

Title

White Rock Canyon and
its Riparian Areas

Authors

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Introduction

The arid Southwest is interrupted here and there by streams, springs, and seeps that harbor an entirely different flora from their immediate surroundings. White Rock Canyon below the Jemez Mountains' Pajarito Plateau west of Santa Fe is a particularly interesting example because it is at somewhat of a boundary between northern and southern and eastern and western native plants. As such it may represent the extreme extension of several species. The better-studied Bandelier National Monument immediately to the south would be a logical location for such a study were it not for the fact that its entire riparian region adjacent to the Rio Grande was deeply submerged by the high water behind Cochiti dam in the mid-1980s. Native plants in the splendid outflow areas of Frijoles and Alamo creeks were largely destroyed and replaced by invasive, weedy, and often non-native species. True, Bandelier contains good riparian habitat above the level of the flooding, but most of that is under ponderosa and so has a more forested character. To the north of White Rock Canyon the land has been increasingly disturbed by habitation. Thus, in addition to its rugged slopes, benches, and sand flats, White Rock Canyon between Ancho and Pajarito creeks is worth study as an example of open riparian habitat in the region.

Finally, given recent discussions about possible reintroduction of desert bighorn sheep into White Rock Canyon, it seems prudent to complete a floristic inventory of the area.

Overview of the Area

The White Rock Canyon Study Area (WRCSA) comprises the land bounded by the Rio Grande on the east, Pajarito Creek on the north, and Ancho Creek on the south, a distance along the river of approximately 3.0 miles (Figure 1). In addition to these two perennial creeks, the strip is crossed by several intermittent washes such as that from Water Canyon, and by a small spring 1/4 mile north of Water Canyon that maintains a narrow marshy riparian corridor of remarkable plant diversity. There are also several seeps (or at least moist areas) that support additional diversity. In addition to the riparian habitats, the area includes steep rocky slopes, broad mud and sand flats, bosques, gravelly hills and ravines (in two of these was found the plains species, *Dalea aurea*), and benches of interspersed lava rocks and soil, also supporting a characteristic variety of plant life. The lists in the table at the end of this report and in the appendix give some idea of this variety.

Access

The study area is roughly 850 ft below the rim of the canyon and is accessed by trails down to the two creeks: Pajarito (1.5 miles from Piedra Loop, La Senda) and Ancho (3.2 miles from State Route 4). The Pajarito springs trail is shown in Figure 2; and various trails to Ancho Rapids are shown in Figure 3. There are no easy routes between the rim and the Rio in between these trails. It is perhaps the remoteness of this area that has protected much of its plant life, although it is clear that the area was grazed for years until the late 1970s.

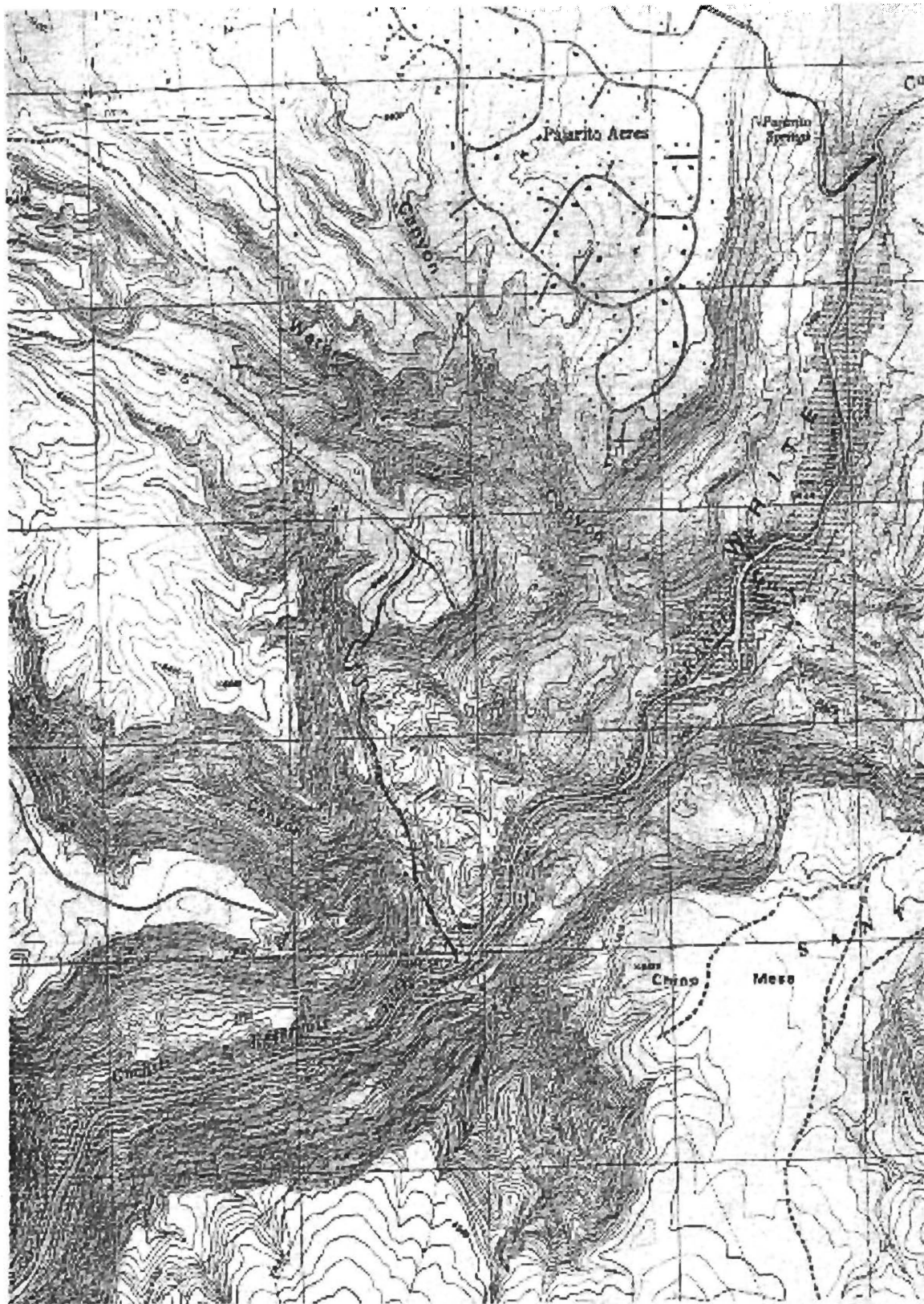


Figure 1. The WRCSA comprises the land bounded by the Rio Grande on the east, Pajarito Creek on the north, and Ancho Creek on the south, a distance along the river of approximately 3.0 miles.

Pajarito Spring and Creek

Pajarito spring flows from the bottom of a basalt cliff some 150 ft above and about 3/4 mile from the river. The area surrounding the spring is quite moist and produces a dense growth of trees (hackberry, box elder, cottonwood, coyote willow, privet, piñon, and juniper) and shade-loving plants (*Epipactis gigantea*, Grape-*Vitis arizonica*, *Oxypolis fendleri*, *Erigeron philadelphicus*, and others). The spring quickly becomes a sunny creek with many plants crowding in on it (*Rorippa nasturtium aquaticum*, *Helenium autumnale*, *Lobelia cardinalis*, *Bidens cernua*) and others responding to the general moist soil adjacent to it (*Draba reptans*, *Penstemon jamesii* and *barbatus*, *Androsace occidentalis*, and *Aster ericoides* and *commutatus*). At the Rio, where it was briefly submerged by Cochiti Lake, a new growth is evident (tamarisk, *Apocynum cannabinum*, *Baccharis salicinalemoryi* [the author is not aware of this shrub occurring along the Rio north of here]).

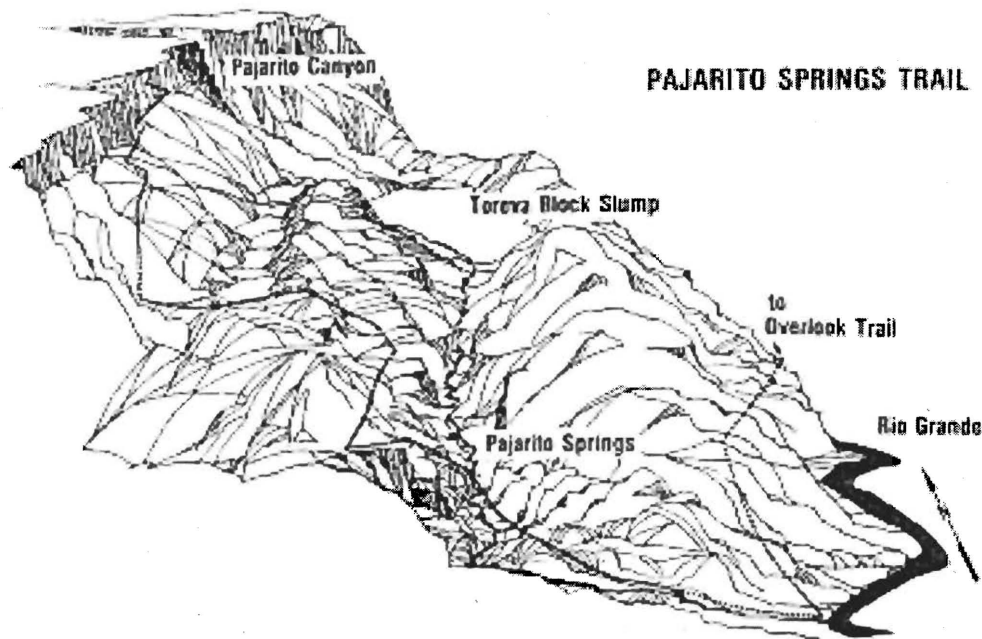


Figure 2. Pajarito springs trail.

Ancho Creek

This nearly perennial stream (perhaps truly perennial in its lower reaches as evidenced by the new beaver dam across it about 1/4 mile upstream from the Rio) begins about a mile in from the Rio (although its length varies with seasonal moisture). In the mid-1980s, Cochiti Lake inundated about 100 yards of flats at its confluence with the Rio Grande, which shows the result with dead juniper trees and broadcast disturbed-soil plants (*Descurania sophia*, *Lappula redowskii*, and others). Because of its generally high banks, the rest of the three-mile stretch of the Rio Grande was not flooded significantly and remains relatively untouched excepting for signs of Native American habitation and more recent cattle grazing.

Apparently no significant grazing has been done on this land for the past 15 years or so (although a few cattle seem to cross the Rio into it at low water).

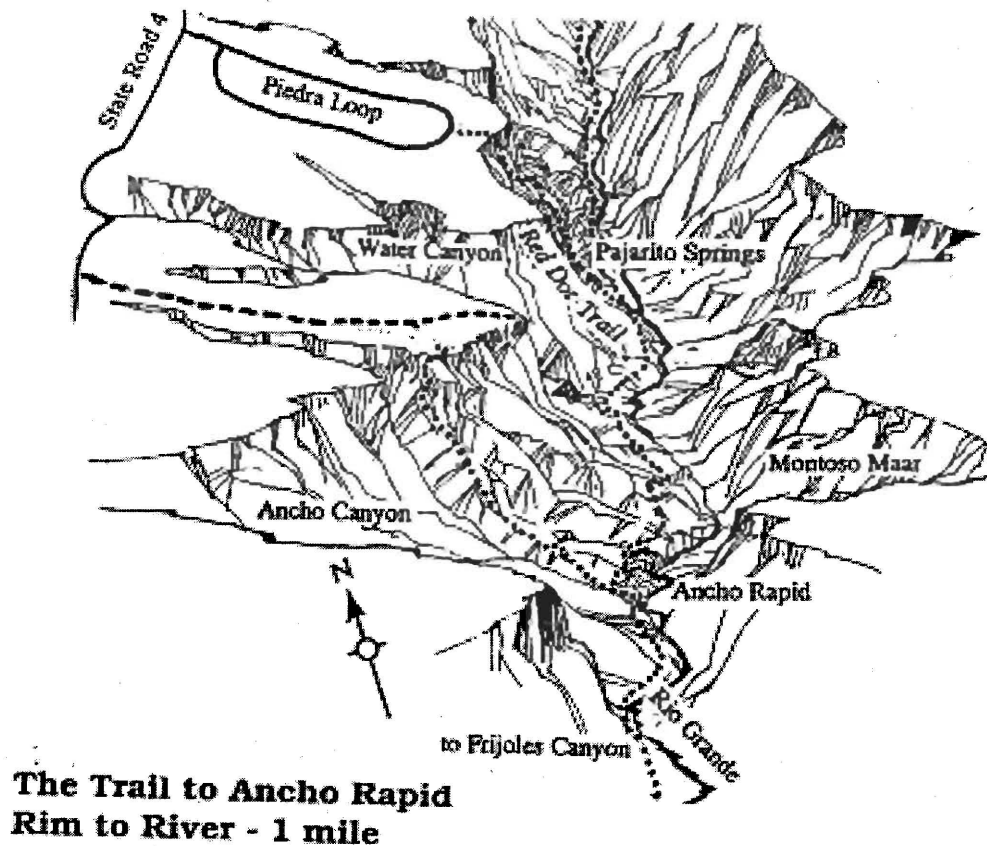


Figure 3. Various trails leading to Ancho Rapid.

Water Canyon Spring

About 1/4 mile north of the Water Canyon delta (and ephemeral stream) is a spring (not marked on Figure 1). It arises in a steep ravine about a few hundred yards from the Rio and flows in a nearly straight line to the river. For most of its length the water is obscured by a dense covering of plant life (*Rorippa nasturtium aquaticum*, *Veronica americana*, *Sisyrinchium demissum*, *Potentilla anserina*, *Juncus tenuis*, and others). This is perhaps the most interesting part of the WRCSA with its own special flora—an unlooked-for ribbon of green crossing sandy, semi-arid flats and harboring riparian species not seen along the other two streams.

Acknowledgments

Several people have helped with the plant survey. My wife, Yvonne, and Becky Shankland have accompanied me on several trips making suggestions, helping not only with plant identification, but photography and collecting. Mary and Steve Whitmore and Dave and Alice Fehlau went on the May 25th National Park Service hike. Finally, Roger Peterson and George Cox accompanied me on July 10. In addition to assistance with many species and nomenclature, they did all the identification of the grasses. The sketches of the canyon

topography were done by Dorothy Hoard and taken from her book, "Los Alamos Outdoors."

**General List of Native Plants occurring
at the
White Rock Canyon Study Site**

The list is divided into several sections: plants will be classified as occurring:

- in canyon habitat (C), well away from the creeks and subdivided into:

- sandy flats Cf
- steep hillsides Ch
- rock-dirt benches Cb

- near riparian (Nr), areas near the creeks probably influenced by the stream

- Ancho creek Nr-a
- Water Canyon spring Nr-s
- Pajarito creek Nr-p

- in riparian (R), species found in or immediately adjacent to the creeks themselves subdivided into areas along

- the Rio Grande Rr
- Pajarito creek Rp
- Water Canyon seep Rs (spring-fed, marshy area north of Water Canyon)
- Ancho creek Ra

Aceraceae			
<i>Acer</i>	<i>negundo</i>		Rp
Apiaceae			
<i>Oxypolis</i>	<i>fendleri</i>		Rp, Ra
Anacardiaceae			
<i>Rhus</i>	<i>radicans</i>		Rp
	<i>trilobata</i>		Cf, h, b
Asclepiadaceae			
<i>Asclepias</i>	<i>asperula</i>		Cf, b
	<i>invoucrata</i>		Cf
	<i>macrotis</i>		Ch
	<i>subverticulata</i>		Cf
	<i>englemanniana</i>		Rr
Asteraceae			
<i>Ambrosia</i>	<i>artemisifolia</i>		
<i>Ambrosia</i>	<i>psilostachya</i>	Cf	
<i>Artemisia</i>	<i>bigelovii</i>	Cb	
	<i>draculculus</i>	Cf, h, b	
	<i>filifolium</i>	Cb	
	<i>lucoviciana</i>	Cf, h, b	Nr--a
	<i>tridentata</i>	Cb	
<i>Aster</i>	<i>ericoides</i>	Nr	
	<i>exilis</i>	?	
	<i>fulcatus</i> var. <i>commutatus</i>		Nr
<i>Baccharis</i>	<i>salicina/emoryi</i>		Rp, Rw
<i>Baileya</i>	<i>multiradiata</i>	Ch	
<i>Berlandiera</i>	<i>lyrata</i>	Cf, b	Ra
<i>Bidens</i>	<i>cernua</i>	Rp	
	<i>frondosa</i>	Rp	
<i>Brickkellia</i>	<i>californica</i>	Ch	
	<i>brachyphylla</i>	Ch	
<i>Chrysothamnus</i>		<i>nauseosus</i>	Cb
<i>Cirsium</i> spp.	<i>undulatum?</i>		
<i>Conyza</i>	<i>canadensis</i>		
	<i>parryi</i>	Cf	
<i>Erigeron</i>	<i>aphanactis</i>	Cf	
	<i>bellidiastrum</i>	Cf (sand)	
	<i>colo-mexicanus</i>	Cf, h, b	
	<i>divergens</i>	Cf, h, b	
	<i>flagellus</i>		
	<i>philadelphicus</i>	Rp	
<i>Euthamia</i>	<i>occidentalis</i>	Rr	
<i>Gaillardia</i>	<i>pinnatifida</i>	Cb	
<i>Grindelia</i>	<i>aphanacts</i>	Cf	
<i>Gutierrezia</i>	<i>sarothrae</i>	Cf	
<i>Helenium</i>	<i>autumnale</i>	Rp	
<i>Heterotheca</i> (<i>Chrysopsis</i>) <i>villosa</i>			Cf, h, b
<i>Hymenoxis</i>	<i>argentea</i>	Cf, h, b	
	<i>richardsonii</i>	Cf, h, b	
<i>Hymenopappus</i>	<i>filafolium</i>		Cb
	<i>flavescens</i>	Cf, b	
<i>Leucelene</i> (<i>Chaetopappa</i>) <i>ericoides</i>			Cf, b
<i>Machaeranthera</i> (<i>Happlopapps</i>) <i>spinulosa</i>			Cf, b
	<i>tanacetifolia</i>	Cb	

<i>Malacothrix</i>	<i>fendleri</i>	Cf	
<i>Pyrhopappus</i>	<i>multicaulis</i>	Nr	
<i>Ratibita</i>	<i>columnifera</i>	Rr	
	<i>tagetes</i>	Nr-p, Rr	
<i>Scorzonera/ (Podosperma)</i>	<i>laciniata</i>		Cf
<i>Senecio</i>	<i>flaccidus</i>	Cf, b	
<i>Senecio/Packera</i>		<i>neomexicanus</i>	Cf
<i>Solidago</i>	<i>canadensis</i>	Rs	
<i>Sonchus</i>	<i>asper</i>	Nr-s	
<i>Stephanomeria</i>	<i>pauciflora</i>	Cf, b	
<i>Thelesperma</i>	<i>filifolium</i>	Nr-a	
	<i>megapotamicum</i>		Cf, b
<i>Taraxacum</i>	<i>officinale</i>	Ra	
<i>Townsendia</i>	<i>annua</i>	Cf (disturbed land at Ancho rapids)	
	<i>exscapa</i>	Cf	
<i>Trogopogon</i>	<i>dubius</i>	Cf	
<i>Xanthium</i>	<i>strumarium</i>	Nr-a,s	

Boraginaceae

<i>Cryptantha (Oreocarya)</i>	<i>jamesii</i>	Cf, h, b	
	<i>crassasepela</i>	Cf	
<i>Lapula</i>	<i>redowskii</i>	Cf Nr-a	
<i>Lithospermum</i>	<i>incisum</i>	Ch Nr-a	

Brassicaceae

<i>Arabis</i>	<i>fendleri</i>	Ch, Nr	
<i>Cardamen</i>	<i>cordifolia</i>	Rs	
<i>Cardaria</i>	<i>chalepensis</i>	Cf (Water Canyon outflow)	
<i>Descurania</i>	<i>sophia</i>	Disturbed Ground at Ancho rapids	
	<i>richardsonii</i>	Ch	
<i>Draba</i>	<i>reptans</i>	Nr,p	
<i>Dithyrea</i>	<i>wislizenii</i>	Cf	
<i>Erysimum</i>	<i>capitatum</i>	Cb Ra	
<i>Lepidium</i>	<i>virginicum</i> var. <i>medium</i>	Ch,b Ra	
<i>Rorippa</i>	<i>nasturcium aquatica</i>	Ra,s,p	
<i>Sisymbrium</i>	<i>altissima</i>	Nr-a	
<i>Streptanthella</i>	<i>longirostris</i>	Cf (Water Canyon outflow)	
<i>Thelypodium</i>	<i>wrightii</i>	Nr-a Ra	

Cactaceae

<i>Echinocereus</i>	<i>fendleri</i>	Cf	
	<i>triglochidiatus</i>	Cf, h, b	
	<i>viridiflorus</i>	Ch Nr-a	
<i>Escobaria</i>	<i>vivipara</i>		
<i>Opuntia</i>	<i>imbricata</i>	Cf, b Nr-a	
	<i>polyacantha</i>	Cf, b	
	<i>phaeacantha</i>	Cf	

Campanulaceae

<i>Lobelia</i>	<i>cardinalis</i>	Rp	
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Caryophyllaceae

<i>Cerastium</i>	<i>glomeratum/viscosum</i>	Rs	
<i>Silene</i>	<i>antirrhium</i>	Cf	

Chenopodiaceae

<i>Atriplex</i>	<i>canescens</i>	Ch, b	
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<i>Chenopodium</i>	<i>glaucum</i>	Cf Nr, s
	<i>album</i>	
	<i>incanum</i>	
	<i>leptophyllum</i>	
<i>Corispermum</i>	spp.	Cf (sand)
<i>Eurotia</i>	<i>lanata</i>	Ch, b

Commelinaceae

<i>Tradescantia</i>	<i>occidentalis</i>	Cf
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Convolvulaceae

<i>Convolvulus</i>	<i>arvensis</i>	
<i>Evolvulus</i>	<i>sericeus</i>	Ch, b

Cyperaceae

Carex sp., Sedge
Cyperus feruginescens, Bulrush
Eleocharis palustris (?), Spikerush
Scirpus pungens, Bullrush

Cupressaceae

Juniperus monosperma, One-seeded Juniper

Dipsaceae

<i>Dipsacus</i>	<i>fullonum</i>	Rs
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Equisetaceae

<i>Equisetum</i>	<i>arvense</i>	Rp
	<i>laevigatum</i>	Rp

Euphorbiaceae

<i>Croton</i>	<i>texensis</i>	Cf
<i>Euphorbia</i>	<i>brachycera</i>	Cf, b
	<i>dentata</i>	Cf
	<i>fendleri</i>	Cf, h, b
<i>Tragia</i>	<i>nepetaefolia/ramosa?</i>	Ch, b

Fabaceae

<i>Amphora</i>	<i>fruticosa</i>	Rr
	<i>canescens??</i>	Rr
<i>Astragalus</i>	<i>ceramicus</i>	Cb
	<i>flexuosus</i>	Cf, h, b
	<i>lentiginosus</i>	Cf
	<i>lotiflorus</i>	Cf
	<i>nuttalianus</i>	Cf, h, b
	<i>missouriensis</i>	Cf, b
	<i>praelongus</i>	Cf
<i>Dalea</i>	<i>aurea</i>	Cf (ravine in low hills)
	<i>brachystachys</i>	Cf
	<i>candida</i>	Cf
	<i>compactum</i>	Cf Nr-p
	<i>formosa</i>	Cf (ravine in low hills)
	<i>jamesii</i>	Cf
	<i>lanata</i>	Cf
	<i>nana</i>	Rr
	<i>purpurea</i>	
<i>Glycyrrhiza</i>	<i>lepidota</i>	Nr-r

<i>Lotus</i>	<i>wrightii</i>	Cf, b
<i>Lupinus</i>	<i>brevicaulis?</i>	Cb
	<i>kingii</i> var. <i>kingii</i>	Cf
<i>Medicago</i>	<i>lupulina</i>	
<i>Melilotus</i>	<i>officinalis</i>	Cf, Rp
	<i>candida</i>	Ra
<i>Psoraleidum</i>	<i>lanceolatum</i>	Ch
<i>Robinia</i>	<i>neomexicana</i>	Cf
<i>Sophora</i>	<i>nuttalliana</i>	Ch, b
<i>Trifolium</i>	<i>pratense</i>	Rp
<i>Vicia</i>	<i>exigua</i>	Ch, b
Fagaceae		
<i>Quercus</i>	<i>gambelii</i>	Cf, h, b
	<i>undulata</i>	Ch, b
Fumariaceae		
<i>Corydalis</i>	<i>aureus</i>	Ch, b Ra
Grossulariaceae		
<i>Ribes</i>	<i>cereum</i> var. <i>pediculare</i>	Rp Nr--a, p
	<i>inermis</i> , Common Gooseberry	Nr-s
Hydrophyllaceae		
<i>Phacelia</i>	<i>integrifolia</i>	Ch
Iridaceae		
<i>Sisyrinchium</i>	<i>demissum</i>	Rs
Juncaceae		
<i>Juncus tenuis</i>	Rush	
Lamiaceae		
<i>Hedeoma</i>	<i>nanum</i>	Ch
<i>Lycopus</i>	<i>americanus</i>	Cb
<i>Monarda</i>	<i>fistulosa</i> var. <i>menthifolia</i>	Nr-p
<i>Prunella</i>	<i>vulgaris</i>	Ns
Liliaceae		
<i>Calochortus</i>	<i>nuttallii</i>	Cb
<i>Yucca</i>	<i>baccata</i>	Cf, b
	<i>angustissima</i>	Cf
Linaceae		
<i>Linum</i>	<i>puberulum</i>	Cb
	<i>aristatum</i> var. <i>australe</i>	Cf, b
	spp. with orange center?	Cb
Loasaceae		
<i>Mentzelia</i>	<i>nuda</i> var. <i>stricta</i>	Cb
	<i>pumila</i> var. <i>stricta</i>	Cb
	<i>pumila</i> var. <i>stricta</i> / <i>springeri</i>	Ch
Malvaceae		
<i>Sphaeralcea</i>	<i>angustifolia</i> var. <i>lobata</i>	
	<i>coccineus</i>	Cf, h, b

	<i>fendleri</i>	Ch Nr-r
Moraceae		
<i>Morus</i>	<i>alba</i> , White Mulberry	Nr-r
Nyctaginaceae		
<i>Mirabilliis</i>	<i>linearis</i>	Nr-p
	<i>oxybaphoides</i>	Cf, b
	<i>multiflora</i>	Cf
Oleaceae		
<i>Forestiera</i>	<i>neomexicana</i>	Rp
Onagraceae		
<i>Epilobium</i>	<i>ciliatum</i>	Ra, s
<i>Gaura</i>	<i>coccinea</i>	Ch
	<i>parviflora</i>	Cf
<i>Oenothera</i>	<i>coronopifolia</i>	Cf
	<i>caespitosa</i>	Ch
	<i>elata</i> , Hooker Evening Primrose	Cf
Orchidaceae		
<i>Epipactis</i>	<i>gigantea</i>	Rp
Orobanchaceae		
<i>Orobanche</i>	<i>ludoviciana</i> (?)	Cb
Pinaceae		
<i>Pinus</i>	<i>edulis</i>	Cf, b
Plantaginaceae		
<i>Plantago</i>	<i>patagonica</i>	Cf
Poaceae		
<i>Agropyron</i>	<i>cristatum</i> , Crested Wheatgrass	
<i>Agrostis</i>	<i>stolonifera</i> , Creeping Bent	
<i>Aristida</i>	<i>purpurea</i> , var. <i>longiseta</i> , Red Three-awn	
<i>Aristida</i>	<i>purpurea</i> , var. <i>nealleyi</i> , Nealley's Three-awn	
<i>Bothriochloa</i>	<i>laguroides</i> , Silver Bluestem	
<i>Bouteloua</i>	<i>curtipendula</i> , Side-oats Grama	
<i>Bouteloua</i>	<i>eriopoda</i> , Black Grama	
<i>Bouteloua</i>	<i>gracilis</i> , Blue Grama	
<i>Bouteloua</i>	<i>hirsuta</i> , Hairy Grama	
<i>Bromus</i>	<i>japonicus</i> , Japanese Brome	
<i>Bromus</i>	<i>tectorum</i> , Cheat Grass	
<i>Cenchrus</i>	<i>incertus</i>	
<i>Dactylus</i>	<i>glomerata</i> , Orchard Grass	
<i>Dicanthelium</i>	<i>oligosanthes</i> var. <i>scribnerianum</i> , Scribner's	
Rosettegrass		
<i>Distichlis</i>	<i>spicata</i> , Salt Grass	
<i>Elymus</i>	<i>canadensis</i> , Canada Wild rye	
<i>Elymus</i>	<i>smithii</i> , Western Wheatgrass	
<i>Epineuron</i> (Tridens)	<i>pilosus</i> , Hairy Tridens	
<i>Festuca</i>	<i>arundinacea</i> , Tall Fescue	
<i>Glyceria</i>	<i>striata</i> , Fowl Mannagrass	
<i>Hilaria</i>	<i>jamesii</i> , Galleta	
<i>Hordeum</i>	<i>jubatum</i> , Foxtail Barley	
<i>Muhlenbergia</i>	<i>repens</i> , Creeping Muhly	

Muhlenbergia
Muhlenbergia
Muhlenbergia
Oryzopsis
Oryzopsis
Panicum
Phragmites
Poa
Poa
Schizachyrium
Sitanion
Sphenopholus
Sporobolus
Stipa

porteri, Bush Muhly
torreyi, Ring Muhly
wrightii, Spike Muhly
hymenoides, Indian Rice Grass
micrantha, Littleseed Rice Grass
obtusum, Vine-mesquite
australis, Common Reed
fendleriana, Mutton Grass
pratensis, Kentucky Bluegrass
scoparium, Little Bluestem
hystrix, Squirreltail
obtusata var. *obtusata*, Prairie Wedgescale
cryptandrus, Sand Dropseed
comata, Needle-and-thread Grass

Polemoniaceae

<i>Ipomopsis</i>	<i>inconspicua</i> var. <i>sinuata</i>	Nr-s
	<i>laxiflora</i>	Cf
	<i>longiflora</i>	Cf
	<i>pumila</i>	Cb

Polygonaceae

<i>Eriogonum</i>	<i>jamesii</i>	Ch, b
	<i>polycladon</i>	Nr-r
<i>Polygonum</i>	<i>amphibium</i> var. <i>emersum</i>	Rp
<i>Rumex</i>	<i>salicifolius</i> var. <i>mexicanus</i>	Ra, p

Polypodiaceae

<i>Pellaea</i>	<i>fendleri</i>	Ch, b
<i>Woodsia</i>	<i>mexicana</i> (?)	

Portulacaceae

<i>Portulaca</i>	<i>oleracea</i>	Cf
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Primulaceae

<i>Androsace</i>	<i>septentrionalis</i>	Ch
	<i>occidentalis</i>	Nr-p

Quercus

<i>Quercus</i>	<i>gambeli</i>	Ch, b
	<i>undulata</i>	Ch, b

Ranunculaceae

<i>Clematis</i>	<i>ligusticifolia</i>	Rp
<i>Ranunculus</i>	<i>cymbalaria</i>	Rs

Rosaceae

<i>Fallugia</i>	<i>paradoxia</i>	Cf, h, b
<i>Potentilla</i>	<i>anserina</i>	Rs
<i>Rosa</i>	<i>woodsii</i>	--

Rutaceae

<i>Ptelea</i>	<i>trifoliata</i>	Rp
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Salicaceae

<i>Populus</i>	<i>deltoides</i> spp. <i>wislizenis</i>	Ra
<i>Salix</i>	<i>exigua</i>	Ra, p

Saxifragaceae

Fendlera *rupicola* (upper elevations) Ch, b

Scrophulariaceae

Castilleja *integra* Cf, h, b
Cordylanthus *wrightii* Cf
Linaria *vulgaris* Rr
Mimulus *glabratus* Rs
Penstemon *barbatus* Nr-p
 jamesii Cb
 secundafloris Ch
Verbascum *thapsus* Nr-s Ra
Veronica *americana* Rs

Solanaceae

Datura *innoxia* Cf
Lycium *pallidum* Cb
Physalis *hedeaeifolia* var. *fendleri* (*cordifolia*) Nr-s
Solanum *elaeagnifolium* Cf, h, b

Tamariceae

Tamarix *pentandra* Rp Nr-water canyon flooded area

Ulmaceae

Celtis *reticulata* Rp

Verbenaceae

Glandularia *wrightii* Ch,b
Verbena *hastata* (Peterson) Rp

Vitaceae

Parthenocissu *inserta* Rp
Vitis *arizonica* Rp

Zygophyllaceae

Tribulus *terrestris* Nr-s

APPENDIX

Trail to Ancho Rapids, April 25, 1999

Trail well above riparian area (comparison area)

Chamaesyce serpyllifolia
Mirabilis grandiflora
Heterotheca villosa
Happlopappus spinulosa
Hymenopappus filifolium
Chrysothamnus nauseosus
Artemesia tridentata
Sphaeralcea coccinea
Artemesia dracunculoides
Aesclepias asperula
Eriogonum jamesii
Penstemon jamesii
Tragia nepenthaefolia
Erigeron flagellaris
Astragalus nuttalliana
A. flexuosus
Vicia exigua
Lupinus brevicaulis/kingii?
Baileya multiradiata
Phacelia heterophylla

Trail just above or near the riparian, but relatively dry

<i>Ribes cereum</i> var. <i>pediculare</i>	Nr
<i>Thelletesperma filifolia</i>	Nr
<i>Artemesia ludoviciana</i>	Nr
<i>Artemesia</i> _____	Nr
<i>Echinocereus viridiflorus</i>	Nr
<i>Opuntia</i> sp.	Nr
<i>Opuntia imbricata</i>	Nr
<i>Xanthium strumarium</i>	Nr
<i>Sisymbrium altissimum</i>	Nr
<i>Descurainia sophia</i>	Nr
<i>Lappula radowskii</i>	Nr
<i>Castilleja integra</i>	Nr
<i>Townsendia annua</i>	Nr
<i>Oenothera caespitosa</i>	Nr
<i>coronopifolia</i>	Nr
<i>albicaulis?</i>	Nr
<i>Lithospermum incisum</i>	Nr
<i>Forsteria neomexicana</i>	Nr

Riparian area in or adjacent to the stream

<i>Rorippa nasturcium aquatica</i>	Ra
<i>Berlandiera lyrata</i>	Ra
<i>Corydallis aureus</i>	Ra
<i>Verbascum thapsus</i>	Ra
<i>Melilotus candida</i>	Ra
<i>Taraxacum officianale</i>	Ra
<i>Epilobium ciliatum</i>	Ra
<i>Oxypolis fendleri</i>	Ra
<i>Juncus</i>	Ra
<i>Carex</i>	Ra
<i>Thelypodium wrightii</i>	Ra
<i>Lepidium virginicum</i>	Ra
<i>Erymisium capitatum</i>	Ra
<i>Salix exigua</i>	Ra
<i>Populus deltoides</i> spp. <i>wislizenis</i>	Ra