WA	536,565
Pecos Wilderness	FS	NM	220,087
Platte River Wilderness	FS	CO-WY	25,211
Popo Agie Wilderness	FS	WY	103,510
Rawah Wilderness	FS	CO	78,207
Salt River Canyon Wilderness	FS	AZ	32,073
San Gabriel Wilderness	FS	CA	35,188
San Geronimo Wilderness	FS-BLM	CA	115,195
San Rafael Wilderness	FS	CA	195,018
Sawtooth Wilderness	FS	ID	215,510
Scapegoat Wilderness	FS	MT	235,043
Selway-Bitterroot Wilderness	FS	ID-MT	3,120,935
Sequoia-Kings Canyon Wilderness	NPS	CA	688,423
Sheep Mountain Wilderness	FS	CA	36,720
Siskiyou Wilderness	FS	CA	154,753
South San Juan Wilderness	FS	CO	171,363
South Sierra Wilderness	FS	CA	29,413
Steens Mountain Wilderness	BLM	OR	144,913
Stephen Mather Wilderness	NPS	WA	682,080
Sycamore Canyon Wilderness	FS	AZ	58,873
Tatoosh Wilderness	FS	WA	15,332
Teton Wilderness	FS	WY	582,188
The Brothers Wilderness	FS	WA	17,339
Trinity Alps Wilderness	FS	CA	496,607
Uncompahgre Wilderness	FS	CO	99,260

<b>Wilderness Area</b>	<b>Agency</b>	<b>State</b>	<b>Acres</b>
Ventana Wilderness	FS	CA	239,989
Washakie Wilderness	FS	WY	659,274
Weminuche Wilderness	FS	CO	474,879
Wenaha-Tucannon Wilderness	FS	OR-WA	180,612
West Elk Wilderness	FS	CO	181,870
Wheeler Peak Wilderness	FS	NM	20,385
Winegar Hole Wilderness	FS	WY	12,529
Yolla Bolly-Middle Eel Wilderness	FS	CA	147,443
Yosemite Wilderness	NPS	CA	641,662

*FS = Forest Service*

*BLM = Bureau of Land Management*

*NPS = National Park Service*

## Appendix E: Species that Warrant Consideration

County	Scientific Name	Common Name	Taxon	Notes
Harding, NM	<i>Orconectes deanae</i>	Conchas Crayfish	Invertebrate crustacean	Occurs in the Canadian River in Mills Canyon.(Pittenger 2004). Species may be relatively intolerant of excessive deposition of fine-grained sediments and that watershed degradation and resulting stream siltation is likely a major determinant of habitat suitability. This could be a good species associated with an aquatic ecosystem characteristic (water quality). Pittenger, John. 2004. Distribution of the Conchas Crayfish in New Mexico, Internal rept. NM Dept. of Game and Fish.
Harding, NM	<i>Euphorbia strictior</i>	Panhandle Spurge	Plant	NatureServe Global Status Last Reviewed: 21Mar1999 Habitat Comments: Plains and hills; often in disturbed soils in rights-of-way, sandy limestone soils, in pinyon-juniper woodland or juniper savannah. Infrequent in sandy areas of the short grass plains
Harding, NM	<i>Herrickia horrida</i>	Horrid Herrickia	Plant	Sept 07 removed from Forest Sensitive Species list NatureServe Global Status Last Reviewed: 10Sep1997 Locally common where it occurs in northern New Mexico (P. Knight 1996). Comments: The known distribution in New Mexico is Mora, Cofax, and Harding
Harding, NM	<i>Packera spellenbergii</i>	Spellenberg's Groundsel	Plant	Sept 07 Forest Service Sensitive Species list NatureServe Global Status Last Reviewed: 24Dec1997 Habitat Comments: High plains, shortgrass prairie. On nearly barren, white calcareous knolls. Associated with alpine fever-few ( <i>Parthenium alpinum</i> ).
Harding, NM	<i>Buteo albonotatus</i>	Zone-tailed hawk	Bird	Zone-tailed hawks occur in canyons in pine-oak, evergreen, and riparian woodlots at lower (2800 - 5500 ft) to middle (5000 - 7500 ft) elevations. Desert Riparian Deciduous Woodland, Marsh. Woodlands, especially of cottonwoods, that occur where desert streams provide sufficient moisture for a narrow band of trees and shrubs along the margins.
Union, NM	<i>Gastrophryne olivacea</i>	Great Plains narrowmouth toad	Amphibian	NatureServe Global Status Last Reviewed: 24Oct2001 Found in supposed mutualistic association with tarantulas in some areas. Riverine Habitat(s): CREEK, Pool Palustrine Habitat(s): TEMPORARY POOL Terrestrial Habitat(s): Cropland/hedgerow, Desert, Grassland/herbaceous, Savanna, Shrubland/chaparral, Suburban/orchard, Woodland - Conifer, Woodland - Hardwood, Woodland - Mixed

County	Scientific Name	Common Name	Taxon	Notes
				<p>Special Habitat Factors: Benthic, Burrowing in or using soil, Fallen log/debris</p> <p>Habitat Comments: This species inhabits semi-arid and arid lowlands such as mesquite and shrublands. It is also known from grasslands, rocky wooded hills, marsh edges, near springs, streams, and rain pools, river floodplains, scrub desert, and cultivated fields. It hides in rotten logs and stumps, burrows, and under rocks and other cover when inactive. Eggs and larvae develop in temporary pools formed by heavy rains and larger ponds that dry up in some years.</p> <p>Bison M NEW MEXICO 1988: Although the Great Plains narrowmouth toad was abundant over much of its range (Behler and King 1979), in New Mexico the species was very localized and apparently of very low population density (Degenhardt 1986). The single specimen known from the state was a calling male found in a flooded roadside ditch in 1986 (Degenhardt 1986). The characteristic call of this species had been recorded previously in the same vicinity, although no specimens were obtained at the time (Degenhardt pers. Comm.) (NMDGF, 1988)*17*.</p> <p>1995: This species was very rare and/or very limited in distribution and was in need of special consideration in NM (Painter, 1995)*31*.</p> <p>2000: A specimen of the Great Plains narrowmouth was discovered at Kiowa National Grasslands, Union County in New Mexico (Moriarty et al., 2000) *46*. 46 - Moriarty, Emily C., Suzanne L. Collins, and Joseph T. Collins. 2000. <i>Gastrophryne Olivacea</i> (Great Plains Narrowmouth). <i>Herpetological Review</i> 31(1).</p>
Colfax, NM	<i>Haliaeetus leucocephalus</i>	Bald eagle	Bird	<p>Sept 07 not retained on Forest Sensitive Species list NatureServe Global Status Last Reviewed: 11Mar2005 Bison M The species is primarily water-oriented, and the majority of the populations occurring in New Mexico are found near streams and lakes. 24 - New Mexico Department of Game and Fish (Santa Fe, NM 87503). 1988. Handbook of Species Endangered in New Mexico, F-180:1-2. Beverly said to add it from Forest Sensitive List 03/05/2008</p>

County	Scientific Name	Common Name	Taxon	Notes
Harding, NM	<i>Rana blairi</i>	Plains Leopard Frog	Amphibian	Sept 07 Forest Sensitive Species List
Mora and Harding, NM	<i>Thamnophis proximus diabolicus</i>	Arid land ribbon snake	Reptile	Jim Stuart NMGF 6/24/08 Canadian River Mills Canyon, Sauz creek, historical observation on dry Cimmaron outside of admin. Boundary
Colfax, NM	<i>Poanes hobomok wetona</i>	Hobomok Skipper	Insect	NatureServe Global Status Last Reviewed: 27Apr2007  Palustrine Habitat(s): Bog/fen, Riparian  Terrestrial Habitat(s): Forest Edge, Woodland - Conifer, Woodland - Mixed  Habitat Comments: Habitat presumed to be similar to rest of the species, that is cool, grassy openings, edges. etc., often along streams and also boggy wetlands in generally wooded terrain. Probably not generally in grasslands away from wooded areas. 06/04/2008 <a href="http://www.butterfliesandmoths.org/species?l=2114">http://www.butterfliesandmoths.org/species?l=2114</a> Caterpillar hosts: Various grasses including panic grasses ( <i>Panicum</i> ) and bluegrasses ( <i>Poa</i> ). Adult food: Nectar from flowers including common milkweed, henbit, viper's bugloss, and blackberry. Habitat: Openings and edges of damp woods, edges of bogs, light gaps along streams
Harding, Mora, and Colfax, NM	<i>Phenacobius mirabilis</i>	Suckermouth minnow	Fish	NatureServe Global Status Last Reviewed: 17Sep1996 David Propst indicates that suckermouth minnow, state threatened, is found within the Canadian River in Mills Canyon. Steve Platania, UNM, is now doing surveys and could provide point information. Threats are excessive sedimentation of run habitats, habitat desiccation and habitat fragmentation (NMDGF. Threatened and Endangered Species of NM, 2006 Biennial Review. June 2006 – available on Dept. website <a href="http://wildlife.state.nm.us/conservation/threatened_endangered_species/index.htm">http://wildlife.state.nm.us/conservation/threatened_endangered_species/index.htm</a> )

County	Scientific Name	Common Name	Taxon	Notes
				<p>Riverine Habitat(s): BIG RIVER, CREEK, Low gradient, MEDIUM RIVER, Moderate gradient, Riffle</p> <p>Special Habitat Factors: Benthic</p> <p>Habitat Comments: Plains species tolerant of moderate turbidity; runs and riffles of creeks and small to medium (sometimes large) rivers with substrates ranging from sand and gravel to large boulders (Sublette et al. 1990, Page and Burr 1991). Spawns presumably over gravelly riffles.</p> <p>BisonM 07/25-2007 In New Mexico, it appears never to have been common, and the reduction of surface flows is likely to have diminished the range in the state (Propst et al. 1985). However, in stream reaches in which it occurs, its populations have appeared fairly stable (NMDGF, 1988)*01*.</p> <p>1994/1996: The suckermouth minnow was probably secure in much of its native range. On the fringes of its native range, its populations had declined (NMDGF, 1994)*11*; (NMDGF, 1996)*12*.</p> <p>1996: Little information was available to accurately describe its status in the Canadian River in New Mexico. Available records indicate it was uncommon and surveys of the Mills Canyon reach of the Canadian River in 1994 and 1995 failed to collect the species (NMDGF, 1996)*12*.</p> <p>12 - New Mexico Department of Game and Fish, Spring 1996. Threatened and Endangered Species of New Mexico -- 1996 Biennial Review and Recommendations. Authority: Wildlife Conservation Act (NMSA 17-2-37 through 17-2-46, 1978).</p>
Harding, Mora, and Colfax, NM	<i>Astragalus wittmannii</i>	One-flowered Milkvetch	Plant	<p>Sept 07 Listed on Forest Sensitive Species list</p> <p>Grows on Outcrops of Greenhorn limestone, limestone knolls and hills in open grassland ca. 6500 ft</p>

## Appendix F: Definition of Scales from the USDA Forest Service's National Hierarchical Framework of Ecological Units

This framework describes ecosystems at two scales: the ecoregion and subregion.

Ecoregions are made up of three ecological units: domains, divisions and provinces.

Domains and Divisions are primarily defined by climate and are too broad for the purposes of this report.

Provinces are controlled primarily by continental weather patterns such as length of dry season and duration of cold temperatures and are also characterized by similar soil orders. Provinces are the highest division which accounts more specifically for extensive areas of similar potential natural vegetation (Cleland et al. 1997).

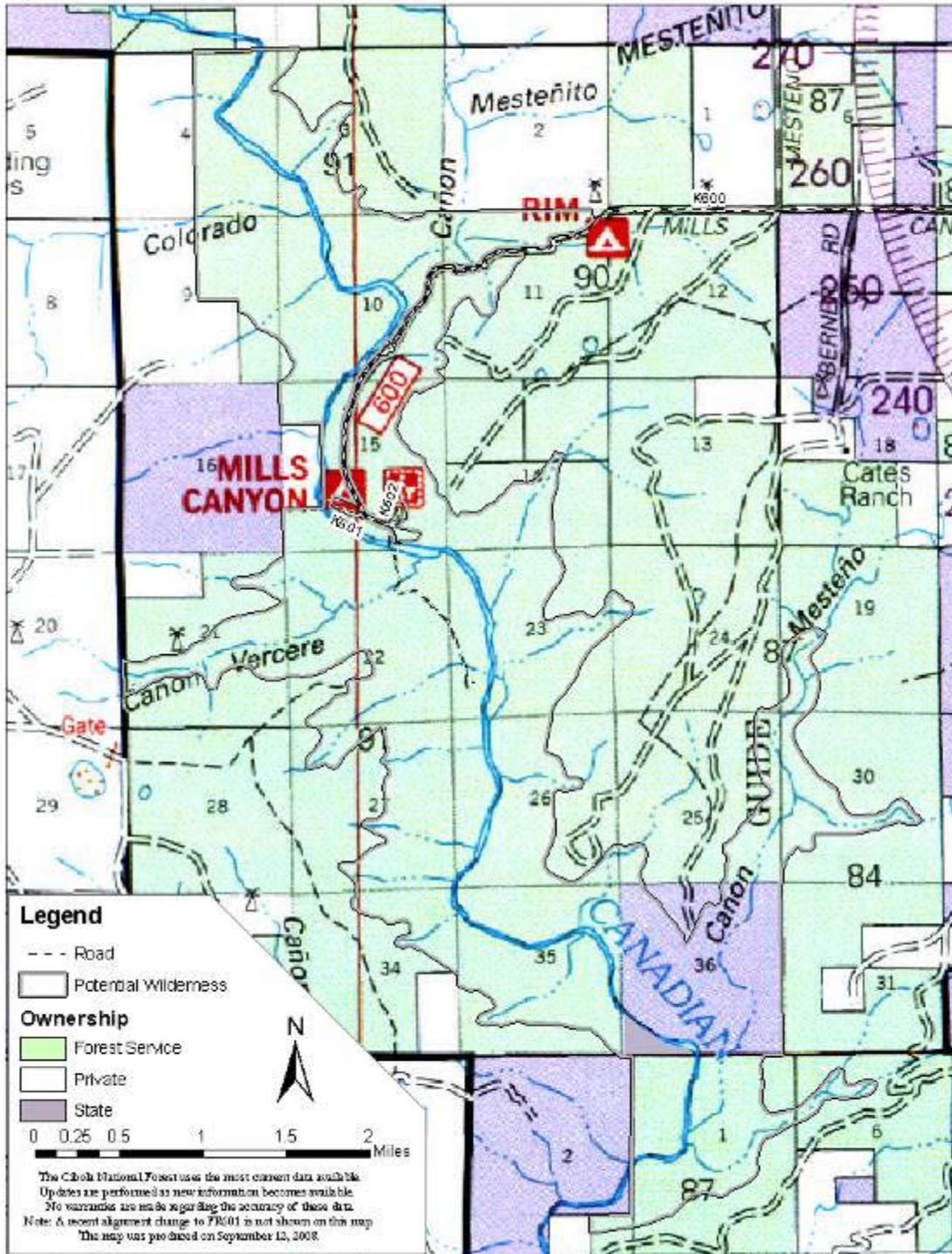
Subregions are characterized by combinations of climate, geomorphic process, topography, and stratigraphy that influence moisture availability and exposure to radiant solar energy, which in turn directly control hydrologic function, soil-forming processes, and potential natural community distributions. Sections and Subsections are the two ecological units mapped at this scale (Cleland et al. 1997).

“Sections are delineated primarily by evaluation and integration of physical and biological components including climate, physiography, lithology, soils, and potential natural communities....Sections are large land areas of relatively homogeneous physical and biological components that interact to form environments of similar productive capabilities, response to disturbances, and potentials for resource management.” (McNab 2007)

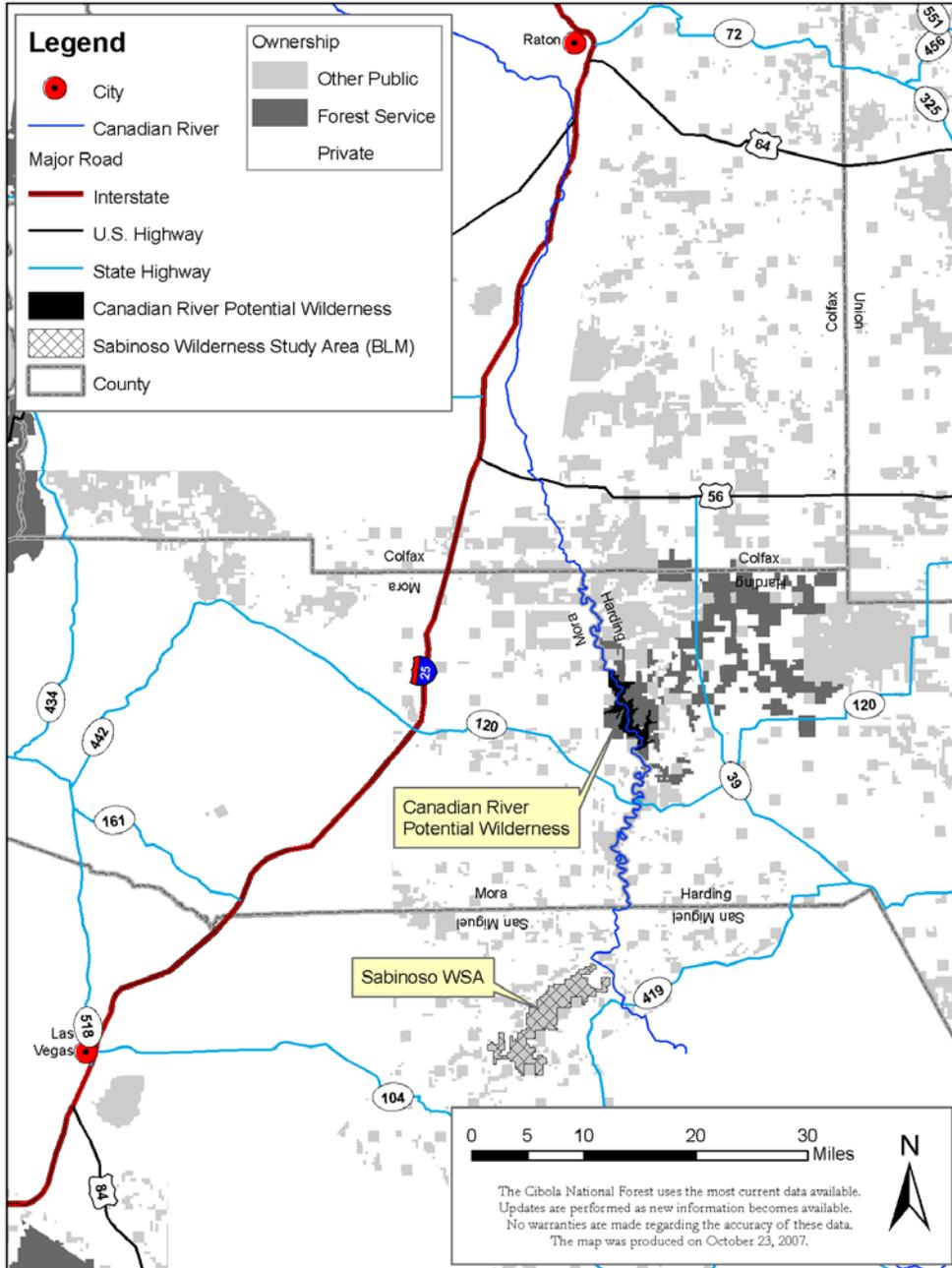
Subsections are smaller areas within a section that usually correspond to discrete changes in geomorphology (Cleland et al. 1997).

Ecoregions and subregions were originally delineated in 1980 and revised in 1995 and the Forest Service is currently working to refine these delineations. The new delineations for sections and subsections may not correspond precisely to the boundaries at the province level but their physical and biological features are described hierarchically. This report will For the purpose of this report, the *Description of “Ecological Subregions: Sections of the Conterminous United States”*: *First Approximations* (McNab 2007) and its associated maps will be used.

Map 1: Canadian River Potential Wilderness Area



# Map 2: Canadian River Potential Wilderness Area Vicinity Map



Map 3: Areas Visually Impacted by NFSR 600 and the Mills Canyon Campground within the Canadian River PWA

