Research Natural Area

Name: Canada Bonito

Location:

State: NM County: Los Alamos Forest: Santa Fe District: Española
T. 19N R. 5E S. 23 (US)

Geology:

Description:

Major portion of area underlain by the Tschicoma Formation: predominantly coarsely porphyritic dacite, rhyodacite, and quartz latite containing pyroxene, hornblende, biotite, plagioclase, and occasional quartz phenocrysts; thick massive flows and domes. Small areas at upper and lower ends underlain by the Tshirege Member of the Bandelier Tuff: nonwelded to densely welded ash flow deposits, characteristically containing sparse to abundant inclusions of hornblende-rich quartz-latite pumice, and sparse accidental lithic inclusions.

Reference:

Smith, R.L., Bailey, R.A., and Ross, C.S., 1970. Geologic map of the Jemez Mountains, New Mexico: U.S. Geol. Survey Misc. Geol. Inv. Map I-571

Climate:

TES Gradient: S=6, N=7
Precipitation: ___ Annual: 27 in. Warm season (May - Oct.)=71 %
Cool Season (Nov. - Apr.)=29 %
Mean Annual Snow: 55 in.

South Aspect
Mean Temperature: Annual 39 °F Jul. 59 °F Jan. 20 °F
Freeze Free Period: 90 days

North Aspect
Mean Temperature: Annual 34 °F Jul. 54 °F Jan. 15 °F
Freeze Free Period: 60 days

Trewartha's climate type: Dcbw Temperate continental with cool summer and dry winter.

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

Soils:

ESTABLISHMENT RECORD

for

CAÑADA BONITO RESEARCH NATURAL AREA

within

Santa Fe National Forest

Los Alamos County, New Mexico

ESTABLISHMENT REPORT

CAÑADA BONITO RESEARCH NATURAL AREA

USDA FOREST SERVICE
SOUTHWESTERN REGION
SANTA FE NATIONAL FOREST
ESPANOLA RANGER DISTRICT
LOS ALAMOS COUNTY, NEW MEXICO

Prepared by: _____ Date March 24, 1987
William W. Dunmire, The Nature Conservancy
Mollie S. Toll, Department of Biology,
University of New Mexico

Recommended by: Peter W. Karp Date 1/6/88
Pete Karp, District Ranger
Espanola Ranger District

Recommended by: _____ Date 2-3-88
Maynard T. Rost, Forest Supervisor
Santa Fe National Forest

Recommended by: John W Russell Date 3/31/88
John W. Russell
Chairman, Southwestern
Research Natural Area Committee

Recommended by: _____ Date 4/15/88
Sotero Muniz, Regional Forester
Southwestern Region

Recommended by: Charles M. Loveless Date May 16, 1988
Charles M. Loveless, Station Director
Rocky Mountain Forest and Range Experiment Station

The abovesigned certify that all applicable land management planning and environmental analysis requirements have been met and that boundaries are clearly identified in accordance with FSM 4063.21, Mapping and Recordation and FSM 4063.41 5.e(3) in arriving at this recommendation.

ESTABLISHMENT RECORD

for

CAÑADA BONITO RESEARCH NATURAL AREA

within

Santa Fe National Forest

Los Alamos County, New Mexico

INTRODUCTION

The Cañada Bonito Research Natural Area (RNA) comprises approximately 300 acres (121.4 hectares) in the Jemez Mountains of north-central New Mexico. The proposed RNA is located in the Espanola Ranger District, Santa Fe National Forest, in Los Alamos County, and is all acquired National Forest land.

Thurber fescue meadow has been noted as an important high-elevation meadow ecosystem for protection within the RNA program (USFS Regional Guide, 1983: Table 3-1). Attempts to locate examples of such fescue meadows within the Southwestern Region have been frustrated since the few representative areas are in an unnatural condition and are located within grazing allotments. In July, 1982, a task group of the Regional RNA Committee investigated several candidate meadow areas proposed by the Santa Fe, Carson, Lincoln, Cibola, and Gila National Forests. The Task Group concurred that Cañada Bonito constituted the only real opportunity to provide suitable representation.

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 current Santa Fe National Forest planning document, the Santa Fe National Forest Plan (July 1987), includes the proposed Cañada Bonito 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 Cañada Bonito RNA provides the best, and possibly the only, alternative for maintenance of a Thurber fescue meadow within the Southwestern Region. Examples of this important high elevation ecosystem type are in very short supply, with most acreage already within grazing allotments, and/or suffering from major erosion problems or heavy public use. The proposed RNA is one of few remaining Thurber fescue sites that have not yet been committed to domestic livestock use in the recent past. The value of this tract of land for scientific research, benchmark comparisons, and seed reserves easily outweighs its value as livestock grazing land. There may, for example, be the need to measure grazing deterioration or implement restoration practices, on many adjoining or similar lands. The seed resources and ecological perspective given by Cañada Bonito meadow are precisely suited to these and other such future needs or goals.

Commitment of all of this Region's high elevation Thurber fescue ecosystems to commodity oriented management precludes future options. Reservation of this tract for study and naturally-maintained genetic pools will provide safeguards and alternatives for future management considerations. A prime consideration in managing the Cañada Bonito RNA will be to maintain unmodified conditions and natural ecological processes.

PRINCIPAL DISTINGUISHING FEATURES

Cañada Bonito research natural area at 9,200-9,700 ft (2,800-2,960 m) is an outstanding example of a high elevation Thurber fescue (Festuca thurberi) community at or very near its climax expression. This park, surrounded by spruce-fir and aspen forests, has not been grazed by permitted domestic livestock since at least 1940 when the area was withdrawn as a defense facility. Thurber fescue meadows are dominant on south-facing slopes. On upper slopes and ridgetops are patches of aspen, providing abrupt contrast to the fescue meadows. Steeper north-facing slopes within or adjoining this research natural area have closed forests of Engelmann spruce (Picea engelmannii) and corkbark fir (Abies lasiocarpa var. arizonica).

LOCATION

Cañada Bonito is located in the Espanola Ranger District, Santa Fe National Forest, Espanola District. The area lies approximately four miles (6.4 km) northwest of Los Alamos, New Mexico (Maps 1 and 2). From the center of Los Alamos, take State Route 4 leading west out of town about 1.5 miles (2.4 km) to the turnoff on the right to the Pajarito Ski Area. Proceed 4 miles (6.4 km) on this all-weather road, just past the ski area, to where the gated forest road, now Forest Trail 282, takes off to the right (north). Walk approximately 1 mile (1.6 km) on this trail which is now closed to public vehicle use, to the Research Natural Area. The lower meadow of Cañada Bonito RNA is bounded on the south by this road.

Beginning at a point in Cañada Bonito at lat. 35 deg. 54 min. 17 sec., long. 106 deg. 22 min. 57 sec.;
THENCE, ascend Cañada Bonito to a point approximately 66 ft east of the Guaje trail and at lat. 35 deg. 54 min. 30 sec., long 106 deg. 23 min. 45 sec.;
THENCE, ascend to a point on a NW-SE ridge 0.25 miles west of the .05 Mile Point, which is 1,204.5 ft south of M.P. 6 located on the East boundary of Baca Location No. 1;
THENCE, descend in a northeasterly direction to a point at the head of a drainage in Quemazon Canyon, being the 9400 ft contour, as depicted on the 1977 USGS Valle Toledo, New Mexico 7.5 min. quadrangle map;
THENCE, in a southeasterly direction along said 9400 ft contour to a point on a NE-SE ridge at lat. 35 deg. 54 min 29 sec., long. 106 deg. 22 min. 39 sec.;
THENCE, descend a south slope to the point of beginning in Cañada Bonito.

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 Küchler Potential Natural Vegetation system (Küchler 1966). 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 Cañada Bonito Research Natural Area.

Type	Society of American Foresters Cover Type[1]	Küchler PNV Type[2]	Surface Area Acres	Hectares
Engelmann Spruce-Subalpine Fir	SAF 206	K-20 Southwestern Spruce-Fir	86	34.8
Interior Douglas-fir	SAF 210	K-17 Pine-Douglas-fir	48	19.4
Aspen	SAF 217	(K-17) Pine-Douglas-fir	89	36.0
Thurber fescue Grassland	[none]	K-45 Alpine Meadows	77	31.2
		TOTAL	300	121.4

[1]Eyre 1980.
[2]Küchler 1966.

PHYSICAL AND CLIMATIC CONDITIONS

Distinctive topographic conditions have allowed the formation of a montane grassland in the proposed RNA. The Cañada Bonito meadow extends from a midslope position approximately 8,900 ft (2,713 m) in elevation to the ridgetop crest at 9,860 ft (3,005 m) on a south-facing peak. The site aspect ranges from 180° to 240°. The steep slope (20-40%) and relatively smooth terrain are conducive to fire conduction, a vital element in long-term maintenance of such grasslands (Allen 1984). As is typical in other such montane grasslands, a sharp ecotone is present between the meadow and the

adjacent spruce-fir forest along the upper ridgecrest boundary. Along lower and sideslope meadow margins, grassland/forest boundaries are often abrupt, but not so clearly correlated with topography as at the ridgecrest.

No long term records of climatic conditions in the Jemez Mountains exist. In comparison with lower elevation data from Los Alamos, estimates for the Cañada Bonito RNA indicate significantly higher precipitation levels and shorter frost free seasons. Los Alamos, at 7,400 ft (2,556 m), receives 18 in (45 cm) of precipitation annually (Tuan et al. 1973; National Oceanic and Atmospheric Administration. 1976). Forty percent of the yearly precipitation falls from convectional storms during July and August. Weather in the nearby Jemez peaks, at about 9,800 ft (2,987 m), is influenced by adiabatic cooling and orthographically induced precipitation (Allen 1984). Average annual rainfall is 27 in (68 cm), with 71% of the rain falling during the warm season (May to October). Mean annual snow accumulation is 55 in (140 cm).

Temperatures at the Cañada Bonito RNA vary significantly with exposure. Mean temperatures on the southern aspect are estimated at 59°F (15°C) for July, and 20°F (-7°C) for January, with an average frost free period of 90 days. The cooler north aspect has a mean temperature in July of 54°F (12°C), and in January of 15°F (-9°C). Climatic data was compiled from Southwestern Region Terrestrial Ecosystem Survey information.

DESCRIPTION OF VALUES

Flora

The field work for this RNA consisted of a broad survey of habitat types (HT) based upon the methodology of DeVelice et al. (1986). A brief review of this approach follows. For a more detailed description of the vegetative makeup of these types, see DeVelice et al. (1986).

Cañada Bonito's Thurber fescue grassland is considered to have been self-perpetuating for a long period of time, perhaps in excess of 1000 years (Allen 1984). Other than this grassland, the Research Natural Area supports two basic potential climax types; mixed conifer forest and spruce-fir forest. These forest types vary in distribution depending on elevation and aspect.

The two principal habitat types of the mixed conifer forest occur on the steep south- and west-facing slopes. Abies concolor/Acer glabrum (ABCO/ACGL) HT is limited to the lower quarter of the area, while Abies concolor/Quercus gambelii (ABCO/QUGA) HT is found in the upper three fourths of these slopes. Abies concolor and Pseudotsuga menziesii are the dominant trees. Pinus flexilis, Picea engelmannii, and Populus tremuloides are well represented (the latter forming some almost pure seral stands) and Pinus ponderosa and Acer glabrum are occasional to common. Common shrubs include Quercus gambelii, Robinia neomexicana, and Jamesia americana, with Holodiscus dumosus and Physocarpus monogynus appearing on the upper slopes. The larger grassy openings within this forest are mainly composed of Festuca thurberi and Danthonia sp., while Bromus ciliatus is the principal grass under the forest canopy. At

the east end of the RNA, where the upper slopes begin to face east, a band of Abies concolor/Vaccinium myrtillus (ABCO/VAMY) HT is encountered before entering the Picea engelmannii series as the aspect turns northward.

On the north- and northeast-facing slopes, Picea engelmannii dominates with Abies lasiocarpa scarce if present at all. Abies lasiocarpa/Erigeron eximius (ABLA/EREX) HT and Abies lasiocarpa/Vaccinium myrtillus (ABLA/VAMY) HT are the principal habitat types, with mosaics of Abies lasiocarpa/Rubus parviflorus (ABLA/RUPA) HT and ABLA/VAMY-RUPA HT. Throughout most of this forest, Abies concolor and Populus tremuloides continue to be well represented, with occasional Pseudotsuga menziesii and Acer glabrum. The luxuriant herbaceous ground cover is comprised of forbs and grasses typical of these habitat types. Shrubs, poorly represented, include Juniperus communis and Physocarpus monogynus.

The wood lily, Lilium philadelphicum, is listed on the USFS Southwestern Region Sensitive Plant List, and is classified as Endangered by the State of New Mexico (NRD Rule No. 85-3). This plant potentially occurs in the spruce-fir portion of the RNA, although, to date, it has not been collected or observed.

The following plant list was compiled from field observations by; Reggie Fletcher, USFS Southwestern Region Botanist, on June 30, 1982; Janet Williams, during the summer of 1984; Bill Dunmire (The Nature Conservancy) and Mollie S. Toll (University of New Mexico, Department of Biology) on July 21, 1986; and Bill Dunmire on September 2, 1986.

Abbreviated Plant List for Cañada Bonito RNA

Latin Name	Common Name[1]	Habitat[2]		Reference[3]		
GRASSES AND OTHER GRASS-LIKE PLANTS:						
Agrostis scabra	Rough bentgrass	G			JW	
Agropyron smithii	Western wheatgrass	G			JW	BD/MT
Bromus anomalus	Nodding brome		F		JW	BD/MT
Bromus ciliatus	Hairy brome	G	F	RF		BD/MT
Carex foena	Sedge	G			JW	
Carex heliophila	Sedge	G		RF		
Carex pityophila	Sedge	G			JW	
Danthonia intermedia	Timber danthonia	G	F	RF		
Danthonia parryi	Parry danthonia	G	F		JW	BD/MT
Elymus virginicus	Virginia wildrye	G			JW	
Festuca arizonica	Arizona fescue	G		RF	JW	BD/MT
Festuca ovina	Sheep fescue	G		RF		
Festuca thurberi	Thurber fescue	G		RF	JW	BD/MT
Koeleria cristata	Junegrass	G		RF		BD/MT
Koeleria macrantha	Junegrass	G			JW	

Muhlenbergia montana	Mountain muhly	G		RF	JW	
Poa artica	Arctic bluegrass	G		RF		
Poa fendleriana	Muttongrass	G		RF	JW	
Poa pratensis	Kentucky bluegrass	G		RF	JW	BD/MT
Sitanion hystrix	Bottlebrush squirreltail	G		RF	JW	BD/MT
FORBS:						
Achillea lanulosa	Western yarrow	G		RF	JW	BD/MT
Actaea rubra	Baneberry		F			BD/MT
Agoseris auranthiaca	Orange agoseris	G		RF	JW	
Allium cernuum	Nodding onion	G		RF	JW	BD/MT
Allium geyeri	Onion	G			JW	
Antennaria sp.	Pussytoes	G			JW	
Antennaria parvifolia	Rocky Mountain pussytoes	G		RF		
Arabis drummondii	Drummond rockcress	G		RF		
Arenaria fendleri var. fendleri	Fendler sandwort	G		RF		
Aster laevis	Smooth aster	G			JW	
Calochortus gunnisonii	Gunnison mariposa lily	G		RF	JW	BD/MT
Campanula rotundifolia	Bluebell	G		RF	JW	BD/MT
Castilleja austromontana	Paintbrush	G		RF		
Castilleja miniata	Indian paintbrush	G	F		JW	BD/MT
Cerastium arvense	Starry mouse-ear	G		RF	JW	
Erigeron eximius	Forest fleabane		F			BD/MT
Erigeron flagellaris	Trailing fleabane	G		RF	JW	BD/MT
Erigeron formosissima	Itchy fleabane	G			JW	
Erigeron vetensis	Fleabane	G		RF		
Erysimum capitatum	Western wallflower	G		RF	JW	BD/MT
Fragaria ovalis	Wild strawberry	G	F	RF	JW	BD/MT
Galium boreale	Northern bedstraw	G			JW	BD/MT
Gentiana affinis	Pleated gentian	G			JW	BD/MT
Gentiana strictiflora	Gentian	G			JW	
Geranium caespitosum	Purple geranium	G	F		JW	BD/MT
Geranium richardsonii	Geranium		F			BD/MT
Geum triflorum	Avens	G			JW	BD/MT
Geum turbinatum	Avens	G		RF		
Gilia aggregata	Skyrocket dogretch	G			JW	BD/MT
Helenium hoopesii	Orange sneezeweed	G			JW	BD/MT
Heuchera parviflora var. flavescens	Alumroot	G		RF	JW	
Hieracium fendleri var. fendleri	Redtail hawkweed	G		RF		
Iris missouriensis	Flag	G		RF	JW	BD/MT
Lathyrus arizonicus	Arizona peavine	G	F	RF	JW	BD/MT
Mertensia lanceolata	Bluebells	G		RF		

Oreochrysum parryi			F			BD/MT
Orthocarpus luteus	Yellow owlclover	G			JW	
Potentilla hippiana	Horse cinquefoil	G			JW	BD/MT
Potentilla pulcherrima	Beauty cinquefoil	G		RF	JW	BD/MT
Pseudocymopterus montanus	Mountain parsley	G	F	RF	JW	BD/MT
Rudbeckia hirsuta	Coneflower	G			JW	BD/MT
Senecio bigelovii	Groundsel	G			JW	
Senecio neomexicanus	New Mexican groundsel	G		RF		
Senecio wootonii	Groundsel		F			BD/MT
Sisyrinchium campestre	Blue-eyed grass	G		RF		
Sisyrinchium montanum	Blue-eyed grass	G			JW	
Smilacina racemosa	False Solomon's seal		F			BD/MT
Stellaria longipes var. longipes	Longstalk starwort	G			JW	BD/MT
Swertia radiata	Deers-ears swertia	G			JW	
Taraxacum officinale	Dandelion	G		RF	JW	BD/MT
Thermopsis divaricarpa	Goldenpea	G			JW	
Thermopsis pinetorum	Big goldenpea	G	F			BD/MT
Thalictrum fendleri	Meadowrue	G	F		JW	
Thlaspi alpestre	Pennycress	G		RF		
Tragapogon dubius	Salsify	G		RF	JW	BD/MT
Trifolium spp.	Clover	G			JW	
Valeriana edulis	Tobaccoroot	G	F	RF	JW	BD/MT
Vicia americana	American vetch	G	F	RF	JW	BD/MT
Viola canadensis	Cañada violet		F			BD/MT
Viola sp.	Violet	G			JW	

HALF-SHRUBS, SHRUBS, AND TREES:

Abies concolor	White fir		F	RF		BD/MT
Acer glabrum var. neomexicanum	Rocky Mountain maple		F	RF		BD/MT
Arctostaphylos uva-ursi	Kinnikinnick		F			BD/MT
Artemisia ludoviciana	Louisiana wormwood	G	F	RF	JW	
Holodiscus dumosus	Ocean spray	G	F			BD/MT
Jamesia americana	Cliff jamesia		F			BD/MT
Juniperus communis	Common juniper		F	RF		BD/MT
Physocarpus monogynus	Mountain ninebark		F			BD/MT
Picea engelmannii	Engelmann spruce	G	F	RF		BD/MT
Pinus flexilis	Limber pine		F			BD/MT
Pinus ponderosa	Ponderosa pine	G	F	RF		BD/MT
Populus tremuloides	Quaking aspen	G	F	RF		BD/MT
Potentilla fruticosa	Shrubby cinquefoil		F	RF		BD/MT
Pseudotsuga menziesii	Douglas-fir	G	F	RF		BD/MT
Quercus gambelii	Gambel oak	G				BD/MT
Robinia neomexicana	New Mexico locust		F			BD/MT

Rosa woodsii	Rose	G	F	JW	BD/MT
Vaccinium myrtillus	Whortleberry		F		BD/MT

[1]Common names are used according to U.S.D.A.,Forest Service (1974)
[2]G = grassland; F = forest

[3]RF = Fletcher (1982); JW = Williams (1978); BD/MT = Bill Dunmire and Mollie S. Toll (July 21, 1986); and BD = Bill Dunmire (September 2, 1986)

Fauna

The grassland and aspen edges are heavily used by elk in spring, summer, and fall. Inhibition of aspen clone regeneration by elk browsing is evident throughout the area.

The Jemez Mountain salamander (Plethodon neomexicanus) is listed as endangered by the State of New Mexico (NMGF Reg. 624). This species is known to occur in spruce-fir forest situations within two miles of the RNA, although, to date, it has not been collected or observed within the RNA.

The following animal list was derived from the RUN WILD III computer-stored data base (Lehmkuhl and Patton 1982; Patton 1979) and is based on the following habitat types for Santa Fe county, New Mexico:

1. subalpine grassland biome
2. spruce-fir series, mixed conifer association
3. spruce-fir series, aspen subclimax
4. Douglas fir-white fir series

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

Abbreviated Animal List for Cañada Bonito RNA

BIRDS:

Blackbird, Brewer's	Euphagus cyanocephalus
Bluebird, Western	Sialia mexicana
Bluebird, Mountain	Sialia currucoides
Chickadee, Mountain	Parus gambeli
Chickadee, Black-capped	Parus atricapillus
Creeper, Brown	Certhia americana
Crossbill, Red	Loxia curvirostra
Crow, American	Corvus brachyrhynchos

Dove, Mourning	Zenaida macroura
Eagle, Golden	Aquila chrysaetos
Finch, Rosy	Leucosticte arctoa
Finch, House	Carpodacus mexicanus
Flicker, Northern	Colaptes auratus
Flycatcher, Hammond's	Empidonax hammondii
Flycatcher, Olive-sided	Contopus borealis
Flycatcher, Dusky	Empidonax oberholseri
Flycatcher, Western	Empidonax difficilis
Goshawk, Northern	Accipiter gentilis
Grosbeak, Black-headed	Pheucticus melanocephalus
Grosbeak, Evening	Coccothraustes vespertinus
Grosbeak, Pine	Pinicola enucleator
Grouse, Blue	Dendragapus obscurus
Hawk, Sharp-shinned	Accipiter striatus
Hawk, Red-tailed	Buteo jamaicensis
Hummingbird, Rufous	Selasphorus rufus
Hummingbird, Broad-tailed	Selasphorus platycercus
Hummingbird, Black-chinned	Archilochus alexandri
Jay, Steller's	Cyanocitta stelleri
Jay, Gray	Perisoreus canadensis
Junco, Dark-eyed	Junco hyemalis
Kestrel, American	Falco sparverius
Kinglet, Ruby-crowned	Regulus calendula
Martin, Purple	Progne subis
Nighthawk, Common	Chordeiles minor
Nutcracker, Clark's	Nucifraga columbiana
Nuthatch, Pygmy	Sitta pygmaea
Nuthatch, White-breasted	Sitta carolinensis
Nuthatch, Red-breasted	Sitta canadensis
Owl, Great Horned	Bubo virginianus
Owl, Flammulated	Otus flammeolus
Owl, Long-eared	Asio otus
Owl, Saw-whet	Aegolius acadicus
Owl, Spotted	Strix occidentalis
Peewee, Western Wood	Contopus sordidulus
Pigeon, Band-tailed	Columba fasciata
Pipit, Water	Anthus spinoletta
Raven, Common	Corvus corax
Robin, American	Turdus migratorius
Sapsucker, Yellow-bellied	Sphyrapicus varius
Sapsucker, Williamson's	Sphyrapicus thyroideus
Siskin, Pine	Carduelis pinus
Solitaire, Townsend's	Myadestes townsendi
Sparrow, Vesper	Pooecetes gramineus
Sparrow, White-crowned	Zonotrichia leucophrys
Sparrow, Violet-green	Tachycineta thalassina
Sparrow, Chipping	Spizella passerina

Swallow, Tree	Tachycineta bicolor
Swift, White-throated	Aeronautes saxatalis
Tanager, Western	Piranga ludoviciana
Thrush, Hermit	Catharus guttatus
Thrush, Swainson's	Catharus ustulatus
Towhee, Rufous-sided	Pipilo erythrophthalmus
Vireo, Solitary	Vireo solitarius
Vireo, Warbling	Vireo gilvus
Warbler, Grace's	Dendroica graciae
Warbler, Wilson's	Wilsonia pusilla
Warbler, Virginia's	Vermivora virginiae
Waxwing, Cedar	Bombycilla cedrorum
Woodpecker, Hairy	Picoides villosus
Woodpecker, Three-toed	Picoides tridactylus
Woodpecker, Downy	Picoides pubescens
Woodpecker, Lewis'	Melanerpes lewis
Wren, Winter	Troglodytes troglodytes
Wren, House	Troglodytes aedon

MAMMALS:

Badger	Taxidea taxus
Bat, Silver-haired	Lasionycteris noctivagans
Bat, Hoary	Lasiurus cinereus
Bat, Townsend's Big-eared	Plecotus townsendii
Bat, Big Brown	Eptesicus fuscus
Bear, Black	Ursus americanus
Chipmunk, Least	Eutamias minimus
Chipmunk, Colorado	Eutamias quadrivittatus
Cottontail, Nuttall's	Sylvilagus nuttalli
Coyote	Canis latrans
Deer, Mule	Odocoileus hemionus
Elk	Cervus elaphus
Ermine	Mustela erminea
Gopher, Botta's Pocket	Thomomys bottae
Gopher, Northern Pocket	Thomomys talpoides
Lion, Mountain	Felis concolor
Marmot, Yellow-bellied	Marmota flaviventris
Mouse, Pinyon	Peromyscus truei
Mouse, Deer	Peromyscus maniculatus
Mouse, Western Jumping	Zapus princeps
Mouse, Western Harvest	Reithrodontomys megalotis
Myotis, Long-legged	Myotis volans
Myotis, Fringed	Myotis thysanodes
Myotis, Small-footed	Myotis leibii
Porcupine	Erethizon dorsatum
Raccoon	Procyon lotor
Shrew, Vagrant	Sorex vagrans

Skunk, Striped	Mephitis mephitis
Squirrel, Red	Tamiasciurus hudsonicus
Squirrel, Golden-mantled Ground	Spermophilus lateralis
Vole, Heather	Phenacomys intermedius
Vole, Southern Red-backed	Clethrionomys gapperi
Vole, Meadow	Microtus pennsylvanicus
Vole, Long-tailed	Microtus longicaudus
Weasel, Long-tailed	Mustela frenata
Woodrat, Mexican	Neotoma mexicana
Woodrat, Bushy-tailed	Neotoma cinerea

REPTILES:

Lizard, Short-horned	Phrynosoma douglassi
Lizard, Sagebrush	Sceloporus graciosus
Rattlesnake, Western	Crotalus viridis
Snake, Common Garter	Tamnophis sirtalis
Snake, Gopher	Pituophis melanoleucus
Snake, Smooth Green	Opheodrys vernalis
Snake, Ringneck	Diadophis punctatus
Snake, Milk	Lampropeltis triangulum
Snake, Western Terrestrial Garter	Thamnophis elegans

Geology

The Jemez Mountains were formed by relatively recent volcanic activity along the western fault margin of the Rio Grande Rift (Burton 1982, in Allen 1984:22). Massive eruptions 1.4 million and again 1.1 million years ago each ejected about 300 km^3 of pyroclastic material. Subsequent cone collapse produced two large calderas, Toledo and Valle Grande. The Toledo Caldera has a diameter of 7.5 miles (12 km) and the Valle Grande Caldera has a diameter of 13.7 miles (22 km). These eventually filled to a level of about 8,900 ft (2,713 m) with Pleistocene lacustrine deposits. The modern Jemez Mountains consist of secondary domes within the calderas, and remnants of pre-collapse volcanic material rimming the calderas. The Cañada Bonito alpine meadow is located on an extensive southerly exposure of one of these rim peaks.

A major portion of the RNA is underlain by the Tschicoma Formation which is predominantly coarse porphyritic dacite, rhyodacite, and quartz latite (Smith et al. 1970). Small areas of the RNA are underlain by the Tshirege Member of the Bandelier Tuff (nonwelded to densely welded ash flow deposits).

Soils

Soils vary significantly with vegetation, slope, and geologic parent material. The majority of the area is comprised of deep, dark colored soils with gravelly or cobbly

subsoils. Higher elevational meadows with a southern aspect vegetated with Thurber fescue are predominantly on Pachic Paleoborolls and Cryoborolls. In areas occupied by spruce-fir forest, those locations with Bandelier Tuff parent material have a relatively fertile soil classified as an Entic Cryandept.

Table 2. Existing Soils in the Cañada Bonito RNA [1]

	Mapping Unit		Grade
Spruce Forest North Aspect	618	Entic Cryandepts [medial-skeletal]	15-40%
	619	Entic Cryandepts [medial-skeletal]	40-80%
Grassland South Aspect	660	Cryic Pachic Paleoborolls [clayey-skeletal, mixed]	0-15%
	661	Argic Pachic Cryoborolls [clayey-skeletal, mixed]	15-40%

[1] Soils information summarized here and a soils map can be found in the Terrestrial Ecosystem Report for Española Ranger District, an unfinished manuscript on file in the Supervisor's Office, Santa Fe National Forest.

Lands

All the land of the proposed RNA was transferred from the Forest Service to the Manhattan Project in 1943, then to the Atomic Energy Commission in 1956, and finally back to the Forest Service in 1969. This land has Weeks Law status which means it is closed to mining entry and open to mining leasing. There are no known rights-of-way or vested interests within the proposed boundaries.

Cultural

Some cultural sites representing high elevation lithic scatters have been recorded in small clearings near the RNA. No residences have been found, and it is thought that the general area in which the RNA is located was used primarily for transient camps during prehistoric times. The exact area of the RNA has not been surveyed for cultural resources. Upon establishment as an RNA, the area will be withdrawn from any archeological research that would in any way modify the existing site. Withdrawal of this area from archeological research would not significantly affect the data base as the entire area surrounding the RNA was heavily utilized by prehistoric human inhabitants.

IMPACTS AND POSSIBLE CONFLICTS

Mineral Resources

The proposed RNA lies within the Baca Known Geothermal Area. Geothermal research and development is currently underway in a small portion of the BKG Area located about 17 miles (27 km) west of the RNA. A portion of the RNA was also included in a recent application for noncompetitive oil and gas leasing. Some testing for oil and gas was done in the general area, but not within the RNA boundaries. There are no known oil and gas reserves.

Grazing

No impacts or conflicts are anticipated as this area has been closed to permitted grazing since 1943. A need for grazing in the adjacent area has been discussed, but due to very high initial investment costs in fencing and water development, this does not seem practical in the near future. If grazing should be allowed in adjacent areas, the proposed RNA will be fenced to exclude livestock use.

Timber

This area has about 100 acres (40.5 hectares) of spruce-fir which will be withdrawn from the timber base. The small amount of aspen which occurs in this RNA also has been withdrawn.

Total forested: approximately 150 acres (60.8 hectares)
Commercial forest: approximately 100 acres (40.5 hectares)

Watershed Values

Cañada Bonito is contained within the Los Alamos Watershed, a fifth order watershed. It is a tributary to Los Alamos Canyon, which eventually flows into the Rio Grande about 15 miles (24 km) east of the proposed RNA. The Cañada Bonito watershed is approximately 600 acres (243 hectares) in size, and the proposed RNA makes up about 30% of the watershed. The Cañada Bonito RNA also drains into the Quemazon watershed, which is larger than Cañada Bonito; this contribution represents about 10% of the watershed.

Recreation Values

Recreation use in the RNA vicinity ranges from unauthorized ORV use, to big game hunting, hiking, and cross-country skiing. The RNA is also adjacent to a road that makes a very popular scenic drive loop. This road is now gated at each

end and will be used only as a foot and horseback trail. Management of ORV use (see Transportation Plans) will primarily impact motorized recreational use. Hunting and winter use of the area will probably not conflict with potential research projects.

Wildlife and Plant Values

The north-facing slope of the Cañada Bonito RNA contains potential habitats for the Jemez Mountains salamander, a New Mexico State listed endangered (Group 2) animal species and a Federal notice of review species. The area also contains potential habitat for Lilium philadelphicum, a New Mexico State listed endangered plant species.

Wilderness, Wild and Scenic River, National Recreation Area Values

The proposed Cañada Bonito RNA has not been nominated to be included in any of the above public land categories.

Transportation Plans

The road which is contiguous to the RNA on the southwest boundary is identified on the Forest Transportation Map as a trail. However, it was negotiable by four-wheel-drive vehicles and served as a loop connection between two well used higher standard roads. Because unauthorized ORV use will not be allowed inside the RNA, this loop connection was closed to vehicle use with gates at the intersections with the main roads.

Utility Corridor Plans

The RNA is immediately adjacent to a proposed 345 kv powerline (OLE Project). The proposed line will not be in the RNA. In addition, an existing 4" natural gas pipeline passes one mile (1.6 km) north of the RNA. Operations to maintain these right-of-ways will be carefully administered so as not to impact RNA values.

MANAGEMENT PLAN

The Santa Fe National Forest Plan 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 recreational activities are permitted provided they do not significantly modify the area, or threaten or impair the research or educational value of the area.

1. Vegetation Management

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

2. Fences

As the surrounding area is currently not obligated to livestock grazing, a protective fence is unnecessary at this time. However, should fencing be required in the future, they will be constructed to protect the biotic values of the RNA.

ADMINISTRATIVE RECORDS AND PROTECTION

Administration and protection of the Cañada Bonito RNA will be the responsibility of the Santa Fe National Forest. The District Ranger, Espanola Ranger District, Espanola, 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 Cañada Bonito RNA will be maintained in the following offices:

Regional Forester, Southwestern Region, Albuquerque, NM
Rocky Mountain Station, Fort Collins, CO
Santa Fe National Forest, Santa Fe, NM
District Ranger, Espanola Ranger District, Espanola, NM

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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, Region 3, Albuquerque. 90 pp.

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USDA Forest Service. 1987. Sante Fe National Forest Plan. USDA Forest Service, Southwestern Region, Albuquerque, NM.

Williams, Janet E. 1984. Initial monitoring of proposed research natural areas. Ms. on file, Rocky Mountain Forest and Range Experiment Station, Albuquerque. 35 pp.

LEGAL DESCRIPTION REVIEW

Section 34, T.20 N., R.5 E.,
and
Sections 2 and 3, T.19 N., R.5 E., NMPM

REF: Legal description filed with RNA.

The document attached has been reviewed by me for use in describing the location of the Canon Bonito RNA. The attached description is adequate in determining the location of the RNA and is free of any patent ambiguity, as written, at the date of orginal execution.

Garland Burnett

Reviewed by: s/s Garland Burnett Date: 6/2/93
Forest Land Surveyor

Professional Registration State/Number: NM 11950

seal

Santa Fe National Forest Plan

USDA Forest Service

Southwestern Region

Published July 1987

The existing road system contains many miles of local roads that are in poor condition. Many of these roads are unneeded for current management, and in fact are impacting wildlife habitat, water quality, and other resources. The Plan emphasizes road management, where unneeded roads will be closed to use between management activities. An estimated 660 miles of unneeded roads will be seeded and closed permanently.

The trail system provides access for much of the dispersed recreation that occurs on the Forest. Currently many miles are in need of reconstruction or relocation. In addition, a number of miles of connecting trails need to be constructed. The trail system will be significantly improved through an increase in maintenance as well as 16 miles/year of construction and reconstruction. Motorized and non-motorized use will be managed to reduce user conflicts and support management area objectives.

RESEARCH NATURAL AREAS

What will be the Forests' contribution to the Southwestern Research Natural Area (RNA) system?

Opportunities have been identified to provide areas for scientific study and protection through establishment of Research Natural Areas. The Forest currently has the Monument Canyon RNA identified (640 acres) for the study of the Ponderosa Pine type.

The Forest Plan identifies two additional RNA's for future research that display unique characteristics in woodland and grassland ecosystems. They are:

Canada Bonito (Thurber fescue)	300 acres
Mesita de las Ladrones (Juniper savannah)	500 acres

4. MANAGEMENT DIRECTION

MANAGEMENT AREA L

These areas are closed to motorized travel. Existing use on roads under special use authorization will continue until expiration of the permit or a suitable substitute for access is obtained.

Use of mechanical conveyances, such as mountain bicycles, is permitted.

Prepare Recreation Opportunity Guides to increase public awareness of these areas.

A10 A11 Plan, construct, and maintain a trail system to a standard consistent with the desired SPNM experience. Construct or reconstruct the following trails as scheduled in Table 13:

Atalaya Mountain	Bear Wallow Loop Trails #150,182,254
Thompson Peak	Peralta Canyon Trails #126,132,140
Rio Nambe Trail #160	Winsor Trail #254 (Bishop's Lodge - Pacheco)

A13 Meet the Visual Quality Objective (VQO) of Retention -- management activities should not be evident to the casual forest visitor within one year of project completion.

Emphasize use of native or natural materials such as local rock, logs, and indigenous plant species for structural projects or facilities.

WILDLIFE C01 In White Rock Canyon, wildlife management should emphasize maintenance or enhancement of birds of prey habitat, threatened or endangered species migration corridors, riparian areas, and mule deer habitat.

The riparian zone will be evaluated for enhancement opportunities with specific consideration of possible contribution to threatened or endangered species recovery. Mule deer habitat quality will be maintained or enhanced.

In the East Fork of the Jemez River, wildlife management should emphasize late forest seral stage habitat, threatened or endangered species, and fisheries.

In Corral Canyon, wildlife management should emphasize birds of prey, mule deer, and mountain lion habitat. A field evaluation will be made at least every two years to detect invasion by Barbary sheep and to recommend appropriate action.

USDA-FOREST SERVICE

PHOTOGRAPHIC RECORD

(See FSM 1643.52)

PHOTOGRAPHER: William W. Dunmire | DATE SUBMITTED:

HEADQUARTERS UNIT: | LOCATION:

INITIAL DISTRIBUTION OF PRINTS AND FORM 1600-1:

☐ 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. (1)	PERMANENT (To be filled in by the WO) (2)	(3)	(4)	(5)	(6)	(7)
				ALL: New Mexico Santa Fe NF Espanola Ranger Distr. Sandoval Co.		ALL: 24x36mm color slides
1			9-2-86		Southwest slopes of Cañada Bonito RNA from Pajarito Ski Area	
2			8-9-86		Thurber fescue grassland on southwest slopes of Cañada Bonito	
3			8-9-86		Aspen clone at west end of Cañada Bonito RNA	
4			8-9-86		Engelmann spruce reproduction under aspen canopy, west end of RNA	
5			8-9-86		Dying aspen reproduction at edge of aspen island	
6			8-9-86		East edge of grassland with conifer invasion at edge of aspen	
7			8-9-86		Interior Douglas fir forest type on south-facing slopes, southeast portion of RNA	
8			9-2-86		White fir/Gambel Oak type on steep, south-facing slope	

Photo 1. Southwest slopes of Cañada Bonito RNA, 1 mile (1.6 km) distant from the Pajarito Ski Area. RNA is in the center of photo.

Photo 2. Thurber fescue grassland on southwest slopes of Cañada Bonito. Festuca thurberi and Danthonia sp. dominate the grasses.

Photo 3. Aspen clone at west end of the RNA. This is one of several aspen islands surrounded by Thurber fescue grassland.

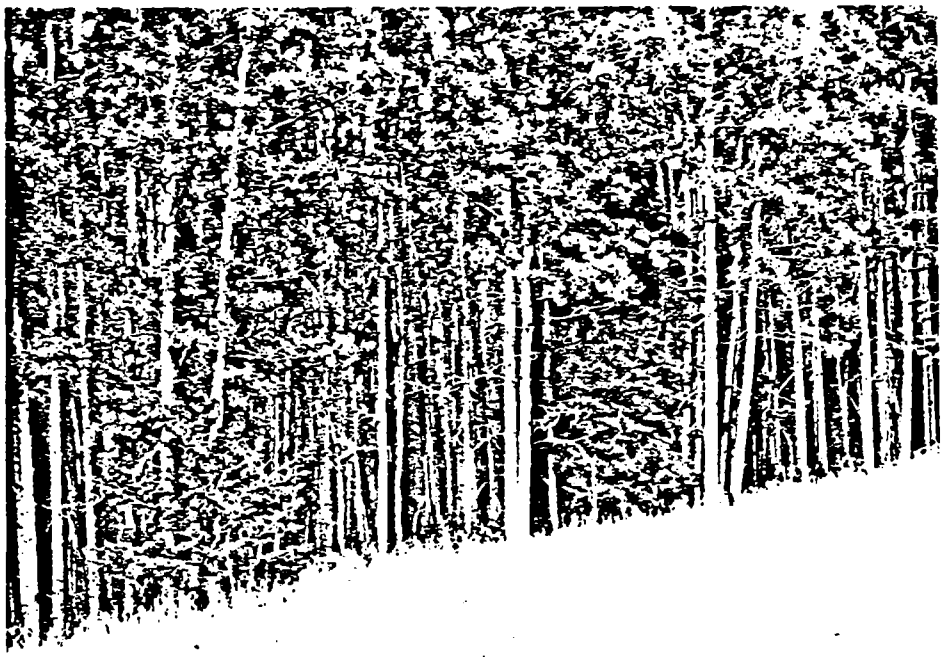


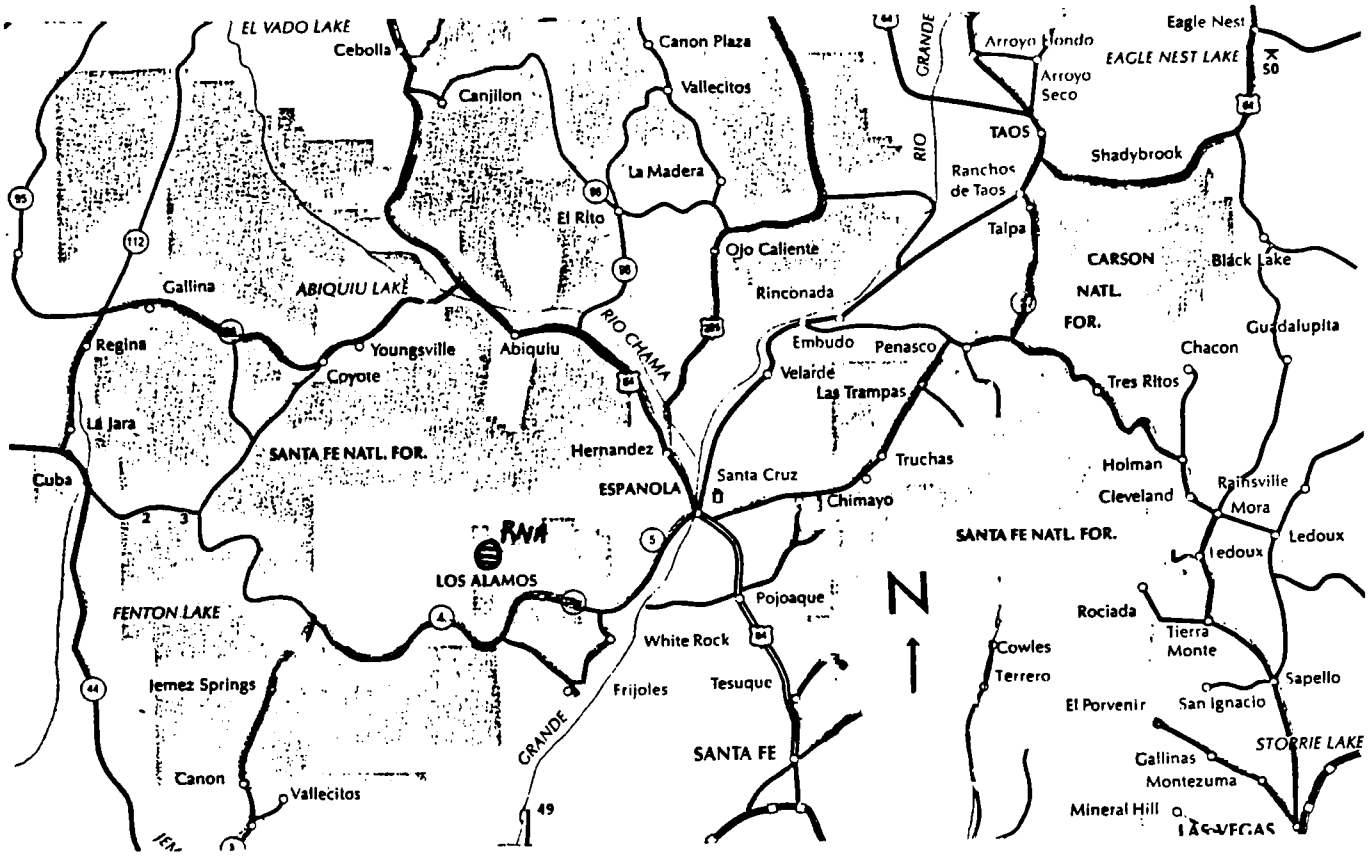
Photo 4. Engelmann spruce reproduction under aspen canopy at west end of RNA. All of the denser stands of aspen exhibit some degree of conifer tree succession from within.

Photo 5. Dying aspen reproduction at edge of aspen island is probably the result of heavy elk browsing. Vigorous aspen invasion into the grassland is uncommon.

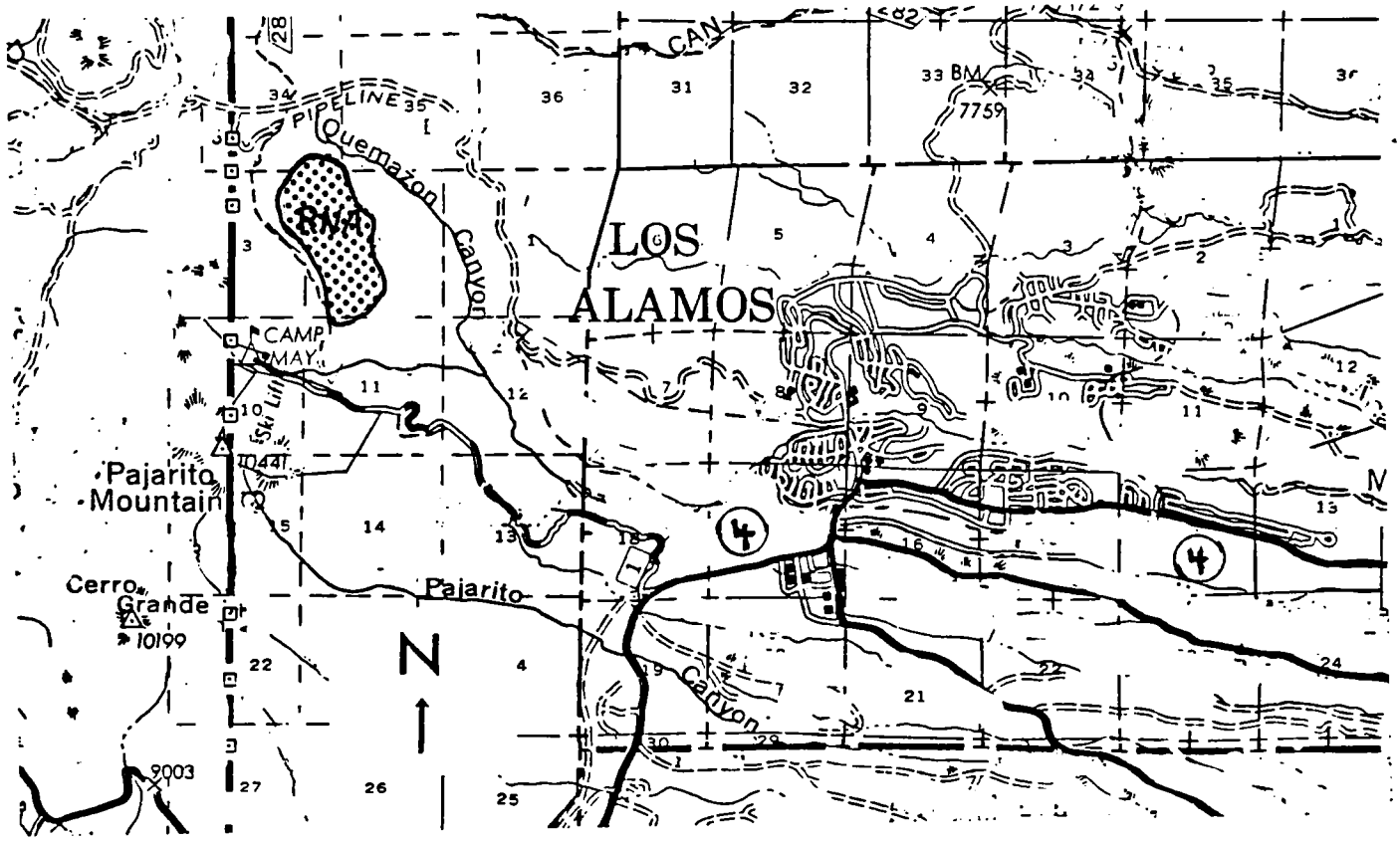
Photo 6. East edge of grassland with Pinus flexilis, Pinus ponderosa and Pseudotsuga menziesii invasion at edge of aspen. Last significant invasion of conifers into the grassland occurred in the 1920s.

Photo 7. Interior Douglas fir forest type on south-facing slopes of the southeast portion of the RNA. Trees here include Pseudotsuga menziesii, Pinus ponderosa, Pinus flexilis, Abies concolor and Populus tremuloides.

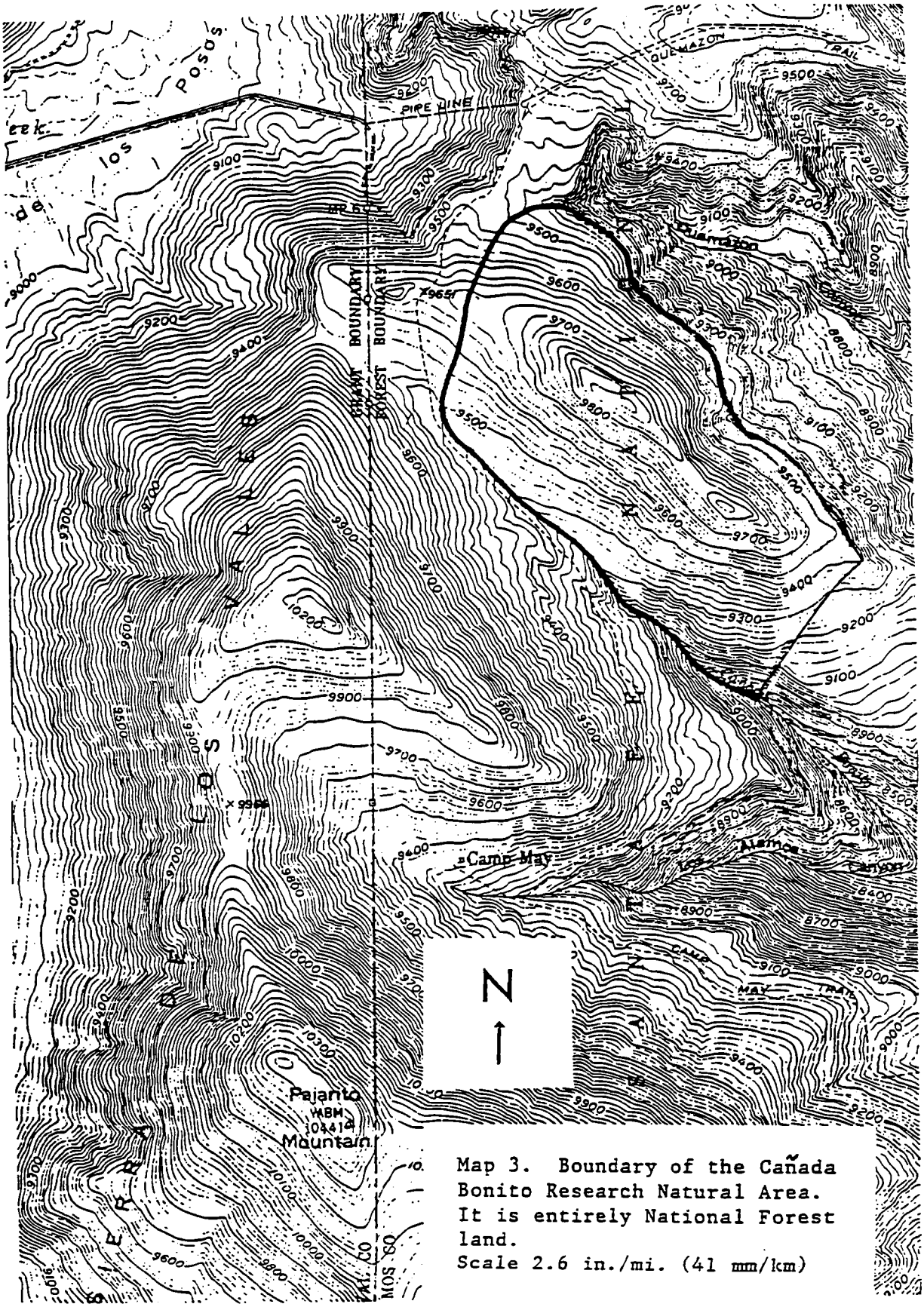
Photo 8. ABCO/QUGA Habitat Type on steep south-facing slope with overstory of Abies concolor, Psuedotsuga menziesii, and Pinus sp. with dense, shrubby undergrowth including Quercus gambelii and Robinia neomexicana.



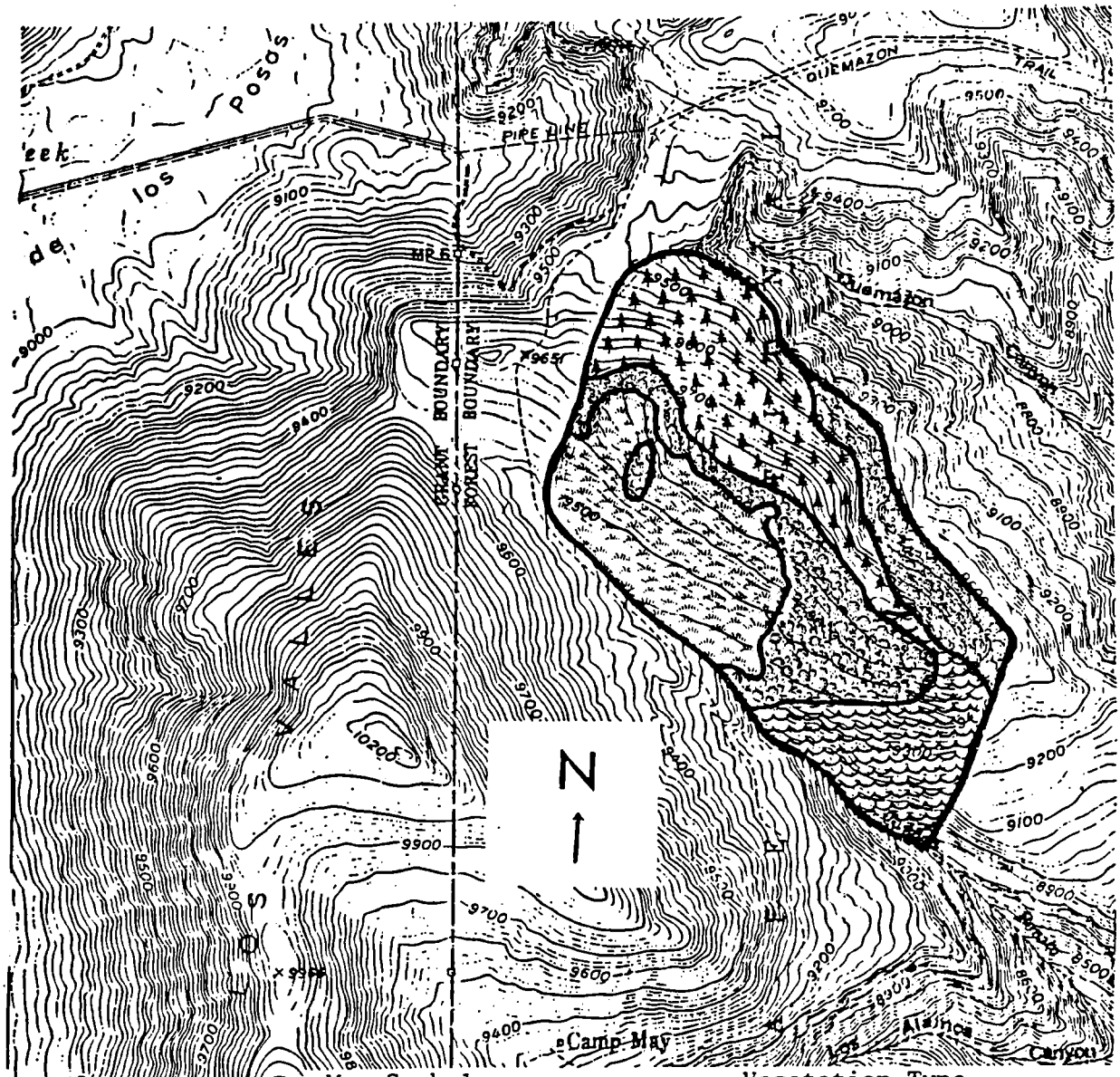
Map 1. Location of RNA (North Central New Mexico)



Map 2. Access Route to Cañada Bonito RNA



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



Map Symbol	Vegetation Type
	Thurber fescue grassland K-45
	Aspen SAF 217, K-17
	Interior Douglas fir SAF 210, K-17
	Engelmann spruce - subalpine fir SAF 206, K-20

Map 4. Distribution of vegetation types in the Cañada Bonito Research Natural Area.

DECISION NOTICE

and

DESIGNATION ORDER

for the

CANADA BONITO RESEARCH NATURAL AREA

USDA FOREST SERVICE
SANTA FE NATIONAL FOREST, ESPANOLA RANGER DISTRICT
LOS ALAMOS COUNTY, NEW MEXICO

An Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) for the Canada Bonito Research Natural Area as proposed by the Southwestern Regional Office have been completed and are available for review at the Southwestern Regional Office, at the Espanola Ranger District Office in Espanola, New Mexico and at the Los Alamos Area Office of Espanola Ranger District in Los Alamos, New Mexico.

By virtue of the authority vested in me by the Secretary of Agriculture under regulations at 7 CFR 2.42, 36 CFR 251.23, and 36 CFR Part 219, I hereby establish the Canada Bonito Research Natural Area (RNA). It shall be comprised of approximately 300 acres of land in Los Alamos County, New Mexico, on the Espanola Ranger District of the Santa Fe National Forest, as described in the section of the Establishment Record entitled "Location."

The Regional Forester recommended the establishment of a RNA ("Canada Bonito") in the Record of Decision for the Santa Fe National Forest Land and Resource Management Plan (Forest Plan) in 1987. That recommendation was the result of an analysis of the factors listed in 36 CFR 219.25 and Forest Service Manual 4063.41. Results of the Regional Forester's analysis are documented in the Forest Plan and Final Environmental Impact Statement which are available to the public.

The Regional Forester has reexamined the Canada Bonito area to examine whether the environmental effects of establishing the area as an RNA have not changed since 1987. This analysis is documented in the attached environmental assessment. Based on the analysis in the environmental assessment, it is my decision to adopt Alternative 2, which is to establish Canada Bonito as an RNA. Alternative 2 is selected because it provides long-term protection and recognition of a Thurber fescue meadow type. The Canada Bonito RNA will be managed in compliance with all relevant laws, regulations, and Forest Service Manual direction regarding RNA's, and in accordance with the management direction identified in the Forest Plan.

The other alternative considered was Alternative 1, the "No Action" alternative which would continue management of Canada Bonito as a "proposed" RNA. Alternative 1 was not selected because it would only provide short-term protection of the Canada Bonito area.

Alternative 2 is consistent with the Forest Plan and substantially consistent with the land allocation for the Canada Bonito area in the Forest Plan. The Santa Fe Forest Plan is hereby amended to modify the map designation of Canada Bonito Area M to conform with the area identified in the Establisment Report. This is a non-significant amendment of the Forest Plan (36 CFR 219.10(f)).

Legal notice of this decision will appear in the Federal Register. The Forest Supervisor of the Santa Fe National Forest shall notify the public of this decision and mail a copy of the Decision Notice and Designation Order to all persons on the Santa Fe Forest Plan mailing list.

This decision is subject to appeal pursuant to 36 CFR Part 217. Two (2) copies of the Notice of Appeal must be in writing and submitted to:

The Secretary of Agriculture
14th & Independence Ave., S.W.
Washington, D.C. 20250

The Notice of Appeal prepared pursuant to 36 CFR 217.9(b) must be submitted within 45 days from the date of legal notice of this decision. Review by the Secretary is wholly discretionary. If the Secretary has not decided within 15 days of receiving the Notice of Appeal to review the Chief's decision, appellants will be notified that the Chief's decision is the final administrative decision of the U.S. Department of Agriculture (36 CFR 217.17(d)).

_____ _____

Chief Date

FINDING OF NO SIGNIGICANT IMPACT

and

ENVIRONMENTAL ASSESSMENT

Establishment of Canada Bonito Research Natural Area

LOS ALAMOS COUNTY

LEAD AGENCY:	U.S.D.A. Forest Service
RESPONSIBLE OFFICAL:	Chief, Forest Service U.S. Department of Agriculture Auditors Building, 201 14th St. at Independence Ave., S.W. Washington, D.C. 20250
FOR FURTHER INFORMATION CONTACT:	Reggie A. Fletcher, Ecologist Southwestern Regional Office 517 Gold Avenue S.W. Albuquerque, New Mexico 87102
PREPARED BY:	Lori D. Osterstock, District Ranger Espanola Ranger District P.O. Drawer R Espanola, New Mexico 87532

FINDING OF NO SIGNIFICANT IMPACT

for the establishment of the

CANADA BONITO RESEARCH NATURAL AREA

USDA FOREST SERVICE
SANTA FE NATIONAL FOREST, ESPANOLA RANGER DISTRICT
LOS ALAMOS COUNTY, NEW MEXICO

The attached Environmental Assessment (EA) discusses the proposal to designate the Canada Bonito Research Natural Area on National Forest Lands in Los Alamos County. This proposal is in complete accordance with the Santa Fe National Forest Land Management Plan.

FINDING OF NO SIGNIFICANT IMPACT

Based on the environmental assessment, It has been determined that the proposed action is not a major Federal action that would significantly affect the quality of the human environment; therefore, an environmental impact statement is not needed. This determination is based on the following factors:

A. Context

Although this is an addition to the national system of RNA's, both short-term and long-term physical and biological effects are limited to the local area.

B. Intensity

Evaluation of the proposal under the criteria listed in 40 CFR 1508.27 demonstrates that:

1. The EA discusses the impacts of this proposal. Adverse effects are virtually nonexistant. The beneficial impacts will be long term and will directly impact the public.

2. Public Health and Safety:

   There are no known effects on public health and safety.

3. Unique Characteristics of Geographic Area

   The unique characteristics of this area are what make it a suitable addition to the Research Natural Area System. There are no known effects outside of the proposed area, which is characteristic of many other locations on the Santa Fe National Forest.

4. Effects on Quality of the Human Environment:

   The effects associated with this proposal are known and will have a positive affect on the quality of the human environment, and the affects are not considered controversial within the meaning of NEPA regulations. There will be no irreversible or irretrievable commitments of resources. The effects of the proposed activities have been revealed, made known to the public, and the proposal has been designed and mitigated to address the various issues.

5. Uncertain, Unique or Unknown Risks:

   This proposal does not involve any uncertain, unique, or unknown risks. Research activities which will likely occur have been common on the Santa Fe National Forest and other National Forests throughout the United States.

6. Precedent for Future Actions:

   No new precedents are expected as a result of this proposal. This assessment is site and project specific.

7. Cumulative Effects:

   There are no known cumulative effects.

8. Adverse Effects on Scientific, Cultural or Historical Resources:

   There are no known effects on historic or cultural resources, or on actual or eligible National Register sites. There are no adverse effects anticipated to any scientific resources. This determination was made as a result of the resource survey conducted for the obliteration of a road adjacent to the proposed RNA, and noted in the SHPO clearance report.

9. Effects on Threatened, Endangered, and Sensitive (T. E. & S.) Species or Habitat:

   Potential T. E. & S. species habitats were identified and surveys were conducted for two adjacent proposed projects and serve to address the question within the proposed RNA (refer to Canada Bonito/Pipeline Road EA and the Ojo Line Extension EIS). The surveys meet current standards and guidelines. A Biological Evaluation was completed by a Wildlife Biologist. The RNA proposal has no known effect on T.E.&S. species or their habitat. The proposed RNA is adjacent to the Jemez Salamander Conservation Area; mitigation measures have been developed for protection of the Jemez Salamander as required by the Memorandum of Agreement for the Conservation of the Jememz Mountain Salamander (signed 5-30-91).

10. Legality of Action:

    The action will not violate any Federal, State, or local law or requirements imposed for the protection of the environment. Mitigation measures and monitoring requirements, such as those for protecting water quality, cultural resources, wildlife habitat, Jemez Salamander, etc., will be implemented to ensure that all laws and other requirements will be met.

Environmental Assessment

Establishment of Canada Bonito Research Natural Area

I. Purpose And Need For Action

A. Project Description

This environmental assessment documents the integrated planning process, scoping, and environmental analysis for the proposed establishment of the proposed Canada Bonito Research Natural Area (RNA), as identified in the Santa Fe National Forest Land Management Plan and in the Canada Bonito Research Natural Area Establishment Report. The Land Management Plan Areas involved are C, M, and N.

The proposed Canada Bonito RNA is 300 acres of Thurber fescue grassland located approximately four miles west of the community of Los Alamos. The area is accessed by the Pipeline road on the north (used and partially maintained by the Department of Energy under permit), and the Camp May road on the south, and had the remnants of a dirt road through the grass on the west side of the proposed RNA. In accordance with the Decision Notice and Finding of No Significant Impact for the Canada Bonito and Pipeline Road Management Enviornmental Assessment, the former road has been obliterated, a path for non-vehicular traffic has been established west of the original travelway, and a closure order has been implemented to protect the research natural area values of the proposed RNA. Current recreation use of the area includes hiking, horseback riding, mountain biking, and cross country skiing. Most recreation use appears to be on the trail, with bird watchers and plant enthuasists hiking in the meadow in the summer.

B. The Need For The Proposed Project

The Regional Forester recommended the establishment of the Canada Bonito RNA in the Record of Decision for the Santa Fe National Forest Land and Resource Management Plan (Forest Plan) in 1987. That recommendation was the result of an analysis of the factors listed in 36 CFR 219.25 and Forest Service Manual 4063.41. Results of the Regional Forester's analysis are documented in the Forest Plan and Final Environmental Impact Statement and in the Draft Establishment Record for the Canada Bonito RNA, both of which are available to the public. In the period between the signing of the Forest Plan and the present, substantial long term research has been initiated within the proposed RNA and lengthy public involvement has been undertaken to determine the best methods for protecting the research values of the area. The results of the analysis regarding the values of the Canada Bonito area to research and the subsequent protection of the research investments in the area indicate the need to make a formal decision regarding the establishment of a recognized RNA.

Further need to establish a formal designation and an effective management strategy for the area was created with the resumption of action on the proposed Ojo Line Extension project, which will require road construction, improvement, and maintenence in support of line construction directly southwest of the proposed RNA.

C. Decision Needed

The decision needed is how best to manage and protect the past, present, and future research investments and the continuing research value of the proposed Canada Bonito RNA.

D. Scoping Summary

The Los Alamos Road and Trail Management Working Group (Working Group) was convened in the spring of 1990 to discuss and recommend management strategies for all of the roads and trails on National Forest lands immediately to the north and west of the community. Access to and appropriate uses of the proposed Canada Bonito RNA were among the issues addressed by the Working Group.

The initial mailing list for this involvement effort was forty people, and through the public involvement process it increased to over 100 people. The Working Group consisted of nine people, representing special interests and forest users. The meetings of the Working Group were public, and other interested individuals attended and participated. Many of the recommendations of the Working Group were unanimous, including the recommended objective of protecting the research natural area values of the proposed RNA.

Management of the Pipeline road to provide for protection of the proposed RNA was immediately and continually a subject of disagreement. Public involvement was expanded through self-initiated petition drives seeking to document support for opening the road past the proposed RNA (500+ signatures) and keeping the road closed (400+ signatures). Numerous letters supporting one position or another were received. Several articles covering the process of road management planning and the location and use of the proposed RNA were published in the Los Alamos Monitor.

Other public notification of the planning process included contacts with Congressional Representatives for the area, local pueblos, interest groups, and other agencies. Seven public meetings were held and the notes from the meetings were sent to all parties on the mailing list.

The draft Environmental Analysis for road management adjacent to the proposed RNA (which identified protecting the research natural values of the RNA as the number one objective) was sent to all working group members, Tom Jervis (Sangre de Cristo Audubon), Craig Allen (Bandelier National Monument), the Santa Fe NF Supervisors office, the R3 Regional Office, and the Rocky Mt. Forest and Range Experiment Station. Craig Allen coordinated the response and comments related to the research activities in the proposed RNA, the investment to date, the past and likely impacts of recreation use in the area, and recommendations for protecting the research value of the area.

Throughout the process it was clear that community opinion was divided on the management of the road past the proposed RNA, but united in support of the proposed RNA.

There were no issues identified which were not addressed and resolved in the road managment environmental analysis. The objectives identified for the proposed RNA are to protect it's values for research and comply with the Forest Plan.

II. Alternatives Considered

The following alternatives were developed by an interdisciplinary team of Forest Service specialists:

1) No Action, meaning no change from the present condition.

2) Establish the Canada Bonito RNA with the boundaries as proposed in the Draft Establishment Record.

In the analysis of each of the above alternatives potential impacts are discussed as are the mitigation measures which could be used to reduce or eliminated the negative impacts of the alternative.

An alternative considered but eliminated from detailed study was to recommend the establishment of the RNA using the general boundary drawn in the Forest Plan preferred alternative map. A review of the extensive analysis undertaken to propose the boundary identified in the Draft Establishment Record indicated no discernable need to second guess the recommendations therein.

III. Affected Environment

Canada Bonito is located on the southeast flank of the Jemez Mountains approximately 30 air miles northwest of Santa Fe, New Mexico. The proposed RNA lies in Sections 2 and 3 of T19N, R5E, NMPM. The Baca Location borders the area to the west, the privately owned Los Alamos Ski Area lies to the south, and the community of Los Alamos lies approximately three miles to the east and southeast.

The Canada Bonito area has been used for recreation since the establishment of Los Alamos in the 1940's. The area was closed to grazing in 1943. Ranging in elevation from 9,000 feet to 9,860 feet, the area proposed as a RNA is a unique montane grassland containing one of the best remaining stands of Thurber fescue in Northern New Mexico. The site is characterized by tall, thick, herbaceous vegetation surrounded by coniferous forest and aspen stands. Slopes have a southwest aspect and range from 5 to 40%.

Research has been conducted in the proposed RNA since the early 1980's. In 1988, the USFS Rocky Mt. Forest and Range Experiment Station began, as principle investigator, the research project "Nutrient Cycling in Montane Grasslands". Activities conducted under this project include establishment and monitoring of permanent vegetation transects, soil/vegetation analysis above and below ground, germination plots, and water runoff experiments. Over $75,000 has been spent in research since 1988, and $55,000 is planned for fiscal year 1992 (October 1991 through September 1992). This project is expected to continue through at least 1993, and a long-term research grant proposal has been made to the National Science Foundation to continue a lower intensity study for the next 30 years.

Access to the site is limited to use of the Pipeline road during low snow periods (April - November) and the County road to the Los Alamos Ski Area which is plowed in the winter. At the County road access point, cross country ski trails have been developed which lead from the gate to an area just south of the proposed RNA. Access to the proposed RNA is limited to foot travel, mountain bike, and horseback unless other modes of travel are specifically permitted in writing.

A high power electric line (the OLE line) is proposed for construction west of the proposed RNA. If the line is constructed as currently planned, it would require road construction, road improvement, and road maintenance from Camp May to the Baca Location. Road and line construction activities will bring a significant number of people and vehicles to the edge of the proposed RNA. The costs of necessary road work are to be born by the company constructing the line (Public Service Company of New Mexico, or PNM). Mitigation in terms of protecting the designated RNA would also be born by PNM.

The Visual Quality Objective (VQO) for Canada Bonito is Retention. Under this VQO, management activities should not be evident to the forest visitor. The critical viewpoints, or areas of prime viewing concern, are from the proposed RNA itself and from the access points to the RNA on the north and south. Of these, all have equal sensitivity, as viewing is often of long duration, revealing extensive detail in the landscape.

IV. Environmental Consequences

The consequences of not protecting the the RNA include the loss of past and current research investments, and the potential loss of future opportunities. Recreational impact between 1988 and 1991 resulted in the loss of a vegetation transect and provided the impetus for the decision to obliterate the old roadway past the proposed RNA and relocate travel to the west thus providing a buffer between most traffic and the area being used for research.

Alternative 1 No Action.

This alternative would result in little change from the present situation, until the OLE line was built. An improved road into the area may increase the incidence of vehicle use in violation of the closure order.

A. Protect and preserve RNA values:

Intrusions upon the RNA by wheeled vehicles would likely increase over time if the public were to perceive that the area was not worthy of the protection promoted in the RATM process. When and if the OLE line is constructed, intrusions would likely increase as the gates may not be closed at all times and construction personnel may not all understand/support the concept of protecting the research values of an undesignated area. Mitigation: Damage to the grassland would be minimized as much as possible through permit administration. Prosecution of gate vandals would be to the extent the District could afford.

B. Consistent with Forest Land Management Plan:

No. The LMP supports the designation of the proposed area as a Research Natural Area.

Alternative 2 Designate the Research Natural Area as Proposed

This alternative would result in little immediate change from the present situation, but would improve long term public compliance with the closure order which restricts motorized travel in the area. If the OLE line was built an official designation would likely increase the compliance of contract personnel with the restrictions in the permit and reduce the chances that an improved road into the area would increase the incidence of vehicle use in violation of the closure order.

A. Protect and preserve RNA values:

Intrusions upon the RNA by wheeled vehicles would likely remain low since the public has shown significant support for the proposed RNA and the protection promoted in the RATM process. When and if the OLE line is constructed, intrusions may increase as the gates may not be closed at all times and construction personnel may not all understand/support the concept of protecting the RNA, although understanding and support is considered to be more likely with an official designation to refer to . Mitigation: Damage to the grassland would be minimized as much as possible through permit administration. Prosecution of gate vandals would be to the extent the District could afford.

B. Consistent with Forest Land Management Plan:

Yes. The LMP supports the designation of the proposed area as a Research Natural Area.

APPENDIX

Site Location Map	A
Public Contacted	B

Note: The project analysis file, available at Espanola District Office, contains the public comments received, Forest Service specialist reports, meeting notes, letters to the mailing list, and newspaper articles pertaining to the project.

APPENDIX B

Listing of Agencies, Groups, Organizations, and Persons Contacted

1.) Listing of Other Agencies Contacted

Bandelier National Monument
Los Alamos County Planning Department
Los Alamos County Police Department
Department of Energy
Los Alamos National Lab

2.) Listing of Pueblo's Contacted

(Personal visits and by way of annual list of District projects)

Cochiti Pueblo
Nambe Pueblo
Tesuque Pueblo
San Ildefonso Pueblo
San Juan Pueblo
Santa Clara Pueblo
Santo Domingo Pueblo

3.) Organizations Contacted

Nature Conservancy
Audubon Society (Sangre de Christo Chapter)
Arizona Cattle Growers
New Mexico Range Improvement Task Force

4.) Listing of Newspapers Contacted

The Los Alamos Monitor
(upon decision, legals will be placed in the Monitor and in the Albuquerque Journal)

5.) Listing of Private Citizens Contacted

Ray Brewer
Florence Naveaux
Andrea Kron
George Busch
Terry Hahn
Kit Taylor
Jennifer Johnson
Janie O'Rourke
Lore M. Watt
Susan Radzinski
Wayne Slattery
Barbara J. De Marsh
Thomas A. Morgan
Lori Schilling
Dawn Lewis
Kris Stokes
Bryan Ratliff
Olin Van Dyck
Louis A Carrillo
Bruce Gavett
Mark and Lynn Jones
John Conway
David and Faye Brown
Karl Bennett
Paula Mattys
Gale Zander

John Reninger
Russ Miller
Wayne Brown
Dale Jarvis
Scott Volz
Rick Ramsey
Jessie Rudnick
Gordon Spingler
Tom Jervis
Eric Lillberg
David Platts
Kevin Holsapple
Terry Ward
Norman Johnson
Danny Gallant
Bruce Carlsten
Dennis E. Joyce
Frank Osvath
Nancy Barnes
Arthur Kleinfelder
Fred Farnsworth
Senator John Stoddard
Charles Thorn
Karri Wilder
Gertrude Barsch

Robert Cox
Marge Fraser
Judy Buckingham
Gaye Burns
Charles H. Koofhion
Dan McGuire
Arthur A. Usner
Ron Van Lysel
Robert Crowley
Paul Smith
Doug Thayer
Dorothy Hoard
Robin Devore
James Auchampaugh
Jennifer McDowell
David C. Guenther
Brian Bartram
Kathy Jones
Mark Zander
John and Renate Zinn
Robi Mulford
Corporal John Chicoine
Don Pettit
Robert Reedy
Dave Barlow

ESTABLISHMENT REPORT

CAÑADA BONITO RESEARCH NATURAL AREA

USDA FOREST SERVICE
SOUTHWESTERN REGION
SANTA FE NATIONAL FOREST
ESPANOLA RANGER DISTRICT
LOS ALAMOS COUNTY, NEW MEXICO

Prepared by: _____ Date March 24, 1987
William W. Dunmire, The Nature Conservancy
Mollie S. Toll, Department of Biology,
University of New Mexico

Recommended by: _____ Date 1/6/88
Pete Karp, District Ranger
Espanola Ranger District

Recommended by: _____ Date 2-3-88
Maynard T. Rost, Forest Supervisor
Santa Fe National Forest

Recommended by: _____ Date 3/31/88
John W. Russell
Chairman, Southwestern
Research Natural Area Committee

Recommended by: _____ Date 4/15/88
Sotero Muniz, Regional Forester
Southwestern Region

Recommended by: _____ Date May 16, 1988
Charles M. Loveless, Station Director
Rocky Mountain Forest and Range Experiment Station

The abovesigned certify that all applicable land management planning and environmental analysis requirements have been met and that boundaries are clearly identified in accordance with FSM 4063.21, Mapping and Recordation and FSM 4063.41 5.e(3) in arriving at this recommendation.

DESIGNATION ORDER

By virtue of the authority vested in me by the Secretary of Agriculture under regulations 7 CFR 2.42 and 36 CFR 251.23, I hereby establish the Cañada Bonito Research Natural Area. The Cañada Bonito Research Natural Area shall be comprised ~~of the following~~ land: Beginning at a point in Cañada Bonita at lat. 35 deg. 54 min. 17 sec., long. 106 deg. 22 min. 57 sec., thence ascend Cañada Bonita to a point approximately 66 ft east of the Guaje trail and at lat. 35 deg. 54 min. 30 sec., long 106 deg. 23 min. 45 sec., thence ascend to a point on a NW-SE ridge 0.25 miles west of the .05 Mile Point, which is 1,204.5 ft south of M.P. 6 located on the East boundary of Baca Location No. 1, thence descend in a northeasterly direction to a point at the head of a drainage in Quemazon Canyon, being the 9400 ft contour, as depicted on the 1977 USGS Valle Toledo, New Mexico 7.5 min. quadrangle map, thence in a southeasterly direction along said 9400 ft contour to a point on a NE-SE ridge at lat. 35 deg. 54 min. 29 sec., long. 106 deg. 22 min. 39 sec., thence descend a south slope to the point of beginning in Cañada Bonito.

1) Regional Forester, Sotero Muniz, recommended the establishment of the Cañada Bonito Research Natural Area in the Santa Fe National Forest Land and Resource Plan. That recommendation was the result of an analysis of the factors listed in 36 CFR 219.25 and Forest Service Manual 4063.41. The results of the Regional Forester's analysis are documented in the Final Environmental Impact Statement for the National Forest Land and Resource Management Plan and the Establishment Record which are available to the public.

2) The Cañada Bonito Research Natural Area will be managed in compliance with all relevant laws, regulations, and manual direction regarding Research Natural Areas. The Cañada Bonito Research Natural Area will be administered in accordance with the management direction identified in the Establishment Record. The Santa Fe National Forest Land and Resource Management Plan is hereby amended to be consistent with the management direction identified in the Establishment Record and this designation order. Directions on page 150 of the Santa Fe National Forest Land and Resource Management Plan are replaced by the directions on page 15 of the Establishment Record. This direction will remain in effect unless amended pursuant to 36 CFR 219.10. This is a nonsignificant amendment of the Santa Fe National Forest Land and Resource Management Plan.

3) The Forest Supervisor of the Santa Fe National Forest shall notify the public of this amendment and will mail a copy of the Designation Order and amended direction to all persons on the Santa Fe Land and Resource Management Plan mailing list.

Based on the environmental analysis documented in the National Forest Land and Resource Management Plan and the Establishment Record I find that the designation of the Cañada Bonito Research Natural Area is not a major federal action significantly affecting the quality of the human environment.

This decision is subject to appeal pursuant to 36 CFR 211.18. A Notice of Appeal must be in writing and submitted to:

Chief
USDA, Forest Service
P.O. Box 96090
Washington, D.C. 20013-6090

The Notice of Appeal must be submitted within 45 days form the date of this decision. Within five days of receipt, the Chief will transmit the Notice of Appeal and a copy of the Designation order to the Secretary of Agriculture for review at the Secretary's discretion. The appeal will be deemed denied if the Secretary takes no action within ten days of receiving the appeal.

_____ _____

Chief Date

INTRODUCTION

The Cañada Bonito Research Natural Area (RNA) comprises approximately 300 acres (121.4 hectares) in the Jemez Mountains of north-central New Mexico. The proposed RNA is located in the Espanola Ranger District, Santa Fe National Forest, in Los Alamos County, and is all aquired National Forest land.

Thurber fescue meadow has been noted as an important high-elevation meadow ecosystem for protection within the RNA program (USFS Regional Guide, 1983: Table 3-1). Attempts to locate examples of such fescue meadows within the Southwestern Region have been frustrated since the few representative areas are in an unnatural condition and are located within grazing allotments. In July, 1982, a task group of the Regional RNA Committee investigated several candidate meadow areas proposed by the Santa Fe, Carson, Lincoln, Cibola, and Gila National Forests. The Task Group concurred that Cañada Bonito constituted the only real opportunity to provide suitable representation.

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 current Santa Fe National Forest planning documents, the Revised Draft Environmental Impact Statement and Proposed Forest Plan (January 1986), include the Cañada Bonito 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 Cañada Bonito RNA provides the best, and possibly the only, alternative for maintenance of a Thurber fescue meadow within the Southwestern Region. Examples of this important high elevation ecosystem type are in very short supply, with most acreage already within grazing allotments, and/or suffering from major erosion problems or heavy public use. The proposed RNA is one of few remaining Thurber fescue sites that have not yet been committed to domestic livestock use in the recent past. The value of this tract of land for scientific research, benchmark comparisons, and seed reserves easily outweighs its value as livestock grazing land. There may, for example, be the need to measure grazing deterioration or implement restoration practices, on many adjoining or similar lands. The seed resources and ecological perspective given by Cañada Bonito meadow are precisely suited to these and other such future needs or goals.

Commitment of all of this Region's high elevation Thurber fescue ecosystems to commodity oriented management precludes future options. Reservation of this tract for study and

naturally-maintained genetic pools will provide safeguards and alternatives for future management considerations. A prime consideration in managing the Cañada Bonito RNA will be to maintain unmodified conditions and natural ecological processes.

PRINCIPAL DISTINGUISHING FEATURES

Cañada Bonito research natural area is an example of an outstanding high elevation (9200 - 9700 feet or 2800 - 2960 m) Thurber fescue (Festuca thurberi) community at or very near its climax expression. This park, surrounded by spruce-fir and aspen forests, has not been grazed by permitted domestic livestock since at least 1940 when the area was withdrawn as a defense facility. Thurber fescue meadows are dominant on south-facing slopes. On upper slopes and ridgetops are patches or mosaics of aspen, providing abrupt contrast to the fescue meadows. Steeper north-facing slopes within or adjoining this research natural area have closed forests of Engelmann spruce (Picea engelmannii) and corkbark fir (Abies lasiocarpa var. arizonica).

LOCATION

Cañada Bonito is located in the Espanola Ranger District, Santa Fe National Forest, Espanola District. Beginning at a point in Cañada Bonita at lat. 35 deg. 54 min. 17 sec., long. 106 deg. 22 min. 57 sec., thence ascend Cañada Bonita to a point approximately 66 ft east of the Guaje trail and at lat. 35 deg. 54 min. 30 sec., long 106 deg. 23 min. 45 sec., thence ascend to a point on a NW-SE ridge 0.25 miles west of the .05 Mile Point, which is 1,204.5 ft south of M.P. 6 located on the East boundary of Baca Location No. 1, thence descend in a northeasterly direction to a point at the head of a drainage in Quemazon Canyon, being the 9400 ft contour, as depicted on the 1977 USGS Valle Toledo, New Mexico 7.5 min. quadrangle map, thence in a southeasterly direction along said 9400 ft contour to a point on a NE-SE ridge at lat. 35 deg. 54 min 29 sec., long. 106 deg. 22 min. 39 sec., thence descend a south slope to the point of beginning in Cañada Bonito.

The area lies approximately four miles (6.4 km) northeast of Los Alamos, New Mexico (Maps 2 and 3). From the center of Los Alamos, take State Route 4 leading west out of town about 1.5 miles (2.4 km) to the turnoff on the right to the Pajarito Ski Area. Proceed 4 miles (6.4 km) on this all-weather road, just past the ski area, to where the gated forest road, now Forest Trail 282, takes off to the right (north). Walk approximately 1 mile (1.6 km) on this trail which is now closed to public vehicle use, to the Research Natural Area. The lower meadow of Cañada Bonito RNA is bounded on the south by this road.

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 Küchler Potential Natural Vegetation system (Küchler 1966). 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 Cañada Bonito Research Natural Area.

Type	Society of American Foresters Cover Type[1]	Küchler PNV Type[2]	Surface Acres	Surface Hectares
Engelmann Spruce-Subalpine Fir	SAF 206	K-20 Southwestern Spruce-Fir	86	34.8
Interior Douglas-fir	SAF 210	K-17 Pine-Douglas-fir	48	19.4
Aspen	SAF 217	(K-17) Pine-Douglas-fir	89	36.0
Thurber fescue Grassland	[none]	K-45 Alpine Meadows	77	31.2
		TOTAL	300	121.4

checked all okay

[1]Eyre 1980.
[2]Küchler 1966.

PHYSICAL AND CLIMATIC CONDITIONS

Distinctive topographic conditions have allowed the formation of a montane grassland in the proposed RNA. The Cañada Bonito meadow extends from a midslope position (approximately 8900 feet or 2713 meters in elevation) to the ridgetop crest at 9860 feet (3005 meters) on a south-facing peak, with a site aspect ranging

from 180° to 240°. The steep slope (20-40%) and relatively smooth terrain is conducive to fire conduction, a vital element in long-term maintenance of such grasslands (Allen 1984). As is typical in other such montane grasslands, a sharp ecotone is present between meadow and the adjacent spruce-fir forest along the upper ridgecrest boundary. Along lower and sideslope meadow margins, grassland/forest boundaries are often abrupt, but not so clearly correlated with topography as at the ridgecrest.

No long term records of climatic conditions in the Jemez Mountains exist. In comparison with data from lower elevation Los Alamos, estimates for the vicinity of the Cañada Bonito RNA indicate significantly higher moisture levels and shorter frost free season. Los Alamos, at about 7400 feet (2556 m), receives 18 inches (457 mm) of precipitation annually (Tuan et al. 1973; National Oceanic and Atmospheric Administration 1976), with about 40% of the yearly precipitation falling during July and August convectional storms. Weather in the nearby Jemez peaks, at about 9800 feet (2987 m), is influenced by adiabatic cooling and orthographically induced precipitation (Allen 1984). Average annual rainfall is 27 inches (686 mm), with the great majority (71%) falling during the warm season (May to October). Mean annual snow accumulation is 55 inches, or 140 cm.

Temperature at the Cañada Bonito RNA varies significantly with exposure. Mean temperatures on the southern aspect are estimated at 59° F (15° C) for July, and 20° F (-7° C) for January, with a frost free period of 90 days. The cooler north aspect has a mean temperature in July of 54° F (12° C),and in January of 15° F (-9°C). Climatic data was compiled from Southwestern Region Terrestrial Ecosystem Survey information.

DESCRIPTION OF VALUES

Flora

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

Cañada Bonito's Thurber fescue grassland is considered to have been self-perpetuating for a long period of time, perhaps in excess of 1000 years (Allen 1984). Other than this grassland, the Research Natural Area supports two basic potential climax types, mixed conifer forest and spruce-fir forest. These forest types vary in distribution depending on elevation and aspect.

The two principal habitat types of the mixed conifer forest occur on the steep south- and west-facing slopes. Abies concolor/Acer glabrum (ABCO/ACGL) HT is limited to the lower quarter of the area, while Abies concolor/Quercus gambelii (ABCO/QUGA) HT is found in the upper three fourths of these slopes. Abies concolor and Pseudotsuga menziesii are dominant. Pinus flexilis, Picea engelmannii, and Populus tremuloides are well represented (the latter forming some almost pure seral stands) and Pinus ponderosa and Acer glabrum occasional to common. Common shrubs include Quercus gambelii, Robinia

neomexicana, and Jamesia americana, with Holodiscus dumosus and Physocarpus monogynus appearing on the upper slopes. The larger grassy openings within this forest are mainly composed of Festuca thurberi and Danthonia sp., while Bromus ciliatus is the principal grass under the forest canopy. At the east end of the RNA, where the upper slopes begin to face east, a band of Abies concolor/Vaccinium myrtillus (ABCO/VAMY) HT is encountered before entering the Picea engelmannii series as the aspect turns northward.

On the north- and northeast-facing slopes, Picea engelmannii dominates with Abies lasiocarpa scarce if present at all. Abies lasiocarpa/Erigeron eximius (ABLA/EREX) HT and Abies lasiocarpa/Vaccinium myrtillus (ABLA/VAMY) HT are the principal habitat types, with mosaics of Abies lasiocarpa/Rubus parviflorus (ABLA/RUPA) HT and ABLA/VAMY-RUPA HT. Throughout most of this forest Abies concolor and Populus tremuloides continue to be well represented, with occasional Pseudotsuga menziesii and Acer glabrum. Luxuriant herbaceous ground cover is comprised of forbs and grasses typical of these habitat types. Shrubs, poorly represented, include Juniperus communis and Physocarpus monogynus.

The wood lily, Lilium philadelphicum, is listed on the USFS Southwestern Region Sensitive Plant List, and is classified as Endangered by the State of New Mexico (NRD Rule No. 85-3). This plant potentially occurs in the spruce-fir portion of the RNA, although it has not been collected or observed to date.

The following plant list was compiled from field observations by Reggie Fletcher, USFS Southwestern Region Botanist, on June 30, 1982, by Janet Williams, in the summer of 1984, by Bill Dunmire (The Nature Conservancy) and Mollie S. Toll (University of New Mexico, Department of Biology), on July 21, 1986, and by Bill Dunmire on September 2, 1986.

Abbreviated Plant List for Canada Bonito R.N.A.

Latin Name	Common Name[1]	Habitat[2]			Reference[3]	
GRASSES AND OTHER GRASS-LIKE PLANTS:						
Agrostis scabra	Rough bentgrass	G			JW	
Agropyron smithii	Western wheatgrass	G			JW	BD/MT
Bromus anomalus	Nodding brome		F		JW	BD/MT
Bromus ciliatus	Hairy brome	G	F	RF		BD/MT
Carex foena	Sedge	G			JW	
Carex heliophila	Sedge	G		RF		
Carex pityophila	Sedge	G			JW	
Danthonia intermedia	Timber danthonia	G	F	RF		
Danthonia parryi	Parry danthonia	G	F		JW	BD/MT

Elymus virginicus	Virginia wildrye	G			JW	
Festuca arizonica	Arizona fescue	G		RF	JW	BD/MT
Festuca ovina	Sheep fescue	G		RF		
Festuca thurberi	Thurber fescue	G		RF	JW	BD/MT
Koeleria cristata	Junegrass	G		RF		BD/MT
Koeleria macrantha	Junegrass	G			JW	
Muhlenbergia montana	Mountain muhly	G		RF	JW	
Poa artica	Arctic bluegrass	G		RF		
Poa fendleriana	Muttongrass	G		RF	JW	
Poa pratensis	Kentucky bluegrass	G		RF	JW	BD/MT
Sitanion hystrix	Bottlebrush squirreltail	G		RF	JW	BD/MT
FORBS:						
Achillea lanulosa	Western yarrow	G		RF	JW	BD/MT
Actaea rubra	Baneberry		F			BD/MT
Agoseris auranthiaca	Orange agoseris	G		RF	JW	
Allium cernuum	Nodding onion	G		RF	JW	BD/MT
Allium geyeri	Onion	G			JW	
Antennaria sp.	Pussytoes	G			JW	
Antennaria parvifolia	Rocky Mountain pussytoes	G		RF		
Arabis drummondii	Drummond rockcress	G		RF		
Arenaria fendleri var. fendleri	Fendler sandwort	G		RF		
Aster laevis	Smooth aster	G			JW	
Calochortus gunnisonii	Gunnison mariposa lily	G		RF	JW	BD/MT
Campanula rotundifolia	Bluebell	G		RF	JW	BD/MT
Castilleja austromontana	Paintbrush	G		RF		
Castilleja miniata	Indian paintbrush	G	F		JW	BD/MT
Cerastium arvense	Starry mouse-ear	G		RF	JW	
Erigeron eximius	Forest fleabane		F			BD/MT
Erigeron flagellaris	Trailing fleabane	G		RF	JW	BD/MT
Erigeron formossissima	Itchy fleabane	G			JW	
Erigeron vetensis	Fleabane	G		RF		
Erysimum capitatum	Western wallflower	G		RF	JW	BD/MT
Fragaria ovalis	Wild strawberry	G	F	RF	JW	BD/MT
Galium boreale	Northern bedstraw	G			JW	BD/MT
Gentiana affinis	Pleated gentian	G			JW	BD/MT
Gentiana strictiflora	Gentian	G			JW	
Geranium caespitosum	Purple geranium	G	F		JW	BD/MT
Geranium richardsonii	Big Dick geranium		F			BD/MT
Geum triflorum	Avens	G			JW	BD/MT
Geum turbinatum	Avens	G		RF		
Gilia aggregata	Skyrocket dogretch	G			JW	BD/MT
Helenium hoopesii	Orange sneezeweed	G			JW	BD/MT
Heuchera parviflora var. flavescens	Alumroot	G		RF	JW	
Hieracium fendleri var. fendleri	Redtail hawkweed	G		RF		

Iris missouriensis	Flag	G		RF	JW	BD/MT
Lathyrus arizonicus	Arizona peavine	G	F	RF	JW	BD/MT
Mertensia lanceolata	Bluebells	G		RF		
Oreochrysum parryi			F			BD/MT
Orthocarpus luteus	Yellow owlclover	G			JW	
Potentilla hippiana	Horse cinquefoil	G			JW	BD/MT
Potentilla pulcherrima	Beauty cinquefoil	G		RF	JW	BD/MT
Pseudocymopterus montanus	Mountain parsley	G	F	RF	JW	BD/MT
Rudbeckia hirsuta	Coneflower	G			JW	BD/MT
Senecio bigelovii	Groundsel	G			JW	
Senecio neomexicanus	New Mexican groundsel	G		RF		
Senecio wootonii	Groundsel		F			BD/MT
Sisyrinchium campestre	Blue-eyed grass	G		RF		
Sisyrinchium montanum	Blue-eyed grass	G			JW	
Smilacina racemosa	False Solomon's seal		F			BD/MT
Stellaria longipes var. longipes	Longstalk starwort	G			JW	BD/MT
Swertia radiata	Deers-ears swertia	G			JW	
Taraxacum officinale	Dandelion	G		RF	JW	BD/MT
Thermopsis divaricarpa	Goldenpea	G			JW	
Thermopsis pinetorum	Big goldenpea	G	F			BD/MT
Thalictrum fendleri	Meadowrue	G	F		JW	
Thlaspi alpestre	Pennycress	G		RF		
Tragapogon dubius	Salsify	G		RF	JW	BD/MT
Trifolium spp.	Clover	G			JW	
Valeriana edulis	Tobaccoroot	G	F	RF	JW	BD/MT
Vicia americana	American vetch	G	F	RF	JW	BD/MT
Viola canadensis	Canada violet		F			BD/MT
Viola sp.	Violet	G			JW	
HALF-SHRUBS, SHRUBS, AND TREES:						
Abies concolor	White fir		F	RF		BD/MT
Acer glabrum var. neomexicanum	Rocky Mountain maple		F	RF		BD/MT
HALF-SHRUBS, SHRUBS, AND TREES [cont.]:						
Arctostaphylos uva-ursi	Kinnikinnick		F			BD/MT
Artemisia ludoviciana	Louisiana wormwood	G	F	RF	JW	
Holodiscus dumosus	Ocean spray	G	F			BD/MT
Jamesia americana	Cliff jamesia		F			BD/MT
Juniperus communis	Common juniper		F	RF		BD/MT
Physocarpus monogynus	Mountain ninebark		F			BD/MT
Picea engelmannii	Engelmann spruce	G	F	RF		BD/MT
Pinus flexilis	Limber pine		F			BD/MT
Pinus ponderosa	Ponderosa pine	G	F	RF		BD/MT
Populus tremuloides	Quaking aspen	G	F	RF		BD/MT
Potentilla fruticosa	Shrubby cinquefoil		F	RF		BD/MT

Pseudotsuga menziesii	Douglas-fir	G	F	RF		BD/MT
Quercus gambelii	Gambel oak	G				BD/MT
Robinia neomexicana	New Mexico locust		F			BD/MT
Rosa woodsii	Rose	G	F		JW	BD/MT
Vaccinium myrtillus	Whortleberry		F			BD/MT

[1]Common names are used according to U.S.D.A., Forest Service (1974)
[2]G = grassland; F = forest

[3]RF = Fletcher (1982); JW = Williams (1978); BD/MT = plants observed by Bill Dunmire (The Nature Conservancy) and Mollie S. Toll (University of New Mexico, Department of Biology), on July 21, 1986, and by Bill Dunmire on September 2, 1986

Fauna

The grassland and aspen edges are heavily used by elk in spring,summer, and fall. Inhibition of aspen clone regeneration by elk browsing is evident throughout the area.

The Jemez Mountain salamander (Plethodon neomexicanus) is listed as endangered by the State of New Mexico (NMGF Reg. 624). This species is known to occur in spruce-fir forest situations within two miles of the RNA, although it has not been collected or observed within the RNA to date.

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 Santa Fe county, New Mexico:

1. subalpine grassland biome
2. spruce-fir series, mixed conifer association
3. spruce-fir series, aspen subclimax
4. Douglas fir-white fir series

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

Abbreviated Animal List for Cañada Bonito R.N.A.

BIRDS:

Blackbird, Brewer's	Euphagus cyanocephalus
Bluebird, Western	Sialia mexicana
Bluebird, Mountain	Sialia currucoides
Chickadee, Mountain	Parus gambeli
Chickadee, Black-capped	Parus atricapillus
Creeper, Brown	Certhia americana
Crossbill, Red	Loxia curvirostra
Crow, American	Corvus brachyrhynchos
Dove, Mourning	Zenaida macroura
Eagle, Golden	Aquila chrysaetos

Finch, Rosy	Leucosticte arctoa
Finch, House	Carpodacus mexicanus
Flicker, Northern	Colaptes auratus
Flycatcher, Hammond's	Empidonax hammondii
Flycatcher, Olive-sided	Contopus borealis
Flycatcher, Dusky	Empidonax oberholseri
Flycatcher, Western	Empidonax difficilis
Goshawk, Northern	Accipiter gentilis
Grosbeak, Black-headed	Pheucticus melanocephalus
Grosbeak, Evening	Coccothraustes vespertinus
Grosbeak, Pine	Pinicola enucleator
Grouse, Blue	Dendragapus obscurus
Hawk, Sharp-shinned	Accipiter striatus
Hawk, Red-tailed	Buteo jamaicensis
Hummingbird, Rufous	Selasphorus rufus
Hummingbird, Broad-tailed	Selasphorus platycercus
Hummingbird, Black-chinned	Archilochus alexandri
Jay, Steller's	Cyanocitta stelleri
Jay, Gray	Perisoreus canadensis
Junco, Dark-eyed	Junco hyemalis
Kestrel, American	Falco sparverius
Kinglet, Ruby-crowned	Regulus calendula
Martin, Purple	Progne subis
Nighthawk, Common	Chordeiles minor
Nutcracker, Clark's	Nucifraga columbiana
Nuthatch, Pygmy	Sitta pygmaea
Nuthatch, White-breasted	Sitta carolinensis
Nuthatch, Red-breasted	Sitta canadensis
Owl, Great Horned	Bubo virginianus
Owl, Flammulated	Otus flammeolus
Owl, Long-eared	Asio otus
Owl, Saw-whet	Aegolius acadicus
Owl, Spotted	Strix occidentalis
Peewee, Western Wood	Contopus sordidulus
Pigeon, Band-tailed	Columba fasciata
Pipit, Water	Anthus spinoletta
Raven, Common	Corvus corax
Robin, American	Turdus migratorius
Sapsucker, Yellow-bellied	Sphyrapicus varius
Sapsucker, Williamson's	Sphyrapicus thyroideus
Siskin, Pine	Carduelis pinus
Solitaire, Townsend's	Myadestes townsendi
Sparrow, Vesper	Pooecetes gramineus
Sparrow, White-crowned	Zonotrichia leucophrys
Sparrow, Violet-green	Tachycineta thalassina
Sparrow, Chipping	Spizella passerina
Swallow, Tree	Tachycineta bicolor
Swift, White-throated	Aeronautes saxatalis
Tanager, Western	Piranga ludoviciana
Thrush, Hermit	Catharus guttatus

Thrush, Swainson's	Catharus ustulatus
Towhee, Rufous-sided	Pipilo erythrophthalmus
Vireo, Solitary	Vireo solitarius
Vireo, Warbling	Vireo gilvus
Warbler, Grace's	Dendroica graciae
Warbler, Wilson's	Wilsonia pusilla
Warbler, Virginia's	Vermivora virginiae
Waxwing, Cedar	Bombycilla cedrorum
Woodpecker, Hairy	Picoides villosus
Woodpecker, Three-toed	Picoides tridactylus
Woodpecker, Downy	Picoides pubescens
Woodpecker, Lewis'	Melanerpes lewis
Wren, Winter	Troglodytes troglodytes
Wren, House	Troglodytes aedon

MAMMALS:

Badger	Taxidea taxus
Bat, Silver-haired	Lasionycteris noctivagans
Bat, Hoary	Lasiurus cinereus
Bat, Townsend's Big-eared	Plecotus townsendii
Bat, Big Brown	Eptesicus fuscus
Bear, Black	Ursus americanus
Chipmunk, Least	Eutamias minimus
Chipmunk, Colorado	Eutamias quadrivittatus
Cottontail, Nuttall's	Sylvilagus nuttalli
Coyote	Canis latrans
Deer, Mule	Odocoileus hemionus
Elk	Cervus elaphus
Ermine	Mustela erminea
Gopher, Botta's Pocket	Thomomys bottae
Gopher, Northern Pocket	Thomomys talpoides
Lion, Mountain	Felis concolor
Marmot, Yellow-bellied	Marmota flaviventris
Mouse, Pinyon	Peromyscus truei
Mouse, Deer	Peromyscus maniculatus
Mouse, Western Jumping	Zapus princeps
Mouse, Western Harvest	Reithrodontomys megalotis
Myotis, Long-legged	Myotis volans
Myotis, Fringed	Myotis thysanodes
Myotis, Small-footed	Myotis leibii
Porcupine	Erethizon dorsatum
Raccoon	Procyon lotor
Shrew, Vagrant	Sorex vagrans
Skunk, Striped	Mephitis mephitis
Squirrel, Red	Tamiasciurus hudsonicus
Squirrel, Golden-mantled Ground	Spermophilus lateralis
Vole, Heather	Phenacomys intermedius
Vole, Southern Red-backed	Clethrionomys gapperi
Vole, Meadow	Microtus pennsylvanicus
Vole, Long-tailed	Microtus longicaudus

Weasel, Long-tailed	Mustela frenata
Woodrat, Mexican	Neotoma mexicana
Woodrat, Bushy-tailed	Neotoma cinerea

REPTILES:

Lizard, Short-horned	Phrynosoma douglassi
Lizard, Sagebrush	Sceloporus graciosus
Rattlesnake, Western	Crotalus viridis
Snake, Common Garter	Tamnophis sirtalis
Snake, Gopher	Pituophis melanoleucus
Snake, Smooth Green	Opheodrys vernalis
Snake, Ringneck	Diadophis punctatus
Snake, Milk	Lampropeltis triangulum
Snake, Western Terrestrial Garter	Thamnophis elegans

Geology

The Jemez Mountains were formed by relatively recent volcanic activity along the western fault margin of the Rio Grande Rift (Burton 1982, in Allen 1984:22). Massive eruptions 1.4 million and 1.1 million years ago each ejected about 300 km^3 of pyroclastic material. Subsequent cone collapse produced two large calderas, Toledo (7.5 miles or 12 km in diameter) and Valle Grande (13.7 miles or 22 km in diameter), which eventually filled to a level of about 8900 feet (2713 m) with Pleistocene lacustrine deposits. The modern Jemez Mountains consist of secondary domes within the calderas, and remnants of pre-collapse volcanic material rimming the calderas. The Cañada Bonito alpine meadow is located on an extensive southerly exposure of one of these rim peaks.

A major portion of the RNA is underlain by the Tschicoma formation (predominantly coarsely porphyritic dacite, rhyodacite, and quartz latite; Smith et al. 1970). Small areas are underlain by the Tshirege Member of the Bandelier Tuff (nonwelded to densely welded ash flow deposits).

Soils

Soils vary significantly with vegetation, slope, and geologic parent material. The majority of the area is comprised of deep, dark colored soils with gravelly or cobbly subsoils. Meadow areas dominated by Thurber fescue (higher elevation, south aspect) are dominantly Pachic Paleoborolls and Cryoborolls. In areas occupied by spruce-fir forest, those locations with Bandelier Tuff parent material have a relatively fertile soil classified as Entic Cryandepts.

Table 2. Existing Soils in the Cañada Bonito RNA[1].

	Mapping Unit		Grade
Spruce Forest North Aspect	618	Entic Cryandepts [medial-skeletal]	15-40%
	619	Entic Cryandepts [medial-skeletal]	40-80%
Grassland South Aspect	660	Cryic Pachic Paleoborolls [clayey-skeletal, mixed]	0-15%
	661	Argic Pachic Cryoborolls [clayey-skeletal, mixed]	15-40%

[1]Soils information summarized here and a soils map can be found in the Terrestrial Ecosystem Report for Española Ranger District, an unfinished manuscript on file in the Supervisor's Office, Santa Fe National Forest.

Lands

All the land encompassed in the proposed RNA was transferred from the Forest Service to the Manhattan Project in 1943, thence to the Atomic Energy Commission in 1956, and finally back to the Forest Service in 1969. This land has Weeks Law status (closed to mining entry, open to mining leasing). There are no known rights-of-way or vested interests within the proposed boundaries.

Cultural

Some cultural sites representing high elevation lithic scatters have been recorded in small clearings near the RNA. No residences have been found, and it is thought that the general area in which the RNA is located was used primarily for transient camps during prehistoric times. The exact area of the RNA has not been surveyed for cultural resources. Upon establishment as an RNA, the area will be withdrawn from any archeological research that would in any way modify the existing site. Withdrawal of this area from archeological research would not significantly affect the data base as the entire area surrounding the RNA was heavily utilized.

IMPACTS AND POSSIBLE CONFLICTS

Mineral Resources

The proposed RNA lies within the Baca Known Geothermal Area. Geothermal research and development is currently underway in a small portion of the BKG Area located about 17 miles (27 km) west of the RNA. A portion of the Area was also included in a recent application for non- competitive oil and gas leasing. Some testing for oil and gas was done in the general area, but not within the RNA boundaries. There are no known oil and gas reserves.

Grazing

No impacts or conflicts are anticipated as this area has been closed to permitted grazing since 1943. A need for grazing in the adjacent area has been discussed, but due to very high initial investment costs in fencing and water development, this does not seem practical in the near future. If grazing should be allowed in adjacent areas, the proposed RNA will be fenced to exclude livestock use.

Timber

This area has about 100 acres (40.5 hectares) of spruce-fir which will be withdrawn from the timber base. The small amount of aspen which occurs in this RNA also has been withdrawn.

Total forested: approximately 150 acres (60.8 hectares)

Commercial forest: approximately 100 acres (40.5 hectares)

Watershed Values

Cañada Bonito is contained within the Los Alamos Watershed, a fifth order watershed. It is a tributary to Los Alamos Canyon, which eventually flows into the Rio Grande about 15 miles (24 km) east of the proposed RNA. The Cañada Bonito watershed is approximately 600 acres (243 hectares) in size, and the proposed RNA makes up about 30% of the watershed. The Cañada Bonito RNA also drains into the Quemazon watershed, which is larger than Cañada Bonito; this contribution represents about 10% of the watershed.

Recreation Values

Recreation use in the RNA vicinity ranges from unauthorized ORV use, to big game hunting, hiking, and cross-country skiing. The RNA is also adjacent to a road that makes a very popular scenic drive loop. This road is now gated at each end and will be used only as a foot and horseback trail. Management of ORV use (see Transportation Plans) will primarily impact motorized recreational use. Hunting and winter use of the area will probably not conflict with potential research projects.

Wildlife and Plant Values

The north-facing slope of the Cañada Bonito RNA contains potential habitats for the Jemez Mountains salamander, a New Mexico State listed endangered (Group 2) animal species and a Federal notice of review species, and for Lilium philadelphicum, a New Mexico State listed plant species.

Wilderness, Wild and Scenic River, National Recreation Area Values

None of the above congressionally designated areas have been proposed for the Cañada Bonito RNA or vicinity.

Transportation Plans

The road which is contiguous to the RNA on the southwest boundary is identified on the Forest Transportation Map as a trail. However, it was negotiable by four-wheel-drive vehicles and served as a loop connection between two well used higher standard roads. Because unauthorized ORV use will not be allowed inside the RNA, this loop connection was closed to vehicle use with gates at its intersection with the main roads.

Utility Corridor Plans

The RNA is immediately adjacent to a proposed 345 kv powerline (OLE Project). The proposed line will not be in the RNA. In addition, an existing 4" natural gas pipeline passes one mile (1.6 km) north of the RNA. Operations to maintain these right-of-ways will be carefully administered so as not to impact RNA values.

MANAGEMENT PLAN

The Santa Fe National Forest Plan 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.

1. Vegetation Management

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

2. Fences

As the surrounding area is currently not obligated to livestock grazing, a protective fence is unnecessary at this time.

ADMINISTRATIVE RECORDS AND PROTECTION

Administration and protection of the Cañada Bonito RNA will be the responsibility of the Santa Fe National Forest. The District Ranger, Espanola Ranger District, Espanola, 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 Cañada Bonito RNA will be maintained in the following offices:

Regional Forester, Southwestern Region, Albuquerque, NM
Rocky Mountain Station, Fort Collins, CO
Santa Fe National Forest, Santa Fe, NM
District Ranger, Espanola Ranger District, Espanola, NM

REFERENCES

Allen, Craig D. 1984. Montane grasslands in the landscape of the Jemez Mountains, New Mexico. Unpublished M.S. Thesis, Department of Biology, University of Wisconsin, Madison. 195 pp.

DeVelice, Robert L., John A. Ludwig, William H. Moir, and Frank Ronco, Jr. 1986. A classification of forest habitat types of northern New Mexico and southern Colorado. U.S.D.A. Forest Service General Technical Report RM-131, 59 pp. Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colo.

Eyre, F.H., ed. 1980. Forest cover types of the United States and Canada. Society of American Foresters, Washington, D.C. 148 pp.

Federal Committee on Ecological reserves (F.C.E.R.) 1977. A directory of research natural areas on federal lands of the United States of America. USDA Forest Service, Washington, D.C. 280 pp.

Foxx, Teralene S., and Gail D. Tierney. 1985. Status of the flora of the Los Alamos National Environmental Research Park: checklist of vascular plants of the Pajarito Plateau and Jemez Mountains. LA- 8050-NERP, Vol. III; UC-11. Los Alamos National Laboratory, Los Alamos, New Mexico. 142 pp.

Küchler, A.W. 1966. Potential natural vegetation. U.S. Department of Interior, Geological Survey. 1969. Washington, D.C.

Lehmkuhl, John F. and David R. Patton. 1984. Run Wild, Wildlife/Habitat relationships: user's manual for the Run Wild III data storage and retrieval system. USDA Forest Service, Southwestern Region, Wildlife Unit Technical Report, 68 pp.

Little, Elbert L., Jr. 1979. Checklist of United States trees. USDA Forest Service, Agricultural Handbook 541. Washington, D.C.

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 National Research Conference 44:425-430.

NEW MEXICO NATURAL HERITAGE PROGRAM
UNIVERSITY OF NEW MEXICO
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Albuquerque, New Mexico 87131-1091
(505) 277-1991 • FAX # (505) 277-7587

January 6, 1993

Jerry Elson
Santa Fe National Forest
Pinyon Building, P.O. Box 1689
Santa Fe, New Mexico 87504

RE: Research Natural Area Boundary Review

Dear Mr. Elson,

Attached is the boundary description for the proposed Canada Bonito RNA for your review, and a prototype of the Legal Description Review form required to complete the Establishment Report. Please forward the completed Legal Description Review directly to Reggie Fletcher, Regional Ecologist, USFS, 510 Gold Ave., N.W., Albuquerque NM. If you have any questions, please contact me.

Sincerely,

Esteban Muldavin
Ecologist

Beginning at a point in Cañada Bonito at lat. 35 deg. 54 min. 17 sec., long. 106 deg. 22 min. 57 sec.;
THENCE, ascend Cañada Bonito to a point approximately 66 ft east of the Guaje trail and at lat. 35 deg. 54 min. 30 sec., long 106 deg. 23 min. 45 sec.;
THENCE, ascend to a point on a NW-SE ridge 0.25 miles west of the .05 Mile Point, which is 1,204.5 ft south of M.P. 6 located on the East boundary of Baca Location No. 1;
THENCE, descend in a northeasterly direction to a point at the head of a drainage in Quemazon Canyon, being the 9400 ft contour, as depicted on the 1977 USGS Valle Toledo, New Mexico 7.5 min. quadrangle map;
THENCE, in a southeasterly direction along said 9400 ft contour to a point on a NE-SE ridge at lat. 35 deg. 54 min 29 sec., long. 106 deg. 22 min. 39 sec.;
THENCE, descend a south slope to the point of beginning in Cañada Bonito.

Canada Bonito Cmts

Deleted from DG 9/10/58

8/19/93

JLW Comments on Canada Bonito RNA ER

1. Photographic Record (Form 1600-1): why Sandoval County? The RNA is in Los Alamos County.

2. Spelling of Canada with a tilde (~) should be consistent (it should be used throughout). Also for 'Espanola'. But the 2-3 references to Canada (i.e. the country) should not have a tilde.

3. Misspelled words: p.2 of DN/DO; p. 1,3,4,6,9 of EA; p. 17 of ER (boundary certif.). Note: the EA had no page numbers, so I put some.

4. The ER has two page 3's.

5. See comments marked on enclosed copy.

6. Several references to use of horses: horses should be eliminated from the RNA (unless a wild herd), to reduce entry of exotic plant species, no?

7. Our management style on this RNA is to use fire to maintain the grass & to keep succession (entry of trees) on hold, right? (p. 14). If so, spell out more detail. Fire applied only to the 25.7% of the RNA which is grassy, without trees?

8. No reference to a weather station, so precip & temp are based on guesswork? "Southwestern Region Terrestrial Ecosystem Survey"? Where did they get <u>their</u> info??

9. P. 7; USDA-FS (1974): not listed in the References Section!

10. P. 12, Mineral Resources: "A portion of the RNA was also included in a recent application for noncompetitive oil & gas leasing". That, plus high interest in recreation, plus more than half of the respondents to a petition wanting to keep the road open (P. 5 of EA)---all spell <u>trouble</u>!

11. P. 14: his, his, him, & he---let's use modern English!

12. Boundary Certificate: done for "Canon Bonito", not for Canada Bonito.

13. No author names for flora & fauna. No reference to authorities, e.g. E.L. Little, etc. P. 7 indicates USDA-FS, 1974, but that one is not listed in References. Animal names based on a database, not a published authority.

14. Summarize the latitude & longitude in one sentence in the 1st paragraph of "Location".

15. P. 3A of the ER: SAF 210 & SAF 217 not the same as K-17 of Kuchler.

16. Map quality poor. Original plus 2 (color) photocopies, please. Also: not much similarity between maps & Location paragraph, p. 2.

COMMENTS ON CANADA BONITO RNA
(by Peg Boland)

DN/DO

First paragraph--it is not necessary to indicate that the EA is available at the district office. the 4th paragraph indicates that the EA is attached to the DN/DO.

Second page, second paragraph--"Alternative 1 is consistent" etc. should be "Management direction for the RNA is consistent with teh Forest Plan. The Sante Fe Forest Plan is hereby amended to designate Canada Bonito as an established RNA and modify the map designation . . ."

FONSI

First paragraph, second sentence--"This proposal is in complete accordance with the . . . Plan" is not accurate--the Plan wouldn't need to be amended if the RNA was already established in the Plan. This sentence could just be deleted.

Second paragraph, second sentence--"It" should be "it;" and

B. 1 "nonexistant" should be "nonexistent;" and "The beneficial impacts" sentence is not needed--it is a value judgment that could be contested so why include it?

Second page, first paragraph--"affect" should be "effect" in the both places it appears in the first sentence ("affect" is a verb, "effect" is a noun).

EA

First page

A. Second paragraph--"Pipeline Road Management Enviornmental" should be "Environmental."

Second page

D. Scoping Summary, last paragraph, last sentence--"it's" should be "its."

Third page

II. Alternatives considered, second paragraph--"reduce or eliminated" should be "eliminate."

This EA could have been strengthened by discussing boundaries in the Forest Plan as an alternative considered--the case of chosing Alternative 2 would better have been made in the EA, not in the draft ER. However, I wouldn't insist that they go back to change the EA now.

III. Affected environment, third paragraph--"principle investigator" should be "principal."

EA's do not need an "Affected Environment" section (see FSH 1909.15 for the different requirements of EA's and EIS's). It is not necessary to remove this section from this EA but you probably do not want to encourage others to include this--it just makes extra unnecessary work and repeats much of what is in the ER.

Fourth page

Alternative 1, B.--The no action alternative is consistent with the management direction and land allocation in the Forest Plan.

Alternative 2, B.--Alternative 2 is consistent with the management direction in the Forest Plan but the Forest Plan would need to be amended to change the land allocation and made Canada Bonito an established rather than just a recommended RNA.

ER

Page 14, 2. Fences. Delete second sentence--that decision will be made in a future decision document, not in this ER.

Surveyor's report calls this the "Canon" Bonita RNA rather than "Canada."

USDA-FOREST SERVICE

PHOTOGRAPHIC RECORD

(See FSM 1643.52)

PHOTOGRAPHER: William W. Dunmire

DATE SUBMITTED:

HEADQUARTERS UNIT:

LOCATION:

INITIAL DISTRIBUTION OF PRINTS AND FORM 1600-1:

☐ 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. (1)	PERMANENT (To be filled in by the WO) (2)	(3)	(4)	(5)	(6)	(7)
				ALL: New Mexico Santa Fe NF Espanola Ranger Distr. Sandoval Co.		ALL: 24x36mm color slides
1			9-2-86		Southwest slopes of Cañada Bonito RNA from Pajarito Ski Area	
2			8-9-86		Thurber fescue grassland on southwest slopes of Cañada Bonito	
3			8-9-86		Aspen clone at west end of Cañada Bonito RNA	
4			8-9-86		Engelmann spruce reproduction under aspen canopy, west end of RNA	
5			8-9-86		Dying aspen reproduction at edge of aspen island	
6			8-9-86		East edge of grassland with conifer invasion at edge of aspen	
7			8-9-86		Interior Douglas fir forest type on south-facing slopes, southeast portion of RNA	
8			9-2-86		White fir/Gambel Oak type on steep, south-facing slope	

August, 1984

Plant List for Canada Bonito, Santa Fe National Forest, New Mexico.

	ACLA	Achillea lanulosa
	AGAU	Agoseris aurantiaca
	AGSM	Agropyrom smithii
	ALCE	Allium cernum
	ALGE	Allium geyeri
*	ANTE1	Antennaria spp. 3
	ARLU	Artemisia ludoviciana
**	ASLA	Aster laevis
	BLTR	Blepharoneuron tricholepis
	BRAN	Bromus anomalus
	CAMI	Castilleja miniata
	CAGU	Calochortus gunnisonii
	CARE1	Carex spp. 1
	CARE2	Carex spp. 2
	CARO	Campanula rotundifolia
	CEAR	Cerastium arvense
	DAPA	Danthonia parryi
	ELVI	Elymus virginicus
**	ERCA	Erysimum capitatum
	ERFL	Erigeron flagellaris
	ERFO	Erigeron formosissimus
	FEAR	Festuca arizonica
	FETH	Festuca thurberi
	FROV	Fragaria ovalis
	GABO	Galium boreale
	GEAF	Gentian affinis
	GECA	Geranium caespitosum
	GETR	Geum triflorum
*	HEPAF	Heuchera parvifolia var. flavescens
	IRMI	Iris missouriensis
	KOMA	Koeleria macrantha
	LAAR	Lathyrus arizonicus
	MUMO	Muhlenbergia montana
	PEFL	Pentaphylloides floribunda
	POFE	Poa fendleriana
	POHI	Potentilla hippiana
	POPR	Poa pratensis
	POPU	Potentilla pulcherrima
	PSMO	Pseudocymopteris montanus
	ROWO	Rosa woodsii
	RUHI	Rudbeckia hirta
	SEBI	Senecio bigelovii
	SIHY	Sitanion hystrix
	SIMO	Sisyrinchium montanum
	SOMU	Solidago multiradiata
*	STLOL	Stellaria longipes var. longipes
	TAOF	Taraxacum officinale
	THDI	Thermopsis divaricarpa
	TRDU	Tragapogon dubius
	VAED	Valeriana edulis
	VIAM	Vicia americana
	VIOL1	Viola spp.

** Addition to previous list
* Correction on previous list

Air photo 6-17-81 24 613100 481-246
Strip #26 Quad 107