Research Natural Area

Name: McCrystal Meadow

Location:

State: NM County: Colfax Forest: Carson District: Questa
T. 30N R. 16E S. 15 (Us)

Geology:

Description:

Area is underlain by Jurassic and Triassic rocks undivided: red, gray, and brown shale and sandstone; light-gray cross-bedded dune sandstone; lensing limestone conglomerate.

Reference:

New Mexico State Highway Department, , Geology And Aggregate Resources District V; map 8: NM Hwy Dept., Santa Fe, NM

Climate:

TES Gradient: Lsc 7/0
Precipitation: ___ Annual: 30 in. Warm season (May - Oct.)= 61 %
Cool Season (Nov. - Apr.)= 39 %
Mean Annual Snow: 71 in.

Mean Temperature: Annual 34 °F Jul. 53 °F Jan. 14 °F
Freeze Free Period: 60 days

Mean Temperature: Annual ___ °F Jul. ___ °F Jan. ___ °F
Freeze Free Period: ___ days

Trwartha's climate type: E Boreal

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

Soils:

ESTABLISHMENT REPORT

MCCRYSTAL MEADOW RESEARCH NATURAL AREA

USDA FOREST SERVICE
SOUTHWESTERN REGION
CARSON NATIONAL FOREST
QUESTA RANGER DISTRICT
COLFAX COUNTY, NEW MEXICO

Prepared by: _____ Date 7/1/87
William W. Dunmire, The Nature Conservancy
Mollie S. Toll, Department of Biology,
University of New Mexico

Recommended by: _____ Date 12/21/87
Ron Thibedeau, District Ranger
Questa Ranger District

Recommended by: _____ Date 1/4/88
John Bedell, Forest Supervisor
Carson National Forest

Recommended by: _____ Date 1/5/88
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.

ESTABLISHMENT RECORD

for

MCCRYSTAL MEADOW RESEARCH NATURAL AREA

within

Carson National Forest

Colfax County, New Mexico

INTRODUCTION

The McCrystal Meadow Research Natural Area (RNA) comprises approximately 272 acres (110.1 hectares) in the Sangre de Cristo Mountains of north-central New Mexico. The proposed RNA is located in the Questa Ranger District, Carson National Forest, in Colfax County, and is all acquired National Forest land.

High elevation wet meadow has been noted as an important high-elevation ecosystem for protection within the RNA program (USFS Regional Guide, 1983: Table 3-1). In July, 1982, a task group of the Regional RNA Committee investigated candidate meadow areas proposed by the Carson National Forest. The Task Group concurred that McCrystal Meadow constituted the only real opportunity to provide suitable representation.

Location of this meadow in the Valle Vidal Unit of the Carson Forest was an important factor facilitating the process of establishment as a Research Natural Area. This large parcel of land came to the National Forest System in 1981 as a donation from the Vermejo Park Corporation.

LAND MANAGEMENT PLANNING

The need for representation of this biotic community was identified in the Southwestern Regional Guide (August 1983) although this particular site was not identified by name. The Carson National Forest Plan, implemented December 8, 1986, does not include the Valle Vidal portion of the Forest. The Little Costilla Peak, McCrystal Meadow, and Clayton Pass proposed Research Natural Areas are within the Valle Vidal. The Forest is presently working on an amendment to the Forest Plan to include the Valle Vidal. It is anticipated that the environmental analysis (or EIS) prepared for the amendment will support the establishment of the three proposed Research Natural Areas. In the meantime the areas are designated for protection in the Multiple Use Area Guide for the Valle Vidal which has been approved by the Regional Forester. The management of the Valle Vidal will be governed by the Multiple Use Area Guide until the Forest Plan is amended to include the Unit.

JUSTIFICATION STATEMENT FOR ESTABLISHMENT OF AREA

McCrystal Meadow Research Natural Area was identified primarily as an outstanding example of a wet meadow ecosystem. This is an important high-elevation ecosystem in the Southwest. The need to include such an ecosystem within the RNA network of the Southwestern Region has been stated in the Regional Guide (USFS 1983).

A distinguishing characteristic of the proposed RNA is a very unusual soil type for the Southwest. The peat soil is formed of undecomposed sedges, and offers an outstanding possibility for documenting climatic and vegetational changes during the late Pleistocene and Holocene by means of pollen

stratification. The area is also important as summer elk pasture and has been managed as such during recent years.

PRINCIPAL DISTINGUISHING FEATURES

McCrystal Meadow features marsh in a high elevation post-glacial landscape. The marsh is pocked with small glacial lakes (karsts), and bounded to the south by glacial moraine. Sedges dominate the vegetation and doubtless comprise the bulk of the recently accumulated peat soil. Several grasses and two low growing willows also inhabit the marsh areas. Above the meadow is a closed spruce-fir (Picea engelmannii - Abies lasiocarpa) forest with occasional open areas of Thurber fescue (Festuca thurberi). The majority of McCrystal Meadow is located on private land controlled by the Vermejo Park Corporation.

LOCATION

McCrystal Meadow is in the Valle Vidal unit of the Questa Ranger District, Carson National Forest. The area is located roughly 25 miles (40.2 km) northeast of Questa, New Mexico, in the Ash Mountain USGS 15′ quadrangle (latitude 36°50′,longitude 105°13′), Township 30 N, Range 16 E, Sections 14, 15 22, and 23 (Map 1). The east boundary is the property line with Vermejo Park Corporation. The west boundary of the triangular shaped RNA is oriented along a ridge at approximately 11,400 ft (3475 m) The south boundary commences at a point at 11,400 ft (3475 m) on the section line between sections 15 and 22 and proceeds more or less in a straight line to a point on the Vermejo Park Corporation boundary located at 11,000 ft (3350 m) in the northwest quarter of section 23. Elevations within the RNA range from 11,400 ft (3475 m) to 10,800 ft (3290 m). The proposed RNA comprises approximately 272 acres (110.1 hectares).

Access requires a long cross-country hike from the road over terrain that is fairly easily traversed. The road to the hike-in point is easily traveled in a passenger vehicle most of the year when the Forest Road 1950 to the Valle Vidal unit is open (Maps 2 and 3). This road, however, is not plowed in winter, and travelers should always check with the Questa Ranger District Station before planning a trip to this area.

Begin from the town of Costilla, New Mexico, near the Colorado border, approximately 44 miles (70.8 km) north of Taos, New Mexico. From State Route 3, take County Road 96 to the east. Pavement ends after 6 miles (9.6 km), but the well-graveled road continues to a point 17 miles (27.4 km) from Costilla, where it becomes Forest Road 1950. At mile 18.4 (29.6 km) take the right fork to Shuree and continue past the Clayton Pass corrals which are in a low saddle at mile 26.4 (42.5 km). Park at approximately mile 27.0 (43.4 km). McCrystal Meadow is reached on foot by traveling up Middle Ponil Creek about 3 miles (4.9 km), then continuing north another 0.5 mile (0.8 km) over a low saddle on the northwest flank of Ash Mountain to the open meadow.

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 marsh type not covered in the SAF forest categories, on the candidate research natural area.

Table 1. Estimated Areas of Vegetation Types in the McCrystal Meadow 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 Engelmann Spruce Subalpine Fir	260	105.2
Subalpine Sedge Marsh	[none]	K-45 Alpine Meadows	12	4.9
		TOTAL:	272	110.1

[1]Eyre 1980.
[2]Küchler 1966.

PHYSICAL AND CLIMATIC CONDITIONS

Areas of this elevational range in northern New Mexico are generally classified as subhumid to humid in climate, and receive the greatest annual precipitation in the state. Average annual rainfall for the McCrystal Meadow is 30 inches (762 mm), and average annual snowfall 71 inches (180.3 cm). Precipitation in the mountains comes in all seasons to a greater extent than it does in the arid and semiarid climates of New Mexico. Warm season rainfall (May to October), frequently from local orographic or convectional storms, accounts for 61% of the annual cycle of precipitation, with 39% falling as snow from cyclonic storms between November and April. Summer thunderstorms are more frequent in the peaks where the mountain slopes help trigger vertical movement in moist air that is already unstable, but greatest amount of precipitation per storm event is actually higher towards the bases of mountains. Mean annual temperature is a cool 34° F (1.3° C), with a July average of 53° F (13.1° C)

and a January average of 14° F (-6.0° C). Climatic information was derived from Terrestrial Ecosystem Survey data compiled by the Southwestern Region Soil, Water, Air staff.

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).

The proposed RNA contains only a small portion of subalpine sedge marsh habitat type (Table 1, Map 4). Approximately 120 acres (48.6 hectares) of this marsh, including the stream that drains it, lies on private land adjacent to the RNA to the east.

Sedges including Carex festivella, C. rostrata, and C. kelloggii dominate the vegetation of the marsh. Deschampsia caespitosa is the most common grass here. Other grasses include Poa pratensis, Calamagrostis canadensis, and Phleum alpinum. The marsh contains an occasional weather-beaten clump of Engelmann spruce (Picea engelmannii). Shrubby cinquefoil (Potentilla fruticosa) is the only common shrub. At least two species of low growing willow, Salix subcoerula and S. glauca var. glabrescens inhabit the wettest portions of the marsh.

As expected on east-facing slopes at this elevation, above the marsh is a closed Engelmann spruce and subalpine fir (Abies lasiocarpa) forest. Habitat types here include Abies lasiocarpa/Erigeron eximius (ABLA/EREX HT), Abies lasiocarpa/Vaccinium myrtillus (ABLA/VAMY HT), and Abies lasiocarpa/Moss (ABLA/MOSS HT). A fourth habitat type, Abies lasiocarpa/Mertensia ciliata (ABLA/MECI HT) occurs near the marsh and where there are seeps. Within this forest are occasional grassy openings, principally of Thurber fescue (Festuca thurberi). These openings typically support bristlecone pine (Pinus aristata)at the edges, and key to Pinus aristata/Festuca thurberi habitat type (PIAR/FETH HT).

The southwestern boundary of the proposed RNA takes in the upper edge of a Thurber fescue grassland. Engelmann spruce and bristlecone pine codominate the cover, along with occasional aspen (Populus tremuloides).

There are no known threatened, endangered, or unique plant species on the proposed RNA.

The following plant list was compiled from field observations by Jeff Redders (Soil Scientist, USFS, Southwestern Region) and Bill Dunmire (The Nature Conservancy) on August 28, 1986.

Abbreviated Plant List for McCrystal Meadow Peak RNA

Latin Name	Common Name[1]	Location[2]	
GRASSES AND GRASS-LIKE PLANTS:			
Calamogrostis canadensis	Bluejoint reedgrass		WM
Carex festivella	Ovalhead sedge		WM
Carex kelloggii	Sedge		WM
Carex rostrata	Sedge		WM
Deschampsia caespitosa	Tufted hairgrass		WM
Festuca thurberi	Thurber fescue	F	
Phleum alpinum	Alpine timothy		WM
Poa pratensis	Kentucky bluegrass	F	WM
Trisetum montanum	Rocky Mountain trisetum	F	
FORBS:			
Achillea lanulosa	Western yarrow	F	
Antennaria rosea	Rose pussytoes	F	
Arnica latifolia	Broadleaf arnica	F	
Berula erecta	Stalky berula		WM
Caltha leptosepala	Marshmarigold		WM
Castilleja occidentalis	Paintbrush		WM
Epilobium angustifolium	Blooming Sally	F	
Erigeron eximius	Fleabane	F	
Fragaria ovalis	Wild strawberry	F	
Gentiana thermalis	Rocky gentian		WM
Haplopappus parryi	Goldenweed	F	
Ligusticum porteri	Loveroot		WM
Moneses uniflora	Moneses	F	
Oxypolis fendleri	Fendler cowbane		WM
Pedicularis groenlandica	Elephanthead		WM
Penstemon whippleanus	Beard tongue	F	
Polemonium delicatum	Skunkleaf Jacob's-ladder	F	
Polemonium foliosissimum	Jacob's-ladder		WM
Polygonum bistortoides	Bistort		WM
Polygonum viviparum	Alpine bistort		WM
Potentilla pulcherrima	Beauty cinquefoil	F	WM
Senecio amplectens	Groundsel	F	
Senecio cymbalarioides	Groundsel	F	
Swertia perennis	Alpine-bog swertia		WM
Veratrum californicum	California hellebore	F	WM
HALF-SHRUBS, SHRUBS, AND TREES:			
Abies lasiocarpa	Subalpine fir	F	
Picea engelmannii	Engelmann spruce	F	WM
Pinus aristata	Bristlecone pine	F	
Populus tremuloides	Quaking aspen	F	
Potentilla fruticosa	Shrubby cinquefoil		WM
Ribes montigenum	Gooseberry currant	F	
Salix glauca var. glabrescens	Willow		WM

Salix subcoerulea	Bluewillow	WM
Vaccinium myrtillus	Myrtle whortleberry	F

[1]Common names follow USDA, Forest Service 1974.

[2]Locations include:
F = Forest
WM = Wet meadow

Plants observed by Bill Dunmire (The Nature Conservancy) and Jeff Redders (Soil Scientist, USFS, Southwest Region) on August 28, 1986.

Fauna

No rare, endangered, or sensitive animal species are known to inhabit this area. The open meadows are important for elk calving and summer elk range.

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 Colfax county, New Mexico:

1. Subalpine conifer forest biome; spruce - subalpine fir series
2. Subalpine grassland biome

These habitat types currently in the data base most closely correspond to those occurring in the proposed RNA. The following species are potentially present:

Abbreviated Animal List for McCrystal Meadow R.N.A.

Common Name	Latin Name
AMPHIBIANS:	
Salamander, tiger	Ambystoma tigrinum
BIRDS:	
Blackbird, Brewer's	Euphagus cyanocephalus
Bluebird, mountain	Sialia currucoides
Chickadee, mountain	Parus gambeli
Creeper, brown	Certhia americana
Crossbill, red	Loxia curvirostra
Dove, mourning	Zenaida macroura
Eagle, golden	Aquila chrysaetos
Falcon, prairie	Falco mexicanus
Finch, rosy	Leucosticte arctoa
Flicker, northern	Colaptes auratus
Flycatcher, western	Empidonax difficilis

Grouse, blue	Dendragapus obscurus
Hummingbird, broad-tailed	Selasphorus platycercus
Jay, Steller's	Cyanocitta stelleri
Junco, dark-eyed	Junco hyemalis
Kinglet, ruby-crowned	Regulus calendula
Nutcracker, Clark's	Nucifraga columbiana
Nuthatch, pygmy	Sitta pygmaea
Nuthatch, red-breasted	Sitta canadensis
Owl, great-horned	Bubo virginianus
Raven, common	Corvus corax
Robin, American	Turdus migratorius
Sapsucker, Williamson's	Sphyrapicus thyroideus
Siskin, pine	Carduelis pinus
Solitaire, Townsend's	Myadestes townsendi
Sparrow, white-crowned	Zonotrichia leucophrys
Swallow, violet-green	Tachycineta thalassina
Tanager, western	Piranga ludoviciana
Thrush, hermit	Catharus guttatus
Vireo, solitary	Vireo solitarius
Waxwing, cedar	Bombycilla cedrorum
Woodpecker, three-toed	Picoides tridactylus

MAMMALS:

Bear, black	Ursus americanus
Bobcat	Felis rufus
Cottontail, Nuttall's	Sylvilagus nuttallii
Deer, mule	Odocoileus hemionus
Elk	Cervus elaphus
Lion, mountain	Felis concolor
Marmot, yellow-bellied	Marmota flaviventris
Shrew, water	Sorex palustris
Squirrel, golden-mantled ground	Spermophilus lateralis
Squirrel, red	Tamiasciurus hudsonicus
Vole, heather	Phenacomys intermedius
Vole, long-tailed	Microtus longicaudus
Weasel, long-tailed	Mustela frenata

REPTILES:

Snake, western terrestrial garter	Thamnophis elegans

Geology

The area is underlain by Jurassic and Triassic rocks undivided. These include red, gray, and brown shale and sandstone, light-gray cross- bedded dune sandstone, and lensing limestone conglomerate.

Soils

Soils of the meadow portion of the proposed RNA are of a type rare in New Mexico. This deep, organic soil derives

primarily from undecomposed remains of sedges, and is classified as Terric Cryofibrist. The dominant mineral soil of the area are Cumulic Cryaquolls, with small areas of Histic Cryaquolls. All these soils have cold temperatures and are saturated with water for long periods of time. Soils of the McCrystal Meadow contrast with the thin soils common in much of the Sangre de Cristo range, derived from granite, scraped over by glaciers, and retaining less water than soils in some other New Mexico mountain ranges. A soils map (July 1984) is on file at the Carson National Forest office.

Lands

All the land encompassed in the proposed RNA was donated to the National Forest Service by the Vermejo Park Corporation on December 30, 1981, under authority of the Donation Act of 1978. Kaiser Steel retains a vested interest in coal. There are no known rights-of-way within the proposed boundaries.

Cultural

A cursory cultural resource survey was performed in a portion of the RNA. No prehistoric or historic cultural resources were found. Due to its high elevation, the probability of locating any prehistoric sites is low, though isolated lithic scatters could be present. 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 very few and only ephemeral prehistoric occupations are expected to have taken place here.

IMPACTS AND POSSIBLE CONFLICTS

Mineral Resources

The proposed RNA is within an area that Exxon Corporation wished to prospect for leasable minerals. Exxon withdrew their lease application in 1986. The coal rights are owned by Kaiser Industries. There is, however, little likelihood of coal reserves in this area, based on a study by the National Park Service in 1979.

Grazing

The area has been closed to grazing, and hence there are no potential impacts or conflicts.

Timber

This area has about 108 acres (43.7 hectares) of spruce-fir which will be withdrawn from the timber base.

Total forested: approximately 108 acres (43.7 hectares)
Commercial forest: approximately 108 acres (43.7 hectares)

Watershed Values

This area is within the fifth code Ponil watershed. The area drains into McCrystal Creek; downstream, this watercourse is known as North Ponil Creek. The North Ponil unites with South Ponil, forming Ponil Creek. Approximately 31 miles (19.4 km) from the RNA, the Ponil Creek feeds into the Cimarron River.

Recreation Values

Recreation use in this area is very light, although the area is scenic. No trails are planned for this area because of its importance as wildlife habitat. It is frequented by trophy elk during the hunting season, and is, therefore, a popular hunting area. Big game hunting and wildlife watching are the only present recreation uses. The area is closed to recreation use and other entry, from January 1 to March 31, for wildlife habitat protection.

Wildlife and Plant Values

This area is important elk calving and elk summer range. McCrystal Creek (for which McCrystal Meadow is the headwater) is the only National Forest fishery for native Rio Grande Cutthroat among tributaries of the Canadian River. No threatened, endangered, or sensitive plant or animal species are known to occur in the area.

Wilderness, Wild and Scenic River, National Recreation Area Values

None of the above congressionally designated areas have been proposed for the McCrystal Meadow RNA or vicinity.

Transportation Plans

There are no roads within this area.

Utility Corridor Plans

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

MANAGEMENT PLAN

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

Vegetation Management

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

ADMINISTRATIVE RECORDS AND PROTECTION

Administration and protection of the McCrystal Meadow RNA will be the responsibility of the Carson National Forest. The District Ranger, Questa Ranger District, Questa 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 McCrystal Meadow RNA will be maintained in the following offices:

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

REFERENCES

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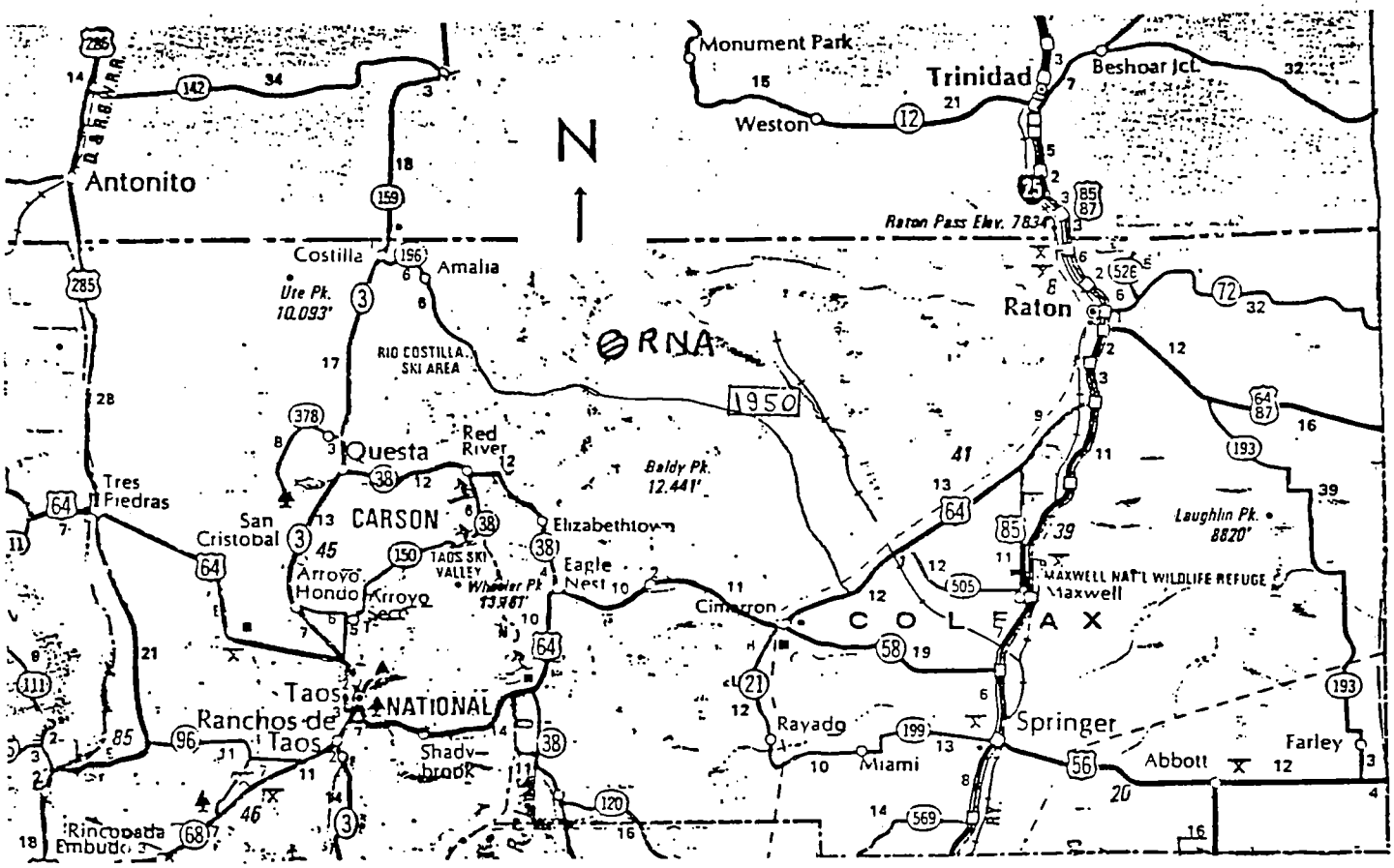
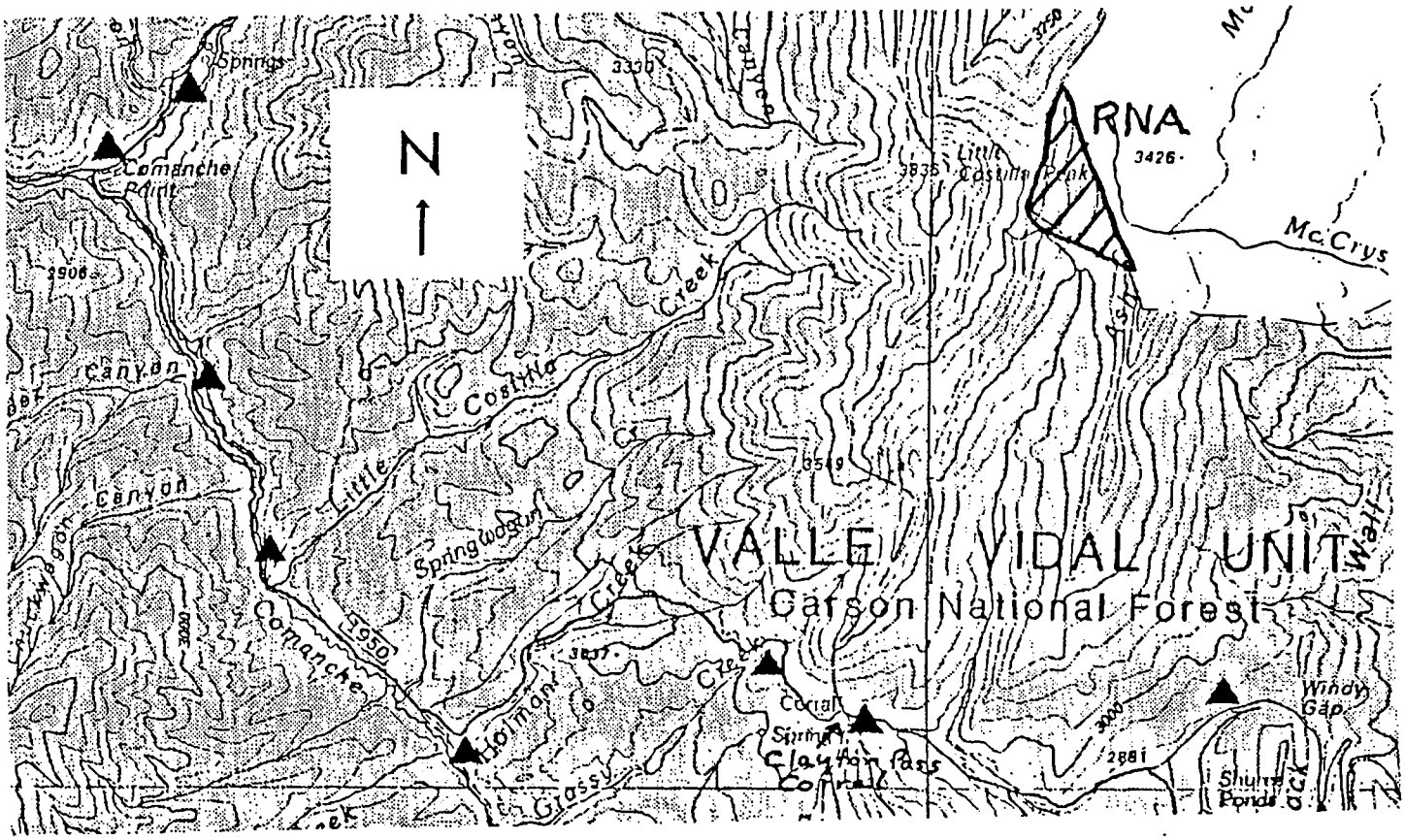
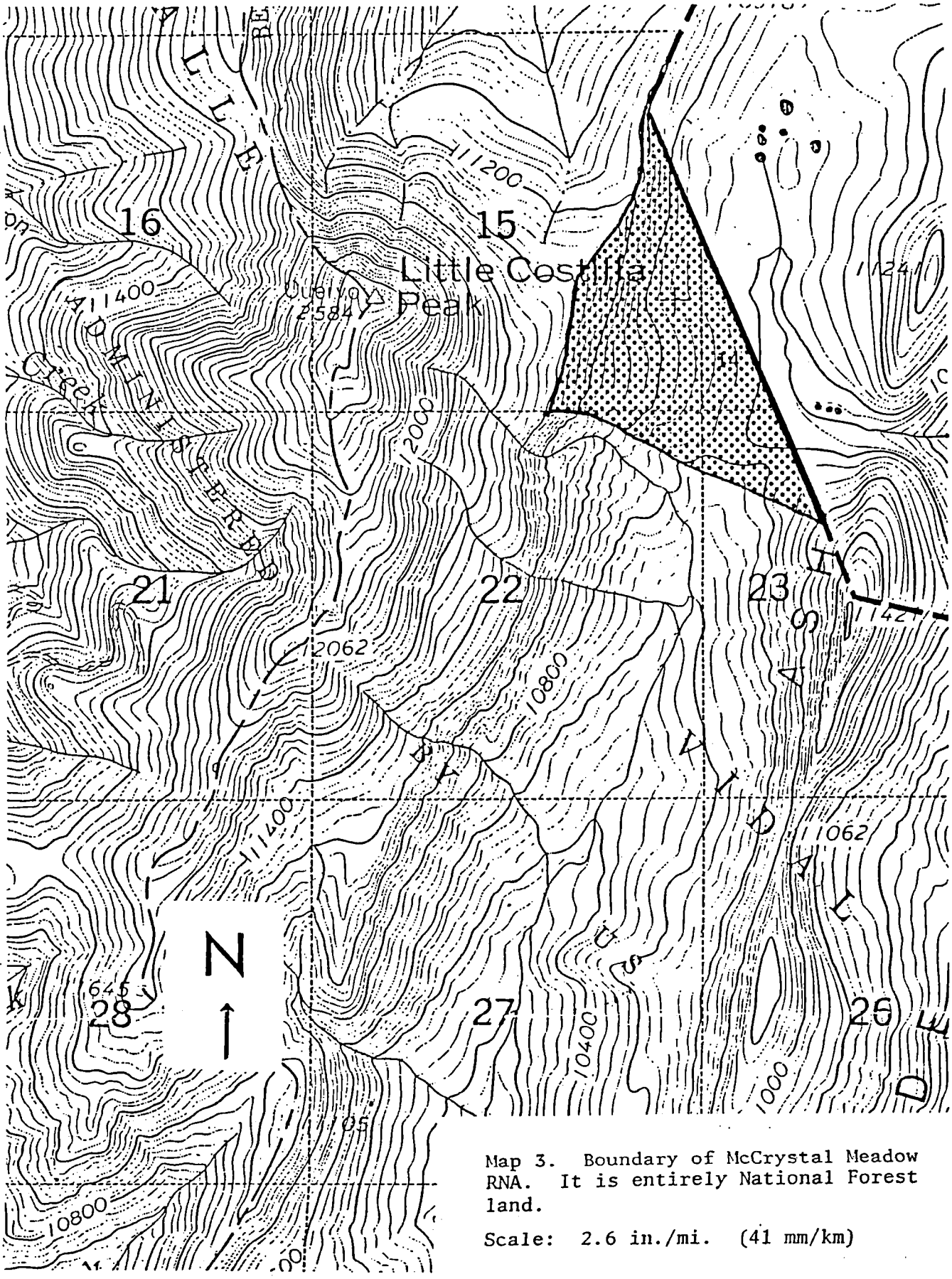


Map 1. Location of RNA (North Central New Mexico)

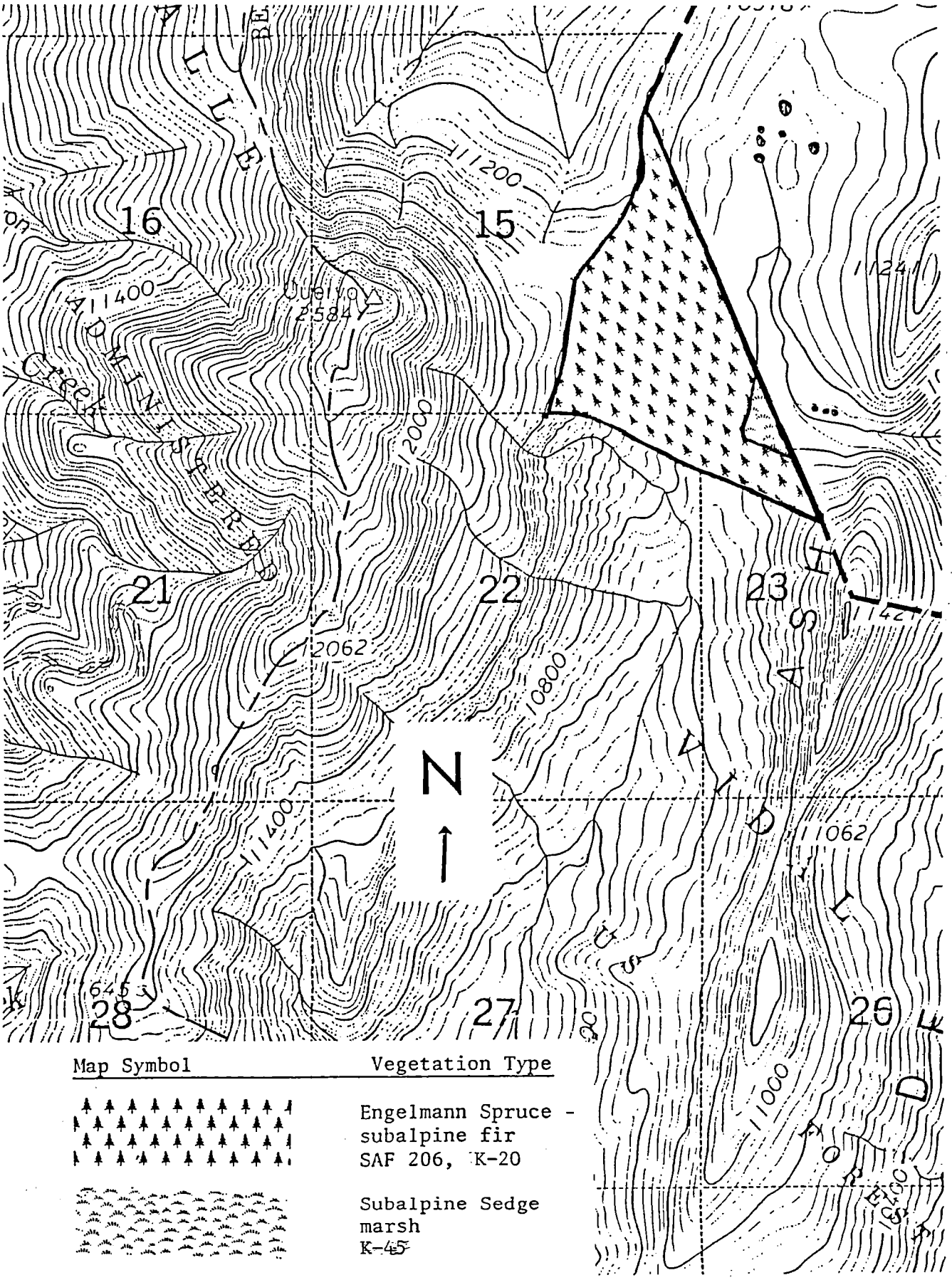


Map 2. Access Route to McCrystal Meadow RNA
Scale: 0.82 in./mi. (1.29 cm.km)



Map 3. Boundary of McCrystal Meadow RNA. It is entirely National Forest land.

Scale: 2.6 in./mi. (41 mm/km)



Map 4. Distribution of vegetation types in the McCrystal Meadow Research Natural Area.

Photo 1. Northeast toward McCrystal Meadow from Little Costilla Peak. RNA includes southwest portion of meadow and forested slopes this side of meadow.

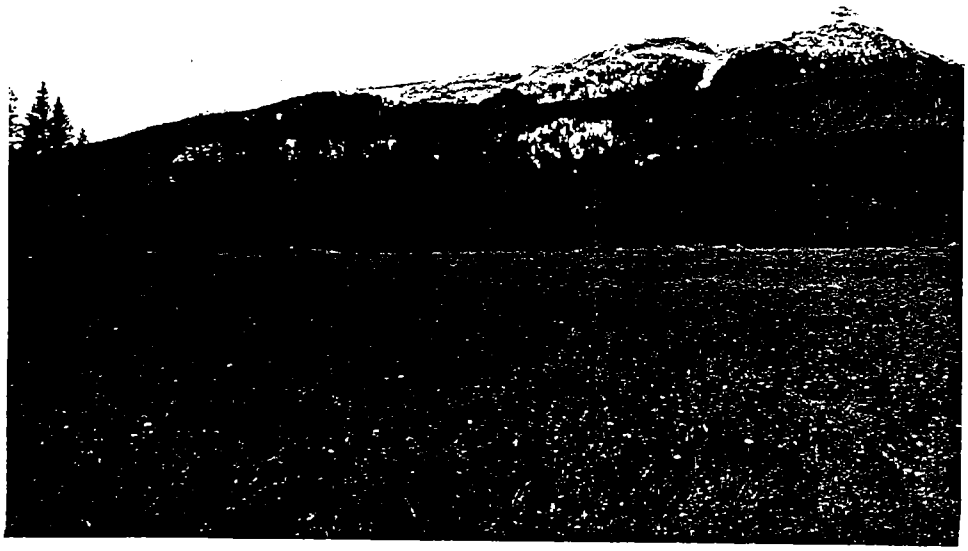


Photo 2. Lower end of McCrystal Meadow, with Little Costilla Peak to the west in the distance.

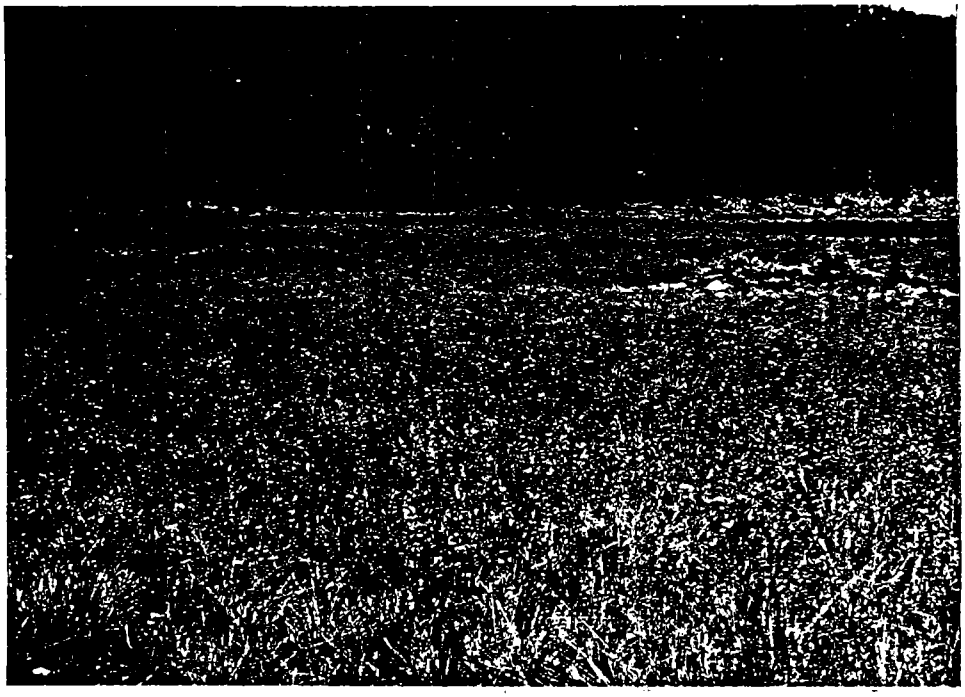


Photo 3. Lower McCrystal Meadow within the RNA. Graminoids include Deschampsia caespitosa, Phleum alpinum and Carex sp.

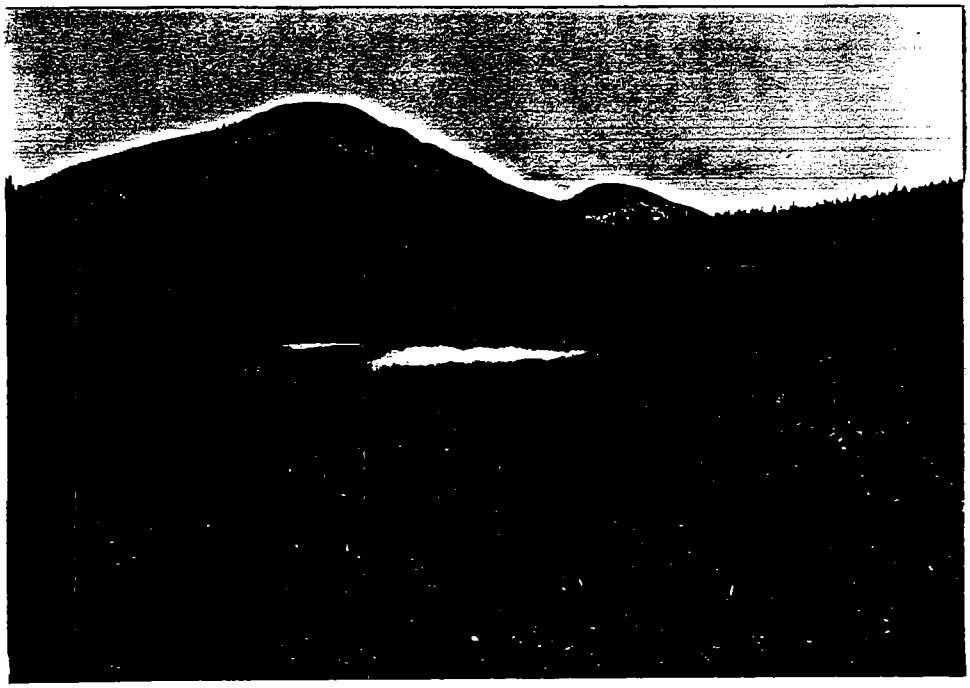


Photo 4. Bog pond at upper end of McCrystal Meadow. This area is presently on private land outside the RNA.

Photo 5. Closed Picea engelmannii/Abies lasiocarpa forest on east slope of Little Costilla Peak within McCrystal Meadow RNA. ABLA/MOSS HT is one of several habitat types on these slopes.

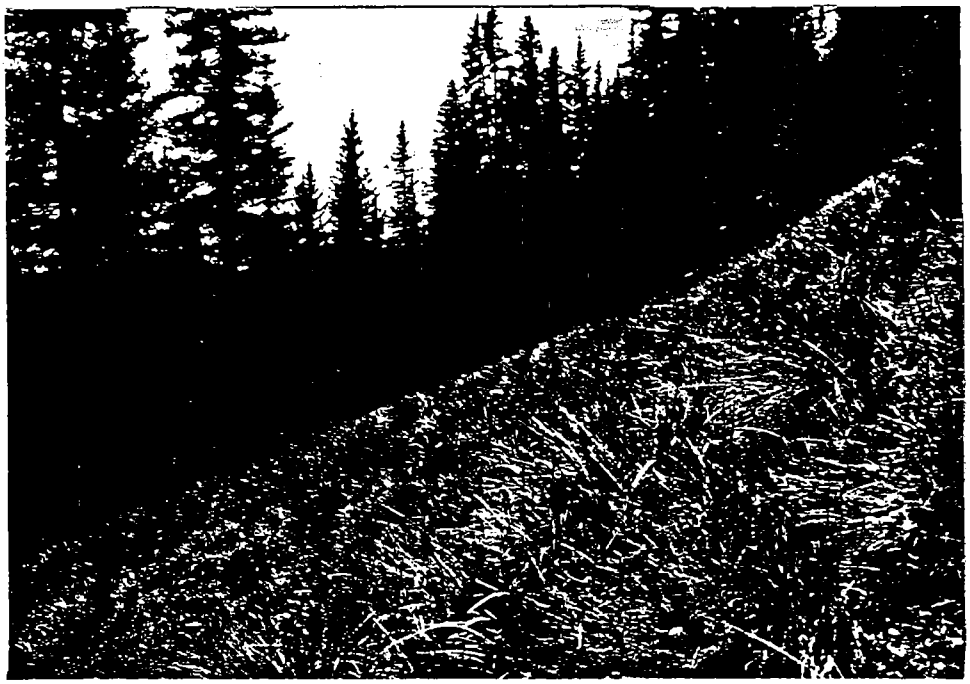


Photo 6. Thurber fescue grassland opening surrounded by Engelmann spruce and bristlecone pine (PIAR/FETH Habitat Type).

USDA-FOREST SERVICE

PHOTOGRAPHIC RECORD

(See FSM 1643.52)

PHOTOGRAPHER	DATE SUBMITTED
William W. Dunmire	7/1/87
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 Carson NF Questa Dist Colfax Co.		ALL: 24x36mm color slides
1.			8-28-86		Northeast toward McCrystal Meadow from Little Costilla Peak.	
2.			8-28-86		West toward Little Costilla Peak from lower McCrystal Meadow.	
3.			8-28-86		Lower, southwest edge of McCrystal Meadow with graminoides including Deschampsia caespitosa, Phleum alpinum, Carex sp.	
4.			8-28-86		Bog ponds on upper McCrystal Meadow on private lands approximately one-quarter mile east of forest boundary.	
5.			8-28-86		Abies lasiocarpa/Moss Habitat Type on east slope of Little Costilla Peak above McCrystal Meadow.	
6.			8-28-86		Thurber fescue grassland opening within spruce-fir forest on east slope of Little Costilla Peak above McCrystal Meadow.	

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 McCrystal Meadow Research Natural Area. The McCrystal Meadow Research Natural Area shall be comprised of the following land: The area is located roughly 25 miles (40.2 km) northeast of Questa, New Mexico, in the Ash Mountain USGS 15' quadrangle (latitude 36°50',longitude 105°13'), Township 30 N, Range 16 E, Sections 14, 15, 22, and 23 (Map 1). The east boundary is the property line with Vermejo Park Corporation. The west boundary of the triangular shaped RNA is oriented along a ridge at approximately 11,400 ft (3475 m). The south boundary commences at a point at 11,400 ft (3475 m) on the section line between sections 15 and 22 and proceeds more or less in a straight line to a point on the Vermejo Park Corporation boundary located at 11,000 ft (3350 m) in the northwest quarter of section 23. Elevations within the RNA range from 11,400 ft (3475 m) to 10,800 ft (3290 m). The proposed RNA comprises approximately 272 acres (110.1 hectares).

Regional Forester, Sotero Muniz, recommended the establishment of the McCrystal Meadow Research Natural Area in the Carson 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.

The McCrystal Meadow Research Natural Area will be managed in compliance with all relevant laws, regulations, and manual direction regarding Research Natural Areas. The McCrystal Meadow Research Natural Area will be administered in accordance with the management direction identified in the Establishment Record. The Carson 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 230 of the Carson National Forest Land and Resource Management Plan are replaced by the directions on page 9 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 Carson National Forest Land and Resource Management Plan.

The Forest Supervisor of the Carson 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 Carson 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 McCrystal Meadow 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

ESTABLISHMENT RECORD

for

MCCRYSTAL MEADOW RESEARCH NATURAL AREA

within

Carson National Forest

Colfax County, New Mexico

INTRODUCTION

The McCrystal Meadow Research Natural Area (RNA) comprises approximately 272 acres (110.1 hectares) in the Sangre de Cristo Mountains of north-central New Mexico. The proposed RNA is located in the Questa Ranger District, Carson National Forest, in Colfax County, and is all acquired National Forest land.

High elevation wet meadow has been noted as an important high-elevation ecosystem for protection within the RNA program (USFS Regional Guide, 1983: Table 3-1). In July, 1982, a task group of the Regional RNA Committee investigated candidate meadow areas proposed by the Carson National Forest. The Task Group concurred that McCrystal Meadow constituted the only real opportunity to provide suitable representation. Location of this meadow in the Valle Vidal Unit of the Carson Forest was an important factor facilitating the process of establishment as a Research Natural Area. This large parcel of land came to the National Forest System in 1981 as a donation from the Vermejo Park Corporation, free of commitments for grazing, timber, or heavy recreational use.

Land Management Planning

The need for representation of this biotic community was identified in the Southwestern Regional Guide (August 1983) although this particular site was not identified by name. The Carson National Forest Plan, implemented December 8, 1986, does not include the Valle Vidal portion of the Forest. The Little Costilla Peak, McCrystal Meadow, and Clayton Pass proposed Research Natural Areas are within the Valle Vidal. The Forest is presently working on an amendment to the Forest Plan to include the Valle Vidal. It is anticipated that the environmental analysis (or EIS) prepared for the amendment will support the establishment of the three proposed Research Natural Areas. In the meantime the areas are designated for protection in the Multiple Use Area Guide for the Valle Vidal which has been approved by the Regional Forester. The management of the Valle Vidal will be governed by the Multiple Use Area Guide until the Forest Plan is amended to include the Unit.

JUSTIFICATION STATEMENT FOR ESTABLISHMENT OF AREA

McCrystal Meadow Research Natural Area was identified primarily as an outstanding example of a wet meadow ecosystem. This is an important high-elevation ecosystem in the Southwest. The need to include such an ecosystem within the RNA network of the Southwestern Region has been stated in the Regional Guide (USFS 1983).

A distinguishing characteristic of the proposed RNA is a very unusual soil type for the Southwest. The peat soil is formed of undecomposed sedges, and offers an outstanding possibility for documenting climatic and vegetational changes during the late Pleistocene and Holocene by means of pollen stratification. The area is also important as summer elk pasture and has been managed as such during recent years.

PRINCIPAL DISTINGUISHING FEATURES

McCrystal Meadow features marsh in a high elevation post-glacial landscape. The marsh is pocked with small glacial lakes (karsts), and bounded to the south by glacial moraine. Sedges dominate the vegetation and doubtless comprise the bulk of the recently accumulated peat soil. Several grasses and two low growing willows also inhabit the marsh areas. Above the meadow is a closed spruce-fir (Picea engelmannii - Abies lasiocarpa) forest with occasional open areas of Thurber fescue (Festuca thurberi). The majority of McCrystal Meadow is located on private land controlled by the Vermejo Park Corporation.

LOCATION

McCrystal Meadow is in the Valle Vidal unit of the Questa Ranger District, Carson National Forest. The area is located roughly 25 miles (40.2 km) northeast of Questa, New Mexico, in the Ash Mountain USGS 15' quadrangle (latitude 36°50', longtitude 105°13'), Township 30 N, Range 16 E, Sections 14, 15, 22, and 23 (Map 1). The east boundary is the property line with Vermejo Park Corporation. The west boundary of the triangular shaped RNA is oriented along a ridge at approximately 14,000 ft (4270 m). The south boundary commences at a point at 11,400 ft (3475 m) on the section line between sections 15 and 22 and proceeds more or less in a straight line to a point on the Vermejo Park Corporation boundary located at 11,000 ft (3350 m) in the northwest quarter of section 23. Elevations within the RNA range from 11,400 ft (3475 m) to 10,800 ft (3290 m). The proposed RNA comprises approximately 272 acres (110.1 hectares).

Access requires a long cross-country hike from the road over terrain that is fairly easily traversed. The road to the hike-in point is easily traveled in a passenger vehicle most of the year when the Forest Road 1950 to the Valle Vidal unit is open (Maps 2 and 3). This road, however, is not plowed in winter, and travelers should always check with the Questa Ranger District Station before planning a trip to this area.

Begin from the town of Costilla, New Mexico, near the Colorado border, approximately 44 miles (70.8 km) north of Taos, New Mexico. From State Route 3, take County Road 96 to the east. Pavement ends after 6 miles (9.6 km), but the well-graveled road continues to a point 17 miles (27.4 km) from Costilla, where it becomes Forest Road 1950. At mile 18.4 (29.6 km) take the right fork to Shuree and continue past the Clayton Pass corrals which are in a low saddle at mile 26.4 (42.5 km). Park at approximately mile 27.0 (43.4 km). McCrystal Meadow is reached on foot by traveling up Middle Ponil Creek about 3 miles (4.9 km), then continuing north another 0.5 mile (0.8 km) over a low saddle on the northwest flank of Ash Mountain to the open meadow.

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 1964). Map 4 depicts the distribution of the SAF types, plus a marsh type not covered in the SAF forest categories, on the candidate research natural area.

Table 1. Estimated Areas of Vegetation Types in the McCrystal Meadow 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	260	105.2
Subalpine Sedge Marsh	[none]	K-45 Alpine Meadows	12	4.9
		TOTAL:	272	110.1

[1]Eyre 1980.
[2]Küchler 1964.

PHYSICAL AND CLIMATIC CONDITIONS

Areas of this elevational range in northern New Mexico are generally classified as subhumid to humid in climate, and receive the greatest annual precipitation in the state. Average annual rainfall for the McCrystal Meadow is 30 inches (762 mm), and average annual snowfall 71 inches (180.3 cm). Precipitation in the mountains comes in all seasons to a greater extent than it does in the arid and semiarid climates of New Mexico. Warm season rainfall (May to October), frequently from local orographic or convectional storms, accounts for 61% of the annual cycle of precipitation, with 39% falling as snow from cyclonic storms between November and April. Summer thunderstorms are more frequent in the peaks where the mountain slopes help trigger vertical movement in moist air that is already unstable, but greatest amount of precipitation per storm event is actually higher towards the bases of mountains. Mean annual temperature is a cool 34° F (1.3° C), with a July average of 53° F (13.1° C) and a January average of 14° F (-6.0° C).

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).

The proposed RNA contains only a small portion of subalpine sedge marsh habitat type (Table 1, Map 4). Approximately 120 acres (48.6 hectares) of this marsh, including the stream that drains it, lies on private land adjacent to the RNA to the east.

Sedges including Carex festivella, C. rostrata, and C. kelloggii dominate the vegetation of the marsh. Deschampsia caespitosa is the most common grass here. Other grasses include Poa pratensis, Calamagrostis canadensis, and Phleum alpinum. The marsh contains an occasional weather-beaten clump of Engelmann spruce (Picea engelmannii). Shrubby cinquefoil (Potentilla fruticosa) is the only common shrub. At least two species of low growing willow, Salix subcoerula and S. glauca var. glabrescens inhabit the wettest portions of the marsh.

As expected on east-facing slopes at this elevation, above the marsh is a closed Engelmann spruce and subalpine fir (Abies lasiocarpa) forest. Habitat types here include Abies lasiocarpa/Erigeron eximius (ABLA/EREX HT), Abies lasiocarpa/Vaccinium myrtillus (ABLA/VAMY HT), and Abies lasiocarpa Moss (ABLA/MOSS HT). A fourth habitat type, Abies lasiocarpa/Mertensia ciliata (ABLA/MECI HT) occurs near the marsh and where there are seeps. Within this forest are occasional grassy openings, principally of Thurber fescue (Festuca thurberi). These openings typically support bristlecone pine (Pinus aristata)at the edges, and key to Pinus aristata/Festuca thurberi habitat type (PIAR/FETH HT).

The southwestern boundary of the proposed RNA takes in the upper edge of a Thurber fescue grassland. Engelmann spruce and bristlecone pine codominate the cover, along with occasional aspen (Populus tremuloides).

There are no known threatened, endangered, or unique plant species on the proposed RNA.

The following plant list was compiled from field observations by Jeff Redders (Soil Scientist, USFS, Southwestern Region) and Bill Dunmire (The Nature Conservancy) on August 28, 1986.

Abbreviated Plant List for McCrystal Meadow Peak RNA

Latin Name	Common Name[1]	Location[2]	
GRASSES AND GRASS-LIKE PLANTS:			
Calamogrostis canadensis	Bluejoint reedgrass		WM
Carex festivella	Ovalhead sedge		WM
Carex kelloggii	Sedge		WM
Carex rostrata	Sedge		WM
Deschampsia caespitosa	Tufted hairgrass		WM
Festuca thurberi	Thurber fescue	F	
Phleum alpinum	Alpine timothy		WM
Poa pratensis	Kentucky bluegrass	F	WM
Trisetum montanum	Rocky Mountain trisetum	F	
FORBS:			
Achillea lanulosa	Western yarrow	F	
Antennaria rosea	Rose pussytoes	F	
Arnica latifolia	Broadleaf arnica	F	
Berula erecta	Stalky berula		WM
Caltha leptosepala	Marshmarigold		WM
Castilleja occidentalis	Paintbrush		WM
Epilobium angustifolium	Blooming Sally	F	
Erigeron eximius	Fleabane	F	
Fragaria ovalis	Wild strawberry	F	
Gentiana thermalis	Rocky gentian		WM
Haplopappus parryi	Goldenweed	F	
Ligusticum porteri	Loveroot		WM
Moneses uniflora	Moneses	F	
Oxypolis fendleri	Fendler cowbane		WM
Pedicularis groenlandica	Elephanthead		WM
Penstemon whippleanus	Beard tongue	F	
Polemonium delicatum	Skunkleaf Jacob's-ladder	F	
Polemonium foliosissimum	Jacob's-ladder		WM
Polygonum bistortoides	Bistort		WM
Polygonum viviparum	Alpine bistort		WM
Potentilla pulcherrima	Beauty cinquefoil	F	WM
Senecio amplectens	Groundsel	F	
Senecio cymbalarioides	Groundsel	F	
Swertia perennis	Alpine-bog swertia		WM
Veratrum californicum	California hellebore	F	WM
HALF-SHRUBS, SHRUBS, AND TREES:			
Abies lasiocarpa	Subalpine fir	F	
Picea engelmannii	Engelmann spruce	F	WM
Pinus aristata	Bristlecone pine	F	
Populus tremuloides	Quaking aspen	F	
Potentilla fruticosa	Shrubby cinquefoil		WM
Ribes montigenum	Gooseberry currant	F	

Salix glauca var. glabrescens	Willow	WM
Salix subcoerulea	Bluewillow	WM
Vaccinium myrtillus	Myrtle whortleberry	F

[1]Common names follow USDA, Forest Service 1974.

[2]Locations include:
F = Forest
WM = Wet meadow

Plants observed by Bill Dunmire (The Nature Conservancy) and Jeff Redders (Soil Scientist, USFS, Southwest Region) on August 28, 1986.

Fauna

No rare, endangered, or sensitive animal species are known to inhabit this area. The open meadows are important for elk calving and summer elk range.

The following animal list was derived from the RUN WILD III computer-stored data base (Lehmkuhl and Pattor 1982: Patton 1979) from the following habitat types, for Colfax county, New Mexico:

1. Subalpine conifer forest biome; spruce - subalpine fir series
2. Subalpine grassland biome

These habitat types currently in the data base most closely correspond to those occurring in the proposed RNA. The following speciied are potentially present.

Abbreviated Animal List for McCrystal Meadow R.N.A.

Common Name	Latin Name
AMPHIBIANS:	
Salamander, tiger	*Ambystoma tigrinum*
BIRDS:	
Blackbird, Brewer's	*Euphagus cyanocephalus*
Bluebird, mountain	*Sialia currucoides*
Chickadee, mountain	*Parus gambeli*
Creeper, brown	*Certhia americana*
Crossbill, red	*Loxia curvirostra*
Dove, mourning	*Zenaida macroura*
Eagle, golden	*Aguila chrysaetos*
Falcon, prairie	*Falco mexicanus*
Finch, rosy	*Leucosticte arctoa*
Flicker, northern	*Colaptes auratus*
Flycatcher, western	*Empidonax difficilis*
Grouse, blue	*Dendragapus obscurus*
Hummingbird, broad-tailed	*Selasphorus platycercus*
Jay, Steller's	*Cyanocitta stelleri*
Junco, dark-eyed	*Junco hyemalis*
Kinglet, ruby-crowned	*Regulus calendula*
Nutcracker, Clark's	*Nucifraga columbiana*
Nuthatch, pygmy	*Sitta pygmaea*
Nuthatch, red-breasted	*Sitta canadensis*
Owl, great-horned	*Bubo virginianus*
Raven, common	*Corvus corax*
Robin, American	*Turdus migratorius*
Sapsucker, Williamson's	*Sphyrapicus thyroideus*
Siskin, pine	*Carduelis pinus*
Solitaire, Townsend's	*Myadestes townsendi*
Sparrow, white-crowned	*Zonotrichia leucophrys*
Swallow, violet-green	*Tachycineta thalassina*
Tanager, western	*Piranga ludoviciana*
Thrush, hermit	*Catharus guttatus*
Vireo, solitary	*Vireo solitarius*
Waxwing, cedar	*Bombycilla cedrorum*
Woodpecker, three-toed	*Picoides tridactylus*
MAMMALS:	
Bear, black	*Ursus americanus*
Bobcat	*Felis rufus*
Cottontail, Nuttall's	*Sylvilagus nuttallii*
Deer, mule	*Odocoileus hemionus*
Elk	*Cervus elaphus*

Lion, mountain	Felis concolor
Marmot, yellow-bellied	Marmota flaviventris
Shrew, water	Sorex palustris
Squirrel, golden-mantled ground	Spermophilus lateralis
Squirrel, red	Tamiasciurus hudsonicus
Vole, heather	Phenacomys intermedius
Vole, long-tailed	Microtus longicaudus
Weasel, long-tailed	Mustela frenata

REPTILES:

Snake, western terrestrial garter	Thamnophis elegans

Geology

The area is underlain by Jurassic and Triassic rocks undivided. These include red, gray, and brown shale and sandstone, light-gray cross-bedded dune sandstone, and lensing limestone conglomerate.

Soils

Soils of the proposed RNA are of a type rare in New Mexico. This deep, organic soil derives primarily from undecomposed remains of sedges, and is classified as Terric Cryofibrist. The dominant mineral soil of the area are Cumulic Cryaquolls, with small areas of Histic Cryaquolls. All these soils have cold temperatures and are saturated with water for long periods of time. Soils of the McCrystal Meadow contrast with the thin soils common in much of the Sangre de Cristo range, derived from granite, scraped over by glaciers, and retaining less water than soils in some other New Mexico mountain ranges. A soils map (July 1984) is on file at the Carson National Forest office.

Lands

All the land encompassed in the proposed RNA was donated to the National Forest Service by the Vermejo Park Corporation on December 30, 1981, under authority of the Donation Act of 1978. Kaiser Steel retains a vested interest in coal. There are no known rights-of-way within the proposed boundaries.

Cultural

A cursory cultural resource survey was performed in a portion of the RNA. No prehistoric or historic cultural resources were found. Due to its high elevation, the probability of locating any prehistoric sites is low, though isolated lithic scatters could be present. 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 very few and only ephemeral prehistoric occupations are expected to have taken place here.

IMPACTS AND POSSIBLE CONFLICTS

Mineral Resources

The proposed RNA is within an area that Exxon Corporation wished to prospect for leasable minerals. Exxon withdrew their lease application in 1986. The coal rights are owned by Kaiser Industries. There is, however, little likelihood of coal reserves in this area, based on a study by the National Park Service in 1979.

Grazing

The area has been closed to grazing, and hence there are no potential impacts or conflicts.

Timber

This area has about 108 acres (43.7 hectares) of spruce-fir which will be withdrawn from the timber base.

Total forested: approximately 108 acres (43.7 hectares)

Commercial forest: approximately 108 acres (43.7 hectares)

Watershed Values

This area is within the fifth code Ponil watershed. The area drains into McCrystal Creek; downstream, this watercourse is known as North Ponil Creek. The North Ponil unites with South Ponil, forming Ponil Creek. Approximately 31 miles (19.4 km) from the RNA, the Ponil Creek feeds into the Cimarron River.

Recreation Values

Recreation use in this area is very light, although the area is scenic. No trails are planned for this area because of its importance as wildlife habitat. It is frequented by trophy elk during the hunting season, and is, therefore, a popular hunting area. Big game hunting and wildlife watching are the only present recreation uses. The area is closed to recreation use and other entry, from January 1 to March 31, for wildlife habitat protection.

Wildlife and Plant Values

This area is important elk calving and elk summer range. McCrystal Creek (for which McCrystal Meadow is the headwater) is the only National Forest fishery for native Rio Grande Cutthroat among tributaries of the Canadian River. No threatened, endangered, or sensitive plant or animal species are known to occur in the area.

Wilderness, Wild and Scenic River, National Recreation Area Values

None of the above congressionally designated areas have been proposed for the McCrystal Meadow RNA or vicinity.

Transportation Plans

There are no roads within this area.

Utility Corridor Plans

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

MANAGEMENT PLAN

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

Vegetation Management

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

ADMINISTRATIVE RECORDS AND PROTECTION

Administration and protection of the McCrystal Meadow RNA will be the responsibility of the Carson National Forest. The District Ranger, Questa Ranger District, Questa 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 McCrystal Meadow RNA will be maintained in the following offices:

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

REFERENCES

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.

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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.

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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.

Tuan, Yi-Fu, Cyril E. Everard, Jerold G. Widdison, and Iven Bennett. 1973. The climate of New Mexico. New Mexico State Planning Office, Santa Fe. 197 pp.

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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.

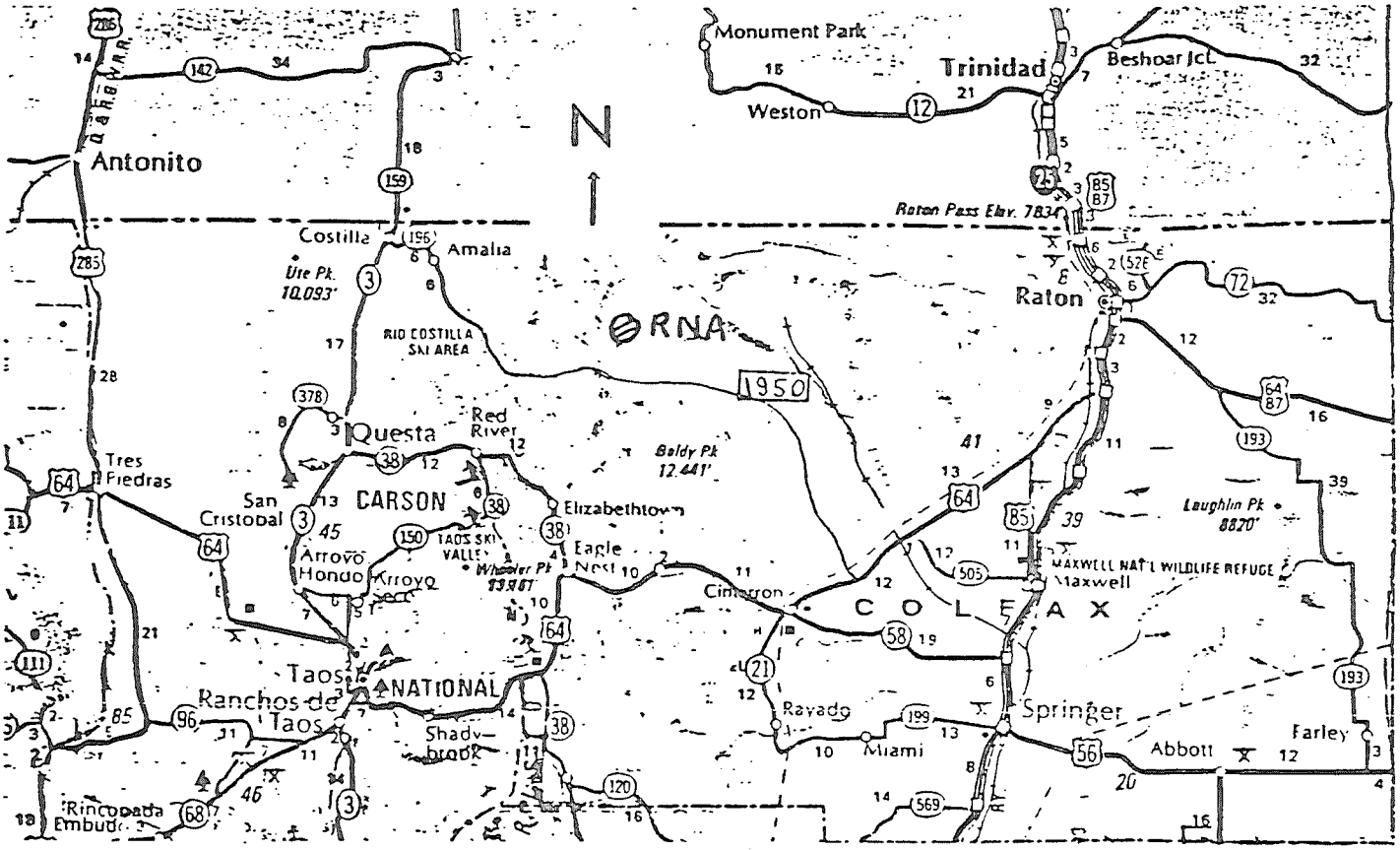
USDA Forest Service. 1986. Carson National Forest Plan. USDA Forest Service, Southwestern Region, Albuquerque.

DESIGNATION ORDER

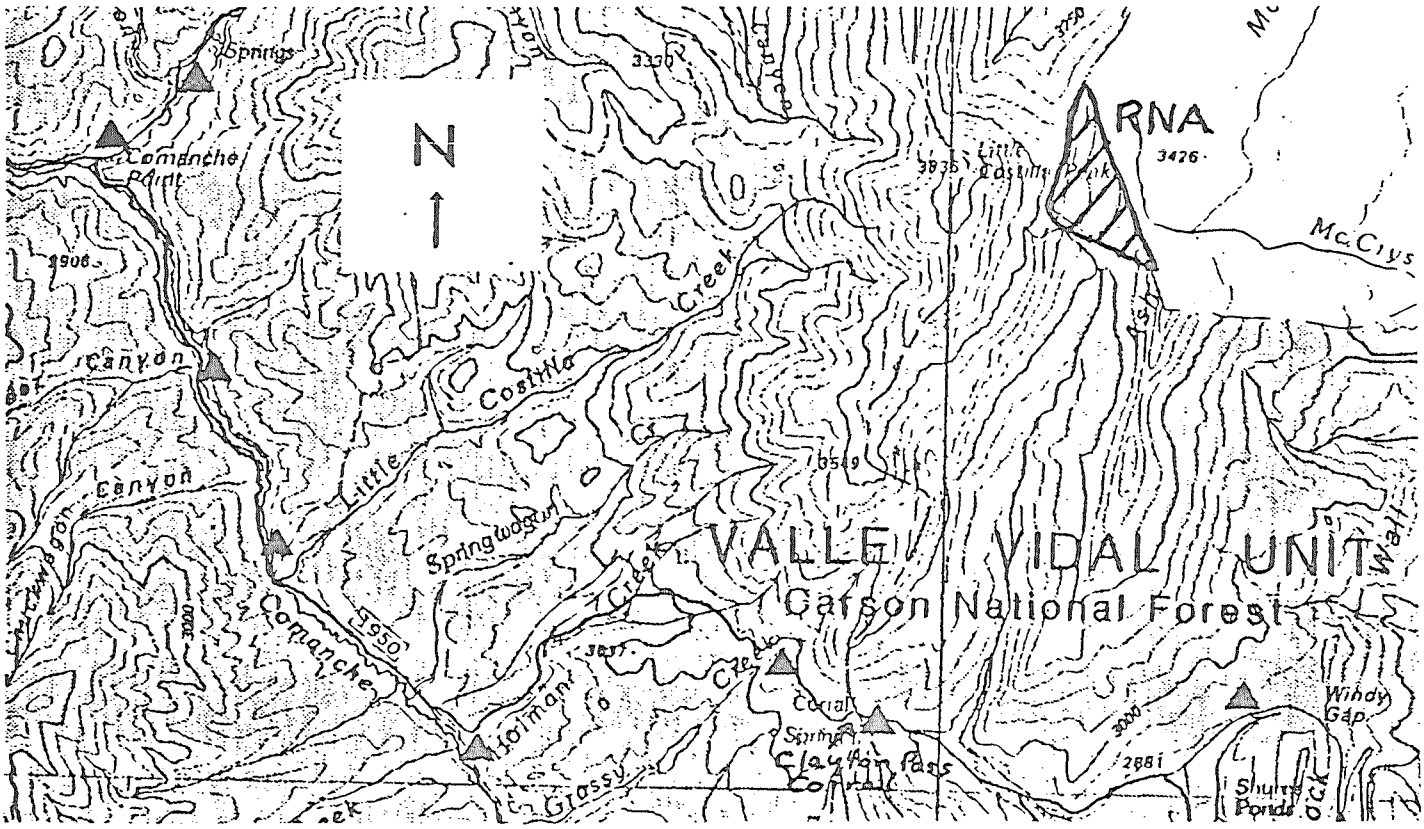
By virtue of the authority vested in me by the Secretary of Agriculture under regulations 7 CFR 2.60(a) and 36 CFR 251.23, I hereby designate as the McCrystal Meadow Research Natural Area the lands described in the following establishment record prepared by William W. Dunmire and Mollie S. Toll, dated July 1, 1987. These lands shall hereafter be administered as a research natural area subject to the above regulations and instructions issued thereunder.

_____ _____

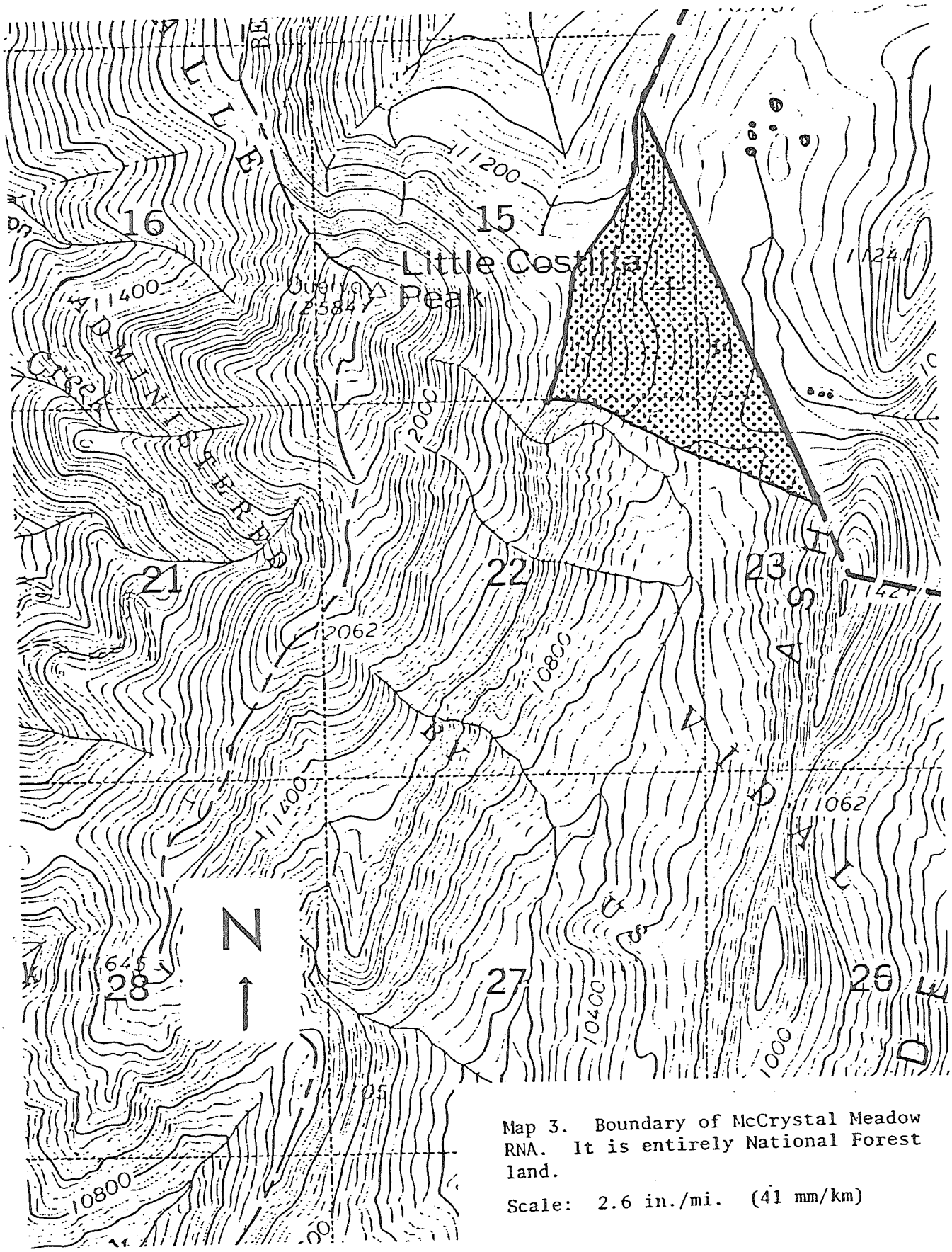
Chief Date



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

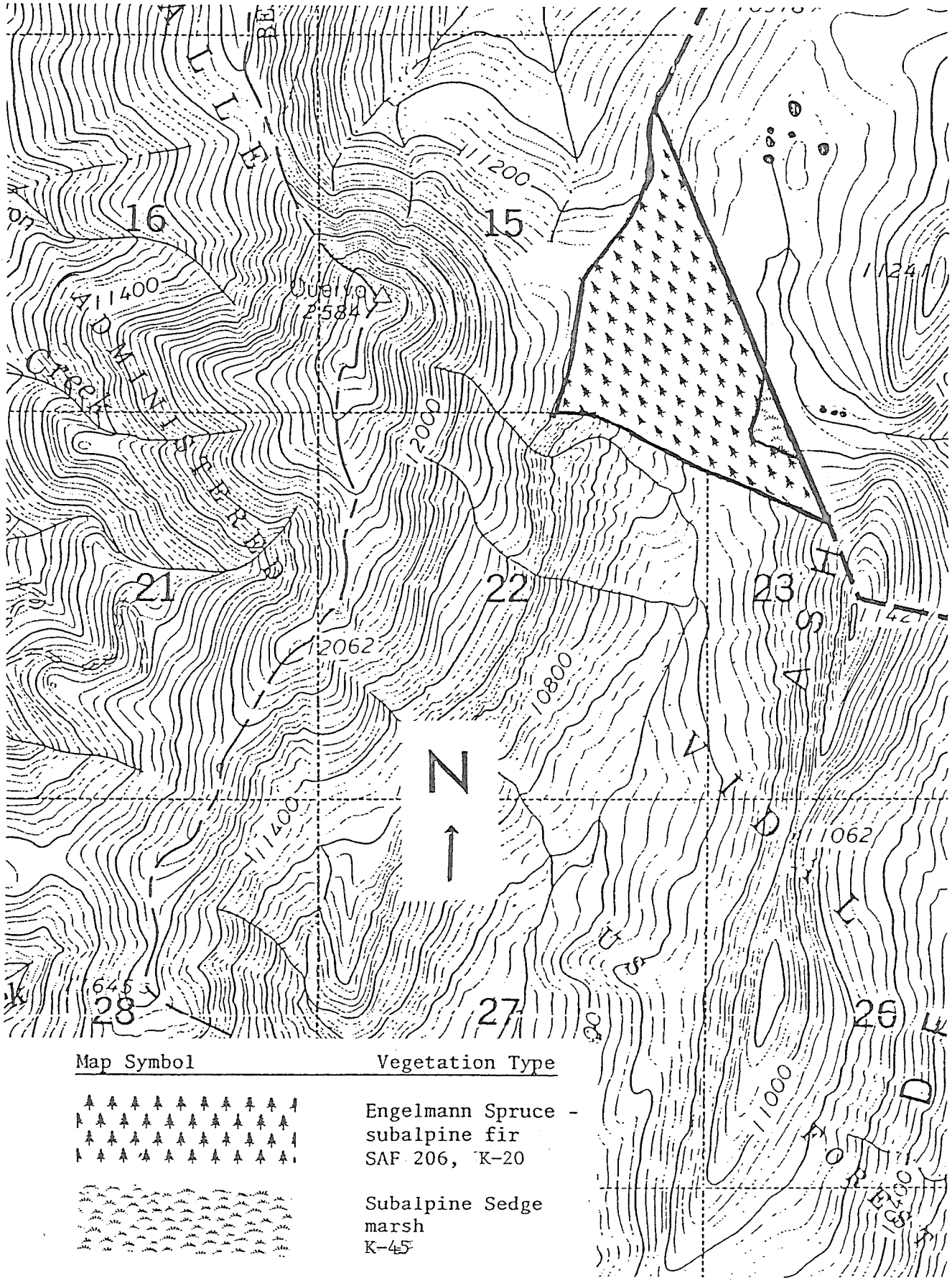


Map 2. Access Route to McCrystal Meadow RNA
Scale: 0.82 in./mi. (1.29 cm.km)



Map 3. Boundary of McCrystal Meadow RNA. It is entirely National Forest land.

Scale: 2.6 in./mi. (41 mm/km)



Map 4. Distribution of vegetation types in the McCrystal Meadow Research Natural Area.

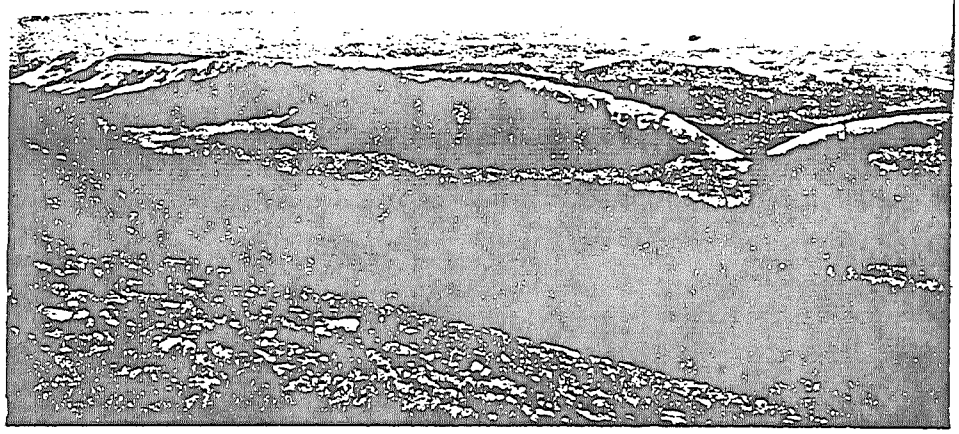


Photo 1. Northeast toward McCrystal Meadow from Little Costilla Peak. RNA includes southwest portion of meadow and forested slopes this side of meadow.

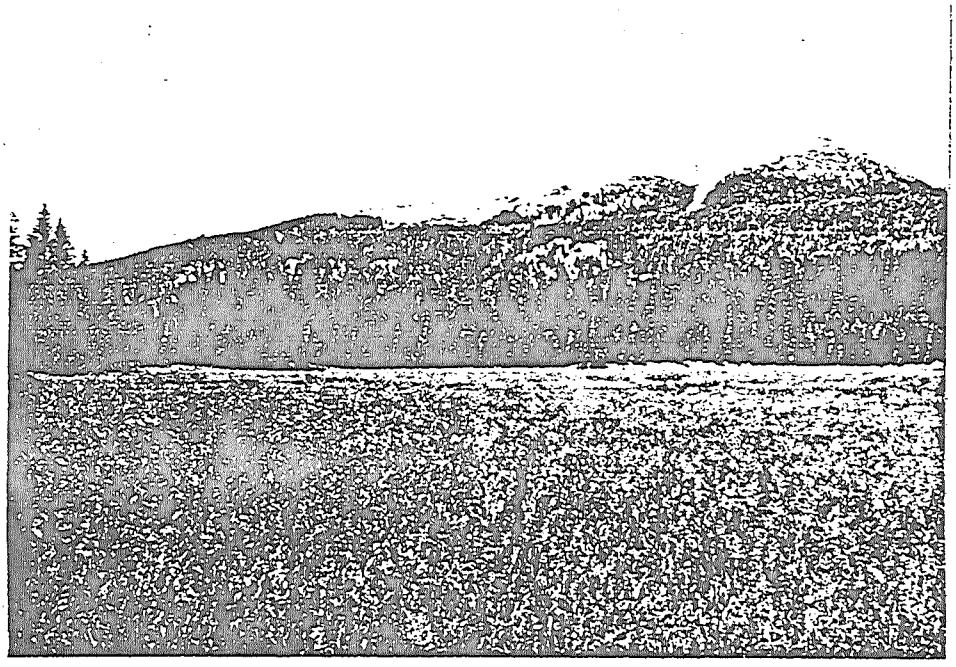


Photo 2. Lower end of McCrystal Meadow, with Little Costilla Peak to the west in the distance.

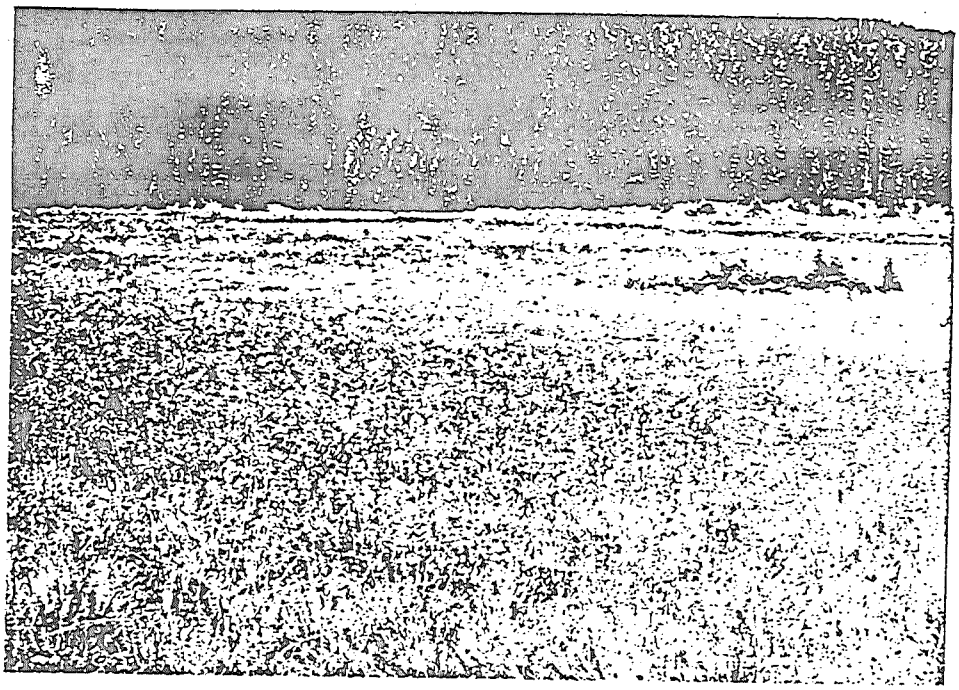


Photo 3. Lower McCrystal Meadow within the RNA. Graminoids include Deschampsia caespitosa, Phleum alpinum and Carex sp.

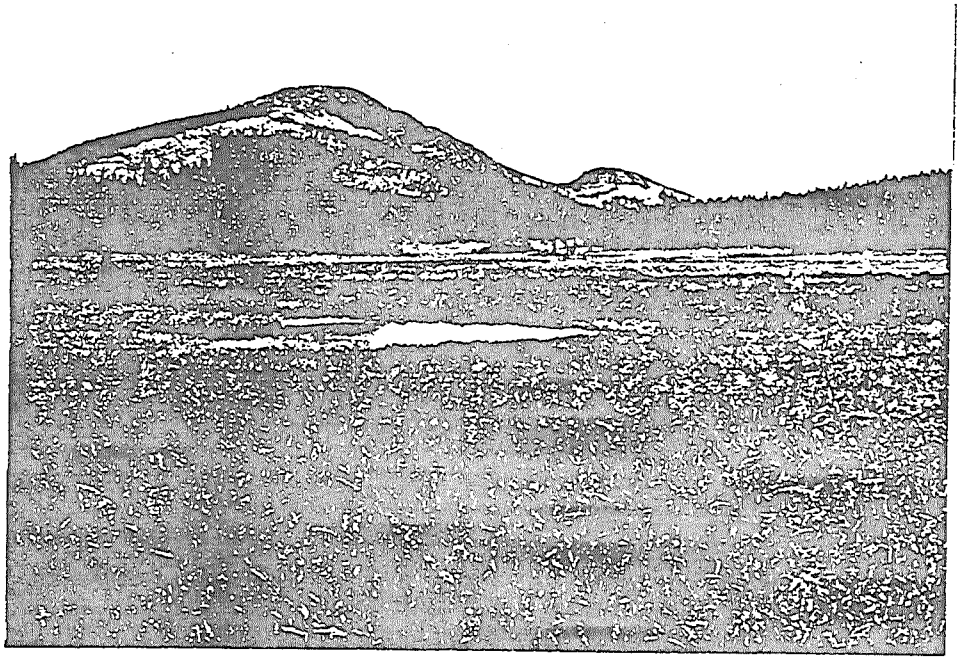


Photo 4. Bog pond at upper end of McCrystal Meadow. This area is presently on private land outside the RNA.

Photo 5. Closed Picea engelmannii/Abies lasiocarpa forest on east slope of Little Costilla Peak within McCrystal Meadow RNA. ABLA/MOSS HT is one of several habitat types on these slopes.

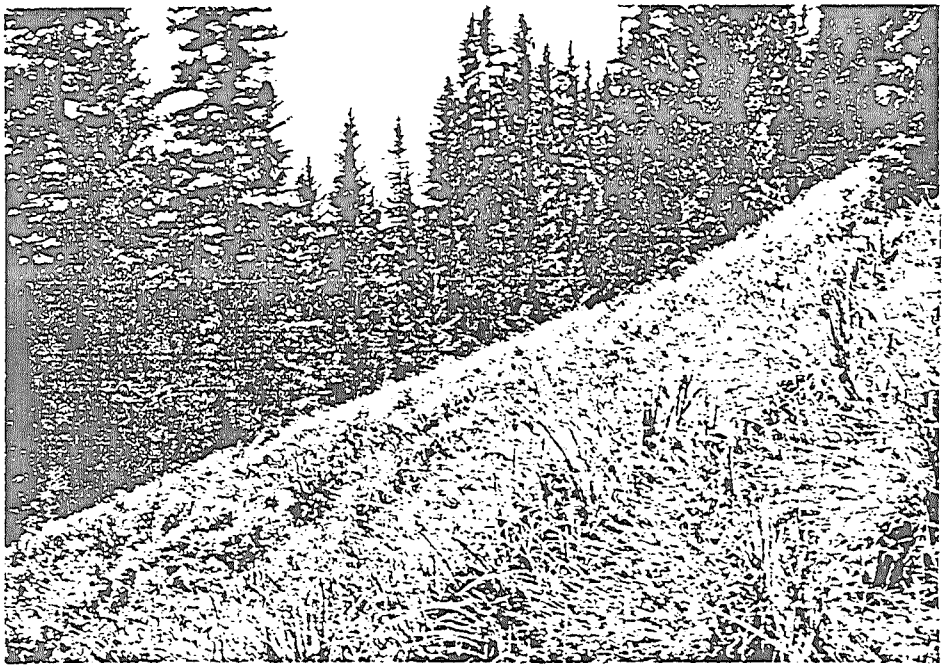


Photo 6. Thurber fescue grassland opening surrounded by Engelmann spruce and bristlecone pine (PIAR/FETH Habitat Type).

USDA-FOREST SERVICE

PHOTOGRAPHIC RECORD

(See FSM 1643.52)

PHOTOGRAPHER: William W. Dunmire

DATE SUBMITTED: 7/1/87

HEADQUARTERS UNIT:

LOCATION:

INITIAL DISTRIBUTION OF PRINTS AND FORM 1600-1:

☐ WO ☐ RO ☐ DIV. ☐ FOREST ☐ DISTRICT ☐ PHOTOGRAPHER Date _____

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PHOTOGRAPH NUMBER TEMP. (1)	PHOTOGRAPH NUMBER PERMANENT (To be filled in by the WO) (2)	SELECTED FOR W.O. PHOTO LIBRARY (3)	DATE OF EXPOSURE (4)	LOCATION (State, Forest, District and County) (5)	CONCISE DESCRIPTION OF VIEW (6)	NEGATIVE (Show size and BW for black and white or C for color) (7)
				ALL: New Mexico Carson NF Questa Dist Colfax Co.		ALL: 24x36mm color slides
1.			8-28-86		Northeast toward McCrystal Meadow from Little Costilla Peak.	
2.			8-28-86		West toward Little Costilla Peak from lower McCrystal Meadow.	
3.			8-28-86		Lower, southwest edge of McCrystal Meadow with graminoides including Deschampsia caespitosa, Phleum alpinum, Carex sp.	
4.			8-28-86		Bog ponds on upper McCrystal Meadow on private lands approximately one-quarter mile east of forest boundary.	
5.			8-28-86		Abies lasiocarpa/Moss Habitat Type on east slope of Little Costilla Peak above McCrystal Meadow.	
6.			8-28-86		Thurber fescue grassland opening within spruce-fir forest on east slope of Little Costilla Peak above McCrystal Meadow.	

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(See FSM 1643,52)

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