

Research Natural Area

Name: Arellano Canyon

Location:

State: NM County: Taos Forest: Carson District: Peñasco
T. 22N R. 14E S. 5, 6, 7, 8

Geology:

Description:

Entire area is underlain by Pennsylvanian rocks undivided: interbedded, dark-green siltstone; mudstone; brown sandstone; clastic, sandy, brownish-gray limestone and thin conglomerate.

Reference:

New Mexico State Highway Department, ..., Geology And Aggregate Resources District V; map 20: NM Hwy Dept., Santa Fe, NM.

Climate:

TES Gradient: LSC 9 = 4/0 N = 7/-1

Precipitation: _____ Annual: 20 in. Warm season (May - Oct.) = 69 %
Cool Season (Nov. - Apr.) = 31 %

Mean Annual Snow: 67 in.

North aspect and higher elevations

Mean Temperature: Annual 36 °F Jul. 56 °F Jan. 17 °F

Freeze Free Period: 70 days

South aspect and lower elevations

Mean Temperature: Annual 39 °F Jul. 59 °F Jan. 20 °F

Freeze Free Period: 90 days

Trewartha's climate type: E Boreal

Reference: Forest Service, 1986, Terrestrial Ecosystem Handbook;
Appendix B: USDA FS R3

Soils:

North aspects and higher elevations consist dominantly of Typic Cryoboralfs, loamy-skeletal, mixed. South aspects are occupied by Entic Glossoboralfs, loamy-skeletal, mixed. Stream-sides are mainly Typic Cryofluvents, loamy-skeletal, mixed (non acid)

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Cool Season (Nov. - Apr.) = 31 %

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Mean Temperature: Annual 36 °F Jul. 56 °F Jan. 17 °F

Freeze Free Period: 70 days

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Soils:

DESIGNATION ORDER

By virtue of the authority vested in me by the Secretary of Agriculture under regulations 7 CFR 2.60(a) and 36 CFR 251.23, hereby designate as the Arellano Canyon Research Natural Area the lands described in the following establishment record prepared by William W. Dunmire and Mollie S. Toll, dated March 20, 1987. These lands shall hereafter be administered as a research natural area subject to the above regulations and instructions issued thereunder.

Chief

Date

ESTABLISHMENT REPORT

ARELLANO CANYON RESEARCH NATURAL AREA

USDA FOREST SERVICE
SOUTHWESTERN REGION
CARSON NATIONAL FOREST
PEÑASCO RANGER DISTRICT
TAOS COUNTY, NEW MEXICO

Prepared by: _____ Date _____
William W. Dunmire, The Nature Conservancy
Mollie S. Toll, Department of Biology,
University of New Mexico

Recommended by: _____ Date _____
District Ranger
Peñasco Ranger District

Recommended by: _____ Date _____
John Bedell, Forest Supervisor
Carson National Forest

Recommended by: _____ Date _____
John W. Russell, Chairman
Southwestern Research Natural Area Committee

Recommended by: _____ Date _____
Sotero Muniz, Regional Forester
Southwestern Region

Recommended by: _____ Date _____
Charles M. Loveless, Station Director
Rocky Mountain Forest and Range
Experiment Station

ESTABLISHMENT RECORD

for

ARELLANO CANYON RESEARCH NATURAL AREA

within

Carson National Forest

Taos County, New Mexico

INTRODUCTION

The Arellano Canyon Research Natural Area (RNA) comprises approximately 641 acres (259.3 hectares) of spruce-fir forest in north-central New Mexico. The proposed RNA is located in the Peñasco Ranger District, in Taos County, and is all acquired National Forest land.

Arellano Canyon provided a top choice in the search for a forest mosaic research natural area with a minimal use history. Outstanding features include its luxuriant streamside riparian forests, inclusion of blue spruce as one of the forest cover types, and mosaics of forest ecosystems in mountainous topography. A task group of the Regional RNA Committee visited this and several other candidate forest areas in July, 1982, and concurred that this was the only available example meeting all the requirements.

LAND MANAGEMENT PLANNING

The need for representation of this biotic community was identified in the Southwestern Regional Guide (August 1983), although this particular site was not identified by name. The Carson National Forest Plan of September 1986 (Record of Decision approved October 31, 1986) includes the Arellano Canyon proposed research natural area. The environmental analysis conducted as part of the planning process supports the recommendation to establish this Research Natural Area.

JUSTIFICATION STATEMENT FOR ESTABLISHMENT OF AREA

The proposed Arellano Canyon Research Natural Area was identified primarily as an outstanding example of a spruce-fir forest ecosystem. This is an important and widespread ecosystem in the Southwest. The need to include such an ecosystem within the RNA network of the Southwestern Region has been stated in the Regional Guide (USFS 1983).

This area features different types of coniferous forests in steep mountain topography. Good examples of old-growth, and both intermediate and late successional stages of these forests are found in this RNA. The streamside forests feature luxuriance and diversity of both shrubs and herbs, and represent excellent riparian condition along small permanent streams.

PRINCIPAL DISTINGUISHING FEATURES

The Arellano Canyon area contains several types of coniferous forests in close juxtaposition, over an elevational grade of nearly 2000 feet or 600 meters. Forest types include Engelmann spruce (*Picea engelmannii*) - corkbark fir (*Abies lasiocarpa* var. *arizonica*) - white fir (*Abies concolor*) - Douglas-fir

tremuloides); Douglas-fir old growth; white fir - Douglas-fir - ponderosa pine (Pinus ponderosa); and Engelmann spruce - corkbark fir - bristlecone pine (Pinus aristata). Two permanent watercourses provide habitat for streamside forests, including blue spruce (Picea pungens); and Engelmann spruce - corkbark fir-blue spruce.

LOCATION

Arellano Canyon is situated in north central New Mexico, in the Peñasco Ranger District, Carson National Forest. The RNA can be located on the Cerro Vista Quadrangle (USGS 7.5') at latitude 36°10', longitude 105°28', Township 22 N, Range 14 E, Sections 5, 6, 7, and 8 (Map 1). The proposed RNA comprises approximately 641 acres (259.3 hectares). Elevation ranges from a low of 8800 feet (2682.2 m) in Arellano Canyon to 10,669 feet (3251.9 m) on La Cueva Peak.

The area lies just north of State Highway 3, between Peñasco and Mora, New Mexico. Access to the lower end of the RNA is by an all-weather, county maintained road; access to the upper end is by a Forest Service Road which is closed during the snow season (Maps 2 and 3). Both access points involve a short walk from the roadway to the RNA.

From Taos, New Mexico, take State Route 3 south and east approximately 26 miles (41.8 km) to Tres Ritos. One half mile (0.8 km) past Tres Ritos, turn left (north) on Forest Road 76. Proceed 2.6 miles (4.2 km) to the point where Arellano Creek crosses the road. Park at the forest campground on the south side of the road, and hike up the creek on an unmaintained trail approximately 0.3 miles (0.5 km) to the Research Natural Area.

For access to the upper end of the RNA, again take State Route 3 from Taos to the turnoff past Tres Ritos. From this point travel 4.9 miles (7.9 km) up Forest Road 76. Turn left on a gravel road (Forest Road 1889, unmarked). Proceed 1.0 miles (1.6 km; do not take the lower- standard side road branching off earlier to the left) to a timber sale road branching to the left. Proceed straight on this timber sale road, which is graveled the first 0.8 miles (1.3 km). Travel an additional 1.5 miles (2.4 km) after leaving the gravel; the road ends at the approximate northeast boundary of the RNA, at about 10,000 feet (3050 m) elevation.

Most of the canyon bottoms within the RNA either have game trails or, at the upper end, are open enough for fairly easy walking. The entire upper third of the RNA is open and easily traversed. In the lower canyon, however, the steep west and east facing slopes are densely forested and offer rough going.

AREA BY COVER TYPES

The distribution of cover types was determined from field surveys conducted in the summer of 1986 and from interpretation of 1981 aerial photography. Table 1 outlines the estimated total areas of vegetation types based on the Society of American Foresters forest type system (Eyre 1980) and the Kuchler Potential Natural Vegetation system (Kuchler 1964). Map 4 depicts the distribution of the SAF types, plus a grassland type not covered in the SAF forest categories, on the candidate research natural area.

Table 1. Estimated Areas of Vegetation Types in the Arellano Canyon Research Natural Area.

<u>Type</u>	Society of American Foresters		Surface Area	
	<u>Cover Type¹</u>	<u>Kuchler PNV Type²</u>	<u>Acres</u>	<u>Hectares</u>
Engelmann Spruce-Subalpine Fir	SAF 206	K-21 Southwestern Spruce - Fir	121	48.9
Bristlecone Pine	SAF 209	K-21	72	29.1
Interior Douglas-fir	SAF 210	K-18 Pine - Douglas-fir	170	68.8
Blue Spruce	SAF 216	K-18	22	8.9
Aspen	SAF 217	K-21	169	68.4
Thurber Fescue Grassland	[none]	K-52 Alpine Meadows	87	35.2
		TOTAL:	641	259.3

¹Eyre 1980.

²Kuchler 1964.

PHYSICAL AND CLIMATIC CONDITIONS

Average annual precipitation for the Arellano Canyon area is a substantial 29 inches (737 mm), with strong warm-season dominance (69% falls between May and October). Annual snowfall averages 67 inches (170 cm). Temperatures vary significantly with exposure and altitude. North aspects and higher elevations maintain an average annual temperature of 36° F (2.2° C), with a July average of 56° F (13.3° C), a January average of 17° F (-8.3° C), and a frost free period of only 70 days. South facing aspects and lower elevations, on the other hand, maintain a slightly higher annual average of 39° F (3.9° C), a July average

slightly higher annual average of 39° F (3.9° C), a July average of 59° F (15.0° C), a January average of 20° F (-6.7° C), and a significantly longer frost free period (90 days).

DESCRIPTION OF VALUES

Flora

A survey of habitat types (HT) was conducted during the 1986 field work. A brief review follows; for a more detailed description of the vegetative makeup of these types, see DeVelice et al. (1986).

Several attributes of the proposed RNA contribute to a remarkable diversity of plant communities and habitat types, including an elevation differential of 2300 feet (701 m), several miles of permanently flowing streams, a full range of slope aspects, and the presence of three life zones. Arellano Canyon's varied fire history, not documented in this report, further contributes to a diversified representation of seral and climax forest types.

The lower third of Arellano Canyon and its western tributary supports blue spruce (Picea pungens) as a dominant member of the canopy, with thinleaf alder (Alnus tenuifolia) codominant. White fir (Abies concolor), Engelmann spruce (Picea engelmannii), mountain willow (Salix scouleriana), limber pine (Pinus flexilis), aspen (Populus tremuloides), and Douglas-fir (Pseudotsuga menziesii) are all well represented. Shrubs include honeysuckle (Lonicera), snowberry (Symphoricarpos), currant (Ribes), and raspberry (Rubus). Picea pungens/Swida sericea HT and Picea pungens/Poa pratensis HT are both represented here.

In the upper two-thirds of the two canyon bottoms, Picea pungens drops out, and Alnus tenuifolia and Picea engelmannii dominate. Subalpine fir (Abies lasiocarpa) appears with Populus tremuloides. Symphoricarpos oreophilus becomes the most common shrub, and common juniper (Juniperus communis) and Rubus parviflorus are well-represented. This riparian community would probably key out to Picea engelmannii/Heracleum sphondylium HT.

The steep east and west facing slopes on either side of the lower canyons exhibit old growth Pseudotsuga menziesii with Abies concolor the dominant reproducing tree. Rocky Mountain maple (Acer glabrum) and Picea engelmannii are well-represented, while Pinus flexilis and ponderosa pine (P. ponderosa) occur sporadically. Shrubs dominate the undergrowth. Most common species in the drier sites are cliff jamesia (Jamesia americana), gambel oak (Quercus gambelii), and Oregon grape (Berberis repens), with Lonicera involucrata, mountain ninebark (Physocarpus monogynus), and ocean spray (Holodiscus dumosus) becoming more common in mesic sites. Grasses are scarce and forbs tend to be poorly represented. Proceeding from dry to mesic aspects on these slopes, habitat types include Abies concolor/Acer glabrum, Abies concolor/Erigeron eximius, to Abies concolor/Vaccinium myrtillus.

At higher elevations, especially where slopes become partly north-facing, Abies lasiocarpa replaces A. concolor as the

dominant fir, with Picea engelmannii codominant in the overstory. Populus tremuloides varies from pure stands occupying sites where fire has played an obvious recent role, to occasional relic trees within spruce-fir stands. Symphoricarpos oreophilus is the most common shrub. Forbs are abundant. Grasses are much less abundant, and are principally represented by hairy brome (Bromus ciliatus) and Kentucky bluegrass (Poa pratensis). Mosaics of Abies lasiocarpa/Erigeron eximius HT, Abies lasiocarpa/Rubus parviflorus HT, and Abies lasiocarpa/Vaccinium myrtillus HT occur throughout the spruce-fir forest.

Several large stands of bristlecone pine (Pinus aristida) occur within the Thurber fescue (Festuca thurberi) grasslands on south-facing slopes on the upper third of the RNA above 10,000 feet (3048 m) elevation. This Pinus aristida/Festuca thurberi HT includes Picea engelmannii along with the ever-present Populus tremuloides in the overstory, Symphoricarpos oreophilus as the principal shrub, and Festuca thurberi dominating the undergrowth.

Finally there are several open Thurber fescue grasslands, all on high, south-facing slopes. In addition to the dominant Festuca thurberi, other grasses present include pine dropseed (Blepharoneuron tricholepsis), oatgrass (Danthonia sp.), bottlebrush squirreltail (Sitanion hystrix), muttongrass (Poa fendleriana), and Poa pratensis. Forbs are represented by western yarrow (Achillea lanulosa), fleabane (Erigeron sp.), and vetch (Vicia sp.), among many others.

No threatened, endangered, or unique plants are known to occur in Arellano Canyon.

The following plant list was compiled from field observations by Will Moir, Range Ecologist, USFS Southwestern Region, on July 8, 1982, and by Bill Dunmire (The Nature Conservancy) on August 27 and 29, 1986.

Abbreviated Plant List for Arellano Canyon RNA

<u>Latin Name</u>	<u>Common Name</u> ¹	<u>Reference</u> ²
GRASSES AND GRASS-LIKE PLANTS:		
<u>Agropyron smithii</u>	Western wheatgrass	BD
<u>Blepharoneuron tricholepis</u>	Pine dropseed	BD
<u>Bromus ciliatus</u>	Hairy brome	WM BD
<u>Carex foena</u>	Sedge	WM
<u>Carex microptera</u>	Sedge	WM
<u>Carex spp.</u>	Sedge	WM BD
<u>Danthonia sp.</u>	Danthonia	BD
<u>Deschampsia caespitosa</u>	Tufted hairgrass	BD
<u>Elymus glaucus</u>	Blue wildrye	WM
<u>Festuca arizonica</u>	Arizona fescue	BD
<u>Festuca thurberi</u>	Thurber fescue	BD
<u>Oryzopsis asperifolia</u>	Ricegrass	WM
<u>Poa fendleriana</u>	Muttongrass	BD
<u>Poa cf. palustris</u>	Fowl bluegrass	WM
<u>Poa pratensis</u>	Kentucky bluegrass	WM BD
<u>Sitanion hystrix</u>	Bottlebrush squirreltail	BD
FORBS:		
<u>Achillea lanulosa</u>	Western yarrow	BD
<u>Aconitum columbianum</u>	Columbia monkshood	WM BD
<u>Actea arguta</u>	Baneberry	BD
<u>Aquilegia sp.</u>	Columbine	WM
<u>Campanula rotundifolia</u>	Bluebell	BD
<u>Cardamine cordifolia</u>	Heartleaf bittercress	WM
<u>Castilleja sp.</u>	Paintbrush	BD
<u>Dodecatheon ellisiae</u>	Dog shootingstar	WM
<u>Epilobium angustifolium</u>	Blooming Sally	BD
<u>Epilobium sp.</u>	Willowweed	WM
<u>Erigeron eximius</u>	Fleabane	BD
<u>Fragaria americana</u>	Strawberry	BD
<u>Fragaria ovalis</u>	Wild strawberry	BD
<u>Geranium richardsonii</u>	Big Dick geranium	WM BD
<u>Habenaria spp.</u>	Bog-orchid	WM
<u>Heracleum lanatum</u>	Cowparsnip	WM
<u>Hydrophyllum fendleri</u>	Waterleaf	WM
<u>Ipomopsis aggregata</u>	Skyrocket	BD
<u>Linaea borealis</u>	American twinflower	WM
<u>Mertensia franciscana</u>	Bluebells	WM
<u>Oreochrysum parryi</u>	Parry goldenweed	BD
<u>Osmorhiza depauperata</u>	Sweetroot	WM

<u>Oxyopolis fendleri</u>	Fendler cowbane	WM	
<u>Pedicularis grayi</u>	Woodbetony	WM	BD
<u>Penstemon spp.</u>	Beard tongue	WM	
<u>Potentilla gracilis</u>	Smooth cinquefoil	WM	
<u>Prunella vulgaris</u>	Selfheal	WM	
<u>Pseudocymopterus montanus</u>	Mountain parsley	WM	
<u>Pyrola asarifolia</u>	Mule floret	WM	
<u>Pyrola secunda</u>	Mule floret	WM	
<u>Rorippa nasturtium-aquaticum</u>	Watercress		BD
<u>Rudbeckia laciniata</u>	Cutleaf coneflower	WM	
<u>Senecio sanguisorboides</u>	Groundsel	WM	
<u>Senecio wootonii</u>	Groundsel		BD
<u>Smilacina racemosa</u>	False Solomonseal	WM	BD
<u>Smilacina stellata</u>	Starry smilax	WM	BD
<u>Solidago sp.</u>	Goldenrod	WM	
<u>Swertia radiata</u>	Deers-ears swertia		BD
<u>Taraxacum officinale</u>	Dandelion	WM	BD
<u>Thalictrum fendleri</u>	Meadowrue	WM	BD
<u>Thermopsis pinetorum</u>	Piney goldenpea	WM	BD
<u>Valeriana edulis</u>	Tobaccoroot	WM	
<u>Veratrum californicum</u>	California hellebore		BD
<u>Veronica sp.</u>	Speedwell	WM	
<u>Vicia sp.</u>	Vetch		BD
<u>Viola nephrophylla</u>	Wanderer violet	WM	BD

HALF-SHRUBS, SHRUBS, AND TREES:

<u>Abies concolor</u>	White fir	WM	BD
<u>Abies lasiocarpa var. arizonica</u>	Corkbark fir	WM	BD
<u>Acer glabrum</u>	Rocky Mountain maple	WM	BD
<u>Alnus tenuifolia</u>	Thinleaf alder	WM	BD
<u>Arctostaphylos uva-ursi</u>	Kinnikinnick		BD
<u>Artemisia franserioides</u>	Ragweed sagebrush	WM	BD
<u>Berberis repens</u>	Oregon grape		BD
<u>Cornus stolonifera</u>	Red-osier dogwood	WM	BD
<u>Holodiscus dumosus</u>	Ocean spray		BD
<u>Jamesia americana</u>	Cliff jamesia	WM	BD
<u>Juniperus communis</u>	Common juniper		BD
<u>Lonicera involucrata</u>	Bearberry honeysuckle	WM	BD
<u>Pachystima myrsinites</u>	Boxleaf	WM	
<u>Physocarpus monogynus</u>	Mountain ninebark		BD
<u>Picea engelmanni</u>	Engelmann spruce	WM	BD
<u>Picea pungens</u>	Blue spruce	WM	BD
<u>Pinus aristata</u>	Bristlecone pine		BD
<u>Pinus flexilis</u>	Limber pine	WM	BD
<u>Pinus ponderosa</u>	Ponderosa pine	WM	BD
<u>Populus tremuloides</u>	Quaking aspen	WM	BD
<u>Potentilla fruticosa</u>	Shrubby cinquefoil	WM	BD
<u>Prunus virginiana</u>	Chokecherry	WM	BD
<u>Pseudotsuga menziesii</u>	Douglas-fir	WM	BD
<u>Quercus gambelii</u>	Gambel oak	WM	BD
<u>Ribes spp.</u>	Wax currant	WM	BD
<u>Rubus sp.</u>	Raspberry		BD
<u>Rubus parviflorus</u>	Western thimbleberry		BD

<u>Salix</u> spp.	Willow	WM	BD
<u>Salix scouleriana</u>	Mountain willow	WM	
<u>Sambucus</u> sp.	Elderberry		BD
<u>Shepherdia canadensis</u>	Russet buffaloberry	WM	BD
<u>Symphoricarpus oreophilus</u>	Mountain snowberry	WM	BD
<u>Vaccinium myrtillus</u>	Myrtle whortleberry	WM	BD

¹Common names used according to USDA, Forest Service 1974, or Martin & Hutchins 1981.

²WM = observed by Will Moir (Range Ecologist, USFS Southwest Region) on July 8, 1982

BD = observed by Bill Dunmire (The Nature Conservancy) on August 27 and 29, 1986

Fauna

No rare, endangered, or sensitive animal species are known to inhabit this area; however, the great diversity of plant communities exhibited here supports a rich variety of animal life. The open grasslands and aspen mosaics in the upper portion of the RNA provide important spring, summer, and fall elk habitat. These communities and the forest-shrub mixes on the lower slopes also support moderately high mule deer populations. Arellano Creek has sufficient flow to support beaver, although this species is not known to reside here at this time.

The following animal list was derived from the Run Wild III computer-stored data base (Lehmkuhl and Patton 1982; Patton 1979) from the following habitat types, for Taos county, New Mexico:

1. Sub-alpine conifer forest and woodland biome
2. Sub-alpine riparian woodland biome; Alnus tenuifolia-Salix association
3. Douglas-fir - white fir series
4. Montane grassland biome; mixed meadow series

These habitat types currently in the data base most closely correspond to those occurring in the proposed RNA.

Abbreviated Animal List for Arellano Canyon R.N.A.

Common Name

Latin Name

AMPHIBIANS:

Frog, striped chorus
Salamander, tiger
Toad, Woodhouse's

Pseudacris triseriata
Ambystoma tigrinum
Bufo woodhousei

BIRDS:

Blackbird, Brewer's
Blackbird, redwinged
Bluebird, mountain
Bluebird, western
Bushtit
Chickadee, black-capped
Chickadee, mountain
Creeper, brown
Crossbill, red
Crow, American
Dipper, American
Dove, mourning
Eagle, golden
Falcon, prairie
Finch, Cassin's
Finch, house
Finch, rosy
Flicker, northern
Flycatcher, Hammond's
Flycatcher, olive-sided
Flycatcher, western
Flycatcher, willow
Goldfinch, lesser
Goshawk, northern
Grosbeak, black-headed
Grosbeak, evening
Grosbeak, pine
Harrier, northern
Hawk, Cooper's
Hawk, red-tailed
Hawk, sharp-shinned
Hummingbird, broad-tailed
Hummingbird, rufous
Jay, gray
Jay, Steller's
Junco, dark-eyed
Kestrel, American
Killdeer
Kinglet, ruby-crowned
Magpie, black-billed
Martin, purple

Euphagus cyanocephalus
Agelaius phoeniceus
Sialia currucoides
Sialia mexicana
Psaltriparus minimus
Parus atricapillus
Parus gambeli
Certhia americana
Loxia curvirostra
Corvus brachyrhynchos
Cinclus mexicanus
Zenaida macroura
Aquila chrysaetos
Falco mexicanus
Carpodacus cassinii
Carpodacus mexicanus
Leucosticte arctoa
Colaptes auratus
Empidonax hammondii
Contopus borealis
Empidonax difficilis
Empidonax traillii
Carduelis psaltria
Accipiter gentilis
Pheucticus melanocephalus
Coccothraustes vespertinus
Pinicola enucleator
Circus cyaneus
Accipiter cooperii
Buteo jamaicensis
Accipiter striatus
Selasphorus platycercus
Selasphorus rufus
Perisoreus canadensis
Cyanocitta stelleri
Junco hyemalis
Falco sparverius
Charadrius vociferus
Regulus calendula
Pica pica
Progne subis

Nighthawk, common
Nutcracker, Clark's
Nuthatch, pygmy
Nuthatch, red-breasted
Nuthatch, white-breasted
Owl, flammulated
Owl, northern saw-whet
Owl, spotted
Pigeon, band-tailed
Pipit, water
Pygmy-owl, northern
Raven, common
Robin, American
Sapsucker, Williamson's
Sapsucker, yellow-bellied
Siskin, pine
Snipe, common
Solitaire, Townsend's
Sparrow, chipping
Sparrow, vesper
Sparrow, white-crowned
Swallow, barn
Swallow, cliff
Swallow, tree
Swallow, violet-green
Swift, white-throated
Tanager, western
Thrush, hermit
Thrush, Swainson's
Turkey, wild
Vireo, solitary
Vireo, warbling
Vulture, turkey
Warbler, Grace's
Warbler, orange-crowned
Warbler, Virginia's
Warbler, Wilson's
Waxwing, cedar
Woodpecker, Lewis'
Woodpecker, three-toed
Wood-pewee, western
Wren, canyon
Wren, house
Wren, rock

Chordeiles minor
Nucifraga columbiana
Sitta pygmaea
Sitta canadensis
Sitta carolinensis
Otus flammeolus
Aegolius acadicus
Strix occidentalis
Columba fasciata
Anthus spinoletta
Glaucidium gnoma
Corvus corax
Turdus migratorius
Sphyrapicus thyroideus
Sphyrapicus varius
Carduelis pinus
Gallinago gallinago
Myadestes townsendi
Spizella passerina
Poocetes gramineus
Zonotrichia leucophrys
Hirundo rustica
Hirundo pyrrhonota
Tachycineta bicolor
Tachycineta thalassina
Aeronautes saxatalis
Piranga ludoviciana
Catharus guttatus
Catharus ustulatus
Meleagris gallopavo
Vireo solitarius
Vireo gilvus
Cathartes aura
Dendroica graciae
Vermivora celata
Vermivora virginiae
Wilsonia pusilla
Bombycilla cedrorum
Melanerpes lewis
Picoides tridactylus
Contopus sordidulus
Catherpes mexicanus
Troglodytes aedon
Salpinctes obsoletus

MAMMALS:

Badger
Bat, big brown
Bat, hoary
Bat, silver-haired
Bear, black
Chipmunk, Colorado
Chipmunk, least

Taxidea taxus
Eptesicus fuscus
Lasiurus cinereus
Lasionycteris noctivagans
Ursus americanus
Tamias quadrivittatus
Tamias minimus

Cottontail, Nuttall's
Coyote
Deer, mule
Deer, white-tailed
Elk
Ermine
Fox, red
Gopher, Botta's pocket
Gopher, northern pocket
Jackrabbit, black-tailed
Jackrabbit, white-tailed
Lion, mountain
Marmot, yellow-bellied
Marten
Mouse, deer
Mouse, northern grasshopper
Mouse, pinyon
Mouse, western harvest
Mouse, western jumping
Myotis, fringed
Myotis, little brown
Myotis, long-eared
Myotis, long-legged
Myotis, small-footed
Porcupine
Raccoon
Shrew, masked
Shrew, vagrant
Shrew, water
Skunk, striped
Squirrel, golden-mantled ground
Squirrel, red
Squirrel, thirteen-lined ground
Vole, heather
Vole, meadow
Vole, southern red-backed
Weasel, long-tailed
Woodrat, bushy-tailed
Woodrat, Mexican
Woodrat, white-throated

Sylvilagus nuttallii
Canis latrans
Odocoileus hemionus
Odocoileus virginianus
Cervus elaphus
Mustela erminea
Vulpes vulpes
Thomomys bottae
Thomomys talpoides
Lepus californicus
Lepus townsendii
Felis concolor
Marmota flaviventris
Martes americana
Peromyscus maniculatus
Onychomys leucogaster
Peromyscus truei
Reithrodontomys megalotis
Zapus princeps
Myotis thysanodes
Myotis lucifugus
Myotis evotis
Myotis volans
Myotis leibii
Erethizon dorsatum
Procyon lotor
Sorex cinereus
Sorex vagrans
Sorex palustris
Mephitis mephitis
Spermophilus lateralis
Tamiasciurus hudsonicus
Spermophilus tridecemlineatus
Phenacomys intermedius
Microtus pennsylvanicus
Clethrionomys gapperi
Mustela frenata
Neotoma cinerea
Neotoma mexicana
Neotoma albigula

REPTILES:

Lizard, short-horned
Rattlesnake, western
Skink, many-lined
Snake, common garter
Snake, gopher
Snake, milk
Snake, smooth green
Snake, western terrestrial
garter

Phrynosoma douglassi
Crotalus viridis
Eumeces multivirgatus
Thamnophis sirtalis
Pituophis melanoleucus
Lampropeltis triangulum
Opheodrys vernalis
Thamnophis elegans

Geology

Arellano Canyon is located in the Sangre de Cristos, a north-trending chain of mountains between the Rio Grande depression on the west and the Raton Basin on the east. In the taller, western Taos Range of the Sangre de Cristos, elevations include numerous peaks from 12,000' (3657.6 m) to 13,173' (4015.1 m; Wheeler Peak, the highest point in New Mexico). The bulk of the Taos Range is composed of undifferentiated Precambrian metamorphic rocks. The Taos horst (a complex zone of normal, reverse, and thrust faults) is responsible for uplifting Precambrian material to the surface (Clark 1966).

The vicinity of the proposed RNA is underlain by Pennsylvanian rocks undivided. These include interbedded dark-green siltstone, mudstone, brown sandstone, clastic sandy brownish-gray limestone, and thin conglomerate.

Soils

The majority of the Arellano Canyon RNA is classified as Jaroso-Angostura-Rock outcrop complex (Hacker and Carleton 1982). These very steep soils and rock outcrop are found on mountain slopes at elevations from 9000 to 11,000 feet (2743.2 - 3352.8 m). Both Jaroso and Angostura soils are deep and well-drained, and were formed in colluvium of interbedded shale and sandstone. Typically, the surface layer of Jaroso soils is very pale brown cobbly loam about 16 inches (40.6 cm) thick, while that of Angostura soils is light brownish gray cobbly loam about 10 inches (25.4 cm) thick. Permeability in each case is moderately slow, with an effective rooting depth of more than 60 inches (152.4 cm).

North aspects and higher elevations consist dominantly of Typic Cryoboralfs, loamy-skeletal, mixed. South aspects are occupied by Entric Glossoboralfs, loamy-skeletal, mixed. Streamsides are mainly non-acid Typic Cryafluvents, loamy-skeletal, mixed.

Lands

Land encompassed in the Arellano Canyon RNA is all acquired Forest land. There are no known rights-of-way or vested interests within the proposed boundaries.

Cultural Resources

The area has not been surveyed for cultural resources. Near the mouth of Arellano Canyon decking of an old lumber mill or bridge can be found. No other cultural resources are known. Upon establishment as an RNA, the area will be withdrawn from any archeological research that would in any way modify the existing locale.

IMPACTS AND POSSIBLE CONFLICTS

Mineral Resources

No known mineral resources exist in this area. The area is covered by oil and gas leases issued to Leonard Minerals Company and Kriti Exploration.

Grazing

Livestock grazing presently occurs in the upper portions of the proposed RNA, including the upper third of the Arellano Creek bottom.

Timber

The vegetation type is predominantly spruce-fir with pockets of aspen. The area hasn't been logged, and there are no plans to do so in the future.

Watershed Values

Arellano Canyon is a fifth order watershed, and contributes approximately 2% to the 84,000 acre Rio Pueblo watershed. Watershed condition is considered optimum.

Recreation Values

Recreation use includes hiking, hunting, and cross-country skiing. The mouth of Arellano Canyon below the RNA is a heavily used camping and fishing area.

Wildlife and Plant Values

No threatened or endangered species are known to occur in the area. The higher elevations contain habitat suitable for the pine marten, a New Mexico State listed species.

Wilderness, Wild and Scenic River, National Recreation Area Values

None of the above congressionally designated areas have been proposed for the Arellano Canyon RNA or vicinity.

Transportation Plans

There is a trail open to ORV use located just west of the proposed Research Natural Area. Two logging spur roads lead to the boundary on the east. The mouth of Arellano Canyon is a high use recreation area which could cause some Off Road Vehicle problems within the boundaries of the proposed Research Natural Area.

Utility Corridor Plans

No existing or potential utility corridor plans exist in the vicinity of this RNA.

MANAGEMENT PLAN

The Carson National Forest Plan (USFS 1986) prescribes that there will be no harvest of timber or firewood and no assigned grazing capacity on Research Natural Areas. The prescriptions also prohibit off-road vehicle travel, open campfires, the introduction of non-native plant or animal species, road or trail construction, and recreational use if degradation results. However, non-motorized dispersed recreation activities are permitted provided they do not significantly modify the area, or threaten or impair the research or educational value of the area. No collection of flora, fauna, or other materials will be allowed, other than for research approved by the Station Director.

1. Vegetation Management

The Forest Plan provides that prescribed fire, using planned and unplanned ignitions, will be allowed in the Arellano Canyon RNA to maintain fire dependent ecosystems. A fire management plan for the RNA will be developed at a later time.

ADMINISTRATIVE RECORDS AND PROTECTION

Administration and protection of the Arellano Canyon RNA will be the responsibility of the Carson National Forest. The District Ranger, Peñasco District, Peñasco, NM has direct responsibility.

The Director of the Rocky Mountain Forest and Range Experiment Station, or his designee, will be responsible for any studies or research conducted in the area, and requests to conduct research in the area will be referred to him. He, or his designee, will evaluate research proposals and coordinate all studies and research in the area with the District Ranger. All plant and animal specimens collected in the course of research conducted in the area will be properly preserved and maintained within university or federal agency herbaria and museums, approved by the Rocky Mountain Station Director.

Records for the Arellano Canyon RNA will be maintained in the following offices:

- Regional Forester, Southwestern Region, Albuquerque, NM
- Rocky Mountain Station, Fort Collins, CO
- Carson National Forest, Taos NM
- District Ranger, Peñasco Ranger District, Peñasco, NM

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ESTABLISHMENT REPORT

ARELLANO CANYON RESEARCH NATURAL AREA

USDA FOREST SERVICE
SOUTHWESTERN REGION
CARSON NATIONAL FOREST
PEÑASCO RANGER DISTRICT
TAOS COUNTY, NEW MEXICO

Prepared by: _____ Date _____
William W. Dunmire, The Nature Conservancy
Mollie S. Toll, Department of Biology,
University of New Mexico

Recommended by: _____ Date _____
District Ranger
Peñasco Ranger District

Recommended by: _____ Date _____
John Bedell, Forest Supervisor
Carson National Forest

Recommended by: _____ Date _____
John W. Russell, Chairman
Southwestern Research Natural Area Committee

Recommended by: _____ Date _____
Sotero Muniz, Regional Forester
Southwestern Region

Recommended by: _____ Date _____
Charles M. Loveless, Station Director
Rocky Mountain Forest and Range
Experiment Station

ESTABLISHMENT RECORD

for

ARELLANO CANYON RESEARCH NATURAL AREA

within

Carson National Forest

Taos County, New Mexico

INTRODUCTION

The Arellano Canyon Research Natural Area (RNA) comprises approximately 641 acres (259.3 hectares) of spruce-fir forest in north-central New Mexico. The proposed RNA is located in the Peñasco Ranger District, in Taos County, and is all acquired National Forest land.

Arellano Canyon provided a top choice in the search for a forest mosaic research natural area with a minimal use history. Outstanding features include its luxuriant streamside riparian forests, inclusion of blue spruce as one of the forest cover types, and mosaics of forest ecosystems in mountainous topography. A task group of the Regional RNA Committee visited this and several other candidate forest areas in July, 1982, and concurred that this was the only available example meeting all the requirements.

LAND MANAGEMENT PLANNING

The need for representation of this biotic community was identified in the Southwestern Regional Guide (August 1983), although this particular site was not identified by name. The Carson National Forest Plan of September 1986 (Record of Decision approved October 31, 1986) includes the Arellano Canyon proposed research natural area. The environmental analysis conducted as part of the planning process supports the recommendation to establish this Research Natural Area.

JUSTIFICATION STATEMENT FOR ESTABLISHMENT OF AREA

The proposed Arellano Canyon Research Natural Area was identified primarily as an outstanding example of a spruce-fir forest ecosystem. This is an important and widespread ecosystem in the Southwest. The need to include such an ecosystem within the RNA network of the Southwestern Region has been stated in the Regional Guide (USFS 1983).

This area features different types of coniferous forests in steep mountain topography. Good examples of old-growth, and both intermediate and late successional stages of these forests are found in this RNA. The streamside forests feature luxuriance and diversity of both shrubs and herbs, and represent excellent riparian condition along small permanent streams.

PRINCIPAL DISTINGUISHING FEATURES

The Arellano Canyon area contains several types of coniferous forests in close juxtaposition, over an elevational grade of nearly 2000 feet or 600 meters. Forest types include Engelmann spruce (*Picea engelmannii*) - corkbark fir (*Abies lasiocarpa* var. *arizonica*) - white fir (*Abies concolor*) - Douglas-fir

tremuloides); Douglas-fir old growth; white fir - Douglas-fir - ponderosa pine (Pinus ponderosa); and Engelmann spruce - corkbark fir - bristlecone pine (Pinus aristata). Two permanent watercourses provide habitat for streamside forests, including blue spruce (Picea pungens); and Engelmann spruce - corkbark fir-blue spruce.

LOCATION

Arellano Canyon is situated in north central New Mexico, in the Peñasco Ranger District, Carson National Forest. The RNA can be located on the Cerro Vista Quadrangle (USGS 7.5') at latitude 36°10', longitude 105°28', Township 22 N, Range 14 E, Sections 5,6,7, and 8 (Map 1). The proposed RNA comprises approximately 641 acres (259.3 hectares). Elevation ranges from a low of 8800 feet (2682.2 m) in Arellano Canyon to 10,669 feet (3251.9 m) on La Cueva Peak.

The area lies just north of State Highway 3, between Peñasco and Mora, New Mexico. Access to the lower end of the RNA is by an all-weather, county maintained road; access to the upper end is by a Forest Service Road which is closed during the snow season (Maps 2 and 3). Both access points involve a short walk from the roadway to the RNA.

From Taos, New Mexico, take State Route 3 south and east approximately 26 miles (41.8 km) to Tres Ritos. One half mile (0.8 km) past Tres Ritos, turn left (north) on Forest Road 76. Proceed 2.6 miles (4.2 km) to the point where Arellano Creek crosses the road. Park at the forest campground on the south side of the road, and hike up the creek on an unmaintained trail approximately 0.3 miles (0.5 km) to the Research Natural Area.

For access to the upper end of the RNA, again take State Route 3 from Taos to the turnoff past Tres Ritos. From this point travel 4.9 miles (7.9 km) up Forest Road 76. Turn left on a gravel road (Forest Road 1889, unmarked). Proceed 1.0 miles (1.6 km; do not take the lower-standard side road branching off earlier to the left) to a timber sale road branching to the left. Proceed straight on this timber sale road, which is graveled the first 0.8 miles (1.3 km). Travel an additional 1.5 miles (2.4 km) after leaving the gravel; the road ends at the approximate northeast boundary of the RNA, at about 10,000 feet (3050 m) elevation.

Most of the canyon bottoms within the RNA either have game trails or, at the upper end, are open enough for fairly easy walking. The entire upper third of the RNA is open and easily traversed. In the lower canyon, however, the steep west and east facing slopes are densely forested and offer rough going.

AREA BY COVER TYPES

The distribution of cover types was determined from field surveys conducted in the summer of 1986 and from interpretation of 1981 aerial photography. Table 1 outlines the estimated total areas of vegetation types based on the Society of American Foresters forest type system (Eyre 1980) and the Kuchler Potential Natural Vegetation system (Kuchler 1964). Map 4 depicts the distribution of the SAF types, plus a grassland type not covered in the SAF forest categories, on the candidate research natural area.

Table 1. Estimated Areas of Vegetation Types in the Arellano Canyon Research Natural Area.

Type	Society of American Foresters		Surface Area	
	Cover Type ¹	Kuchler PNV Type ²	Acres	Hectares
Engelmann Spruce-Subalpine Fir	SAF 206	K-21 Southwestern Spruce - Fir	121	48.9
Bristlecone Pine	SAF 209	K-21	72	29.1
Interior Douglas-fir	SAF 210	K-18 Pine - Douglas-fir	170	68.8
Blue Spruce	SAF 216	K-18	22	8.9
Aspen	SAF 217	K-21	169	68.4
Thurber Fescue Grassland	[none]	K-52 Alpine Meadows	87	35.2
		TOTAL:	641	259.3

¹Eyre 1980.

²Kuchler 1964.

PHYSICAL AND CLIMATIC CONDITIONS

Average annual precipitation for the Arellano Canyon area is a substantial 29 inches (737 mm), with strong warm-season dominance (69% falls between May and October). Annual snowfall averages 67 inches (170 cm). Temperatures vary significantly with exposure and altitude. North aspects and higher elevations maintain an average annual temperature of 36° F (2.2° C), with a July average of 56° F (13.3° C), a January average of 17° F (-8.3° C), and a frost free period of only 70 days. South facing aspects and lower elevations, on the other hand, maintain a slightly higher annual average of 39° F (3.9° C), a July average

slightly higher annual average of 39° F (3.9° C), a July average of 59° F (15.0° C), a January average of 20° F (-6.7° C), and a significantly longer frost free period (90 days).

DESCRIPTION OF VALUES

Flora

A survey of habitat types (HT) was conducted during the 1986 field work. A brief review follows; for a more detailed description of the vegetative makeup of these types, see DeVelice et al. (1986).

Several attributes of the proposed RNA contribute to a remarkable diversity of plant communities and habitat types, including an elevation differential of 2300 feet (701 m), several miles of permanently flowing streams, a full range of slope aspects, and the presence of three life zones. Arellano Canyon's varied fire history, not documented in this report, further contributes to a diversified representation of seral and climax forest types.

The lower third of Arellano Canyon and its western tributary supports blue spruce (Picea pungens) as a dominant member of the canopy, with thinleaf alder (Alnus tenuifolia) codominant. White fir (Abies concolor), Engelmann spruce (Picea engelmannii), mountain willow (Salix scouleriana), limber pine (Pinus flexilis), aspen (Populus tremuloides), and Douglas-fir (Pseudotsuga menziesii) are all well represented. Shrubs include honeysuckle (Lonicera), snowberry (Symphoricarpos), currant (Ribes), and raspberry (Rubus). Picea pungens/Swida sericea HT and Picea pungens/Poa pratensis HT are both represented here.

In the upper two-thirds of the two canyon bottoms, Picea pungens drops out, and Alnus tenuifolia and Picea engelmannii dominate. Subalpine fir (Abies lasiocarpa) appears with Populus tremuloides. Symphoricarpos oreophilus becomes the most common shrub, and common juniper (Juniperus communis) and Rubus parviflorus are well-represented. This riparian community would probably key out to Picea engelmannii/Heracleum sphondylium HT.

The steep east and west facing slopes on either side of the lower canyons exhibit old growth Pseudotsuga menziesii with Abies concolor the dominant reproducing tree. Rocky Mountain maple (Acer glabrum) and Picea engelmannii are well-represented, while Pinus flexilis and ponderosa pine (P. ponderosa) occur sporadically. Shrubs dominate the undergrowth. Most common species in the drier sites are cliff jamesia (Jamesia americana), gambel oak (Quercus gambelii), and Oregon grape (Berberis repens), with Lonicera involucrata, mountain ninebark (Physocarpus monogynus), and ocean spray (Holodiscus dumosus) becoming more common in mesic sites. Grasses are scarce and forbs tend to be poorly represented. Proceeding from dry to mesic aspects on these slopes, habitat types include Abies concolor/Acer glabrum, Abies concolor/Erigeron eximius, to Abies concolor/Vaccinium myrtillus.

At higher elevations, especially where slopes become partly north-facing, Abies lasiocarpa replaces A. concolor as the

dominant fir, with Picea engelmannii codominant in the overstory. Populus tremuloides varies from pure stands occupying sites where fire has played an obvious recent role, to occasional relic trees within spruce-fir stands. Symphoricarpos oreophilus is the most common shrub. Forbs are abundant. Grasses are much less abundant, and are principally represented by hairy brome (Bromus ciliatus) and Kentucky bluegrass (Poa pratensis). Mosaics of Abies lasiocarpa/Erigeron eximius HT, Abies lasiocarpa/Rubus parviflorus HT, and Abies lasiocarpa/Vaccinium myrtillus HT occur throughout the spruce-fir forest.

Several large stands of bristlecone pine (Pinus aristida) occur within the Thurber fescue (Festuca thurberi) grasslands on south-facing slopes on the upper third of the RNA above 10,000 feet (3048 m) elevation. This Pinus aristida/Festuca thurberi HT includes Picea engelmannii along with the ever-present Populus tremuloides in the overstory, Symphoricarpos oreophilus as the principal shrub, and Festuca thurberi dominating the undergrowth.

Finally there are several open Thurber fescue grasslands, all on high, south-facing slopes. In addition to the dominant Festuca thurberi, other grasses present include pine dropseed (Blepharoneuron tricholepsis), oatgrass (Danthonia sp.), bottlebrush squirreltail (Sitanion hystrix), muttongrass (Poa fendleriana), and Poa pratensis. Forbs are represented by western yarrow (Achillea lanulosa), fleabane (Erigeron sp.), and vetch (Vicia sp.), among many others.

No threatened, endangered, or unique plants are known to occur in Arellano Canyon.

The following plant list was compiled from field observations by Will Moir, Range Ecologist, USFS Southwestern Region, on July 8, 1982, and by Bill Dunmire (The Nature Conservancy) on August 27 and 29, 1986.

Abbreviated Plant List for Arellano Canyon RNA

<u>Latin Name</u>	<u>Common Name</u> ¹	<u>Reference</u> ²
GRASSES AND GRASS-LIKE PLANTS:		
<u>Agropyron smithii</u>	Western wheatgrass	BD
<u>Blepharoneuron tricholepis</u>	Pine dropseed	BD
<u>Bromus ciliatus</u>	Hairy brome	WM BD
<u>Carex foena</u>	Sedge	WM
<u>Carex microptera</u>	Sedge	WM
<u>Carex spp.</u>	Sedge	WM BD
<u>Danthonia sp.</u>	Danthonia	BD
<u>Deschampsia caespitosa</u>	Tufted hairgrass	BD
<u>Elymus glaucus</u>	Blue wildrye	WM
<u>Festuca arizonica</u>	Arizona fescue	BD
<u>Festuca thurberi</u>	Thurber fescue	BD
<u>Oryzopsis asperifolia</u>	Ricegrass	WM
<u>Poa fendleriana</u>	Muttongrass	BD
<u>Poa cf. palustris</u>	Fowl bluegrass	WM
<u>Poa pratensis</u>	Kentucky bluegrass	WM BD
<u>Sitanion hystrix</u>	Bottlebrush squirreltail	BD
FORBS:		
<u>Achillea lanulosa</u>	Western yarrow	BD
<u>Aconitum columbianum</u>	Columbia monkshood	WM BD
<u>Actea arguta</u>	Baneberry	BD
<u>Aquilegia sp.</u>	Columbine	WM
<u>Campanula rotundifolia</u>	Bluebell	BD
<u>Cardamine cordifolia</u>	Heartleaf bittercress	WM
<u>Castilleja sp.</u>	Paintbrush	BD
<u>Dodecatheon ellisiae</u>	Dog shootingstar	WM
<u>Epilobium angustifolium</u>	Blooming Sally	BD
<u>Epilobium sp.</u>	Willowweed	WM
<u>Erigeron eximius</u>	Fleabane	BD
<u>Fragaria americana</u>	Strawberry	BD
<u>Fragaria ovalis</u>	Wild strawberry	BD
<u>Geranium richardsonii</u>	Big Dick geranium	WM BD
<u>Habenaria spp.</u>	Bog-orchid	WM
<u>Heracleum lanatum</u>	Cowparsnip	WM
<u>Hydrophyllum fendleri</u>	Waterleaf	WM
<u>Ipomopsis aggregata</u>	Skyrocket	BD
<u>Linaea borealis</u>	American twinflower	WM
<u>Mertensia franciscana</u>	Bluebells	WM
<u>Oreochrysum parryi</u>	Parry goldenweed	BD
<u>Osmorhiza depauperata</u>	Sweetroot	WM

<u>Oxypholis fendleri</u>	Fendler cowbane	WM	
<u>Pedicularis grayi</u>	Woodbetony	WM	BD
<u>Penstemon</u> spp.	Beard tongue	WM	
<u>Potentilla gracilis</u>	Smooth cinquefoil	WM	
<u>Prunella vulgaris</u>	Selfheal	WM	
<u>Pseudocymopterus montanus</u>	Mountain parsley	WM	
<u>Pyrola asarifolia</u>	Mule floret	WM	
<u>Pyrola secunda</u>	Mule floret	WM	
<u>Rorippa nasturtium-aquaticum</u>	Watercress		BD
<u>Rudbeckia laciniata</u>	Cutleaf coneflower	WM	
<u>Senecio sanguisorboides</u>	Groundsel	WM	
<u>Senecio wootonii</u>	Groundsel		BD
<u>Smilacina racemosa</u>	False Solomonseal	WM	BD
<u>Smilacina stellata</u>	Starry smilax	WM	BD
<u>Solidago</u> sp.	Goldenrod	WM	
<u>Swertia radiata</u>	Deers-ears swertia		BD
<u>Taraxacum officinale</u>	Dandelion	WM	BD
<u>Thalictrum fendleri</u>	Meadowrue	WM	BD
<u>Thermopsis pinetorum</u>	Piney goldenpea	WM	BD
<u>Valeriana edulis</u>	Tobaccoroot	WM	
<u>Veratrum californicum</u>	California hellebore		BD
<u>Veronica</u> sp.	Speedwell	WM	
<u>Vicia</u> sp.	Vetch		BD
<u>Viola nephrophylla</u>	Wanderer violet	WM	BD

HALF-SHRUBS, SHRUBS, AND TREES:

<u>Abies concolor</u>	White fir	WM	BD
<u>Abies lasiocarpa</u> var. <u>arizonica</u>	Corkbark fir	WM	BD
<u>Acer glabrum</u>	Rocky Mountain maple	WM	BD
<u>Alnus tenuifolia</u>	Thinleaf alder	WM	BD
<u>Arctostaphylos uva-ursi</u>	Kinnikinnick		BD
<u>Artemisia franserioides</u>	Ragweed sagebrush	WM	BD
<u>Berberis repens</u>	Oregon grape		BD
<u>Cornus stolonifera</u>	Red-osier dogwood	WM	BD
<u>Holodiscus dumosus</u>	Ocean spray		BD
<u>Jamesia americana</u>	Cliff jamesia	WM	BD
<u>Juniperus communis</u>	Common juniper		BD
<u>Lonicera involucrata</u>	Bearberry honeysuckle	WM	BD
<u>Pachystima myrsinites</u>	Boxleaf	WM	
<u>Physocarpus monogynus</u>	Mountain ninebark		BD
<u>Picea engelmanni</u>	Engelmann spruce	WM	BD
<u>Picea pungens</u>	Blue spruce	WM	BD
<u>Pinus aristata</u>	Bristlecone pine		BD
<u>Pinus flexilis</u>	Limber pine	WM	BD
<u>Pinus ponderosa</u>	Ponderosa pine	WM	BD
<u>Populus tremuloides</u>	Quaking aspen	WM	BD
<u>Potentilla fruticosa</u>	Shrubby cinquefoil	WM	BD
<u>Prunus virginiana</u>	Chokecherry	WM	BD
<u>Pseudotsuga menziesii</u>	Douglas-fir	WM	BD
<u>Quercus gambelii</u>	Gambel oak	WM	BD
<u>Ribes</u> spp.	Wax currant	WM	BD
<u>Rubus</u> sp.	Raspberry		BD
<u>Rubus parviflorus</u>	Western thimbleberry		BD

<u>Salix</u> spp.	Willow	WM	BD
<u>Salix scouleriana</u>	Mountain willow	WM	
<u>Sambucus</u> sp.	Elderberry		BD
<u>Shepherdia canadensis</u>	Russet buffaloberry	WM	BD
<u>Symphoricarpus oreophilus</u>	Mountain snowberry	WM	BD
<u>Vaccinium myrtillus</u>	Myrtle whortleberry	WM	BD

¹Common names used according to USDA, Forest Service 1974, or Martin & Hutchins 1981.

²WM = observed by Will Moir (Range Ecologist, USFS Southwest Region) on July 8, 1982

BD = observed by Bill Dunmire (The Nature Conservancy) on August 27 and 29, 1986

Fauna

No rare, endangered, or sensitive animal species are known to inhabit this area; however, the great diversity of plant communities exhibited here supports a rich variety of animal life. The open grasslands and aspen mosaics in the upper portion of the RNA provide important spring, summer, and fall elk habitat. These communities and the forest-shrub mixes on the lower slopes also support moderately high mule deer populations. Arellano Creek has sufficient flow to support beaver, although this species is not known to reside here at this time.

The following animal list was derived from the Run Wild III computer-stored data base (Lehmkuhl and Patton 1982; Patton 1979) from the following habitat types, for Taos county, New Mexico:

1. Sub-alpine conifer forest and woodland biome
2. Sub-alpine riparian woodland biome; Alnus tenuifolia-Salix association
3. Douglas-fir - white fir series
4. Montane grassland biome; mixed meadow series

These habitat types currently in the data base most closely correspond to those occurring in the proposed RNA.

Abbreviated Animal List for Arellano Canyon R.N.A.

Common Name

Latin Name

AMPHIBIANS:

Frog, striped chorus
Salamander, tiger
Toad, Woodhouse's

Pseudacris triseriata
Ambystoma tigrinum
Bufo woodhousei

BIRDS:

Blackbird, Brewer's
Blackbird, redwinged
Bluebird, mountain
Bluebird, western
Bushtit
Chickadee, black-capped
Chickadee, mountain
Creeper, brown
Crossbill, red
Crow, American
Dipper, American
Dove, mourning
Eagle, golden
Falcon, prairie
Finch, Cassin's
Finch, house
Finch, rosy
Flicker, northern
Flycatcher, Hammond's
Flycatcher, olive-sided
Flycatcher, western
Flycatcher, willow
Goldfinch, lesser
Goshawk, northern
Grosbeak, black-headed
Grosbeak, evening
Grosbeak, pine
Harrier, northern
Hawk, Cooper's
Hawk, red-tailed
Hawk, sharp-shinned
Hummingbird, broad-tailed
Hummingbird, rufous
Jay, gray
Jay, Steller's
Junco, dark-eyed
Kestrel, American
Killdeer
Kinglet, ruby-crowned
Magpie, black-billed
Martin, purple

Euphagus cyanocephalus
Agelaius phoeniceus
Sialia currucoides
Sialia mexicana
Psaltriparus minimus
Parus atricapillus
Parus gambeli
Certhia americana
Loxia curvirostra
Corvus brachyrhynchos
Cinclus mexicanus
Zenaida macroura
Aquila chrysaetos
Falco mexicanus
Carpodacus cassinii
Carpodacus mexicanus
Leucosticte arctoa
Colaptes auratus
Empidonax hammondii
Contopus borealis
Empidonax difficilis
Empidonax traillii
Carduelis psaltria
Accipiter gentilis
Pheucticus melanocephalus
Coccothraustes vespertinus
Pinicola enucleator
Circus cyaneus
Accipiter cooperii
Buteo jamaicensis
Accipiter striatus
Selasphorus platycercus
Selasphorus rufus
Perisoreus canadensis
Cyanocitta stelleri
Junco hyemalis
Falco sparverius
Charadrius vociferus
Regulus calendula
Pica pica
Progne subis

Nighthawk, common
Nutcracker, Clark's
Nuthatch, pygmy
Nuthatch, red-breasted
Nuthatch, white-breasted
Owl, flammulated
Owl, northern saw-whet
Owl, spotted
Pigeon, band-tailed
Pipit, water
Pygmy-owl, northern
Raven, common
Robin, American
Sapsucker, Williamson's
Sapsucker, yellow-bellied
Siskin, pine
Snipe, common
Solitaire, Townsend's
Sparrow, chipping
Sparrow, vesper
Sparrow, white-crowned
Swallow, barn
Swallow, cliff
Swallow, tree
Swallow, violet-green
Swift, white-throated
Tanager, western
Thrush, hermit
Thrush, Swainson's
Turkey, wild
Vireo, solitary
Vireo, warbling
Vulture, turkey
Warbler, Grace's
Warbler, orange-crowned
Warbler, Virginia's
Warbler, Wilson's
Waxwing, cedar
Woodpecker, Lewis'
Woodpecker, three-toed
Wood-pewee, western
Wren, canyon
Wren, house
Wren, rock

MAMMALS:

Badger
Bat, big brown
Bat, hoary
Bat, silver-haired
Bear, black
Chipmunk, Colorado
Chipmunk, least

Chordeiles minor
Nucifraga columbiana
Sitta pygmaea
Sitta canadensis
Sitta carolinensis
Otus flammeolus
Aegolius acadicus
Strix occidentalis
Columba fasciata
Anthus spinoletta
Glaucidium gnoma
Corvus corax
Turdus migratorius
Sphyrapicus thyroideus
Sphyrapicus varius
Carduelis pinus
Gallinago gallinago
Myadestes townsendi
Spizella passerina
Poocetes gramineus
Zonotrichia leucophrys
Hirundo rustica
Hirundo pyrrhonota
Tachycineta bicolor
Tachycineta thalassina
Aeronautes saxatalis
Piranga ludoviciana
Catharus guttatus
Catharus ustulatus
Meleagris gallopavo
Vireo solitarius
Vireo gilvus
Cathartes aura
Dendroica graciae
Vermivora celata
Vermivora virginiae
Wilsonia pusilla
Bombycilla cedrorum
Melanerpes lewis
Picoides tridactylus
Contopus sordidulus
Catherpes mexicanus
Troglodytes aedon
Salpinctes obsoletus

Taxidea taxus
Eptesicus fuscus
Lasiurus cinereus
Lasionycteris noctivagans
Ursus americanus
Tamias quadrivittatus
Tamias minimus

Cottontail, Nuttall's
Coyote
Deer, mule
Deer, white-tailed
Elk
Ermine
Fox, red
Gopher, Botta's pocket
Gopher, northern pocket
Jackrabbit, black-tailed
Jackrabbit, white-tailed
Lion, mountain
Marmot, yellow-bellied
Marten
Mouse, deer
Mouse, northern grasshopper
Mouse, pinyon
Mouse, western harvest
Mouse, western jumping
Myotis, fringed
Myotis, little brown
Myotis, long-eared
Myotis, long-legged
Myotis, small-footed
Porcupine
Raccoon
Shrew, masked
Shrew, vagrant
Shrew, water
Skunk, striped
Squirrel, golden-mantled ground
Squirrel, red
Squirrel, thirteen-lined ground
Vole, heather
Vole, meadow
Vole, southern red-backed
Weasel, long-tailed
Woodrat, bushy-tailed
Woodrat, Mexican
Woodrat, white-throated

REPTILES:

Lizard, short-horned
Rattlesnake, western
Skink, many-lined
Snake, common garter
Snake, gopher
Snake, milk
Snake, smooth green
Snake, western terrestrial
garter

Sylvilagus nuttallii
Canis latrans
Odocoileus hemionus
Odocoileus virginianus
Cervus elaphus
Mustela erminea
Vulpes vulpes
Thomomys bottae
Thomomys talpoides
Lepus californicus
Lepus townsendii
Felis concolor
Marmota flaviventris
Martes americana
Peromyscus maniculatus
Onychomys leucogaster
Peromyscus truei
Reithrodontomys megalotis
Zapus princeps
Myotis thysanodes
Myotis lucifugus
Myotis evotis
Myotis volans
Myotis leibii
Erethizon dorsatum
Procyon lotor
Sorex cinereus
Sorex vagrans
Sorex palustris
Mephitis mephitis
Spermophilus lateralis
Tamiasciurus hudsonicus
Spermophilus tridecemlineatus
Phenacomys intermedius
Microtus pennsylvanicus
Clethrionomys gapperi
Mustela frenata
Neotoma cinerea
Neotoma mexicana
Neotoma albigula

Phrynosoma douglassi
Crotalus viridis
Eumeces multivirgatus
Thamnophis sirtalis
Pituophis melanoleucus
Lampropeltis triangulum
Opheodrys vernalis
Thamnophis elegans

Geology

Arellano Canyon is located in the Sangre de Cristos, a north-trending chain of mountains between the Rio Grande depression on the west and the Raton Basin on the east. In the taller, western Taos Range of the Sangre de Cristos, elevations include numerous peaks from 12,000' (3657.6 m) to 13,173' (4015.1 m; Wheeler Peak, the highest point in New Mexico). The bulk of the Taos Range is composed of undifferentiated Precambrian metamorphic rocks. The Taos horst (a complex zone of normal, reverse, and thrust faults) is responsible for uplifting Precambrian material to the surface (Clark 1966).

The vicinity of the proposed RNA is underlain by Pennsylvanian rocks undivided. These include interbedded dark-green siltstone, mudstone, brown sandstone, clastic sandy brownish-gray limestone, and thin conglomerate.

Soils

The majority of the Arellano Canyon RNA is classified as Jaroso-Angostura-Rock outcrop complex (Hacker and Carleton 1982). These very steep soils and rock outcrop are found on mountain slopes at elevations from 9000 to 11,000 feet (2743.2 - 3352.8 m). Both Jaroso and Angostura soils are deep and well-drained, and were formed in colluvium of interbedded shale and sandstone. Typically, the surface layer of Jaroso soils is very pale brown cobbly loam about 16 inches (40.6 cm) thick, while that of Angostura soils is light brownish gray cobbly loam about 10 inches (25.4 cm) thick. Permeability in each case is moderately slow, with an effective rooting depth of more than 60 inches (152.4 cm).

North aspects and higher elevations consist dominantly of Typic Cryoboralfs, loamy-skeletal, mixed. South aspects are occupied by Entric Glossoboralfs, loamy-skeletal, mixed. Stream-sides are mainly non-acid Typic Cryafluvents, loamy-skeletal, mixed.

Lands

Land encompassed in the Arellano Canyon RNA is all acquired Forest land. There are no known rights-of-way or vested interests within the proposed boundaries.

Cultural Resources

The area has not been surveyed for cultural resources. Near the mouth of Arellano Canyon decking of an old lumber mill or bridge can be found. No other cultural resources are known. Upon establishment as an RNA, the area will be withdrawn from any archeological research that would in any way modify the existing locale.

IMPACTS AND POSSIBLE CONFLICTS

Mineral Resources

No known mineral resources exist in this area. The area is covered by oil and gas leases issued to Leonard Minerals Company and Kriti Exploration.

Grazing

Livestock grazing presently occurs in the upper portions of the proposed RNA, including the upper third of the Arellano Creek bottom.

Timber

The vegetation type is predominantly spruce-fir with pockets of aspen. The area hasn't been logged, and there are no plans to do so in the future.

Watershed Values

Arellano Canyon is a fifth order watershed, and contributes approximately 2% to the 84,000 acre Rio Pueblo watershed. Watershed condition is considered optimum.

Recreation Values

Recreation use includes hiking, hunting, and cross-country skiing. The mouth of Arellano Canyon below the RNA is a heavily used camping and fishing area.

Wildlife and Plant Values

No threatened or endangered species are known to occur in the area. The higher elevations contain habitat suitable for the pine marten, a New Mexico State listed species.

Wilderness, Wild and Scenic River, National Recreation Area Values

None of the above congressionally designated areas have been proposed for the Arellano Canyon RNA or vicinity.

Transportation Plans

There is a trail open to ORV use located just west of the proposed Research Natural Area. Two logging spur roads lead to the boundary on the east. The mouth of Arellano Canyon is a high use recreation area which could cause some Off Road Vehicle problems within the boundaries of the proposed Research Natural Area.

Utility Corridor Plans

No existing or potential utility corridor plans exist in the vicinity of this RNA.

MANAGEMENT PLAN

The Carson National Forest Plan (USFS 1986) prescribes that there will be no harvest of timber or firewood and no assigned grazing capacity on Research Natural Areas. The prescriptions also prohibit off-road vehicle travel, open campfires, the introduction of non-native plant or animal species, road or trail construction, and recreational use if degradation results. However, non-motorized dispersed recreation activities are permitted provided they do not significantly modify the area, or threaten or impair the research or educational value of the area. No collection of flora, fauna, or other materials will be allowed, other than for research approved by the Station Director.

1. Vegetation Management

The Forest Plan provides that prescribed fire, using planned and unplanned ignitions, will be allowed in the Arellano Canyon RNA to maintain fire dependent ecosystems. A fire management plan for the RNA will be developed at a later time.

ADMINISTRATIVE RECORDS AND PROTECTION

Administration and protection of the Arellano Canyon RNA will be the responsibility of the Carson National Forest. The District Ranger, Peñasco District, Peñasco, NM has direct responsibility.

The Director of the Rocky Mountain Forest and Range Experiment Station, or his designee, will be responsible for any studies or research conducted in the area, and requests to conduct research in the area will be referred to him. He, or his designee, will evaluate research proposals and coordinate all studies and research in the area with the District Ranger. All plant and animal specimens collected in the course of research conducted in the area will be properly preserved and maintained within university or federal agency herbaria and museums, approved by the Rocky Mountain Station Director.

Records for the Arellano Canyon RNA will be maintained in the following offices:

- Regional Forester, Southwestern Region, Albuquerque, NM
- Rocky Mountain Station, Fort Collins, CO
- Carson National Forest, Taos NM
- District Ranger, Peñasco Ranger District, Peñasco, NM

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- Martin, William C., and Charles R. Hutchins. 1980. A Flora of New Mexico. J. Cramer, Braunschweig, West Germany.
- Patton, David R. 1979. RUN WILD II: a storage and retrieval system for wildlife data. Transactions of the North American Wildlife and Natural Research Conference 44:425-430.

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- USDA Forest Service. 1984. Progress report, Research Natural Areas: recommended representations for important ecosystems on National Forest System land in the Southwestern Region. USDA Forest Service, Southwestern Region, Albuquerque, NM. 90 pp.
- USDA Forest Service. 1986. Carson National Forest Plan. USDA Forest Service, Southwestern Region, Albuquerque.

DESIGNATION ORDER

By virtue of the authority vested in me by the Secretary of Agriculture under regulations 7 CFR 2.60(a) and 36 CFR 251.23, hereby designate as the Arellano Canyon Research Natural Area the lands described in the following establishment record prepared by William W. Dunmire and Mollie S. Toll, dated March 20, 1987. These lands shall hereafter be administered as a research natural area subject to the above regulations and instructions issued thereunder.

Chief

Date

RECEIVED OCT - 7 1986



United States
Department of
Agriculture

Forest
Service

Carson
National
Forest

P.O. Box 558
Taos, NM 87571

Reply To: 4060

Date: October 2, 1986

Mr. William W. Dunmire
The Nature Conservancy
610 Gold Avenue S. W.
P.O. Box 1846
Albuquerque, NM 87103

Dear Bill:

The reports from the Penasco and Questa District Rangers on the impacts and possible conflicts for our potential research natural areas are enclosed.

The oil and gas lease on the Arellano Canyon area probably is a concern and it would have been much better if we had issued the lease with a no surface occupancy stipulation for the area. At this point we have a couple of options, 1) Work with the company at the Application for Permit to Drill phase (if it comes to that) and with normal well spacing, do not include any wells or improvements within the area, or 2) Go to the company and see if they would be willing to withdraw their interest in the area. This may be a possibility as they have 100,000 acres or so under lease on this side of the Forest. Our feeling is that this issue can be resolved.

The grazing issue on Arellano Canyon is of greater concern. When the original study team looked at the area, they looked at the forested portion and did not get to the upper slopes. There was little evidence of past grazing in the forested portion and there was no grazing capacity tied to it. Therefore, the team did not feel that classification as an RNA would impact the Grazing Association. On your visit you did look at the upper slopes and found that the meadows had been grazed this year. The study team knew there were some conflicts when the RNA boundary had to be put on the watershed boundary and this is the reason a portion of the area that is within the watershed that had been logged is not within the boundary we now display. The study team's primary interest was in the forested portion. The District Ranger does feel there would be a hardship on the Grazing Association if they could not graze the upper slopes. If we do decide to stay with the present boundary of the RNA, we have some work to do with the Association. Bill, we do not want this grazing issue to preclude the establishment of this RNA and we feel that if we can get together we can reach resolution. It looks like we have a couple of alternatives to discuss. The first would be to adjust the RNA boundary to exclude those upper meadows. We would continue to graze them with a management emphasis that would place extreme importance of protecting the lower watershed. This is our objective in managing the forage resource in all areas. The second option that could be explored is to retain the present boundary and see if the lost grazing capacity could be replaced elsewhere. We would have to involve the Grazing Association in any decision that would be made in this regard.





Mr. William W. Dunmire

2

The last item dealing with Arellano Canyon is the potential for motorcycle intrusions. The general area does have a lot of motorized use and problems will continue with people driving off of designated routes. Future plans call for more user education, public contacts and monitoring with regard to motorcycle use which should minimize unauthorized use.

The Warranty Deed that the Vermejo Park Corporation issued to the Forest Service for the Valle Vidal stipulated that The United States would honor the Indenture Agreement between Kaiser Steel and Vermejo Park. As the report from the Questa District states, some of the areas Kaiser has coal rights on are included within the proposed RNA's. At the present time there are only about 200 acres of known coal reserves on the donation area and none of this is suitable for surface mining. Therefore, we are hopeful that the Indenture Agreement will not be a problem with designation of the RNA s.

We would like to add an opportunity that is not discussed as far as the McCrystal Meadow area is concerned. A large portion of the meadow is on Vermejo Park Corporation lands. It would be highly desirable to formulate some agreement or understanding with Vermejo that would provide the same emphasis for management on their side of the boundary. We are not sure if they will be receptive to this, but we will follow up with them on it in the future.

Bill, it appears that we will need to get together to discuss the Arellano Canyon area further and we will be happy to meet at your convenience. If you have any questions on the reports, please feel free to contact the District Rangers, Toby Martinez at Penasco and Ron Thibedeau at Questa, or Bill Moehn at this office.

Sincerely,

A handwritten signature in dark ink, appearing to read "John C. Bebell".

JOHN C. BEDELL
Forest Supervisor

Enclosures



Arellano Canyon Research Natural Area
Impacts and Possible Conflict

*Sinda White - Tripartite
T P district
Range Com.*

1. Mineral Resources

No known mineral resources exist. The area is covered by oil and gas leases issued to Leonard Minerals Company and Kriti Exploration Inc.

2. Grazing

Arellano Canyon is open to livestock grazing. The area is used on alternating years for a period of approximately two months.

Excluding Arellano Canyon from grazing would be difficult for two reasons: (1) Approximately three miles of fence would need to be constructed. Based on past performance, the fence would not be maintained by permittees. (2) Arellano Canyon is within the Rio Pueblo grazing allotment and contains forage necessary to meet the current obligation. If grazing was excluded a permit adjustment of approximately 25% (45 head) would be necessary.

3. Timber

Vegetation type is predominantly spruce-fir with pockets of aspen. The area hasn't been logged and there are no plans to do so in the future regardless of Research Natural Area status.

4. Watershed Values

Arellano Canyon is a part of the fifth code watershed of the Rio Pueblo watershed. The Rio Pueblo watershed contains approximately 84,000 acres of which Arellano Canyon contributes approximately 2% of the total. Watershed condition is considered optimum.

5. Recreation Values

Recreation use ranges from unauthorized Off Road Vehicle use to hunting and cross country skiing. The mouth of Arellano Canyon is a heavily used camping and fishing area.

6. Wildlife and Plant Values

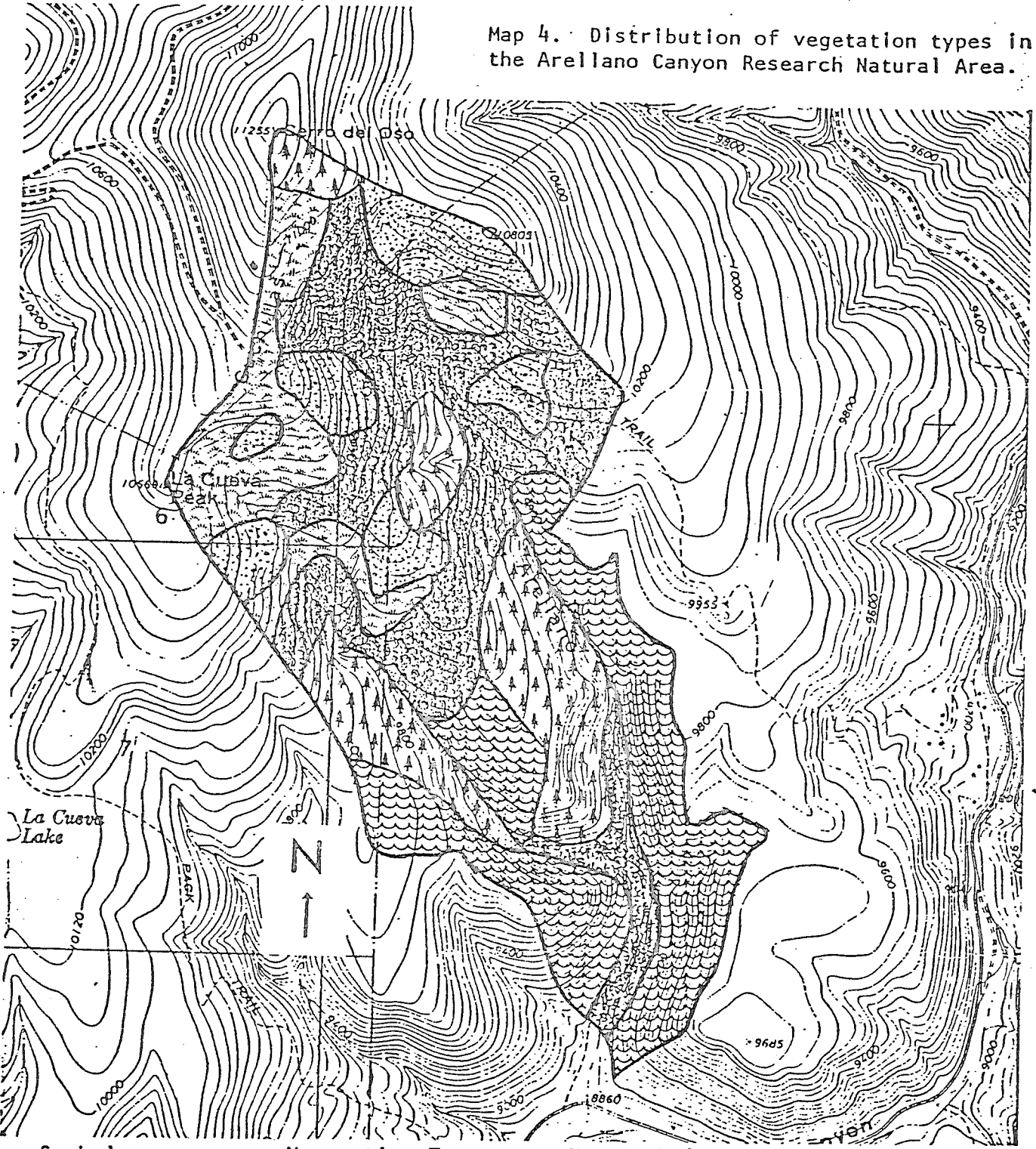
No Threatened and Endangered Species are known to occur in the area. The higher elevations contain habitat suitable for the pine marten, a New Mexico State listed species.

7. Wilderness, Wild and Scenic River, National Recreation Area Values

There are no congressionally designated areas like those mentioned above proposed for this area.



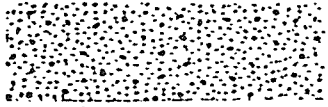
Map 4. Distribution of vegetation types in the Arellano Canyon Research Natural Area.



Map Symbol Vegetation Type



Engelmann spruce -
subalpine fir
SAF 206, K-21

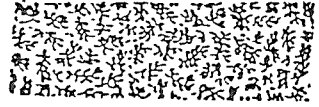


Bristlecone pine
SAF 209, K-22

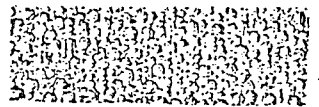


Interior Douglas fir
SAF 210, K-18

Map Symbol Vegetation Type



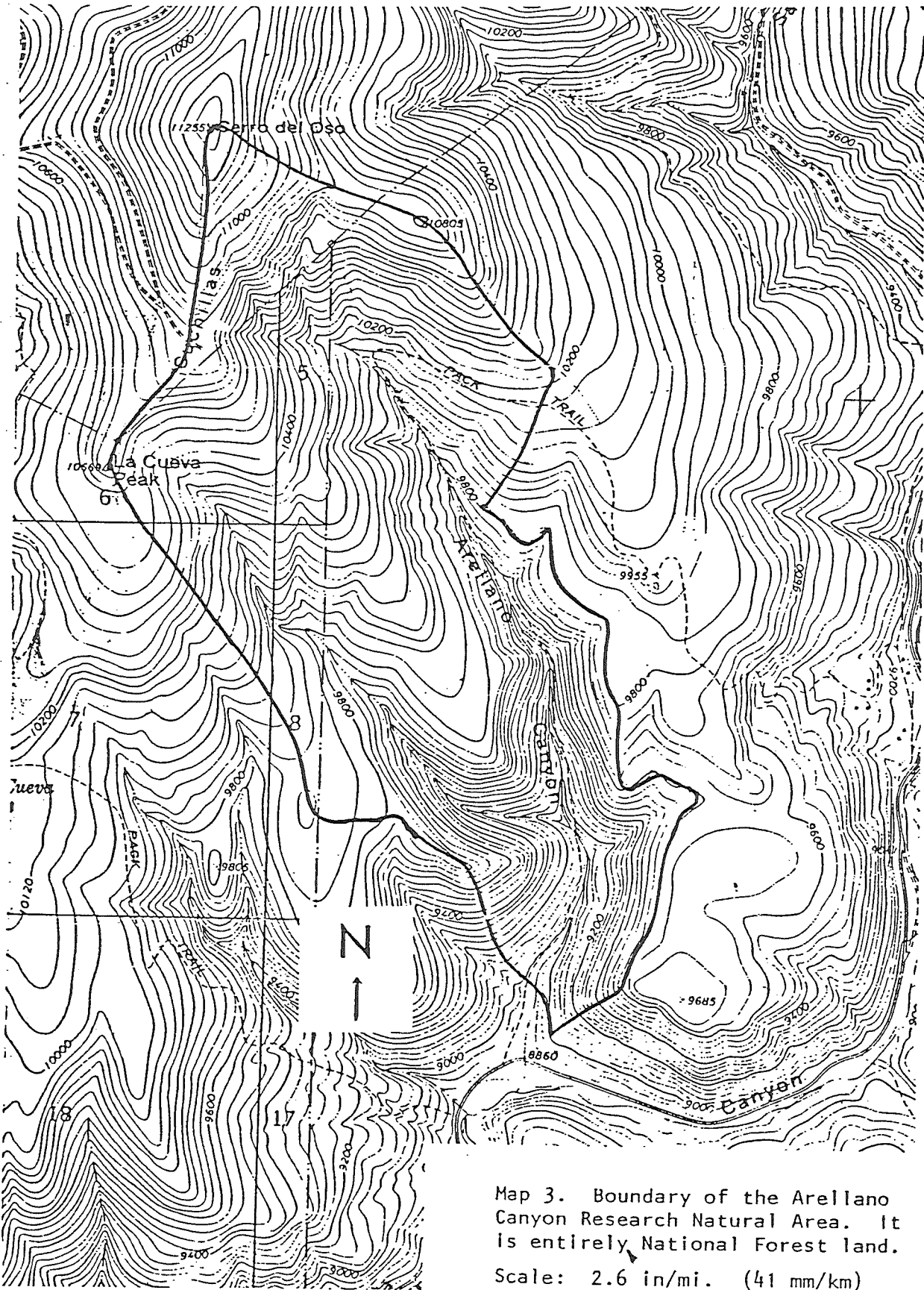
Blue spruce
SAF 216, K-18



Aspen
SAF 217, K-18



Thurber fescue
grassland
K-52



Map 3. Boundary of the Arellano Canyon Research Natural Area. It is entirely National Forest land.
Scale: 2.6 in/mi. (41 mm/km)

USDA-FOREST SERVICE

PHOTOGRAPHER

William W. Dunmire

DATE SUBMITTED

PHOTOGRAPHIC RECORD

(See FSM 1643.52)

HEADQUARTERS UNIT

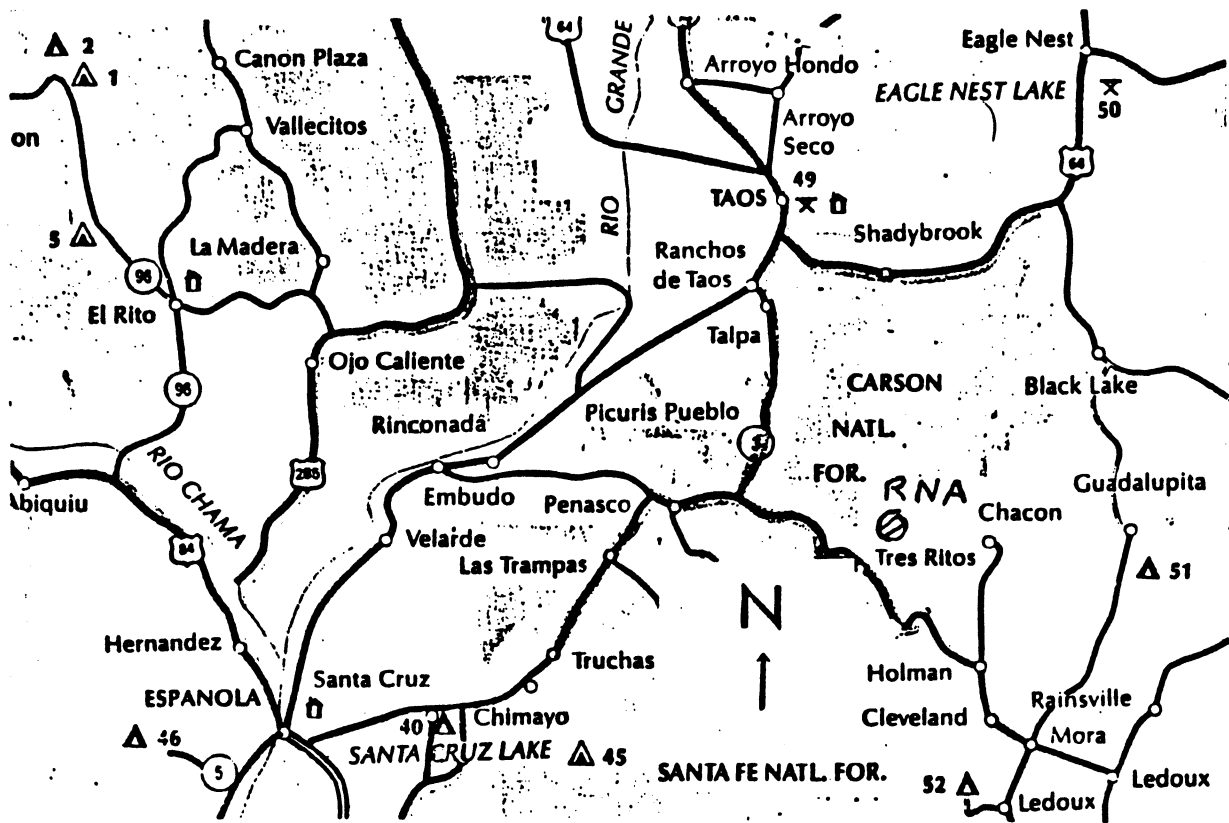
LOCATION

INITIAL DISTRIBUTION OF PRINTS AND FORM 1600-11

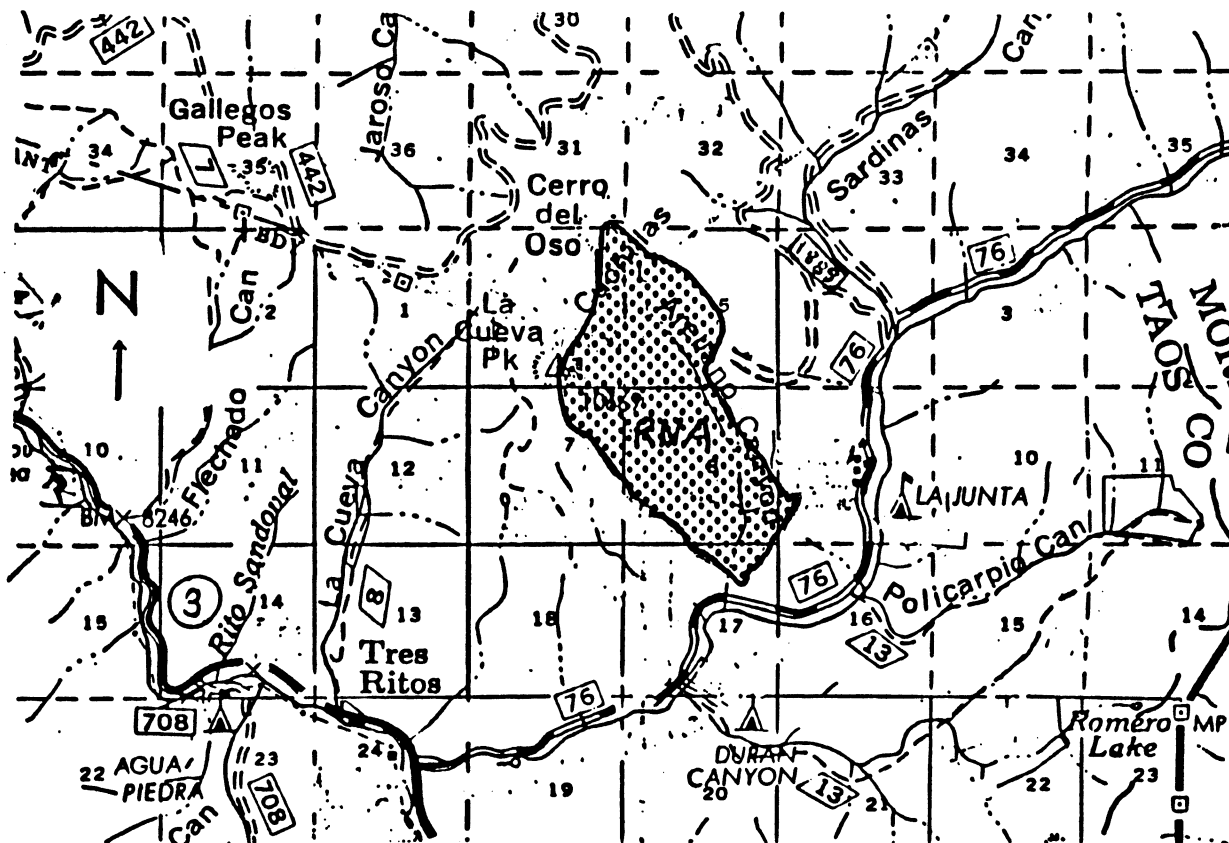
WO RO DIV. FOREST DISTRICT PHOTOGRAPHER Date _____

INSTRUCTIONS: Submit to Washington Office in quadruplicate. Permanent numbers will be assigned and the forms will be distributed as follows: (1) Washington Office, (2) RO or Station, (3) Forest or Center and (4) Photographer.

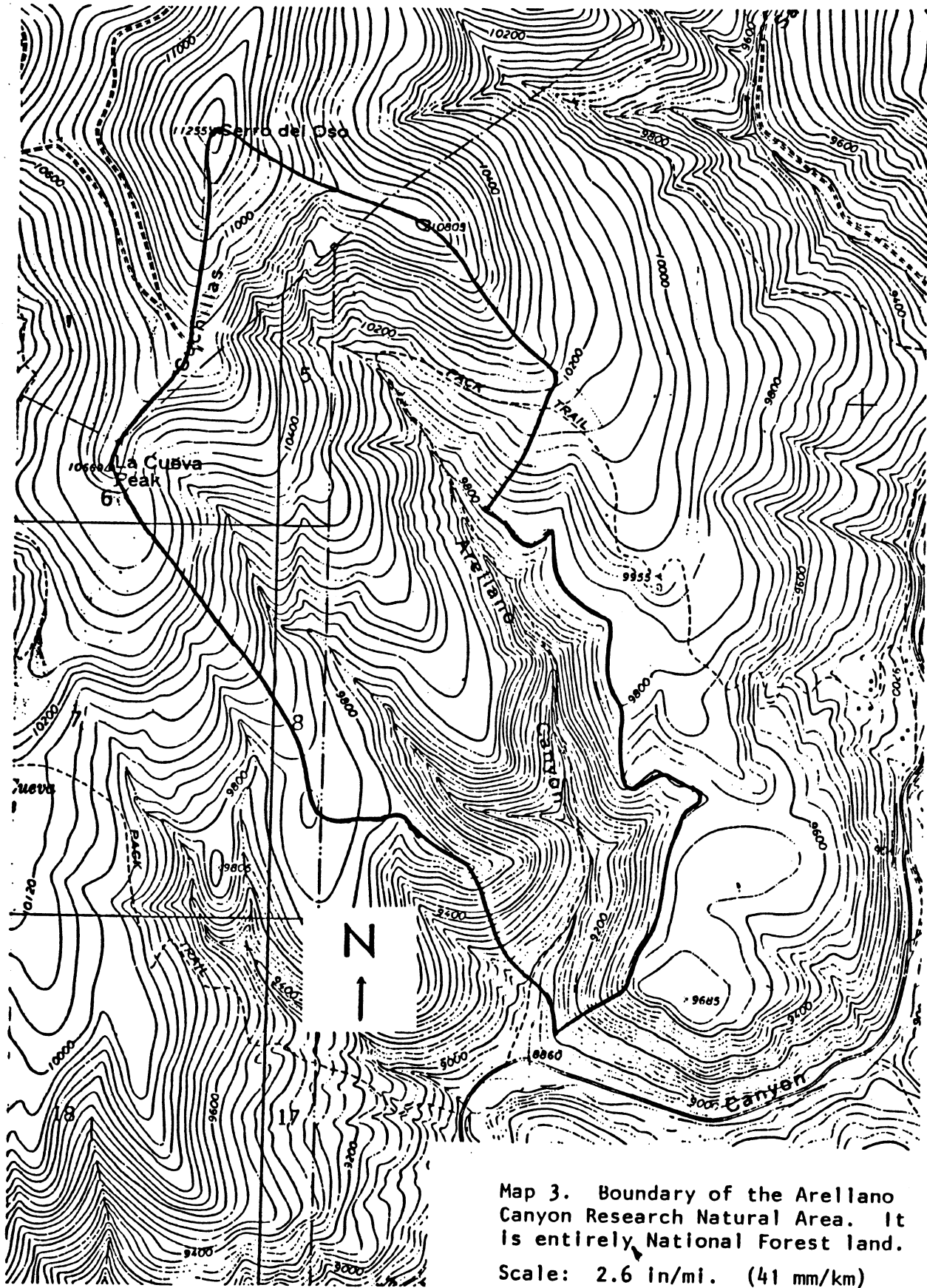
PHOTOGRAPH NUMBER		SELECTED FOR W.O. PHOTO LIBRARY	DATE OF EXPOSURE	LOCATION (State, Forest, District and County)	CONCISE DESCRIPTION OF VIEW	NEGATIVE (Show size and BW for black and white or C for color)
TEMP.	PERMANENT (To be filled in by the WO)					
(1)	(2)	(3)	(4)	(5)	(6)	(7)
				ALL: New Mexico Carson NF Peñasco Dist. Taos Co.		ALL: 24x36mm color slides
1.			8-29-86		North Arellano Canyon from Forest Road 76.	
2.			8-29-86		Blue spruce riparian forest community at lower end of Arellano Canyon RNA.	
3.			8-27-86		Thin-leaf alder riparian forest, upper end of Arellano Canyon RNA.	
4.			8-27-86		South down Arellano Canyon from east ridge of Cerro del Oso.	
5.			8-27-86		Thurber fescue grassland on east flank of Cerro del Oso.	
6.			8-27-86		Bristlecone pine/Thurber fescue Habitat Type on slopes northeast of La Cueva Park.	
7.			8-27-86		Stand of seral aspen on ridge between the two major forks of upper Arellano Canyon	
8.			8-27-86		Corkbark fir/myrtle whortleberry Habitat Type on east-facing slope at 10,000 ft. (3,048 M) near Arellano Canyon bottom.	
9.			8-29-86		White fir/myrtle whortleberry Habitat Type on southwest ridge boundary of Arellano Canyon RNA.	



Map 1. Location of RNA (North Central New Mexico)

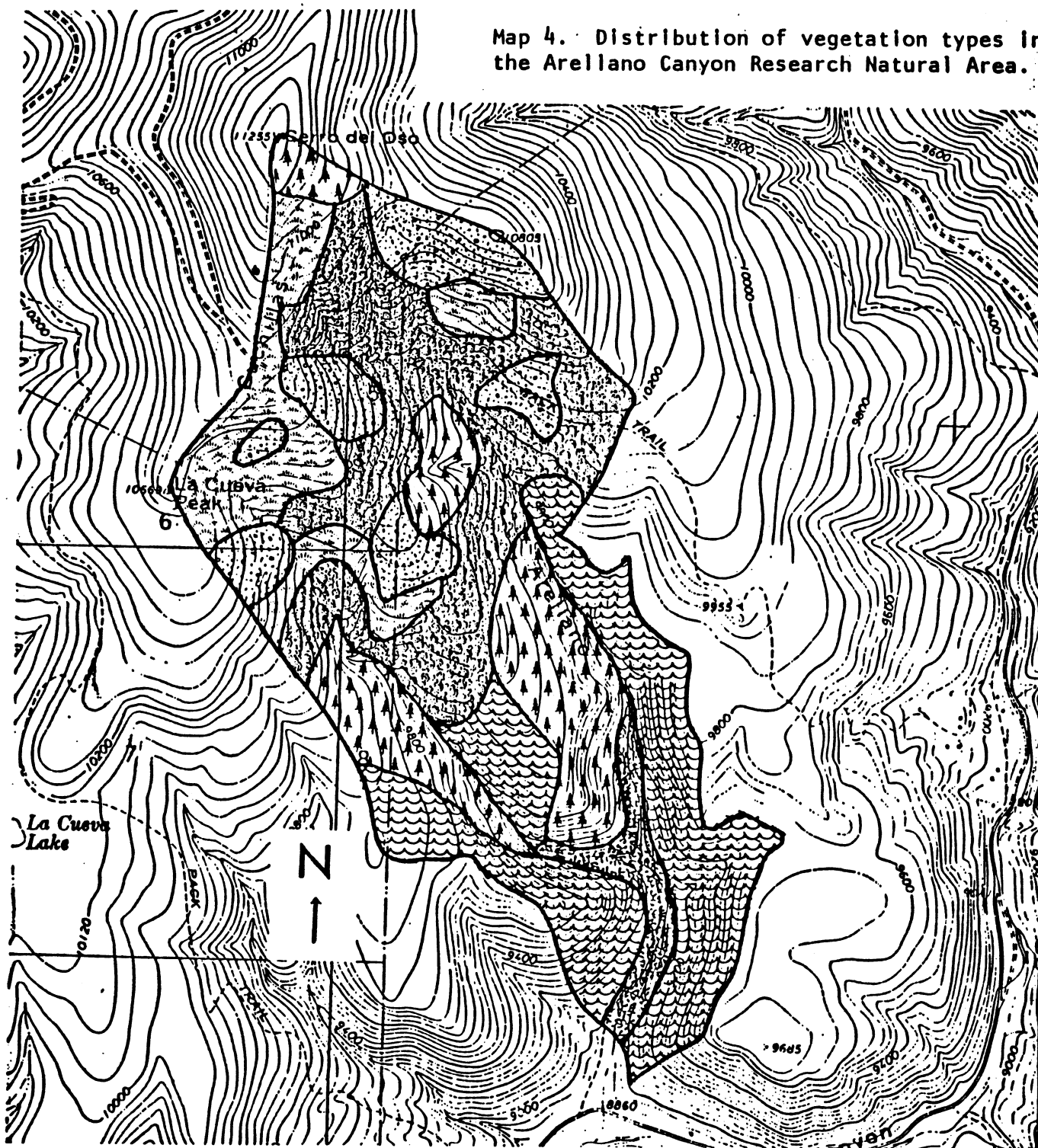


Map 2. Access Route to Arellano Canyon RNA



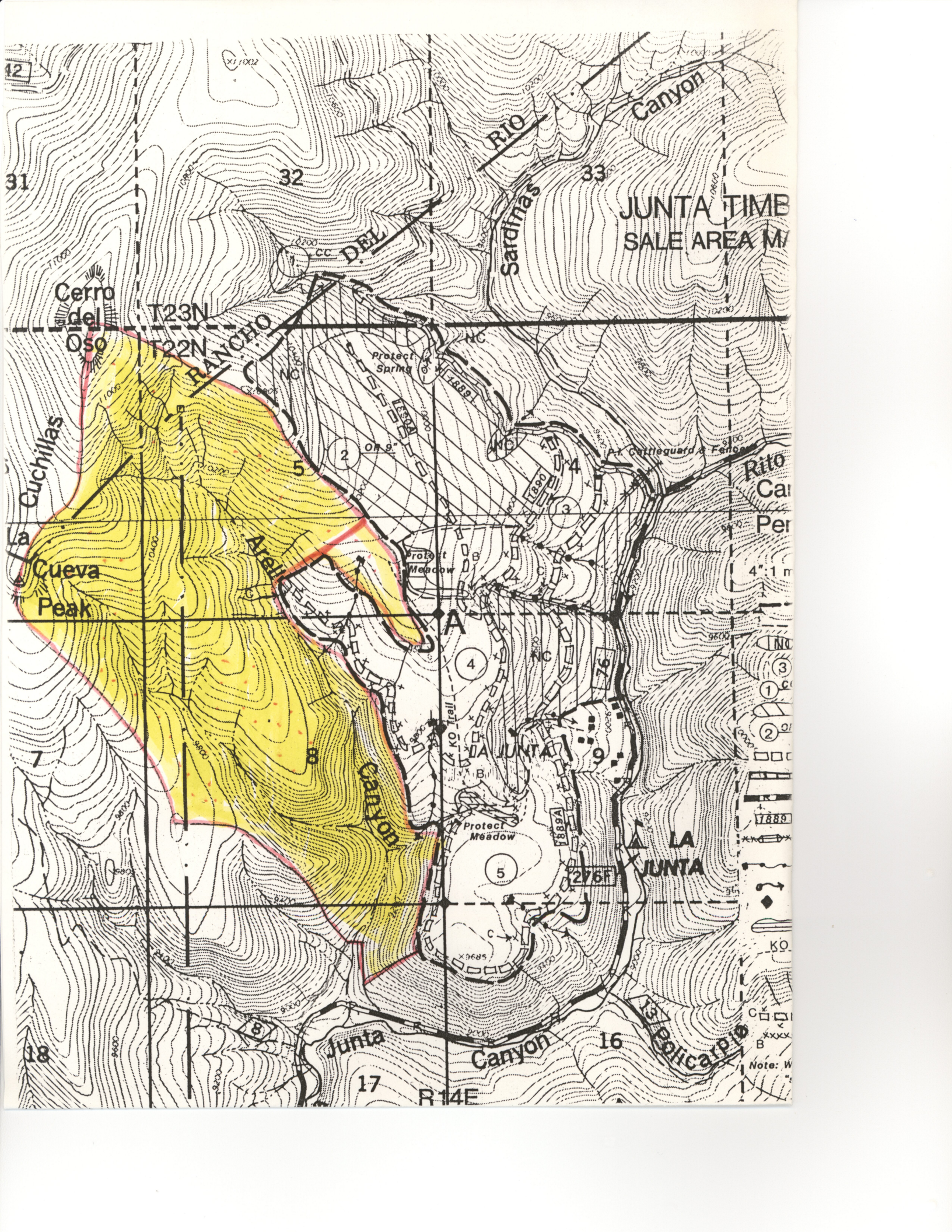
Map 3. Boundary of the Arellano Canyon Research Natural Area. It is entirely National Forest land. Scale: 2.6 in/mi. (41 mm/km)

Map 4. Distribution of vegetation types in the Arellano Canyon Research Natural Area.



Map Symbol	Vegetation Type
	Engelmann spruce - subalpine fir SAF 206, K-21
	Bristlecone pine SAF 209, K-22
	Interior Douglas fir SAF 210, K-18

Map Symbol	Vegetation Type
	Blue spruce SAF 216, K-18
	Aspen SAF 217, K-18
	Thurber fescue grassland K-52



12

31

32

33

JUNTA TIMB
SALE AREA M

Cerro
del
Oso

T23N

T22N

RANCHO
ARELL

DEL

RIO

Canyon

Sardinias

Cuchillas

Cueva
Peak

Arrell

Canyon

Rito
Car
Per

4" = 1 m

7

8

4

3

4

9

5

76

LA JUNTA

LA
JUNTA

18

8

17

R14E

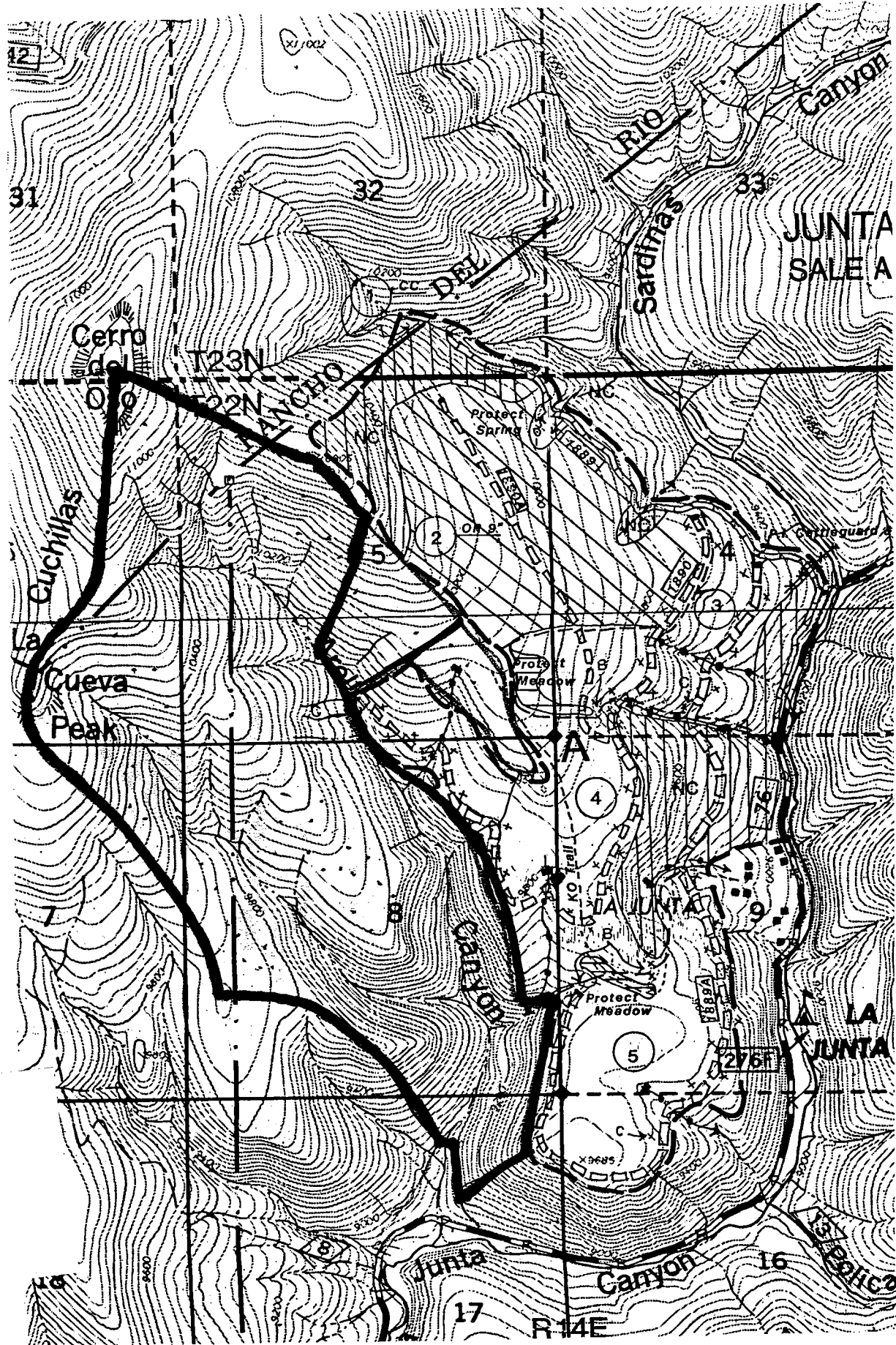
Junta
Canyon

16

Polcarpio

- ①
- ②
- ③
- ④
- ⑤
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- ⑧
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Note: W



Cerro Vista
 B436105
 Holman
 A 436105

ARELLANO CANYON RNA 641. ac.
Cerro Vista Quadrangle (USGS 7.5')

