Research Natural Areas

USDA Forest Service, Rocky Mountain, Intermountain, Southwestern and Great Plains States

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A cooperative project of the

USDA Forest Service Northern Region, Rocky Mountain Region, Southwestern Region, Intermountain Region, Rocky Mountain Research Station, and the Montana Natural Heritage Program

GOODDING

General Information S.USNAHP*87

- Created: 1970
- Size: 545 (acres)
- Elevation Range: 3800 - 4500ft
- Location: *Goodding RNA is located just north of the Mexican border, 15 air miles west of Nogales, Arizona. This RNA lies within the Pajarita Wilderness.*

Site Description

Goodding RNA encompasses the box canyon and adjacent uplands through which Sycamore Creek flows. This RNA features an extremely diverse and interesting example of a madrean pine-oak woodland with associated aquatic features along the Arizona-Mexico border. The area contains many biological elements typically associated with thornshrub ecosystems to the south, such as vine snake and five-striped sparrow and many plant species. Some of the plant species of special interest include: Goodding ash (Fraxinus gooddingii), wild cassava (Manihot angustiloba), Toumey oak (Quercus toumeyi), sweet acacia (Acacia farnesiana) and maindenhair-fern (Adiantum capillus-veneris). Underlying geology is principally rhyolites with conglomerates of shales and sandstone. The lush riparian system associated with the intermittent stream flowing through the RNA supports habitat for a number of rare animals. The RNA is the only known location where three species of leopard frogs have co-occurred: Tarahumara leopard frog (now extripated), Chiricahua leopard frog and lowland leopard frog. Bird diversity is high in the area, and the RNA supports the lowest elevation nesting location for Mexican spotted owl. Perennial waters support rare fish including the Sonoran Chub.

Climate and Enviromental Information

Data not Available

Vegetation - Goodding

Oak-Juniper (K 27) Riparian Hardwood Mesquite Live Oak Savanna (K 55)

GOODDING RESEARCH NATURAL AREA

ABSTRACT

The Goodding Research Natural Area follows the canyon through which flows Sycamore Creek. The creek is intermittent in places, permanent in others. Stream bottom vegetation is riparian in nature and the surrounding hillsides are evergreen oak woodland dominated by Emory oak (*Quercus emoryi*).

The area is located at 31° 25' N. Lat., 111° 12' W. Long., on the Coronado National Forest. The area consists of 545 acres (221 ha) and was established as a Research Natural Area on 8 July, 1970 by the United States Forest Service.

Location

Goodding Research Natural Area is located in Sections 14, 15, 22 and 23 of T. 23S., R. 11E. in Santa Cruz County, Arizona (See Fig. 1). The site is 54 air miles southwest of Tucson and 25 miles (via Ruby Road) northwest of Nogales, Arizona.

Access and Accommodations

Goodding Research Natural Area (GRNA) may be reached from U.S. Highway 89 by taking the Pena Blanca Lake-Ruby turnoff, approximately 6 miles (9.6 km) north of Nogales, Arizona. The same exit from Highway 89 is approximately 59 miles (94 km) south of Tucson. The Ruby road is paved for 10 miles (16.6 km) west of Highway 89. Exactly 10 miles west of Highway 89, there is a fork in the road. The right fork goes to Pena Blanca Lake, the left fork goes to Ruby and Arivaca. To reach GRNA, one must take the unpaved left fork and travel 9.5 miles (15.2 km) to Sycamore Canyon. At Sycamore Canyon, there is a well-marked left fork (F.S. Road 218) which goes to Hank and Yank Spring and Sycamore Canyon. The road ends shortly (approximately one-quarter mile) after one takes the Sycamore Canyon turnoff and it is necessary to walk the half-mile from road's end to GRNA. From the Sycamore Canyon turnoff, the main road continues on to Ruby and Arivaca (See Fig. 1).

It is possible to camp at Hank and Yank Spring as well as in Sycamore Canyon above the spring. Camping is not permitted in GRNA nor in Sycamore Canyon below GRNA. The former restriction on camping in Sycamore Canyon is effective from a point just below road's end at Hank and Yank Spring south to the U.S.-Mexico International Border. It is suggested that campers and/or hikers contact the Nogales Ranger District, P.O. Box 1389, Nogales, Arizona 85621 prior to pursuing activities in the lower Sycamore Canyon area.

The nearest improved campgrounds (tables, fireplaces and rest rooms) are at White Rock Campground which is located immediately beyond the point at which the pavement ends near Pena Blanca Lake. There are also improved campsites and trailer spaces at Pena Blanca Lake which has a small store and concession area.

The City of Nogales, Arizona has numerous motels, restaurants, etc., and would be the most logical place for visitors to GRNA to stay if indoor accommodations are desired.

Climate

The climate of GRNA is semi-arid with abundant rainfall only in July and August. During these two months, the nearby Ruby weather station is one of the wettest areas in the state with an average of

more than nine inches of precipitation (Green and Sellers, 1964). Most of the remaining annual precipitation at Ruby (average 18.99 inches) is concentrated in the winter months and results from widespread storms that move across Arizona from the Pacific Ocean. Snowfall occurs occasionally at GRNA but snow seldom remains on the ground for more than a day.

Temperatures at GRNA are seldom extreme in either direction. Summer highs occasionally exceed 100° F. but the high frequency of afternoon showers in July, August and September helps ameliorate afternoon highs. Summer lows drop to the middle sixties at night. Afternoon highs in January and February are normally in the high fifties or low sixties and nighttime lows are more likely to be above than below freezing.

Topography and Landform

The topography of GRNA is quite rough, consisting of the stream bottom cutting through vertical cliffs and steep slopes. Elevations of the area range between 3,800 and 4,500 feet above sea level. In some places, elevational changes of several hundred feet occur over very short linear distances.

Geologically, the area is dominated by rhyolites and conglomerates of shales and sandstones. Soils consist primarily of Lampshire gravelly, sandy loam that occurs in pockets between rock outcroppings. The soils are shallow, dark colored gravelly soils derived from residues of rhyolitic granite and other acidic igneous rock. Soil depths resting on bedrock range between 4 and 20 inches (Curran, 1973).

Biota

The biota of GRNA is highlighted by species of plants and animals that are rare in the United States. Many of the rare species are common in Mexico and some are common in other parts of the U.S. There are fourteen vertebrate species that are known to occur, at least occasionally, at GRNA that are rare in the United States. One of these, a bird (Louisiana Waterthrush) is unusual in that it is a regular winter visitor elsewhere in the eastern United States. The species normally winters in southern Sonora, Mexico, south to South America. The common fish species in Sycamore Creek, the Sonora Chub (*Gila ditaenia*), is found nowhere else in Arizona or the U.S. and is the only species of fish present in GRNA. There are twenty-seven plant species known to occur at GRNA that are considered rare (Kearney and Peebles, 1964) in Arizona and/or the United States. Tables 1 and 2 summarize briefly the flora and fauna of GRNA and indicate those species that are unusual.

Goodding Research Natural Area is a riparian canyon habitat with permanent water in at least portions of Sycamore Creek which flows through the area. The surrounding countryside is evergreen oak woodland dominated by Emory oak (*Quercus emoryi*) with a predominantly grass (Probably *Bouteloua gracilis*) ground cover. The vegetation of Sycamore Canyon is diverse and influenced by exposure, available moisture and so on such that a wide variety of small habitats exist within GRNA. For example, streamside vegetation consists largely of willow (*Salix bondplandiana*), ash (*Fraxinus pennsylvanica*) and walnut (*Juglans major*). In short, deep canyons extending at right angles from the main canyon may be found Arizona oak (*Quercus arizonica*), poison ivy (*Rhus radicans*) and silverleaf oak (*Quercus hypoleucoides*). Less mesic sites away from the stream harbor manzanita (*Arctostaphylos* sp.), juniper (*Juniperus* sp.), wait-a-minute bush (*Mimosa biuncifera*), catclaw (*Acacia greggii*) and other characteristically xeric species. In shaded, spring-moistened overhangs and narrow canyons may be found maidenhair fern (*Adiantum capillus-veneris*), columbine (*Aquilegia* sp.) and occasionally trailing fern (*Phanerophlebia auriculata*). In areas of permanent water, horsetail (*Equisetum* sp.), seep-willow (*Baccharis glutinosa*) and numerous grasses and sedges may be found.

The vertebrate fauna of GRNA consists of many species that occur throughout similar habitats in

TABLE 1. A listing of plant species that have been observed and/or collected at Goodding Research Natural Area and vicinity. The Literature Cited section of this report includes some of the sources from which this list was derived. Species marked with an asterisk are rare in the United States. Common names are in accordance with those listed in Kearney and Peebles (1964) where possible.

POLYPODIACEAE - Fern Family
- *Adiantum capillus-veneris* ..... maidenhair fern
- *Cheilanthes* sp. ..... lip fern
- * *Phanerophlebia auriculata* ..... trailing fern
- * *Asplenum exiguum* ..... spleenwort

EQUISETACEAE - Horsetail Family
- *Equisetum* sp. ..... horsetail

PSILOTACEAE - Psilotum Family
- * *Psilotum nudum* ..... psilotum

CUPRESSACEAE - Cypress Family
- *Juniperus deppeana* ..... alligator juniper
- *Juniperus monosperma* ..... one-seed juniper

GRAMINEAE - Grass Family
- *Eragrostris intermedia* ..... plains love grass
- *Lycurus phleoides* ..... wolf tail
- *Muhlenbergia arenacea* ..... ear muhly
- *Sporobolus cryptandrus* ..... sand dropseed
- *Sporobolus wrightii* ..... sacaton
- *Aristida ternipes* ..... spider grass
- *Hilaria belangeri* ..... curly-mesquite
- *Leptochloa dubia* ..... sprangle-top
- *Bouteloua hirsuta* ..... hairy grama
- *Bouteloua chondrosioides* ..... spruce-top grama
- *Bouteloua eludens* ..... Santa Rita grama
- *Bouteloua filiformis* ..... slender grama
- *Bouteloua curtipendula* ..... side-oats grama
- * *Setaria geniculata* ..... *bristle grass*
- Andropogon cirratus ..... *Texas blue-stem*
- Andropogon scoparius ..... *little blue-stem*
- Andropogon barbinodis ..... *cane blue-stem*
- Heteropogon contortus ..... *tanglehead*
- * Tripsacum lanceolatum ..... *Mexican grama grass*

BROMELIACEAE - Pineapple Family
- * Tillandsia recurvata ..... *ball moss*

LILIACEAE - Lily Family
- *Yucca* sp. ..... yucca
- *Dasylirion wheeleri* ..... sotol
- *Agave parviflora* ..... small-flowered agave
- *Agave palmeri* ..... Palmer agave

SALICACEAE - Willow Family
- *Populus fremontii* ..... Fremont cottonwood
- * *Salix taxifolia* ..... yew-leaf willow
- *Salix bondplandiana* ..... Bonpland willow

JUGLANDACEAE - Walnut Family
- *Junglans major* ..... walnut

FAGACEAE - Beech Family
- *Quercus reticulata* ..... net-leaf oak

TABLE 2 (Continued)

III. Birds (Continued)

American Robin	*Turdus migratorius*
Hermit Thrush	*Catharus guttatus*
Swainson's Thrush	*Catharus ustulatus*
Eastern Bluebird	*Sialia sialis*
Mountain Bluebird	*Sialia currucoides*
Townsend's Solitaire	*Myadestes townsendi*
Blue-gray Gnatcatcher	*Polioptila caerulea*
Ruby-crowned Kinglet	*Regulus calendula*
Phainopepla	*Phainopepla nitens*
Loggerhead Shrike	*Lanius ludovicianus*
Hutton's Vireo	*Vireo huttoni*
Bell's Vireo	*Vireo bellii*
Solitary Vireo	*Vireo solitarius*
Warbling Vireo	*Vireo gilvus*
Black and White Warbler	*Mniotilta varia*
Orange-crowned Warbler	*Vermivora celata*
Nashville Warbler	*Vermivora ruficapilla*
Virginia's Warbler	*Vermivora virginiae*
Lucy's Warbler	*Vermivora luciae*
Yellow Warbler	*Dendroica petechia*
Audubon's Warbler	*Dendroica coronata*
Black-throated Gray Warbler	*Dendroica nigrescens*
Townsend's Warbler	*Dendroica townsendi*
Hermit Warbler	*Dendroica occidentalis*
Grace's Warbler	*Dendroica graciae*
Northern Waterthrush	*Seiurus novaboracensis*
* Louisiana Waterthrush	*Seiurus motacilla*
MacGillivray's Warbler	*Oporornis tolmiei*
Yellowthroat	*Geothlypis trichas*
Yellow-breasted Chat	*Icteria virens*
Wilson's Warbler	*Wilsonia pusilla*
Painted Redstart	*Setophaga picta*
Western Meadowlark	*Sturnella neglecta*
Hooded Oriole	*Icterus cucullatus*
Scott's Oriole	*Icterus parisorum*
Bullock's Oriole	*Icterus galbula*
Brown-headed Cowbird	*Molothrus ater*
Bronzed Cowbird	*Tangavius aeneus*
Western Tanager	*Piranga ludoviciana*
Hepatic Tanager	*Piranga flava*
Summer Tanager	*Piranga rubra*
Cardinal	*Cardinalis cardinalis*
Pyrrhuloxia	*Pyrrhuloxia sinuata*
Black-headed Grosbeak	*Pheucticus melanocephalus*
Blue Grosbeak	*Guiraca caerulea*
Lazuli Bunting	*Passerina amoena*
House Finch	*Carpodacus mexicanus*
Pine Siskin	*Spinus pinus*
Lesser Goldfinch	*Spinus psaltria*
Green-tailed Towhee	*Chlorua chlorua*
Rufous-sided Towhee	*Pipilo erythrophthalmus*

TABLE 2 (Continued)

III. Birds (Continued)

Brown Towhee	*Pipilo fuscus*
Vesper Sparrow	*Poocetes gramineus*
Lark Sparrow	*Chondestes grammacus*
Rufous-crowned Sparrow	*Aimophila ruficeps*
Black-throated Sparrow	*Amphispiza bilineata*
Oregon Junco	*Junco hyemalis*
Gray-headed Junco	*Junco caniceps*
Chipping Sparrow	*Spizella passerina*
Black-chinned Sparrow	*Spizella atrogularis*
Lincoln's Sparrow	*Melospiza lincolnii*

IV. Mammals

Desert Shrew	*Notiosorex crawfordi*
* Peters' Leaf-chinned Bat	*Moormops megalophylla*
Mexican Long-tongued Bat	*Choeronycteris mexicana*
Long-nosed Bat	*Leptonycteris nivalis*
Cave Myotis	*Myotis velifer*
Long-eared Myotis	*Myotis evotis*
California Myotis	*Myotis californicus*
Small-footed Myotis	*Myotis subulatus*
Western Pipistrelle	*Pipistrellus hespersus*
Big Brown Bat	*Eptesicus fuscus*
Red Bat	*Lasiurus borealis*
Hoary Bat	*Lasiurus cinereus*
Townsend's Big-eared Bat	*Plecotus townsendii*
Pallid Bat	*Antrozous pallidus*
Brazilian Free-tailed Bat	*Taderida brasiliensis*
Black-tailed Jack Rabbit	*Lepus californicus*
Desert Cottontail	*Sylvilagus auduboni*
Rock Squirrel	*Citellus variegatus*
Arizona Gray Squirrel	*Sciurus arizonensis*
Southern Pocket Gopher	*Thomomys umbrinus*
Desert Pocket Mouse	*Perognathus penicillatus*
Rock Pocket Mouse	*Perognathus intermedius*
Merriam's Kangaroo Rat	*Dipodomys merriami*
Southern Grasshopper Mouse	*Onychomys torridus*
Western Harvest Mouse	*Reithrodontomys megalotis*
* Fulvous Harvest Mouse	*Reithrodontomys fulvescens*
Cactus Mouse	*Peromyscus eremicus*
Deer Mouse	*Peromyscus maniculatus*
White-footed Mouse	*Peromyscus leucopus*
Brush Mouse	*Peromyscus boylei*
Hispid Cotton Rat	*Sigmodon hispidus*
White-throated Wood Rat	*Neotoma albigula*
Porcupine	*Erethizon dorsatum*
Coyote	*Canis latrans*
Gray Fox	*Urocyon cinereoargenteus*
Ringtail	*Bassariscus astutus*
Raccoon	*Procyon lotor*
Coati	*Nasua narica*
Spotted Skunk	*Spilogale putorius*

TABLE 2 (Continued)

IV. Mammals (Continued(

Striped Skunk	*Mephitis mephitis*
Hooded Skunk	*Mephitis macroura*
Hog-nosed Skunk	*Conopatus mesoleucus*
* Jaguar	*Felis onca*
Mountain Lion	*Felis concolor*
* Jaquarundi	*Felis yagouaroundi*
Bobcat	*Lynx rufus*
Javelina	*Tayassu tajacu*
Black-tailed Deer	*Odocoileus hemionus*
White-tailed Deer	*Odocoileus virginianus*

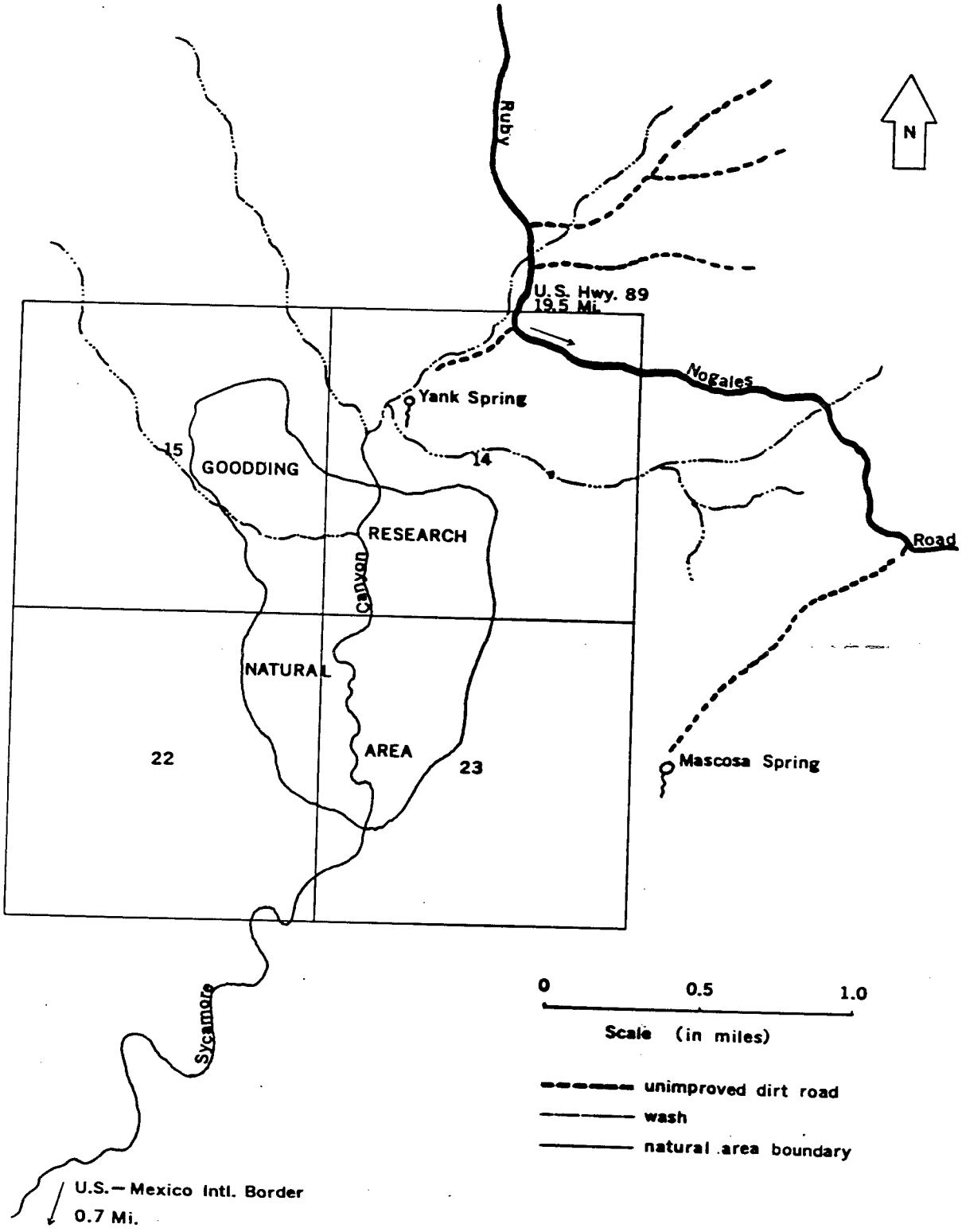

FIGURE 1. Sketch map of Goodding Research Natural Area.

Photo 1. Streamside habitat at Goodding Natural Area. This portion of the stream supports good populations of the Sonora Chub.

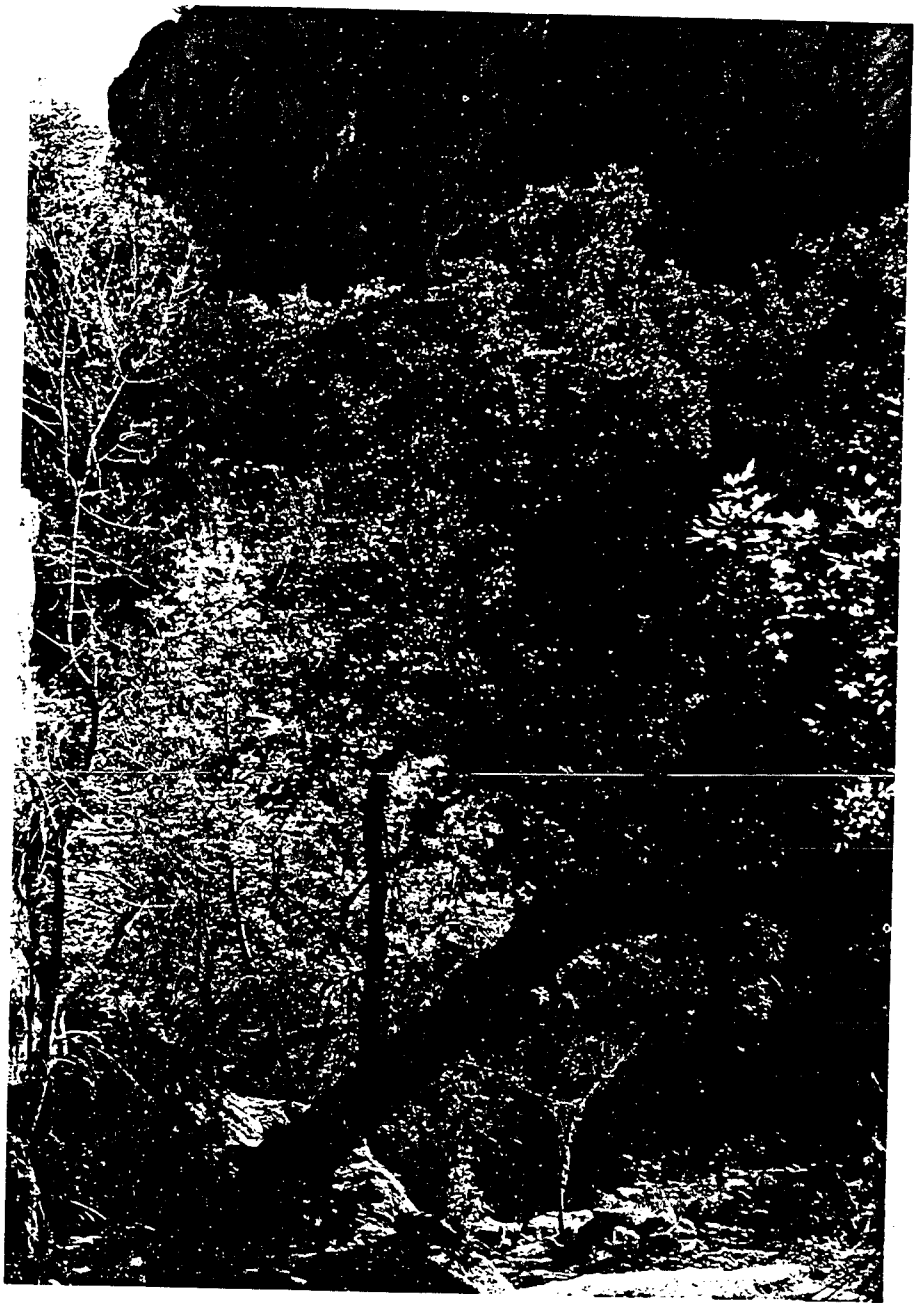

Photo 2. Oak, sycamore and willow growing along an intermittent stretch of Sycamore Creek in the Goodding Natural Area. Note the vertical canyon walls that typify much of this natural area.

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ESTABLISHMENT REPORT

GOODDING RESEARCH NATURAL AREA

Coronado National Forest

Santa Cruz County, Arizona
April 14, 1969

NARRATIVE REPORT

a. Principal Distinguishing Feature

The Goodding Research Natural Area follows closely the Box Canyon through which Sycamore Creek flows. The distinguishing characteristics are the rock cliffs on either side and the intermittent live stream along the Canyon bottom.

b. Location

The area is located in secs. 14, 15, 22, and 23, T. 23 S., R. 11 E., G&SRBM. It is some 15 miles northwest of Nogales and 54 miles, airline, southwest of Tucson. It is within the Nogales Ranger District, Coronado National Forest.

c. Area By Cover Types

The overall cover type is savanna oak (SAF 241) with a narrow, riparian, hardwood type along the stream (probably OVT 243 best describes it).

Savanna Oak	- 274 acres
Oak-Juniper (North Slope)	- 166 acres
Riparian Hardwood	- 30 acres
Rock	- 75 acres
Total	545 acres

d. Physical and Climatical Conditions

The topography is extremely rough for the most part consisting of the stream bottom with steep slopes and vertical cliffs. Elevations range from 3800 feet to 4500 feet above sea level. The drainage is all into Sycamore Creek which drains south into Mexico.

The climate is typical semi-desert with temperatures varying seasonally from 70° F. to 100°F. The precipitation averages approximately 20 inches with summer thunderstorms from July 1 to mid-September and winter rains from December through March.

e. Description of Values

Mr. Leslie N. Goodding, a noted Arizona botanist, has called the area a "hidden botanical garden." On May 22, 1957, Elbert L. Little, Jr., dendrologist for the Forest Service, requested that the area be set aside as a natural area, because it contains many rare Mexican plants found no where else in the United States and because it is representative of the Forest type of Mexican blue oak (Quercus oblongifolia). The Regional Forester designated the area as a Scenic Area on September 20, 1962. Some of the rare species cited by Little are the Goodding ash (Fraxinus gooddingii), wild cassava (Manihot angustiloba), Passiflora bryonioides, Lobelia laxiflora, Dichondra repens, Setaria geniculata, yewleaf willow (Salix taxifolia), Toumey oak (Quercus toumeyi), kidneywood (Eysenhardtia polystachya), and sweet acacia (Acacia farnesiana). Other more common species noted were Fremont cottonwood (Populus fremontii), Bonpland willow (Salix bonplandiana), velvet ash (Fraxinus velutina), alligator juniper (Juniperus deppeana), Mexican blue oak (Quercus oblongifolia), Emory oak (Quercus emoryi), one-seed juniper (Juniperus monosperma), pricklypear (Opuntia sp.), two cholla species (Opuntia spp.), manzanita (Arctostaphylos sp.), mesquite (Prosopis juliflora), catclaw acacia (Acacia greggii), wild grape (Vitis arizonica), two species of yucca (Yucca spp.), beargrass (Nolina sp.), two species of sumac (Rhus spp.), desert seep-willow (Baccharis glutinosa), wild-buckwheat (Eriogonum sp.), Penstemon sp., dock (Rumex sp.), Geranium sp., Gaura sp., mint (Mentha sp.), columbine (Aquilegia sp.), Aster sp., loco (Astragalus sp.), Juncus sp., two species of water-cress (Rorippa spp.), cardinal-flower (Lobelia cardinalis), lipfern (Cheilanthes sp.), butterfly-pea (Clitoria mariana), green sprangle-top (Leptochloa dubia), three-awn (Aristida sp.), sacaton (Sporobolus sp.), sideoats grama (Bouteloua curtipendula), and several species of lichens, both green and red. Other rare species listed by Goodding are trailing-fern (Phanerophlebia auriculata), maidenhair-fern (Adiantum capillus-veneris), spleenwort (Asplenium exiguum), Rusby echeveria (Echeveria rusbyi), Texas lippia (Aloysia lycioides), Bentham-pea (Cracca edwardsii), alamo lotus (Lotus alamosanus), serviceberry (Amelanchier pormonica), mock-orange (Philadelphus microphyllus), Fendlera rupicola, golden currant (Ribes aureum), white-flower honeysuckle (Lonicera albiflora), trailing raspberry (Rubus arizonensis), Tripsacum lanceolatum, Elytraria imbricata, and a parasitic fungus on junipers (Gymnosporangium speciosum).

The geology is principally rhyolites with conglomerates of shales and sandstone. The soils derived therefrom are the reddish brown semi-arid group with numerous rock outcrops. Generally, they are quite thin.

There are many species of wildlife in the proposed area. These consist of deer, javelina, coati-mundi, squirrel, rabbit, snakes, and numerous bird species. Mr. Goodding reported finding a rare vine snake (Oxybelis microphthalmus) and a rare grouse (Dalea lagopus). During the inspection, a Mexican parrot, the Bacard, and a species of flicker were seen. There is a small chub that is only found in Sycamore Creek.

Mineral activity has been limited to rare earth elements outside of the area proposed for designation. There are no known deposits in the area being considered.

Recreation has been limited to hikers and use has been light. The actual area is nearly a half mile from the Hank and Yank historical marker and the end of the road. The upper end of the proposed Natural Area has a watergap across the Canyon making equestrian entry difficult, if not impossible.

Grazing by domestic stock has been rather severe along the Creek at times. The use on the slope has been light to none. So long as the watergaps are in place, grazing will be light. Floods and an irresponsible sandbuggy operator have knocked down the fencing and cattle had been in the area during the past winter. However, tracks were all old and the flora did not appear to be unduly damaged.

There are no water or other uses which would interfere with the Natural Area conditions.

Clyde W. Doran
Coronado Forest Supervisor

W. D. Hurst
Regional Forester

Raymond A. Price
Director, Rocky Mountain Station

Director, Div. of R ~~& E~~, WO

Deputy Chief, Research

ORDER

By virtue of the authority vested in me by Regulation U-4 of the Regulations of the Secretary of Agriculture, I hereby designate as the Goodding Research Natural Area the lands described in the preceding report by the Region 3 Research Natural Area Committee dated April 14, 1969; said lands shall hereafter be administered as a Research Natural Area, subject to the said Regulations and instructions thereunder.

Date

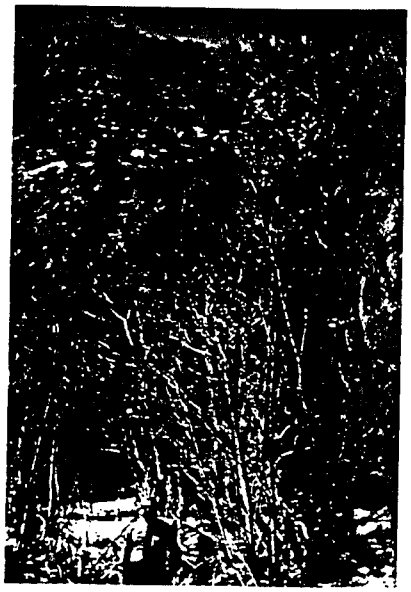
Chief, Forest Service

Picture 5 - Rock formation along Sycamore Canyon.

Picture 6 - Typical savanna oak.

Picture 7 - Typical savanna oak.

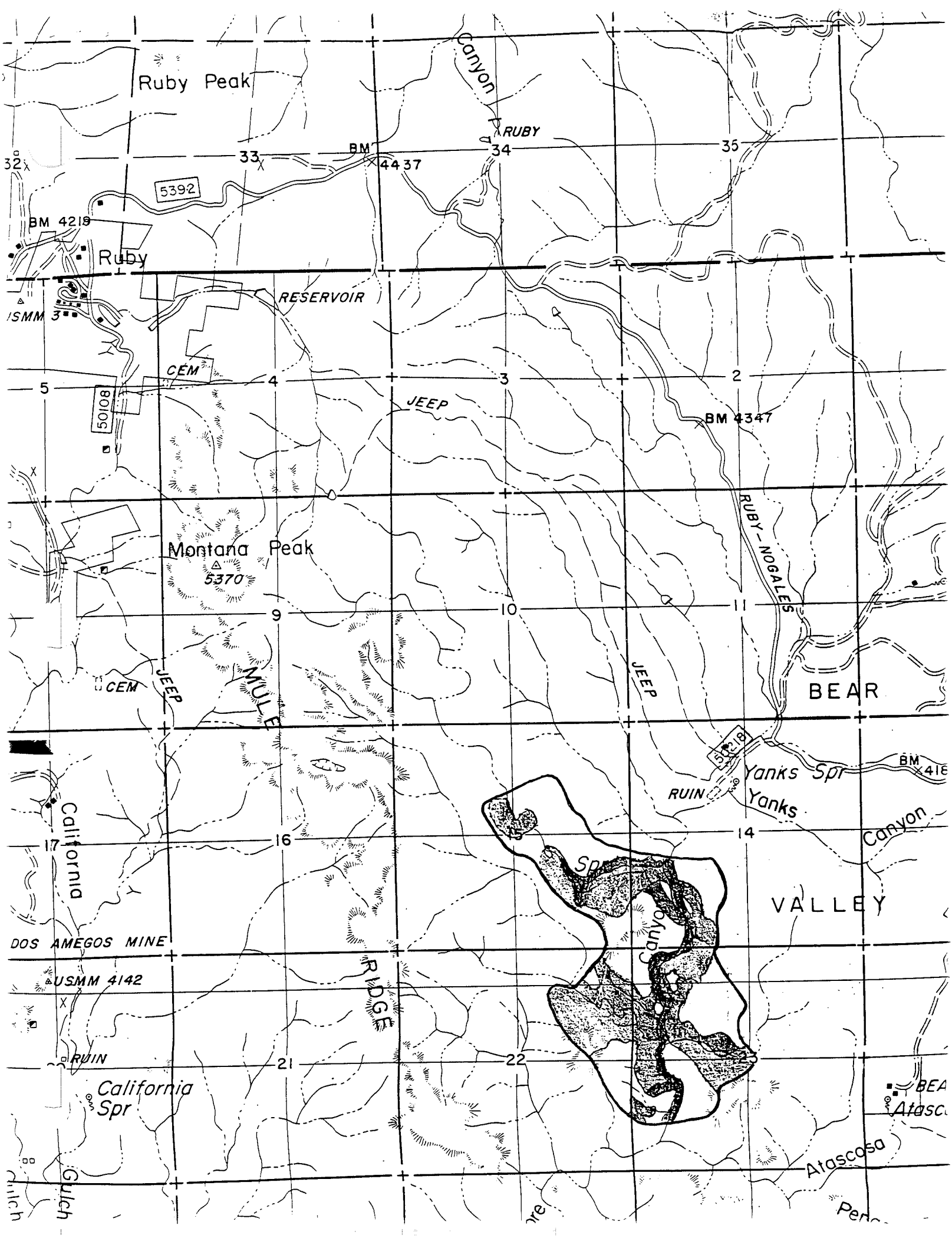
Picture 1 - West side of Sycamore Canyon from riparian hardwood across savanna type.



Picture 2 - Riparian hardwood in foreground and savanna in background

Picture 3 - Canyon side with light savanna.

Picture 4 - Sycamore Creek on solid rock bottom.


Ruby Peak
Canyon
RUBY
BM 4437
33
34
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32
5392
BM 4218
Ruby
RESERVOIR
USMM 3
CEM
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5
50108
JEEP
BM 4347
Montana Peak
5370
RUBY-NOGALES
9
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11
CEM
JEEP
MULE
JEEP
BEAR
5018
Yanks Spr
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Canyon
17
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Atascosa

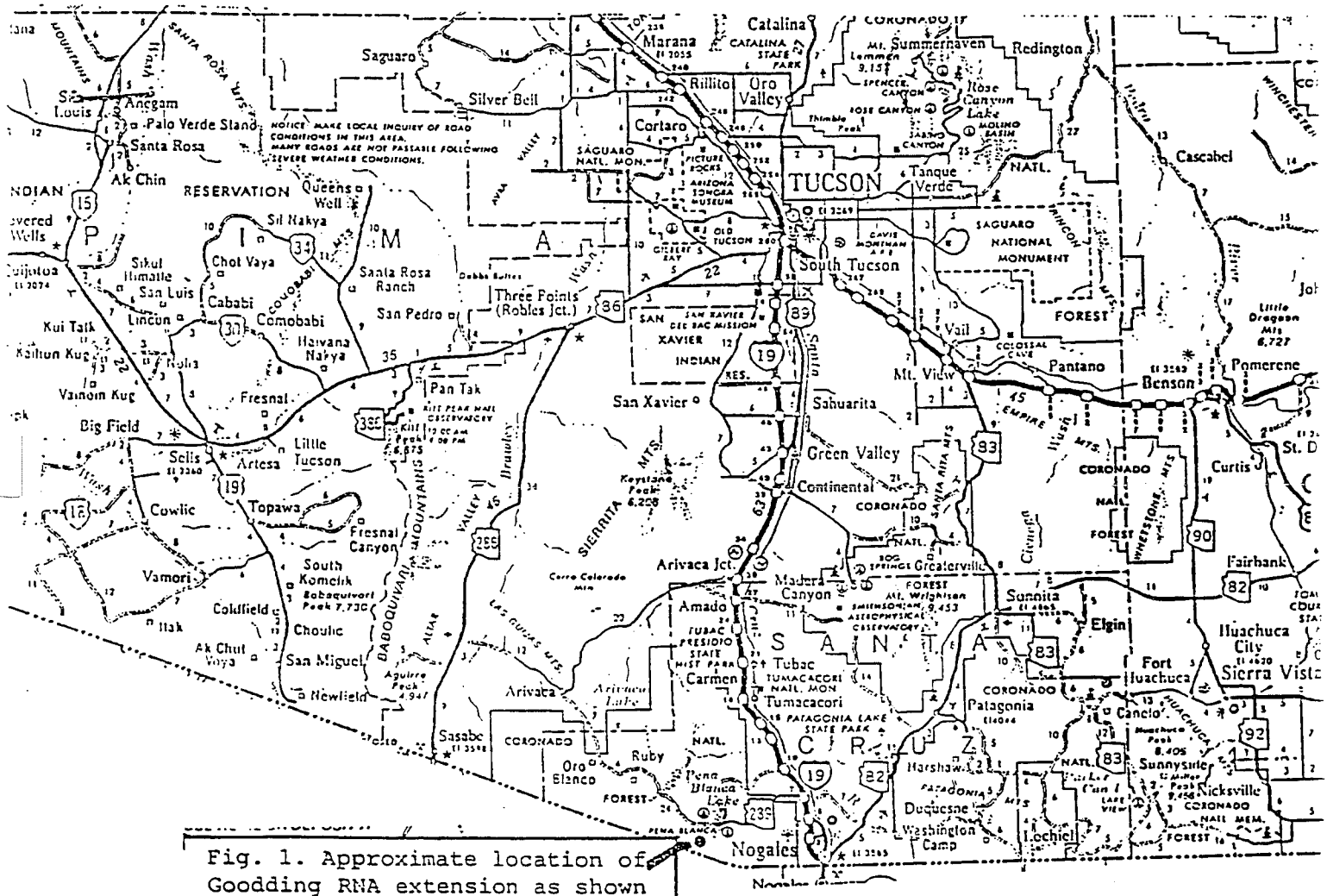

Fig. 1. Approximate location of Goodding RNA extension as shown on an Arizona State Highway map.

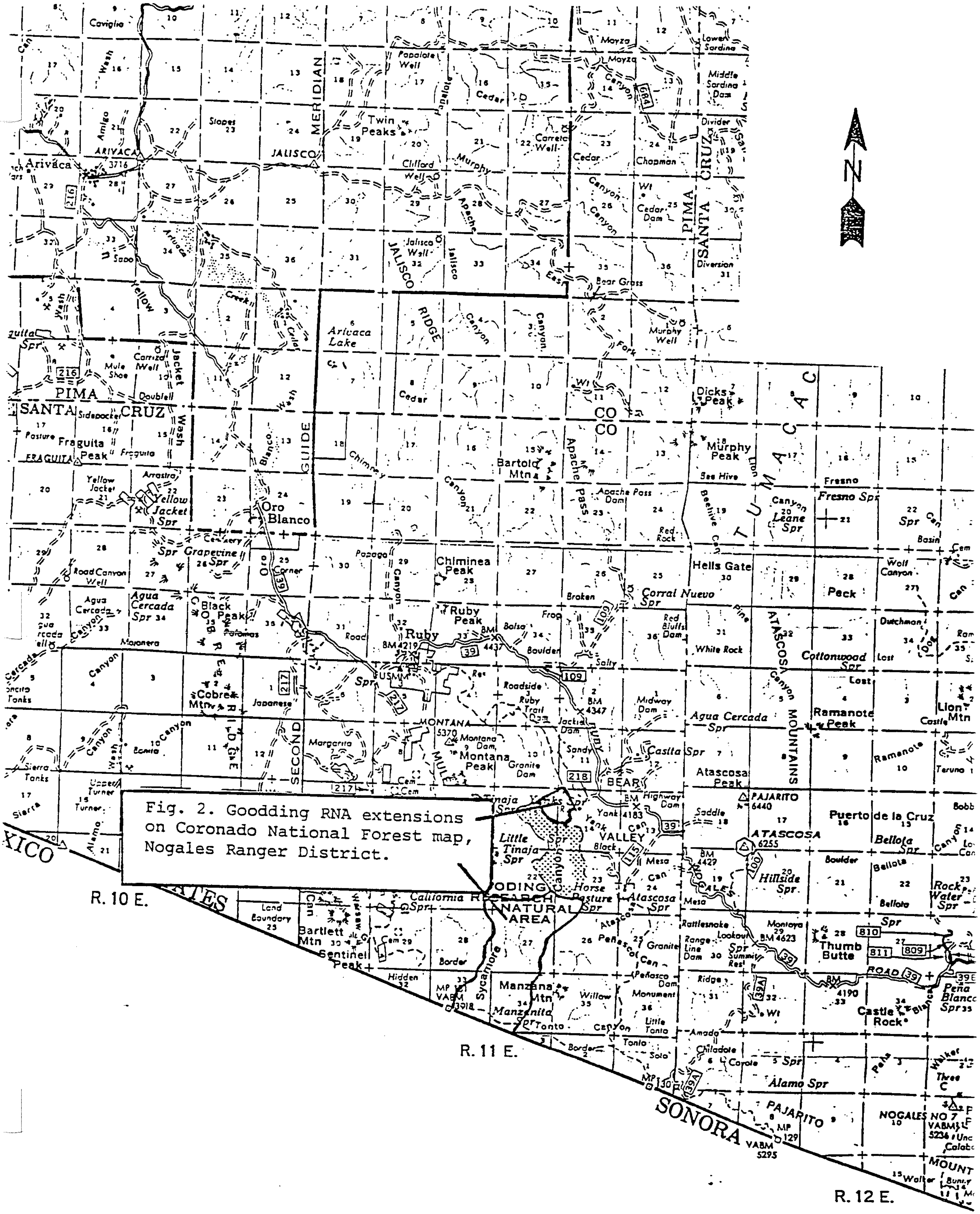

Fig. 2. Goodding RNA extensions on Coronado National Forest map, Nogales Ranger District.

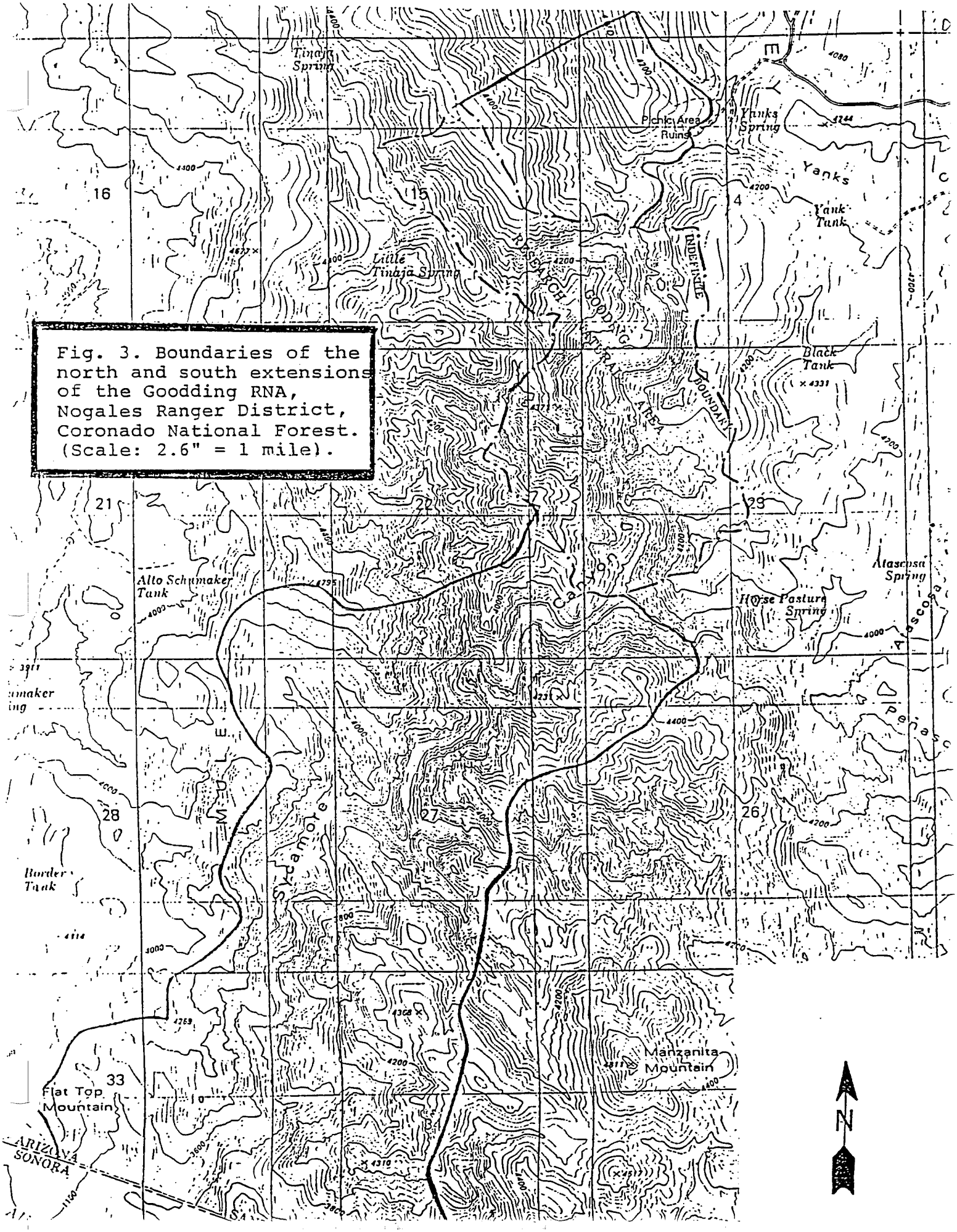

Fig. 3. Boundaries of the north and south extensions of the Goodding RNA, Nogales Ranger District, Coronado National Forest. (Scale: 2.6" = 1 mile).

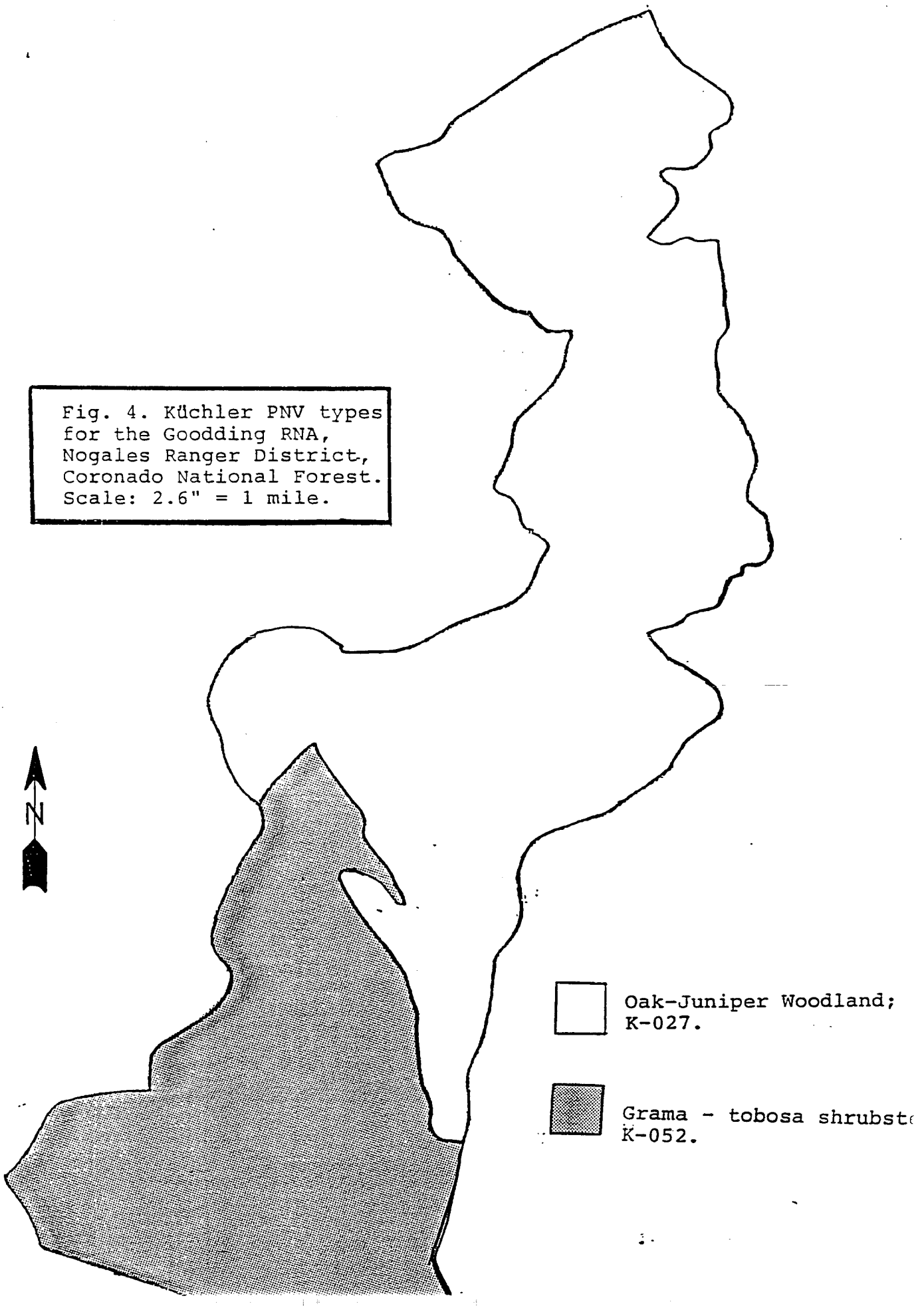

Fig. 4. Küchler PNV types for the Goodding RNA, Nogales Ranger District, Coronado National Forest. Scale: 2.6" = 1 mile.

CORONADO NATIONAL FOREST
Nogales Ranger Station

GOODDING RESEARCH NATURAL AREA

83rd RESEARCH NATURAL AREA

545 ACRES

PREFACE

The material herein on the Goodding Research Natural Area was compiled by Nogales District Ranger, Norman L. Curran. Much research was necessary to glean this information from a large volume of material that included reports, letters, newspapers, official reports, etc.

A number of people have contributed in putting this material together and are listed below. We expect to list many more in the future as we find our what work has been done and from future studies to be conducted.

Mr. Bill Harrison, local Nogales High School Science Teacher, supplied the list of birds of this area and the information for the writeup on rare species of birds of this area.

Mr. Charles T. Mason, Jr., Curator of the Herbarium at the University of Arizona, reviewed the material and recommended a number of changes and corrections that were very helpful in making it readable and correct.

Mr. Dale A. Zimmerman, Professor at Western New Mexico University, reviewed most of the material and added additional information on the area.

Mr. Seymour H. Levy of Tucson reviewed most of the material and made some recommendations that were valuable.

The material herein is directed toward the scientific community and educators but I velieve anyone interested in the Goodding Research Natural Area will find this material valuable and appreciate some of our management objectives.

TABLE OF CONTENTS

SECTION A.

Nogales Ranger District
Coronado National Forest
U. S. Forest Service

GOODDING RESEARCH NATURAL AREA

"HIDDEN BOTANICAL GARDEN"

The Natural Area is named for the late Leslie N. Goodding, a noted Arizona Botanist, who has studied and written about the unusual vegetation in the area. Goodding called the canyon a "hidden botanical garden."

The southern counties of Arizona are the only areas in the United States that contain a representative growth of the Mexican Blue Oak (Quercus oblongifolia).

One plant Psilotum is so rare that this is the only area in the United States west of eastern Texas where Psilotum is known to grow.

A second rare plant is the Goodding Ash (Fraxinus gooddingii), named for Leslie Goodding who first discovered it. Other uncommon species of plant life include Yewleaf Willow (Salix taxifolia), Toumey Oak (Quercus toumeyi) and Kidney Wood (Eysenhardtia polystechya). On October 9, 1967, University of Arizona Professor, Charles T. Mason, confirmed the presence of Maindenhair Fern (Adiantum capillus-veneris) and Trailing Fern (Phanerophlebia auriculata).

Hundreds of bird species have been observed in the area including many that are uncommon and a few that are rare. There are five species of rare birds that migrate through or inhabit the area.

The Copper-tailed Trogon is a very rare migrant on it's way to nesting grounds in the Atascosa and Santa Rita Mountains. The Green Kingfisher is found only near the Mexican border in Arizona. The Rose Throated Becard is a rare Arizona breeding bird found only along the Arizona-Mexican border. They nest in Sycamore Canyon and along Sonita Creek near Nogales in this area. The Beardless Flycatcher nests in willows along the border and the Louisiana Water-Thrush is a regular winter resident. This is the only place in the United States where it does winter.

On the ground most of the animals common to Southern Arizona are found here. However, a few of the reptiles found here are uncommon in the United States and the Vine Snake is rare. A few amphibians found here are not common elsewhere in the United States. This area and the Pena Blanca Canyon are the only places in the United States that the Tarahumara Frog is found. In the area of aquatic vertebrates, a small Sonora Chub (Gila ditaenia) survives through parts of each year in small pools in Sycamore Canyon. This is the only fish species present in Sycamore Canyon Creek and the only one of this species found in the United States. It is restricted to the independent basin of Rio de la Concepcion.

This botanical garden, surrounded by the Oak Savanna Vegetation Type, with plant and animal life found nowhere else in the United States, will serve as a living museum, an outdoor laboratory for nature scientists. The same life forms that make it of such importance to

science also are attractions to be enjoyed by all Americans interested in nature and natural beauty.

HISTORY AND OTHER PERTINENT INFORMATION

HISTORY

The Goodding Research Natural Area was formerly classified as the Sycamore Canyon Scenic Area in 1962 at the behest of Mr. Leslie N. Goodding and efforts of members of botanical organizations in Tucson to preserve this sanctuary. On July 8, 1970 Edward P Cliff, Chief, Forest Service, declared the Canyon a Natural Area under regulation U-4 of the regulations of the Secretary of Agriculture.

PRINCIPAL DISTINGUISHING FEATURES

The Goodding Research Natural Area closely follows the box canyon through which Sycamore Creek flows. The distinguishing characteristics are the rock cliffs on either side and the intermittent live stream along the canyon bottom.

LOCATION

Twenty-five miles northwest of Nogales by way of Ruby Road and 54 air miles southwest of Tucson. It is within the Nogales Ranger District, Coronado National Forest and located in Section 14, 15, 22, and 23, T23S, R11E, G&SRBM.

AREA BY COVER TYPES

The overall cover type is Live Oak Savanna with a narrow, riparian, hardwood type along the stream. The latter type is characterized by Sycamore trees, for which the canyon is called, Adler, Cottonwood, Ash, Willow and Desert Willow along with aquatic species.

A breakdown of cover types by acreage is as listed below:

Live Oak Savanna	274 Acres
Oak-Juniper (North Slope)	166 Acres
Riparian Hardwood	30 Acres
Rock	75 Acres
Total	545 Acres

PHYSICAL AND CLIMATICAL CONDITIONS

The topography is extremely rough, for the most part consisting of the stream bottom with steep slopes and vertical cliffs. Elevations range from 3800 feet to 4500 feet above sea level. The drainage is all into Sycamore Creek which drains south into Mexico.

The climate is typical semi-desert with temperatures varying seasonally from a low daily temperature of 9°F to 44°F during the winter months to a high daytime temperature of 104°F during July. The average annual temperature for this area is 60°F. The precipitation averages approximately 20 inches with summer thunderstorms from July 1 to mid-September and winter rains from December through March.

GEOLOGY

The geology is principally rhyolites with conglomerates of shales and sandstone group with numerous rock outcrops. Generally they are quite thin. The Natural Area has been withdrawn from mineral entry by Public Land Order 5134 of 10/18/71. Mineral activity has been limited to rare earth elements outside the Natural Area. There are no known deposits of mineral in the area.

SOILS

The soils are mapped as Lampshire, gravelly, sandy loam occuring only in pockets between rock outcrop. These soils are shallow, dark

colored, gravelly soils developing residum from rhyolite granite and other acid igneous rock. About 4 to 20 inches of dark brown, gravelly, to very gravelly, sandy loam surface rests directly on bedrock. The PH is 6.4 - 7.0.

GRAZING

Grazing in the past by domestic stock has been rather severe along the creek. The use on the slope had been light to none.

The area has been closed to grazing and the Hank and Yank Spring Area has been fenced to control livestock. Now, about the only time livestock may enter the area is when flooding has ripped out the water gap or someone leaves a gate open.

RECREATION

Recreation has been limited to hikers and use has been light. The actual area is nearly a half mile from the Hank and Yank historical marker and the end of the road. The Hank and Yank Spring Area is used as a campground by hikers, birdwatchers, hunters, and people interested in research and plant and animal life.

SPECIAL CONDITIONS

Research Natural Areas are managed in a way which will protect them from activities which may directly or indirectly modify the ecological processes for which they were established. Public use such as picnicking, camping and other activities which contribute to modification of the area must be prohibited if such use threatens serious impairment of research or educational value.

The management objective for the Research Natural Area does not allow for public uses not directly related with scientific and

educational purposes. Even these activities must be regulated by permit.

Under Authority of 36 CFR 251.25 the area south of the Ruby Road and it's junction with Sycamore Canyon has the Restrictions as listed below. (See Map and Notice in appendix)

1. No camping in Sycamore Canyon below the Hank and Yank Ruins.
2. Camping in the Hank and Yank area is limited to a seven (7) day stay limit. (14 day stay limit elsewhere on the Coronado National Forest)
3. Plant collecting without a permit is prohibited.
4. The Research Natural Area is closed to grazing by livestock.
5. Trapping of wildlife without a permit is prohibited.
6. Building or maintaining fires in the Research Natural Area is prohibited.
7. Destruction of Natural Objects is prohibited.
8. Vehicles beyond the Hank and Yank Ruins are forbidden. Off road travel in the Hank and Yank area is also discouraged.
9. Everyone is encouraged to practice land ethics to protect the area, keep it clean and haul their garbage and trash out with them. Try to leave the area in a natural condition. Just as if no one had been there.

Regulations by their very nature tend to discriminate against the few well informed persons who understand the problems. However, they must be initiated and enforced to protect the area from ever increasing use by those who do not know and sometimes do not care about the importance of each plant and animal in the area.

SECTION B.

PLANT LISTS - USE AND ORGANIZATION

The following list of plants in this booklet are divided into classes - Trees, Shrubs, Forbs, etc., and these classes are also divided as to whether they are Rare or Common to the United States. The page number on the right side of the page is an index by page number to the "Arizona Flora" by Kearney and Peebles. The Grasses are also indexed to the "Manual on Grasses of the United States" by Hitchcock.

Plant specimens collected in this area that are on file in the Nogales Ranger Station Herbarium are marked with an asterisk (*).

This by no means is a complete list of all the plants in the area. Additional species of flora and fauna will be listed as they are identified.

Since we will constantly update and revise our lists of species that exist here, your additional observations will be greatly appreciated.

RARE SPECIES

TREES

			Page
1.	Salix taxifolia *	Yewleaf Willow	211
2.	Quercus toumeyi	Toumey Oak	218
3.	Fraxinus gooddingii (Found also in Pena Blanca Canyon)	Goodding Ash	1063

SHRUBS

4.	Philadelphus microphyllus	Mock Orange (White flower)	366
5.	Fendlera rupicola	Fendlera (Delicate white flower)	367
6.	Ribes aureum	Golden Current (Yellow flower current)	369
7.	Amelanchier mormonica (Also found near Mormon Lake)	Serviceberry	378
8.	Rubus arizonensis	Trailing Raspberry	379
9.	Acacia farnesiana (Found at border)	Sweet Acacia (Flower used in perfumery)	399
10.	Eysenhardtia polystachya	Kidney-wood	432
11.	Dalea lagopus (Only place found in U.S.)	Lagopus Dalea (Pea Bush)	437
12.	Manihot angustiloba	Wild Cassava	509
13.	Aloysia lycioides	Texas lippia	729
14.	Lonicera albiflora	White-flower Honeysuckle	817
15.	Lobelia laxiflora (Only report in U.S.)	Lobellia	828

RARE SPECIES (Continued)

FORB, HERBS, FERNS, VINES, ETC.

			Page
16.	Phanerophlebia auriculata	Trailing fern	45
17.	Asplenium exiguum (One of rarest ferns in U.S.)	Spleenwort (Evergreen Rock Fern)	48
18.	Echeveria rusbyi	Rusby Echeveria	360
19.	Lotus alamosanus (Not found elsewhere in U.S.)	Alamo Lotus (Deer-Vetch) (Red & Yellow Pea)	427
20.	Cracca edwardsii	Bentham-Pea (Woodstem Pea)	443
21.	Passiflora bryonioides	Passion Flower (White petals, purple corona)	562
22.	Dichondra brachypoda (Found below Jct. with Penasco Creek)	Dichondra	672
23.	Elytraria imbricata	Acanthaceous	799
24.	Psilotum (Found 400 miles out of range- only one specimen found in canyon)		

GRASSES OR GRASS-LIKE PLANTS

1.	Setaria geniculata	Bristle Grass	139
2.	Tripsacum lanceolatum	Mexican Gamagrass (Rare Grass related to corn)	145-792

EPIPHYTIC AND FUNGUS

1.	Tillandsia recurvata	Ball Moss	166

(Only flowering Epiphytic plant in Arizona. It is a member of the tropical pineapple family. This plant grows on Juniper, Oak, Ash and rock near the southern boundary of the Natural Area. It is found in but five places in the state. In Flux Canyon it grows on live oak and in Peck Canyon it is found on Junipers.)

PLANTS COMMON TO THE AREA

TREES

PLANTS COMMON TO THE AREA

SHRUBS

PLANTS COMMON TO THIS AREA

HERBS, FORBS, ETC.

			Page
1.	Adiantum capillus - veneris	Maidenhair Fern	36
2.	Cheilanthes sp	Lip Fern	38
3.	Eriogonum sp *	Wild Buckwheat	230
4.	Rumex crispus	Dock	243
5.	Aquilegia chrysantha	Columbine	307
6.	Rorippa sp (2 species)	Water-cress	339
7.	Astragulus sp	Loco Weed	445
8.	Clitoria mariana	Butterfly-pea	479
9.	Geranium sp	Geranium	484
10.	Vitis arizonica	Wild Grape	535
11.	Parthenocissus sp	Virginia Creeper (5leaf)	535
12.	Gaura sp	(Herb)	603
13.	Mentha sp	Mint	747
14.	Penstemon sp	Penstemon	768
15.	Lobelia cardinalis	Cardinal-flower	828
16.	Aster sp	Aster	869
17.	Psitolum (400 miles out of range - only one found in canyon)		

PLANTS COMMON TO THIS AREA

CACTUS

			Page
1.	Carnegiea gigantea (Found south of the Research Area Boundary & the Mexican Border)	Saguaro	569
2.	Ferocactus covillei	Barrel Cactus	573
3.	Mammillaria recurvata (Coryphanta recurvata)	Pincushion Cactus or Fishook Cactus	577
4.	Opuntia phaeacantha	Prickly Pear	583
5.	Opuntia violacea var. santa-rita	Prickly Pear	582
6.	Opuntia spinosior	Cholla	585
7.	Echinocereus pectinatus var. rigidissimus	Rainbow Cactus	571
8.	Mammillaria gummifera var. macdougalii	Cream Cactus	578
9.	Ferocactus wislizeni	Barrel Cactus	573

OTHER SUCCULENTS

1.	Yucca sp	Yucca	185
2.	Agave palmeri	Palmer Agave	195
3.	Agave parviflora	Small-flowered Agave	194
4.	Dasylirion wheeleri	Sotol	190

PLANTS COMMON TO THE AREA

GRASSES OR GRASSLIKE PLANTS

		Page
Eragrostis intermedia	Plains lovegrass	87
Lycurus phleoides	Wolf tail	104
Muhlenbergia arenacea	Ear muhly	109
Sporobolus cryptandrus	Sand dropseed	114
Sporobolus wrightii	Sacation	114
Aristida ternipes	Spidergrass	119
Hilaria belangeri	Curly mesquite	121
Leptochloa dubia	Green sprangletop	123
Bouteloua chondrosioides	Strucetop grama	128
curtipendula	Side-oats grama	129
eludens	Santa Rita grama	128
filiformis	Slender grama	129
hirsuta	Hairy grama	128
Andropogon barbinodis	Cane bluestem	142
scoparius	Little bluestem	142
cirratus	Texas bluestem	142
Heteropogon contortus	Tanglehead	143

PLANT DISEASES IN THE NATURAL AREA

Gymnosporangium speciosum	Parasitic fungus on Juniper (Hideous disease of Juniper)

(Philadelphus microphyllus and Fendlera rupicola are hosts for this disease)

SECTION C.

CHORDATES

Includes True Vertebrates and Those Animals Which Have a Notochord

FISH, REPTILES AND AMPHIBIANS RARE TO THE UNITED STATES

FISH

Gila ditaenia — Sonora Chub

(This is the only Fish Species present in Sycamore Canyon Creek and the only one found in the United States. Restricted to the independent basin of Rio de la Concepcion.)

REPTILES

Oxbelis aeneus — Vine Snake

Oxbelis microphthalmus — Vine Snake

Ficimia quadrangularis — Sonoran Hooked-nose Snake

AMPHIBIANS

Rana tarahumarae — Tarahumara Frog

(In the U.S. this frog is only found in Sycamore, Pena Blanca & Alamo Canyon

Hyla arenicolor — Canyon Tree Frog

Eleutherodactylus angusti — Barking Frog

Bufo microcaphus — Southwestern Toad

Gastrophryne carolinensis — Woodland Narrow-mouth Toad

BIRDS

LIST OF BIRDS RARE TO THE UNITED STATES OBSERVED IN THE GOODDING RESEARCH NATURAL AREA

Trogon elegans — Copper-tailed Trogon

(Very rare migrant on way to nesting grounds in Pine Canyon in the Atascosa Mountains and Madera Canyon in the Santa Rita Mountains.)

Chloroceryle americana — Green Kingfisher

(Rare in Arizona; occurs only near the border.)

Platypsaris aglaiae — Rose Throated Becard

(Rare and local bird along the Arizona-Mexican border. It is a rare Arizona breeding bird. They nest in Sycamore Canyon. Five pair of these birds have been observed nesting at Sonoita Creek near Nogales.)

Camptostoma imberbe — Beardless Flycatcher

(This bird nests in willows; occurs only at border in Arizona.)

Seiurus motacilla — Louisiana Water-Thrush

(This bird is a regular winter resident. This is the only place in the U.S. where it winters.)

CHECK LIST OF BIRDS

This list is incomplete as yet but the birds, as listed below, have been observed in this area.

FAMILY CATHARTIDAE
VULTURES
- Turkey Vulture — CS

FAMILY ACCIPITHRIDAE
HAWKS & EAGLES
- Sharp-spinned Hawk — MTW
- Cooper's Hawk — MR
- Red-tailed Hawk — CR
- Zone-tailed Hawk — OS
- Marsh Hawk — OW
- Golden Eagle — OR

FAMILY FALCONIDAE
FALCONS
- Sparrow Hawk — CR

FAMILY PHASIANIDAE
QUAIL
- Harlequin Quail

FAMILY COLUMBIDAE
PIGEONS & DOVES
- Band-tailed Pigeon — CS
- White-winged Dove — CR
- Morning Dove — MR
- Ground Dove

FAMILY CULCULIDAE
CUCKOOS
- Yellow-billed Cuckoo — X
- Roadrunner — CR

FAMILY STRIGIDAE
OWLS
- Screech Owl — CR
- Great Horned Owl — CR
- Elf Owl — CS
- Long-eared Owl

FAMILY CAPRIMULGIDAE
GOATSUCKERS
- Poor-will — MS
- Common Nighthawk — X

FAMILY APODIDAE
SWIFTS
- White-throated Swift — CR

FAMILY TROCHILIDAE
HUMMINGBIRDS
- Black-chinned Hummingbird — CS
- Costa's Hummingbird — CTS
- Anna's Hummingbird — MW
- Broad-billed Hummingbird — CT
- Lucifer Hummingbird — X

FAMILY TROGONIDAE
TROGONS
- Coppery-tailed Trogon

FAMILY ALCEDINIDAE
KINGFISHERS
- Green Kingfisher

FAMILY PICIDAE
WOODPECKERS
- Red-shafted Flicker — CTW
- Gila Woodpecker — CR
- Acorn Woodpecker
- Lewis' Woodpecker — OW
- Yellow-bellied Sapsucker — MTW
- Ladder-backed Woodpecker — CR
- Arizona Woodpecker — OW

ORDER PASSERIFORMES - PERCHING BIRDS

FAMILY COTINGIDAE
COTINGAS
- Rose-Throated Becard — X

FAMILY TYRANNIDAE
TYRANT FLYCATCHERS
- Western Kingbird — CS
- Cassin's Kingbird — CS
- Olivaceous Flycatcher
- Ash-throated Flycatcher — CS
- Black Phoebe — CR
- Say's Phoebe — CR
- Dusky Flycatcher
- Gray Flycatcher
- Western Flycatcher — CT
- Western Wood Pewee — CTS
- Vermilion Flycatcher — MR
- Beardless Flycatcher — OR

CHECK LIST OF BIRDS (Continued)

FAMILY HIRUNDINIDAE	
SWALLOWS	
Violet-green Swallow	CT
Tree Swallow	X
FAMILY CORVIDAE	
JAYS, CROWS & RAVENS	
Steller's Jay	OTW
Scrub Jay	OTW
Mexican Jay	OTW
Pinyon Jay	
Common Raven	MR
White-necked Raven	MR
FAMILY PARIDAE	
TITMICE & VERDINS	
Bridled Titmouse	OW
Verdin	CR
Common Bushtit	
FAMILY SITTIDAE	
NUTHATCHES	
White-breasted Nuthatch	MTW
FAMILY TROGLODYTIDAE	
WRENS	
House Wren	CTW
Bewick's Wren	OR
Cactus Wren	CR
Canyon Wren	CR
Rock Wren	CR
FAMILY MIMIDAE	
MOCKINGBIRDS & THRASHERS	
Mockingbird	MR
Curve-billed Thrasher	CR
Crissal Thrasher	OR
FAMILY TURDIDAE	
THRUSHES, BLUEBIRDS & SOLITAIRES	
Robin	OTW
Hermit Thrush	OTW
Swainson's Thrush	
Western Bluebird	OW
Townsend's Solitaire	X
Eastern Bluebird	
Mountain Bluebird	
FAMILY SYLVIIDAE	
GNATCATCHERS & KINGLETS	
Blue-gray Gnatcatcher	CTW
Ruby-crowned Kinglet	CW
FAMILY PTILOGONATIDAE	
SILKY FLYCATCHERS	
Phainopepla	CTW,OS
FAMILY LANIDAE	
SHRIKES	
Loggerhead Shrike	OR
FAMILY VIREONIDAE	
VIREOS	
Hutton's Vireo	MW
Bell's Vireo	CS
Solitary Vireo	OW
Warbling Vireo	OT
FAMILY PARULIDAE	
WOOD WARBLERS	
Black & White Warbler	OT
Orange-crowned Warbler	CTW
Nashville Warbler	OT
Virginia's Warbler	OT
Lucy's Warbler	CS
Yellow Warbler	CS
Audubon's Warbler	CTW
Black -throated Gray Warbler	MTW
Townsend's Warbler	MT
Hermit Warbler	OT
Grace's Warbler	X
Northern Water-Thrush	OT
Louisiana Water-Thrush	
MacGillivray's Warbler	CT
Yellowthroat	CTW
Yellow-breasted Chat	CS
Wilson's Warbler	CT
Painted Redstart	OT
FAMILY ICTERIDAE	
MEADOWLARKS, BLACKBIRDS & ORIOLES	
Hooded Oriole	CS
Scott's Oriole	MS
Bullock's Oriole	CS
Brown-headed Cowbird	MR
Western Meadowlark	MW

CHECK LIST OF BIRDS (Continued)

FAMILY THRAUPIDAE	
TANAGERS	
Western Tanager	CT
Hepatic Tanager	OT
Summer Tanager	CS
FAMILY FRINGILLIDAE	
GROSBEAKS & FINCHES	
Cardinal	CR
Pyrrhuloxia	CR
Black-headed Grosbeak	CT
Bule Grosbeak	
House Finch	CR
Pine Siskin	OW
Lesser Goldfinch	CR
TOWHEES & BUNTINGS	
Green-tailed Towhee	CTW
Rufous-sided Towhee	MTW
Brown Towhee	CR
SPARROWS & JUNCOS	
Vesper Sparrow	MW
Lark Sparrow	MW
Rufous-crowned Sparrow	OW
Black-throated Sparrow	CR
Oregon Junco	CW
Gray-headed Junco	CW
Chipping Sparrow	CTW
Black-chinned Sparrow	MTW

The following Key will provide a guide to seasonal occurrence and frequency of sightings one might expect at that time of year for each of the Species listed.

C = Common

O = Occasional or Rare

R = Resident

S = Summer

M = Moderately Common

X = Very Rare

T = Transient

W = Winter

MAMMALS

SPECIES THAT HAVE BEEN OBSERVED OR CAUGHT IN THE GOODDING RESEARCH NATURAL AREA

Family Soricidae	Shrews
Sorex Species	Shrew
Family Phyllostomidae	American Leaf-nosed Bats
Family Leporidae	Hares & Rabbits
Family Sciuridae	Squirrels
Citellus Species	Rock Squirrel
Family Geomyidae	Pocket Gophers
Family Cricetidae	Cricetid Mice & Rats
Family Canidae	Foxes and Coyotes
Canis latrans mearnsi	Coyote
Urocyon cinereoargenteus scottii	Gray Fox
Family Mestelidea	Skunks and Badger
Family Procyonidae	Raccoons and Allies
Nasua rarica molaris	Coati-Mundi
Procyon lotor pallidus	Raccoon
Family Felidae	Cats
Felis concolor azteca	Cougar
Family Tayassuidae,	Peccaries
Tayassus tajacu sonoriensis	Collared Peccary
Family Cervidae	Deer
Odocoileus virginianus cousei	Coues White-tailed Deer

SECTION D.

INSECTA (Invertebrates)

INSECTS

Many people have collected insects of this area because there are a large number of insects in the Sycamore and Pena Blanca Canyons that are rare and/or uncommon to other areas of the United States.

To date we do not have a check list on insects of this area. We hope to have one soon with the help of people like yourself.

SECTION E.

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Additional notes, papers, studies and books pertaining to the Goodding Research Natural Area will be listed as they are made known to the Forest Service at the Nogales Ranger Station.

- All Information would be appreciated -

Goodding Research Natural Area

LIST OF PEOPLE KNOWN TO HAVE DONE RESEARCH WORK, STUDY OR COLLECTING IN THE SYCAMORE CANYON AREA

This list is being made up because so much work has been done in this area and yet so little is known or published.

1. Dr. Charles T. Mason, Professor
   Department of Biological Science
   University of Arizona
   Tucson, Arizona

   Research on Fern; Adiantum capillus-veneris & Phanevophloebia auviculata

2. W. Walton Wright
   University of California
   Riverside, California

   Research on Dichondra; Dichondra brachypoda

3. Dale A. Zimmerman, Professor
   Department of Biological Sciences
   Western New Mexico University
   Silver City, New Mexico 88061

   Research on Cactus; Corphantha recurvata

4. Dr. Elbert L. Little, Jr.
   Forest Service Dondrologist

   Research on Ash; Fraxinus

N O T I C E

RESTRICTED AREA

The following acts are PROHIBITED on the following area:

That area described on the map described as "AREA OF CONCENTRATED PUBLIC RECREATION USE" and further described on that map as RESTRICTED AREA located in portions of Sections 14, 15, 22, 23, 26, 27, 28, 33 and 34, Township 23 South, Range 11 East, Gila and Salt River Meridian under Authority of 36 CFR 251.25.

1. Overnight camping.
2. Trapping of Wildlife without a permit.
3. Collecting of plants without a permit.
4. Building or maintaining fires in the Gooding Natural Research Area.
5. Grazing of livestock in the Gooding Natural Research Area.
6. Destruction of Natural Objects.

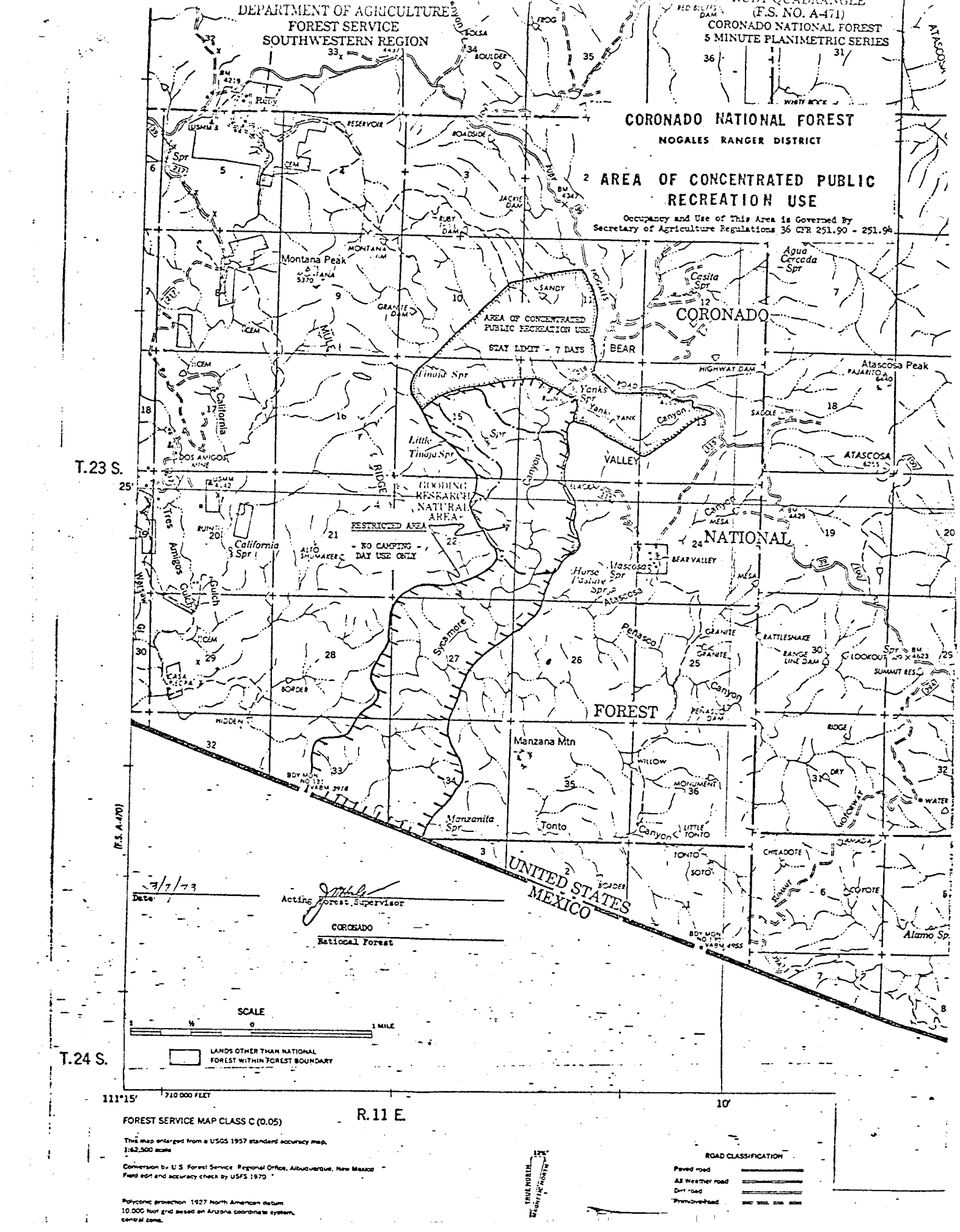
STAY LIMIT

A stay limit of seven (7) days is hereby established for the "AREA OF CONCENTRATED PUBLIC RECREATION USE" as shown on the map described above and located in portions of Section 10, 11, 13, 14 and 15, Township 23 South, Range 11 East, Gila and Salt River Meridian under Authority of 36 CFR 251.25.

Violators will be subject to $500.00 fine, 6 months imprisonment or both (16 USC 551)

3/7/73
Date

for
CHARLES R. AMES
ACTING FOREST SUPERVISOR, CORONADO NATIONAL FOREST


DEPARTMENT OF AGRICULTURE
FOREST SERVICE
SOUTHWESTERN REGION
(F.S. NO. A-471)
CORONADO NATIONAL FOREST
5 MINUTE PLANIMETRIC SERIES
CORONADO NATIONAL FOREST
NOGALES RANGER DISTRICT
2 AREA OF CONCENTRATED PUBLIC RECREATION USE
Occupancy and Use of This Area is Governed By Secretary of Agriculture Regulations 36 CFR 251.90 - 251.94
AREA OF CONCENTRATED PUBLIC RECREATION USE
STAY LIMIT - 7 DAYS
GOODING RESEARCH NATURAL AREA
RESTRICTED AREA
- NO CAMPING -
DAY USE ONLY
CORONADO
NATIONAL
FOREST
UNITED STATES
MEXICO
Montana Peak
Agua Cercada Spr
Casita Spr
Atascosa Peak
Yanks Spr
Little Tinaja Spr
California Spr
Tres Amigos Gulch
Sycamore Canyon
Pajarito Mesa
Atascosa Spr
Peñasco Canyon
Manzana Mtn
Manzanita Spr
Tonto Canyon
Alamo Spr
Date: 3/7/73
Acting Forest Supervisor
CORONADO
National Forest
SCALE
1 MILE
LANDS OTHER THAN NATIONAL FOREST WITHIN FOREST BOUNDARY
T.23 S.
T.24 S.
R.11 E.
111°15'
10'
710 000 FEET
FOREST SERVICE MAP CLASS C (0.05)
This map enlarged from a USGS 1957 standard accuracy map, 1:62,500 scale
Conversion by U.S. Forest Service Regional Office, Albuquerque, New Mexico
Field edit and accuracy check by USFS 1970
Polyconic projection 1927 North American datum
10,000 foot grid based on Arizona coordinate system, central zone.
TRUE NORTH
MAGNETIC NORTH
12°
ROAD CLASSIFICATION
Paved road
All Weather road
Dirt road
Primitive road

UNITED STATES DEPARTMENT OF AGRICULTURE

FOREST SERVICE

ESTABLISHMENT RECORD

FOR THE

GOODDING RESEARCH NATURAL AREA

WITHIN THE

CORONADO NATIONAL FOREST

SANTA CRUZ COUNTY, ARIZONA

U. S. GOVERNMENT PRINTING OFFICE : 1977 O - 251-012

6200–7 (10/73)

SIGNATURE PAGE

for

RESEARCH NATURAL AREA ESTABLISHMENT RECORD

Goodding Research Natural Area and Extensions

Coronado National Forest

Santa Cruz, Arizona

Prepared by Andrew W. Laurenzi Date 11/3/87
Mark H. Cochran, The Arizona Nature Conservancy
Andrew W. Laurenzi, The Arizona Nature Conservancy

Recommended by _____ Date _____
Jerry Lockwood, District Ranger,
Nogales Ranger District

Recommended by _____ Date _____
R.B. Tippeconnic, Forest Supervisor,
Coronado National Forest

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

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

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

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 Goodding Research Natural Area the lands described in the following establishment record prepared by Andrew W. Laurenzi and Mark Cochran, dated November 3, 1987. These lands shall hereafter be administered as a research natural area subject to legislation and regulations governing management of the Pajarito Wilderness Area.

_____ _____

Chief Date

INTRODUCTION

The original Goodding Research Natural Area (GRNA) and two boundary extensions comprise 1692 acres (681 hectares) in the Nogales Ranger District of the Coronado National Forest in Santa Cruz county, Arizona, on reserved public domain, National Forest land. The two extensions are contiguous with the established GRNA and contain the remainder of Sycamore Canyon as it flows to the border with Mexico and a small area of oak woodland to the northwest of the original RNA boundary. The southern extension and established RNA lie within the boundaries of the Pajarito wilderness which was designated by Congress in 1984. Please note that for the purposes of this Establishment Record, Sycamore Canyon refers to the entire GRNA including the extensions. This record describes the entire area with specific reference to the extensions.

LAND MANAGEMENT PLANNING

The Southwest RNA Progress Report (USDA Forest Service, 1983) and the Coronado National Forest Plan and Environmental Impact Statement (USDA Forest Service, 1986a/1986b) include the southern GRNA extension. The environmental analysis conducted as part of the planning process supports the recommendation to establish this extension to the GRNA.

The northern extension was recommended by The Arizona Nature Conservancy during and after the comment period on the Coronado National Forest Plan. The Coronado National Forest Plan was amended on October 1987 to include this northern extension.

JUSTIFICATION FOR ESTABLISHMENT OF AREA

The primary objective in augmenting the Goodding RNA is for the protection of genetic diversity. The extensions essentially fulfill the argument originally put forth by Goodding (1961) to establish Sycamore Canyon as a natural area due to the area's significant botanical diversity. Data provided by the Nongame Data Management System (NGDMS) of the Arizona Game and Fish Department, a centralized, ecological inventory of the state's rarest plants and animals, identified areas adjacent to the original RNA boundary which included populations of rare species for which the area is noted. Both the Southwest RNA Progress Report (USDA Forest Service, 1984) and the Coronado National Forest Plan (1986) identify the need to extend the GRNA to include these populations of rare species.

PRINCIPAL DISTINGUISHING FEATURES

Sycamore Canyon is one of the most biologically diverse sites in the United States. More than 600 vascular plant species and 72 species of fungi have been documented from the area (Toolin et al., 1979; Gilbertson et al., 1972). Among these are more than 30 species of special interest because of their limited distribution globally, in the United States, and in Arizona. Ten plants currently under study by the USFWS for consideration as Federally threatened or endangered plant species, (USDI Fish and Wildlife Service, 1985), reside in the GRNA.

The canyon also includes more than 15 Arizona threatened wildlife vertebrate species: 7 birds, 8 reptiles and amphibians and 1 fish. The area has been identified as critical habitat for the Sonoran chub (Gila ditaenia), a species which is listed threatened by the United States Fish & Wildlife Service. Tarahumara frog (Rana tarhumarae), which is under consideration for Federal listing as threatened (USDI Fish and Wildlife Service, 1985), was previously known to occur in Sycamore Canyon but is now believed extirpated.

The majority of these special interest species are known primarily, if not exclusively, from the extension areas. Refer to Toolin et al. (1979) for a more complete description of the distinguishing features of Sycamore Canyon.

LOCATION

The GRNA and extensions are located within the Nogales Ranger District of the Coronado National Forest in Santa Cruz County, Arizona (Figs. 1 & 2). The RNA is located at latitude 31o 23' north and longitude 111o 13' west. Specifically the GRNA and extensions lie in portions of sections 11, 14, 15, 22, 23, 26, 27, 28, 33 and 34 of T.23S.,R.11E. which are included on the Ruby 7.5' USGS topographic quadrangle (Fig. 3).

The southern extension includes the remainder of Sycamore Canyon to the border of Mexico. The northern extension is contiguous with the northern boundary of the GRNA and includes the gently sloping hillside to the northwest of the Hank n' Yank ruin site. An allotment fence forms the western boundary of this

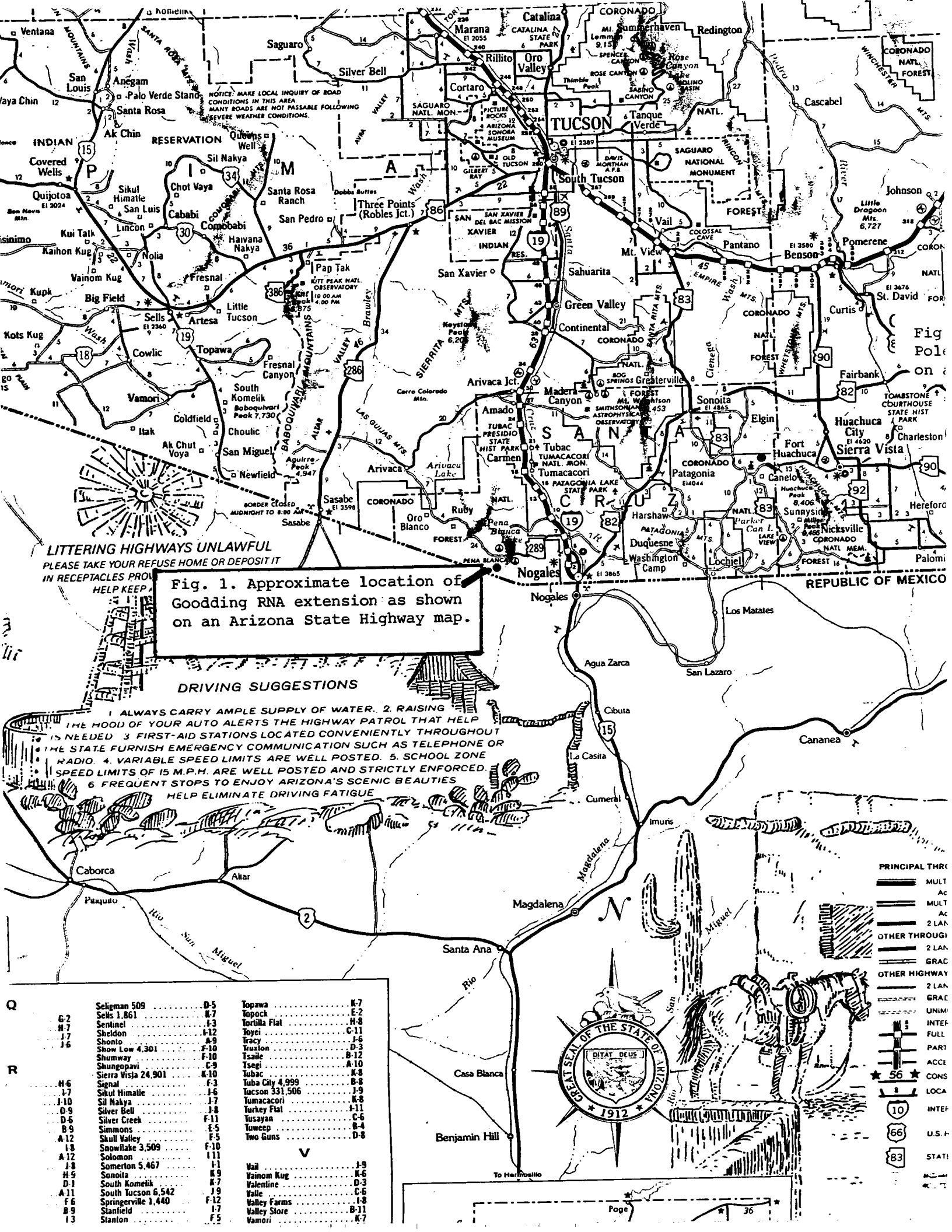
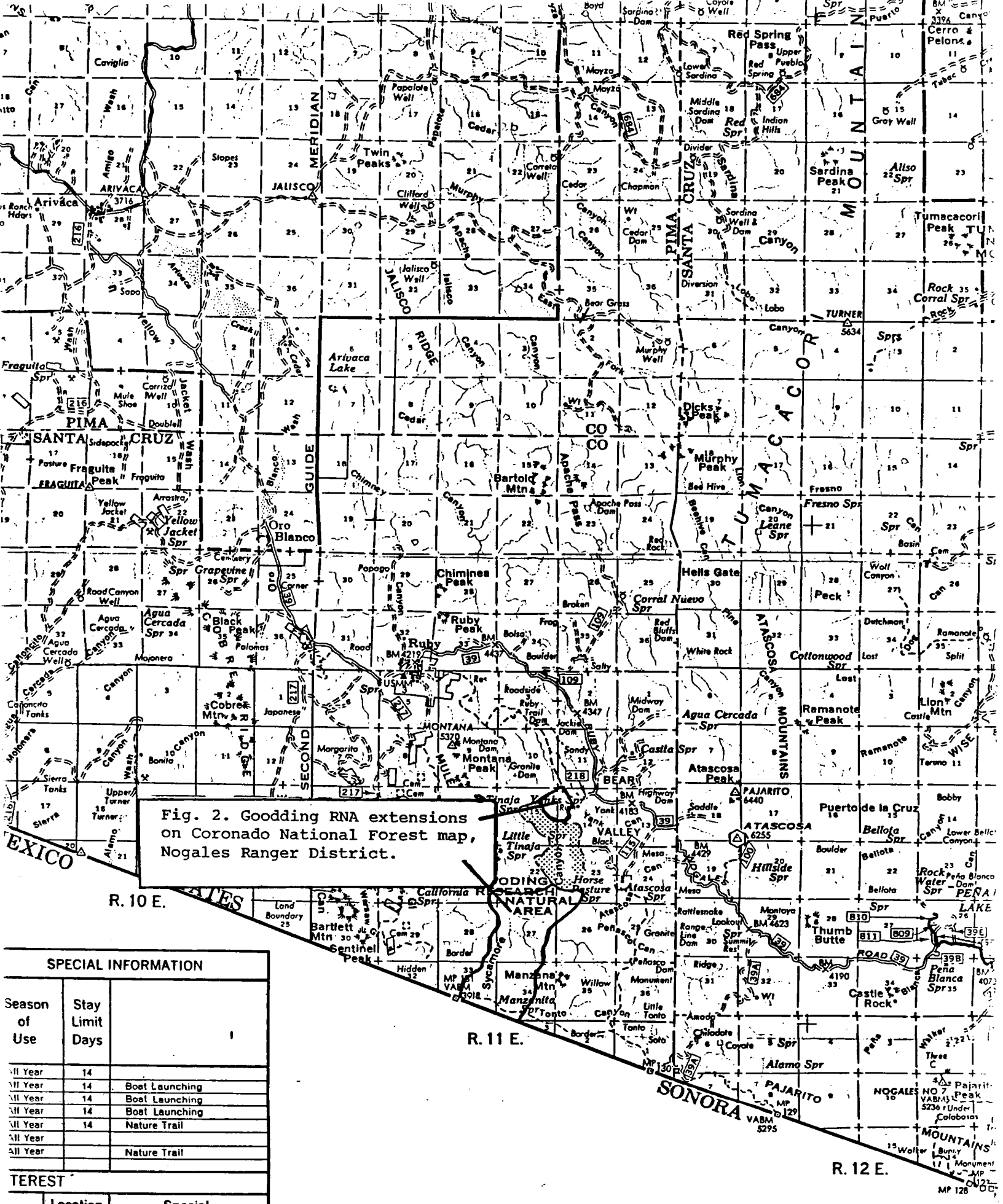


Fig. 1. Approximate location of Goodding RNA extension as shown on an Arizona State Highway map.
LITTERING HIGHWAYS UNLAWFUL
PLEASE TAKE YOUR REFUSE HOME OR DEPOSIT IT IN RECEPTACLES PROVIDED
HELP KEEP ARIZONA BEAUTIFUL
DRIVING SUGGESTIONS
1 ALWAYS CARRY AMPLE SUPPLY OF WATER. 2. RAISING THE HOOD OF YOUR AUTO ALERTS THE HIGHWAY PATROL THAT HELP IS NEEDED. 3 FIRST-AID STATIONS LOCATED CONVENIENTLY THROUGHOUT THE STATE FURNISH EMERGENCY COMMUNICATION SUCH AS TELEPHONE OR RADIO. 4. VARIABLE SPEED LIMITS ARE WELL POSTED. 5. SCHOOL ZONE SPEED LIMITS OF 15 M.P.H. ARE WELL POSTED AND STRICTLY ENFORCED. 6 FREQUENT STOPS TO ENJOY ARIZONA'S SCENIC BEAUTIES HELP ELIMINATE DRIVING FATIGUE
NOTICE: MAKE LOCAL INQUIRY OF ROAD CONDITIONS IN THIS AREA MANY ROADS ARE NOT PASSABLE FOLLOWING SEVERE WEATHER CONDITIONS.
BORDER CLOSED MIDNIGHT TO 8:00 AM
REPUBLIC OF MEXICO
DITAT DEUS
GREAT SEAL OF THE STATE OF ARIZONA
1912
PRINCIPAL THR
OTHER THROUGH
OTHER HIGHWAY
Seligman 509 D-5
Sells 1,861 K-7
Sentinel I-3
Sheldon I-12
Shonto A-9
Show Low 4,301 F-10
Shumway F-10
Shungopavi C-9
Sierra Vista 24,901 K-10
Signal F-3
Sikul Himatle J-6
Sil Nakya J-7
Silver Bell J-8
Silver Creek F-11
Simmons E-5
Skull Valley F-5
Snowflake 3,509 F-10
Solomon I-11
Somerton 5,467 I-1
Sonoita K-9
South Komelik K-7
South Tucson 6,542 J-9
Springerville 1,440 F-12
Stanfield I-7
Stanton F-5
Topawa K-7
Topock E-2
Tortilla Flat H-8
Toyei C-11
Tracy J-6
Truxton D-3
Tsaile B-12
Tsegi A-10
Tubac K-8
Tuba City 4,999 B-8
Tucson 331,506 J-9
Tumacacori K-8
Turkey Flat I-11
Tusayan C-6
Tuweep B-4
Two Guns D-8
V
Vail J-9
Vainom Kug K-6
Valentine D-3
Valle C-6
Valley Farms I-8
Valley Store B-11
Vamori K-7



SPECIAL INFORMATION		
Season of Use	Stay Limit Days	
All Year	14	
All Year	14	Boat Launching
All Year	14	Boat Launching
All Year	14	Boat Launching
All Year	14	Nature Trail
All Year		
All Year		Nature Trail

TEREST

	Location	Special
	G 7	Historic Monument
	F 6	Campground

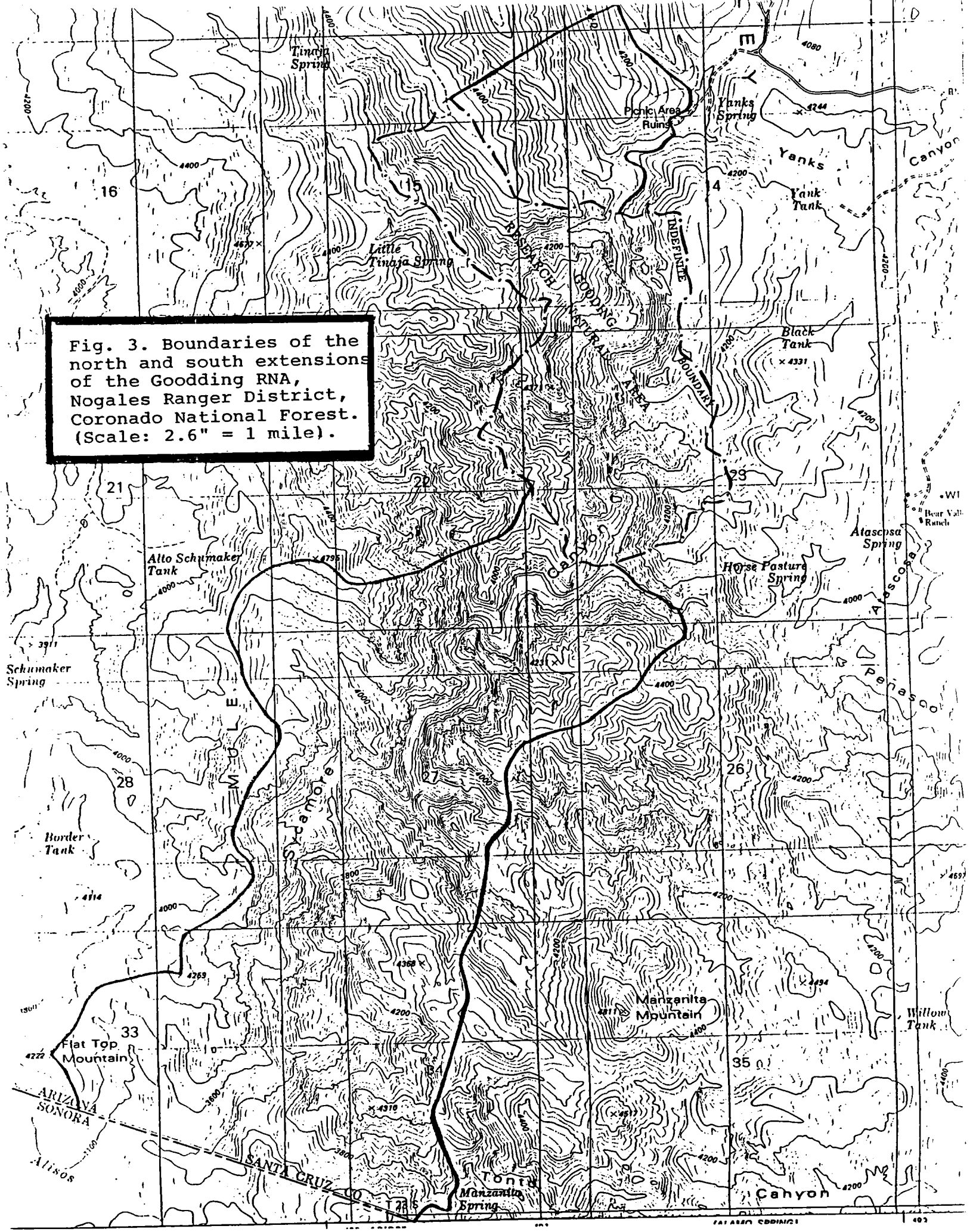


Fig. 3. Boundaries of the north and south extensions of the Goodding RNA, Nogales Ranger District, Coronado National Forest. (Scale: 2.6" = 1 mile).

extension, FS Road 218 the eastern extension and a small, ephemeral drainage the northern boundary. Elevation in the RNA is ca. 3400 feet (1040 meters) at the Mexican border. The highest elevation is along the northwestern boundary ca. 4500 feet (1373 meters). The RNA, including extensions contains 1692 acres (685 hectares).

The RNA is 56 air miles southwest of Tucson and 25 miles (via Ruby Road) northwest of Nogales, Arizona. The RNA can be reached from U.S. Highway 89 by taking the Pena Blanca Lake-Ruby turnoff, approximately 59 miles (94 km) south of Tucson. The Ruby road is paved for 10 miles (16.6 km) west of Highway 89. Exactly 10 miles west of Highway 89, there is a fork in the road. The right fork goes to Pena Blanca Lake. To reach the RNA, one must take the unpaved left fork toward Ruby and Arivaca and travel 9.5 miles (15.2 km) to Sycamore Canyon. At Sycamore Canyon, there is a well-marked left fork (F.S. Road 218) which goes to Hank n' Yank Spring and Sycamore Canyon. The road ends shortly (approximately one-quarter mile) after one takes the turnoff. A short distance away is the a ruin site. The RNA begins immediately west of this ruin and continues down the canyon all the way to the Mexican border (from Smith, 1979:87).

AREA BY COVER TYPES

Information on cover types was obtained from the Southwestern Region RNA Progress Report (USDA Forest Service, 1984), Smith (1974), Toolin et al., (1979) and field reconnaissance.

Küchler

The primary cover types, (Küchler, 1964), are Oak-Juniper Woodland, K-027 and Grama-Tobosa Shrubsteppe, K-052 (Fig. 4).

Society of American Foresters

The primary cover type is Western Live Oak, SAF 241 (Eyre, 1980). The riparian forest and the non-forested portions of the RNA are not covered by SAF cover types.

Habitat Types or Plant Associations

The predominant habitat type found in the original RNA and northern extension is the Quercus oblongifolia/Bouteloua spp. habitat type (Moir, 1986). The remaining communities are not covered by USFS habitat types.

PHYSICAL AND CLIMATIC CONDITIONS

From the Hank n' Yank ruin site, Sycamore Canyon extends for five miles to the U.S.-Mexico border. The canyon bottom and adjacent slopes form the GRNA. Steep slopes and rugged cliffs surround the canyon bottom and are dominated by rhyolites, shales and sandstones. Rugged rock formations include spires that approach 100 feet (30 meters) in height. The Sycamore Canyon stream channel provides intermittent flow the length of the RNA.

The climate of the area is semiarid with abundant rainfall only in July and August. During these two months, the nearby Ruby weather station is one of the wettest areas in the state with an average of more than nine inches (22.9 cm) of precipitation (Green and Sellers, 1964). Most of the remaining annual precipitation at Ruby, which averages 19.0 inches (48.3

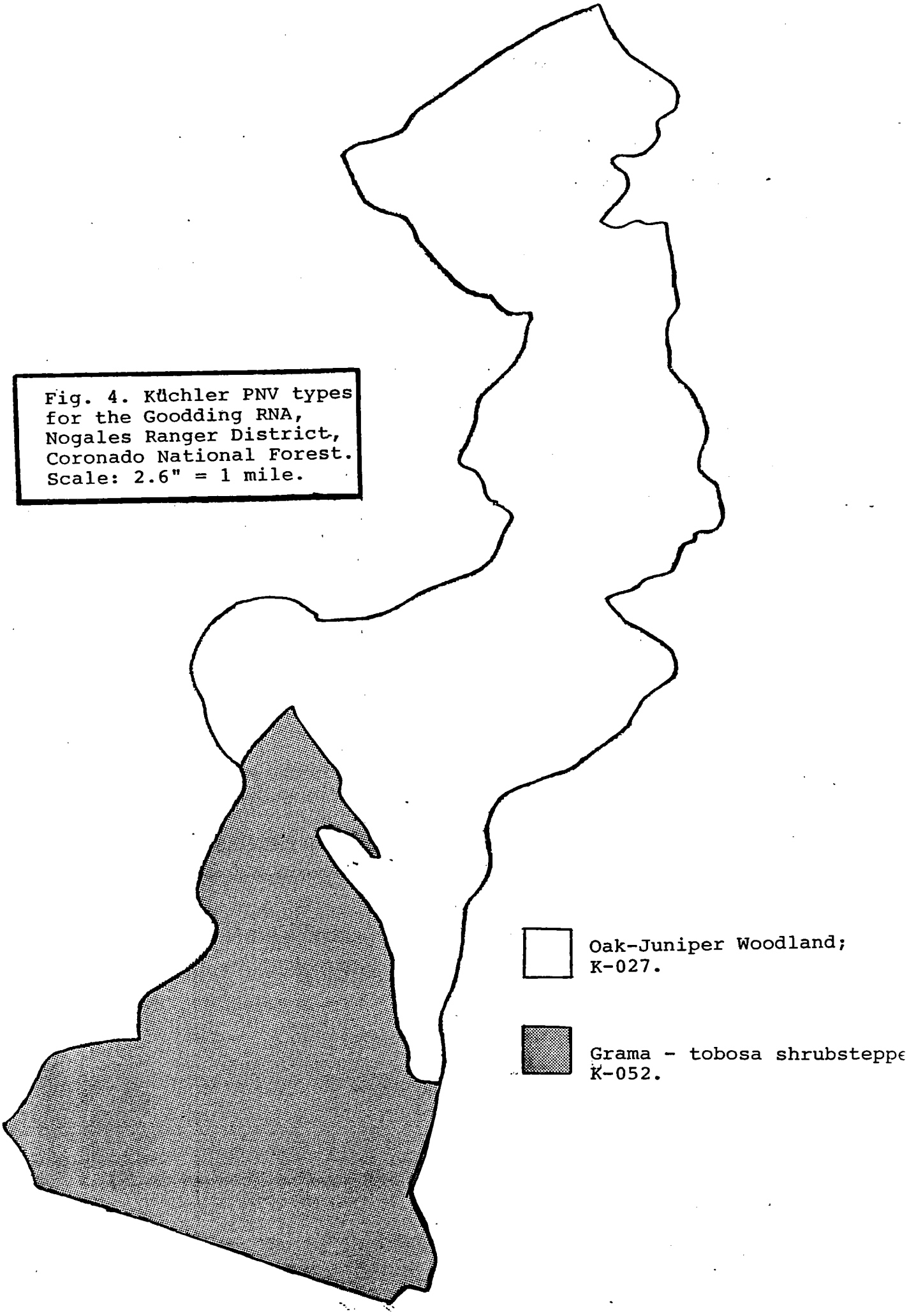


Fig. 4. Küchler PNV types for the Goodding RNA, Nogales Ranger District, Coronado National Forest. Scale: 2.6" = 1 mile.

cm), is concentrated in the winter months and results from widespread storms that move across Arizona from the Pacific Ocean. Snowfall occurs occasionally in the area but snow seldom remains on the ground for more than a day.

Temperatures at the RNA are seldom extreme in either direction. Summer highs occasionally exceed 100° F. (37.5° C) but the high frequency of afternoon showers in July, August and September helps ameliorate afternoon highs. Summer lows drop to the middle sixties at night. Afternoon highs in January and February are normally in the high fifties or low sixties and nighttime lows are more likely to be above than below freezing (climate information was reproduced from Smith, 1974:87-88).

DESCRIPTION OF VALUES

Flora

The flora of Sycamore Canyon has been listed by Toolin et al. (1979) and the fungi by Gilbertson et al. (1972). In all, 624 species of vascular plants, 20 species of lichens, 40 species of mosses and 85 species of fungi have been found so far within the confines of Sycamore Canyon. Of the known fungi, 2 species are known for the United States only from Sycamore Canyon, and 5 species are known in Arizona only from this locality. Of the known vascular plants, 10 species have been documented in the United States only here. These are:

Lobelia laxiflora (lobelia)
Dichondra repens var. sericea (dichondra)
Croton ciliatoglanduliferum (croton)
Aeschynomene villosa (joint vetch)

Lotus alamosanus (vetch)
Sida rhombifolia (axocatzin)
Passiflora bryonoides (passionflower)
Rhynchosia edulis
Henrya insularis (henrya)
Paspalum virletii (virlet paspalum)

10 species are under study by the USFWS for protection under the Endangered Species Act as threatened or endangered. These are:

Anoda abutiloides
Amsonia grandiflora
Choisya mollis
Coryphantha recurvata
Cynanchum wigginsii
Dalea tentaculoides
Desmanthus bicornutus
Dichonra repens sericea
Graptopetalum bartramii
Phaseolus supinus

Several plants are interesting in their disjunct occurrence in Sycamore Canyon. Butterfly pea (Clitoria mariana) is common along the east coast to eastern Texas yet does not occur farther west apart from the Sycamore Canyon population. A spleenwort fern (Asplenium exiguum), known from Himalaya Mountains in Asia has been found in a few locations in Sonora, Mexico and in Sycamore Canyon, the only U.S. location. The nearest known location of Whisk fern (Psilotum nudum) is 300 miles south in Mexico and 1200 miles east in Texas. Utah shadbrush (Amelanchier utahensis), a common component of the flora of Utah and Colorado skips most of Arizona after the Grand Canyon only to surface again in Sycamore Canyon.

Several cover types occur in the GRNA and extensions. The predominant vegetation is oak woodland, Quercus oblongifolia/

Bouteloua spp. habitat type as described by Moir (1986). This open canopy, oak woodland is dominated by blue oak with Emory oak (Quercus emoryi) and alligator juniper (Juniperus deppeana) present as canopy associates. Shrubs are rare and the herbaceous layer is dominated by a rich association of perennial grass species. Common grasses include several gramas (Bouteloua curtipendula, B. gracilis, B.chrondrosoides), Arizona muhly (Muhlenbergia arizonica), bullgrass (Muhlenbergia emersleyi), Plains lovegrass (Eragrostis intermedia), three awn (Aristida hamulosa), Elyoneurus barbiculmis and Trachypogon secundus. The entire northern extension includes this habitat type.

Other types, present in the original RNA and the southern extension, include: 1) oak-juniper woodland on north slopes, which is dominated by red berry juniper (Juniperus erythrocarpa) and pointleaf manzanita (Arctostaphylos pungens); 2) deciduous broadleaf riparian forest dominated by Arizona sycamore (Platanus wrightii), Bonpland's willow (Salix bonplandiana), and Fremont cottonwood (Populus fremontii); and 3) semidesert grassland dominated by a diverse set of temperate and subtropical shrubs with a herbaceous layer characterized by a rich association of perennial grasses that have been noted for the aforementioned, Quercus oblongifolia/Bouteloua spp. habitat type. This scrub - grassland type is found in the southern half of the southern extension on south-facing aspects and is difficult to classify. Floristic elements suggest that it may be best described as an ecotone between semidesert grassland and Sonoran desertscrub or

as a currently undescribed habitat type found more commonly in Sonora, Mexico.

Fauna

The fauna of Goodding Research Natural Area also exhibits noteworthy distribution patterns. A number of species with widespread distributions south of the International border have peripheral occurrences in the GRNA. Notable among these are the Coppery-tailed Trogon (Trogon elegans), the Rose-throated Becard (Platypsaris aglaiae), and the Five-striped Sparrow (Aimophila quinquestriata). The Coppery-tailed Trogon is a Central American species which occurs in the Canyon and several other areas in southern Arizona. The Rose-throated Becard is common in Mexico but is found only in southern Arizona and the lower Rio Grande valley in the United States. The Five-striped Sparrow, which is also widely distributed in Mexico, nests in Sycamore Canyon and several other sites near the border in southeast Arizona. These sites represent its northernmost occurrences. Other Mexican species, which occur in the Canyon, include the Vine Snake (Oxybelis aeneus), Mexican Hooknosed Snake (Gyalopion quadrangularis), the Tarahumara Frog (Rana tarahumarae), the Barking Frog (Hylactophryne augusti), and the Mountain Skink (Eumeces callicephalus). The Sonoran Chub (Gila ditaena), the only fish found in the Canyon, occurs in the United States only in GRNA. This latter species is listed as threatened by the USFWS and the entire Sycamore Canyon streamcourse has been identified as critical habitat.

Reptiles with montane distributions found in the Canyon include the Short-horned Horn Lizard (Phrynosoma douglassi) and the Arizona Mountain Kingsnake (Lampropeltis pyromelana) (Toolin, 1979; Mohlenbrock, 1984).

A list of potential vertebrates was derived from Smith (1974) and the Arizona Nongame Data Management System (see Appendix).

Geology

The entire area is underlain by Tertiary age volcanics: rhyolite, andesite and basalt (Arizona Highway Department, 1966).

Soils

The majority of the area is occupied by soils classified as Lithic Ustorthents; loamy-skeletal, mixed and thermic. These are shallow somewhat excessively drained soils of low fertility (USDA Forest Service, 1986c).

Cultural

No archaeological surveys have been conducted within the area although one prehistoric site (ARO-05-02-06). containing pictographs and a rockshelter has been recorded. Additional prehistoric sites probably occur in the Goodding area.

IMPACTS AND POSSIBLE CONFLICTS

Mineral Resources

No known mineral resources exist in this area. There are, however, mining claims adjacent to and surrounding the area. Possibility does exist for trespass prospector.

Grazing

No impacts or conflicts exist since this area has been closed to grazing. Water gaps at the upper and lower end of Goodding do wash out periodically as does Jacks Canyon in the southeast portion of the RNA. However, trespass use would be low due to inaccessibility of the area.

Timber

This area consists primarily of oak, willow, sycamore, cottonwood, etc. The potential for firewood harvest in this area is very low due to accessibility. Campers and recreationists do gather firewood for overnight stays at the upper end of the area around Hank and Yank Spring.

Watershed

The area is contained in the Rio Altar watershed which drains into Mexico.

Recreation Values

The area is very popular worldwide and of interest to botanists for its diverse flora. It is also popular with picnickers and campers. There is a potential for conflict between this use and RNA objectives, which should be monitored to insure natural and research values are not degraded.

Wildlife and Plant Values

The area contains some of the most unique and diverse flora and fauna in the United States. The area contains habitat for the Sonoran Chub, a T&E species, along with numerous bird species

that migrate from Mexico during the winter months. Several T&E plant species also occur in the area (see Flora above). Two additional Coronado National Forest sensitive plants which occur within the RNA are Goodding's ash (Fraxinus gooddingii) and fleabane (Erigeron eriophyllus).

Wilderness, Wild and Scenic River, National Recreation Area Values

The original GRNA (excluding 7 acres) and the entire southern extension occur within the boundaries of the Pajarito wilderness. 47 acres (18.8 hectares) of the northern extension occur in the wilderness area.

Transportation Plans

This RNA is accessed by a spur originating from a Forest Service System road. There are approximately 0.5 mile of road within the RNA itself. There are no transportation plans which would adversely affect the RNA.

MANAGEMENT PLANNING

Land Management Plan

The GRNA extensions are recommended in the Coronado National Forest Plan Management Area 8A (see Appendix). Management emphasis is to manage for wilderness values and uses while providing for opportunities for nondisruptive research and education. Use restrictions will be imposed as necessary to keep the area in an unmodified or natural condition.

Vegetation Management

There will be no harvest of forest products including fuelwood. Unplanned ignitions will receive appropriate suppression action. Unplanned ignitions outside the area which threaten the area will be suppressed. All livestock use is excluded.

ADMINISTRATIVE RECORDS AND PROTECTION

Administration and protection of the Goodding RNA will be the responsibility of the Coronado National Forest. The District Ranger, Nogales Ranger District, Nogales, AZ 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 request to conduct research in the area should 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 and the RNA research coordinator. 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 GRNA will be maintained in the following offices:

Regional Forester, Southwestern Region, Albuquerque, NM

Rocky Mountain Station, Fort Collins, CO

Coronado National Forest, Tucson, AZ

District Ranger, Nogales Ranger District, Nogales, AZ

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APPENDIX

These pages are reproduced from Smith, (1974) and Coronado National Forest Plan.

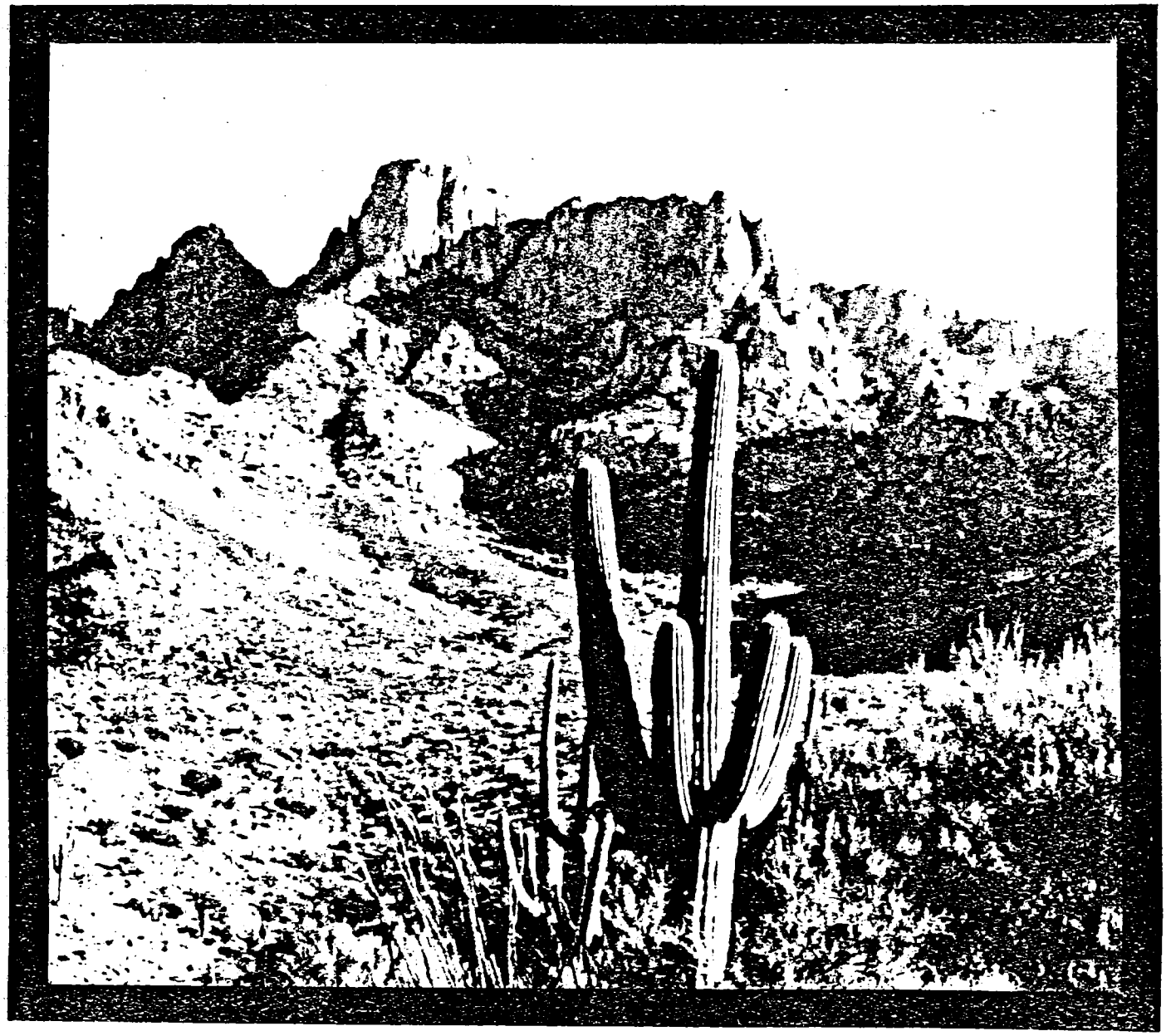
United States
Department of
Agriculture

**Forest
Service**

Southwestern
Region

July 1986

Coronado National Forest Plan



MANAGEMENT AREA 8

Management Emphasis and Intensity: Manage to provide opportunities for nondisruptive research and education. Use restrictions will be imposed as necessary to keep areas in their climax state. There will be no harvest of forest products including fuelwood.

Management Area Description: Includes those lands that have been determined to be suitable for designation as research natural areas. Includes the following areas:

Existing RNA	Acres
Butterfly	1000
Goudy Canyon*	370
Elgin	290
Goodding (North End)*	7

New RNA Proposal	Acres
Canelo	350
Goodding (North Extension)*	153

Other	Acres
Research Ranch	1635

* Remainder in Wilderness (MA8A)

The Research Ranch will not be designated as an official research natural area but will be managed under a memorandum of understanding to meet similar objectives except some vegetative manipulation will be allowed for research projects.

Capability Area Types: 6P, 6P/H, 6H/M, 6M, 9CH/M, and 11AR.
Total acres = 3805.

Specific Standards and Guidelines

Timber Suitability: All Acres Unsuitable.

Management Practices	Activities	Standards and Guidelines
Dispersed Recreation O&M (DU 1)	A14, A15 L23	1. Maintain 50% of trails at level 2 and 50% at level 3. See Appendix E for a definition of levels. 2. Motor vehicles are not permitted in research natural areas. Within the Research Ranch, use of motorized vehicles is permitted only on designated roads and trails. Some trails may be closed to use by motor vehicles for safety reasons, to eliminate conflicting uses or to further protect resources. 3. Attempt to maintain semiprimitive nonmotorized opportunities that exist within the Research Ranch. If any existing roads are determined to be unneeded, close them to create more opportunities for primitive or semiprimitive nonmotorized experience. 4. Manage dispersed use at less than standard.
Visual Resource Management (DU 2)	A03	Manage the following acres at the indicated Visual Quality Objectives: 2,170 Acres Retention 57% (RNAs) 1,635 Acres Partial Retention 43% (Research Ranch)
Wildlife & Fish O&M (DU 10)	C01, C02 C12	Specific standards and guidelines for management of wildlife are shown in the Forest-wide prescription for activities appropriate to this Management Area. They are intended to meet the following objectives:

MANAGEMENT AREA 8A

Management Emphasis and Intensity: Manage for wilderness values and uses while providing opportunities for nondisruptive research and education. Use restrictions will be imposed as necessary to keep areas in their climax state. There will be no harvest of forest products including fuelwood.

Management Area Description: Includes those lands that have been determined to be suitable for both wilderness designation and designation as research natural areas. Includes the following areas:

Existing RNA	Acres
Pole Bridge	460
Santa Catalina (reduced)	890
Goodding*	538
Goudy Canyon*	190

New RNA Proposal		Acres
Goodding extension:	South	1470
	North*	47
Pole Bridge extension		90

* Remainder is outside Wilderness (MA8)

The Santa Catalina RNA will be reduced from 4131 acres to 890 acres. This will give a more manageable size while maintaining viable populations of targeted species.

Pole Bridge RNA is enlarged to include a more representative example of Chihuahua pine. The Goodding RNA is enlarged to include additional examples of Southwestern vegetative types as well as rare and threatened or endangered species.

Capability Area Types: 6H/M, 6M, 9AH/M, and 11AR.
Total acres = 3685

Specific Management Prescription

Timber Suitability: All Acres Unsuitable

Management Practices	Activities	Standards and Guidelines
Visual Resource Management (DU 2)	AO3	Manage the following acres at the indicated Visual Quality Objectives: 3,685 Acres Preservation 100%
Wilderness Recreation O&M (DU 8)	BO2, BO3	1. Maintain trails to level 1 and level 3. See Appendix E for a definition of levels. 2. Use of motorized vehicles is prohibited except as approved for emergency or other special needs. 3. Manage wilderness use at less than standard. 4. Maintain existing ROS class composition.
Wildlife & Fish O&M (DU 10)	CO1, CO2 C12	Specific standards and guidelines for management of wildlife are shown in the Forest-wide prescription for activities appropriate to this Management Area. They are intended to meet the following objectives: 1. Maintain or improve occupied habitat for federally and state listed animals. 2. Maintain or improve current populations of endangered and threatened plants.

MANAGEMENT AREA 8A (Continued)

Management Practices	Activities	Standards and Guidelines
T&E Plant Habitat Improvement (DU 12)	C03, C04 C05	Nonstructural habitat improvement projects will be based on guidelines in the Forest-wide prescription. They are intended to meet the following objective:
Fish Habitat Improvement (DU 13) Game Habitat Improvement (DU 14) Nongame Habitat Improvement		1. Delist threatened and endangered species following guidelines of approved recovery plans and memorandums of understanding.
Range Management O&M (DU 16)	D02	1. Manage rangeland at level A (no livestock). Management excludes livestock grazing to protect other values or eliminate conflicts with other uses.
Watershed Maintenance & Improvement (DU 33, 34)	F03, F05 K04	1. Watershed treatment is a low priority in this management area. If treatment is appropriate, activity selection criteria is described in Appendix D. 2. Monitor these areas for watershed condition trends as relic areas.
Minerals Management (DU 36)	G07	1. There will be no removal of mineral materials. Mineral withdrawals will be unnecessary because the segregative effect of wilderness designation exceeds that of a withdrawal.
Fire Management (DU 56)	P08, P09	1. The management area is in fire suppression zones one and two based on objectives for resource protection. See Section 5 for definition of zones. 2. Use prescribed fire to reduce risk and to permit lightning to more nearly play its natural role.
Insect & Disease Management		1. Outbreaks of insects or disease will not be controlled, except where there is a clear and imminent danger to timber or other values outside the research natural area.

POTENTIAL VERTEBRATES OF THE GOODDING RNA

COMMON NAME	LATIN NAME
Amphibians	
Frog,Barking	Hylactophryne augusti
Frog, Leopard	Rana pipiens
Frog, Tarahumara	Rana tarahumarae
Toad, Red-spotted	Bufo punctatus
Toad, Southwestern	Bufo microscaphus
Toad, Woodland Narrow-mouthed	Gastrophryne carolinensis
Treefrog,Canyon	Hyla arenicolor
Reptiles	
Coachwhip	Masticophis flagellum
Lizard, Collared	Crotaphytus collaris
Lizard, Madrean Earless	Holbrookia elegans
Lizard, Short-horned Horn	Phyrnosoma douglassi
Lizard, Side-blotched	Uta stansburiana
Lizard, Sonora Spiny	Sceloporus clarki
Lizard,Tree	Urosaurus ornatus
Rattlesnake, Black-tailed Diamondback	Crotalus molossus
Rattlesnake, Western	Crotalus atrox
Skink, Mountain	Eumeces callicephalus
Snake, Arizona Coral	Micruroides euryxanthus
Snake, Arizona Moutain King	Lampropeltis pyromelana
Snake, Black-necked Garter	Thamnophis cyrtopsis
Snake, Checkered Garter	Thamnophis marcianus
Snake, Gopher	Pituophis melanoleucus
Snake, Mexican Hooknosed	Gyalopion quadrangularis
Snake, Night	Hypsiglena torquata
Snake, Sonora Hook-nosed	Ficimia quadrangularis
Snake, Southwestern Lyre	Trimorphodon lyrophanes
Snake, Vine	Oxybelis aneus
Snake, Vine	Oxybelis microphthalmus
Turtle, Sonoran Mud	Kinosternon sonoriense
Whipsnake, Sonora	Masticophis bilineatus
Whiptail, Sonora	Cnemidophorus burti
Whiptail, Western	Cnemidophorus tigris
Birds	
Becard, Rose-throated	Platypsaris aglaiae
Bluebird, Mountain	Sialia currucoides
Bluebird, Eastern	Sialia sialis
Bunting, Lazuli	Passerina amoena
Bushtit, Common	Psaltriparus minimus
Cardinal	Cardinalis cardinalis
Chat, Yellow-breasted	Icteria virens
Cowbird, Bronzed	Tangavius aeneus
Cowbird, Brown-headed	Molothrus ater

Cuckoo, Yellow-billed	Coccyzus americanus
Dove, Ground	Columbina passerina
Dove, White-winged	Zenaida asiatica
Dove, Mourning	Zenaida maeroura
Eagle, Golden	Aquila chrysaetos
Finch, House	Carpodacus mexicanus
Flicker, Red-shafted	Colaptes auratus
Flycatcher, Dusky	Empidonax oberholseri
Flycatcher, Ash-throated	Myiarchus cinerascens
Flycatcher, Couse's	Contopus pertinax
Flycatcher, Olivaceous	Myiarchus tuberculifer
Flycatcher, Gray	Empidonax wrightii
Flycatcher, Beardless	Camptostoma imberbe
Flycatcher, Wied's Crested	Myiarchus tyrannulus
Flycatcher, Olive-sided	Nuttallornis borealis
Flycatcher, Vermillion	Pyrocephalus rubinus
Flycatcher, Western	Empidonax dificilis
Gnatcatcher, Blue-gray	Polioptila caerulea
Goldfinch, Lesser	Spinus psaltria
Grosbeak, Black-headed	Pheucticus melanocephalus
Grosbeak, Blue	Guiraca caerulea
Hawk, Cooper's	Accipiter cooperii
Hawk, Marsh	Circus cyaneus
Hawk, Zone-tailed	Buteo albonotatus
Hawk, Sharp-shinned	Accipiter striatus
Hawk, Red-tailed	Buteo jamaicensis
Hawk, Sparrow	Falco sparvenus
Hummingbird, Anna's	Calypte anna
Hummingbird, Costa's	Calypte costae
Hummingbird, Lucifer	Calothorax lucifer
Hummingbird, Broad-tailed	Cynanthus latirostris
Hummingbird, Black-chinned	Archilochus alexandri
Jay, Pinon	Gymnorhinus cyanocephalus
Jay, Steller's	Cyanocitta stelleri
Jay, Scrub	Aphelocoma coerulescens
Jay, Mexican	Aphelocoma ultramarina
Junco, Gray-headed	Junco caniceps
Junco, Oregon	Junco hyemalis
Kingbird, Cassin's	Tyrannus vociferans
Kingfish, Western	Tyrannus verticalis
Kingfisher, Green	Chloroceryle americana
Kinglet, Ruby-crowned	Regulus calendula
Meadowlark,, Western	Sturnella neglecta
Mockingbird	Mimus polyglottos
Nighthawk, Common	Chordeiles minor
Nuthatch, White-breasted	Sitta carolinensis
Oriole, Scott's	Icterus parisorum
Oriole, Hooded	Icterus cucullatus
Oriole, Bullock's	Icterus galbula
Owl, Long-eared	Asio otus
Owl, Elf	Micrathene whitnevi
Owl, Screech	Otus asio
Owl, Great Horned	Bubo virginianus
Pewee, Western Wood	Contopus sordidulus

Phainopepla	Phainopepla nitens
Phoebe, Black	Sayornis nigricans
Phoebe, Say's	Sayornis saya
Pigeon, Band-tailed	Columba fasciata
Poor-will	Phalaenoptilus nuttallii
Pyrrhuloxia	Pyrrhuloxia sinuata
Quail, Harlequin	Cyrtonyx montezumae
Raven, Common	Corvus corax
Raven, White-necked	Corvus cryptoleucus
Redstart, Painted	Setophaga picta
Roadrunner	Geococcyx californianus
Robin, American	Turdus migratorius
Sapsucker, Yellow-bellied	Sphyrapicus
Sapsucker,Yellow-bellied	Sphyrapicus varius
Shrike, Loggerhead	Lanius ludovicianus
Siskin, Pine	Spinus pinus
Solitaire, Townsend's	Myadestes townsendi
Sparrow, Vesper	Poocetes gramineus
Sparrow, Lark	Chondestes grammacus
Sparrow, Lincoln's	Melospiza lincolnii
Sparrow, Chipping	Spizella passerina
Sparrow, Black-chinned	Spizella atrogularis
Sparrow, Black-throated	Amphispiza bilineata
Sparrow, Rufous-crowned	Aimophila ruficeps
Swallow, Tree	Iridoprocne bicolor
Swallow, Violet-green	Tachycineta thalassina
Swallow, Rough-winged	Stelgidopteryx ruficollis
Swift, White-throated	Aeronautes saxatalis
Tanager, Summer	Piranga rubra
Tanager, Hepatic	Piranga flava
Tanager, Western	Piranga ludoviciana
Thrasher, Crissal	Toxostoma dorsale
Thrasher, Curve-billed	Toxostoma curvirostre
Thrush, Swainson's	Catharus ustulatus
Thrush, Hermit	Catharus guttatus
Titmouse, Bridled	Parus wollweberi
Towhee, Brown	Pipilo fuscus
Towhee, Rufous-sided	Pipilo erythrophthalmus
Towhee, Green-tailed	Chlorua chlorua
Verdin	Auriparus flaviceps
Vireo, Warbling	Vireo gilvus
Vireo, Solitary	Vireo solitarius
Vireo, Bell's	Vireo bellii
Vireo, Hutton's	Vireo huttoni
Vulture, Turkey	Cathartes aura
Warbler, Wilson's	Wilsonia pusilla
Warbler, MacGillivray's	Oporonis tolmiei
Warbler, Grace's	Dendroica graciae
Warbler, Hermit	Dendroica occidentalis
Warbler, Townsend's	Dendroica townsendi
Warbler, Black-throated Gray	Dendroica nigrescens
Warbler, Audubon's	Dendroica coronata
Warbler, Yellow	Dendroica petechia
Warbler, Lucy's	Vermivora luciae

Warbler, Virginia's	Vermivora virginiae
Warbler, Nashville	Vermivora ruficapilla
Warbler, Orange-crowned	Vermivora celata
Warbler, Black and White	Mniotilta varia
Waterthrush, Louisiana	Seiurus motacilla
Waterthrush, Northern	Seiurus novaboracensis
Woodpecker, Gila	Centurus uropygialis
Woodpecker, Arizona	Dendrocopos arizonae
Woodpecker, Ladder-backed	Dendrocopos scalaris
Woodpecker, Lewis's	Asyndesmus lewis
Woodpecker, Acron	Melanerpes formicivorus
Wren, Rock	Salpinctes obsoletus
Wren, Canyon	Catherpes mexicanus
Wren, Cactus	Campylorhynchus brunneicapillus
Wren, Bewick's	Thryomanes bewickii
Wren, House	Troglodytes aedon
Yellowthroat	Geothlypis trichas

Mammals

Bat, Mexican Long-tongued	Choeronycteris mexicana
Bat, Peters' Leaf-chinned	Moormops megalophylla
Bat, Red	Lasiurus borealis
Bat, Hoary Bat	Lasiurus cinereus
Bat, Big Brown	Eptesicus fuscus
Bat, Townsend's Big-eared	Plecotus townsendii
Bat, Long-nosed	Leptonycteris nivalis
Bat, Pallid	Antrozous pallidus
Bat, Brazilian Free-tailed	Taderida brasiliensis
Bobcat	Lynx rufus
Coati	Nasua narica
Cottontail, Desert	Sylvilagus auduboni
Coyote	Canis latrans
Deer, Black-tailed	Odocoileus hemionus
Deer, White-tailed	Odocoileus virginianus
Fox, Gray	Urocyon cinereoargenteus
Gopher, Southern Pocket	Thomomys umbrinus
Jaguar	Felis onca
Jaquarundi	Felis yagouaroundi
Javelina	Tayassu tajacu
Lion, Mountain	Felis concolor
Mouse, Brush	Peromyscus boylei
Mouse, White-footed	Peromyscus leucopus
Mouse, Deer	Peromyscus maniculatus
Mouse, Cactus	Peromyscus eremicus
Mouse, Fulvous Harvest	Reithrodontomys fulvescens
Mouse, Western Harvest	Reithrodontomys megalotis
Mouse, Rock Pocket	Perognathus intermedius
Mouse, Desert Pocket	Perognathus penicillatus
Mouse,Southern Grasshopper	Onychomys torridus
Myotis, California	Myotis californicus
Myotis, Long-eared	Myotis evotis

Myotis, Cave	Myotis velifer
Myotis, Small-footed	Myotis subulatus
Pipistrelle, Western	Pipistrellus hespersus
Porcupine	Erethizon dorsatum
Rabbit, Black-tailed Jack	Lepus californicus
Raccoon	Procyon lotor
Rat, Hispid Cotton	Sigmodon hispidus
Rat, Merriam's Kangaroo	Dipodomys merriami
Rat, White-throated Wood	Neotoma albigula
Ringtail	Bassariscus astutus
Shrew, Desert	Notiosorex crawfordi
Skunk, Hog-nosed	Conopatus mesoleucus
Skunk, Hooded	Mephitis macroura
Skunk, Striped	Mephitis mephitis
Skunk, Spotted	Spilogale putorius
Squirrel, Arizona Gray	Sciurus arizonensis
Squirrel, Rock	Citellus variegatus

POLE BRIDGE CANYON
RESEARCH NATURAL AREA

Commencing at the NE section corner of section 24, T.18S., R.29E.

Thence southeasterly approximately 1250 feet to a peak with a shown elevation of 6535' (CHIRICAHUA PEAK, AZ Provisional Edition 1986, 7.5 min. quad) which is the POINT OF BEGINNING. Said point also being on the boundary of the Chiricahua Wilderness (1984).

Thence southeasterly along said wilderness boundary, approximately 2250 feet to the north end of a northeast bearing ridge, with a shown elevation of 7064 feet.

Thence southwesterly and southeasterly along same ridge approximately 5250 feet to a peak with a contour elevation of 8600 feet.

Thence southwesterly approximately 1100 feet, along crest, to a peak with a shown elevation of 8622 feet.

Thence west approximately 600 feet to the intersection with trail 267.

Thence northwesterly approximately 2200 along said trail to the junction with trail 264.

Thence westerly approximately 600 feet to a peak with a contour elevation of 8200 feet.

Thence northerly approximately 4800 feet along crest of divide to a knoll with a contour elevation of 7800 feet.

Thence northeasterly approximately 2000 feet, along ridge, to a point on crest with a contour elevation of 7280 feet.

Thence northeasterly approximately 1800 feet to the POINT OF BEGINNING.

Environmental Assessment
Goodding Research Natural Area (Extension)

Coronado National Forest
Nogales Ranger District
Santa Cruz County, Arizona

Proposed Action

The proposed action is to extend the existing Goodding RNA. The extension was identified as a "proposed" Research Natural Area (RNA) in the Land and Resource Management Plan (Forest Plan) for the Coronado National Forest. It will be managed according to the direction provided in the Forest Plan (Management Areas 8 and 8A). The proposed action, formal designation of the extension as an RNA by the Chief of the Forest Service, will amend the Forest Plan.

Purpose and Need for Action

The purpose of extending the Goodding RNA is to contribute to a series of RNA's designated to "illustrate adequately or typify for research or education purposes, the important forest and range types in each forest region, as well as other plant communities that have special or unique characteristics of scientific interest and importance" (36 CFR 251.23). Goodding RNA was established in 1970 to protect an area that has a very high level of biological diversity. An evaluation by the Regional RNA Committee, pursuant to direction in Forest Service Manual (FSM) 4063.04b, identified that establishment of the RNA was needed to protect the rare plants and animals that occur in this unique canyon. Extending the Goodding RNA provides long-term protection for these species, including Dalea tentaculoides, a USFWS Category 1 plant that occurs only in this canyon, as well as other species such as Phaseolus supinus also Category 1, and the threatened Sonoran chub, Gilia ditaenia.

The extension of the Goodding RNA was identified in the Forest Plan as a "proposed" RNA based on the location of several rare plant and animal populations that are found only in Goodding RNA/Sycamore Canyon. Comments received from interested and affected members of the public supported extending the existing RNA. Site conditions and public concerns have been reviewed; no important changes have occurred.

Conditions and environmental effects of designation are the same as described in the EIS for the Forest Plan. Site specific conditions and effects are as follows:

-The majority of the Goodding RNA is within the Pajarito Wilderness and grazing has been eliminated in the area since 1986. There will be no change to this mangement.

-The Goodding Research Natural Area is in the process of being withdrawn from mineral entry.

-Recreation use is light and limited to existing trails.

Designation of alternate RNA's for protection of this type was considered during Forest Plan development. The extension of the Goodding/Sycamore Canyon RNA was determined at that time to provide the most appropriate site for inclusion in the national network for protection of the biological diversity that occurs in the area.

Alternatives and Environmental Consequences

Alternative A, Proposed Action

Alternative A would extend the Goodding RNA, comprising 1670 acres (676 hectares). This alternative will provide long-term protection for the area. Management of the area will limit recreation use to non-motorized dispersed recreation at a low intensity and reduced service level, and no harvest of forest products (including fuelwood) will be allowed. Wildfires outside the area that endanger the area will be extinguished in an appropriate manner, as will person-caused fires within the area. Unplanned ignitions within the area will receive appropriate suppression action. Use restrictions will be imposed as necessary to keep areas in their natural or unmodified condition (Forest Plan). Goodding RNA is in the process of being withdrawn from mineral entry.

The environmental consequences of Alternative A are described in the EIS for the Coronado Forest Plan. There are no adverse or irreversible environmental effects. Irretrievable effects result from resource outputs either reduced or lost as a result of special area designation. There are no significant cumulative effects of establishing the RNA.

Alternative B, No Action

This alternative continues management according to direction in the Forest Plan for the "proposed" extension. Only short-term protection of the area, dependent on the life of the Forest Plan, will be provided. Management of the area will be the same as in Alternative A. Management emphasis is to provide opportunities for nondisruptive research and education. Use restrictions will be imposed as necessary to keep the area in an unmodified or natural condition.

The environmental consequences of Alternative B, the "No Action" alternative are as described in the EIS for the Coronado Forest Plan. No adverse or irreversible environmental effects are anticipated. Irretrievable effects result from resource outputs either reduced or lost as a result of special area designation.

Agencies and Persons Consulted

In the process of updating information to determine whether or not conditions had changed since adoption of the Forest Plan, several groups and individuals who may have additional information regarding the extension of Goodding RNA were contacted. Representatives from the national office of The Nature Conservancy, the Arizona Chapter of The Nature Conservancy, Arizona Heritage Program, Arizona Game and Fish Department, and Arizona Cattle Growers groups. Documentation of the contacts made and summaries of the comments are attached to this Environmental Assessment.

Supplemental Public Contacts

During the months of August-September 1993, the following groups, agencies, and individuals were contacted, by phone, regarding the establishment of the Canelo Research Natural Area. No negative comments regarding the establishment of this RNA were received. Phone contacts were made by Emilia Parra, Forest Botanist on the Coronado National Forest.

Arizona Chapter of Nature Conservancy - Andy Laurenzi, Peter Warren
Tucson Audubon Society - Doug Koppinger
Arizona State Parks, Natural Areas Association Committee - Jean Tripiano

TITLE PAGE

Establishment Record for Goodding
Research Natural Area within Coronado
National Forest, Santa Cruz County, Arizona.

SIGNATURE PAGE

for

RESEARCH NATURAL AREA ESTABLISHMENT RECORD

Goodding Research Natural Area and Extensions

Coronado National Forest

Santa Cruz, Arizona

Prepared by Andrew W. Laurenzi Date 11/3/87
Mark H. Cochran, The Arizona Nature Conservancy
Andrew W. Laurenzi, The Arizona Nature Conservancy

Recommended by Jerry Lockwood Date 5/12/88
Jerry Lockwood, District Ranger,
Nogales Ranger District

Recommended by R.B. Tippeconnic Date 5.16.88
R.B. Tippeconnic, Forest Supervisor,
Coronado National Forest

Recommended by John W Russell Date 5-26-88
John W. Russell, Chairperson,
Southwestern Research Natural
Area Committee

Recommended by David Gibbs Date 6/16/88
for Sotero Muniz, Regional Forester,
Southwestern Region

Recommended by Charles M. Loveless Date Sept. 28, 1988
Charles M. Loveless, Station Director,
Rocky Mountain Forest and Range
Experiment Station

A. INTRODUCTION

The original Goodding Research Natural Area (GRNA) and two boundary extensions comprise 1670 acres (676 hectares) in the Nogales Ranger District of the Coronado National Forest in Santa Cruz county, Arizona, on reserved public domain, National Forest land. The two extensions are contiguous with the established GRNA and contain the remainder of Sycamore Canyon as it flows to the border with Mexico and a small area of oak woodland to the northwest of the original RNA boundary. The southern extension and part of the northern extension and established RNA lie within the boundaries of the Pajarito Wilderness which was designated by Congress in 1984. Please note that for the purposes of this Establishment Record, Sycamore Canyon refers to the entire GRNA including the extensions. This record describes the entire area with specific reference to the extensions.

(1) Land Management Planning

The Southwest RNA Progress Report (USDA Forest Service, 1983) and the Coronado National Forest Plan and Environmental Impact Statement (USDA Forest Service, 1986a/1986b) include the southern GRNA extension. The environmental analysis conducted as part of the planning process supports the recommendation to establish this extension to the GRNA.

The northern extension was recommended by The Arizona Nature Conservancy during and after the comment period on the Coronado National Forest Plan. The Coronado National Forest Plan was amended on October 1987 to include this northern extension (USDA Forest Service, 1987a).

B. OBJECTIVES

The primary objective in augmenting the Goodding RNA is the protection of significant botanical and zoological genetic diversity.

C. JUSTIFICATION FOR ESTABLISHMENT OF AREA

The extensions essentially fulfill the argument originally put forth by Goodding (1961) to establish Sycamore Canyon as a natural area due to the area's significant botanical diversity. Data provided by the Heritage Data Management System (HDMS) of the Arizona Game and Fish Department, a centralized, ecological inventory of the state's rarest plants and animals, identified areas adjacent to the original RNA boundary which included populations of rare species for which the area is noted. Both the Southwest RNA Progress Report (USDA Forest Service, 1984) and the Coronado National Forest Plan and Amendment No. 3 (1986/1987a) identify the need to extend the GRNA to include these populations of rare species.

D. PRINCIPAL DISTINGUISHING FEATURES

Sycamore Canyon is one of the most biologically diverse sites in the United States. More than 600 vascular plant species and 72 species of fungi have been documented from the area (Toolin et al., 1979; Gilbertson et al., 1972). Among these are more than 30 species of special interest because of their limited distribution globally, in the United States, and in Arizona. Eleven plants currently under study by the USFWS for consideration as Federally threatened or endangered plant species, (USDI Fish and Wildlife Service, 1990), reside in the GRNA.

The canyon also includes more than 16 Arizona threatened vertebrate species: 7 birds, 9 reptiles and amphibians and 1 fish. The area has been identified as critical habitat for the Sonoran chub (Gila ditaenia), a species which is listed threatened by the United States Fish & Wildlife Service. Tarahumara frog (Rana tarhumarae), which is under consideration for Federal listing as threatened (USDI Fish and Wildlife Service, 1991), was previously known to occur in Sycamore Canyon but is now believed extirpated.

The majority of these special interest species are known primarily, if not exclusively, from the extension areas. Refer to Toolin et al. (1979) for a more complete description of the distinguishing features of Sycamore Canyon.

E. LOCATION

The GRNA and extensions are located within the Nogales Ranger District of the Coronado National Forest in Santa Cruz County, Arizona (Figs. 1, 2, & 3). The GRNA comprises approximately 1670 acres (676 hectares). Elevations range from 3480 ft at the Mexican border to 4795 feet at the western edge of the RNA (1061.4 meters to 1462.5 meters). The center of the area is at latitude 33° 49′ north and longitude 109° 26′ west.

Goodding (South Extension) Research Natural Area (comprising 1470 acres (595.4 hectares)) is a tract of land within the administrative boundary of the Coronado National forest in Santa Cruz county, State of Arizona, and more particularly described as follows:

Located in Sections 21, 22, 23, 24, 26, 27, 28, 33, and 34, Township 23 South, Range 11 East, and Section 3, Township 24 South, Range 11 East, Gila and Salt River Meridian.

Commencing at the Closing Corner common to Sections 32 and 33, T. 23S., R. 11 E. on the International Boundary Reserve of the United States of America;
THENCE, southeasterly approximately .34 miles (.55 km) along said boundary to a point on a saddle, which is also on the Pajarita Wilderness Boundary, and is the Point of Beginning;
THENCE, northwesterly approximately .38 miles (.61 km) on Pajarita Wilderness Boundary, to a peak with a shown elevation of 4222 ft (1287.7 m);
THENCE, northeasterly approximately .27 miles (.43 km) along a ridge through a saddle to a peak;
THENCE, easterly approximately .28 miles (.45 km) to a peak with a shown elevation of 4269 ft (1302.0 m);
THENCE, northerly approximately .13 miles (.21 km) through a saddle to a peak;
THENCE, northeasterly and northwesterly approximately .85 miles (1.36 km) along the crest of a ridge, west of Sycamore Canyon, to a knoll with a contour elevation of 4040′ (1231.4 m);

THENCE, northwesterly approximately .35 miles (.56 km) along Mule Ridge, to a point on the Pajarita Wilderness Boundary;
THENCE, northeasterly on said boundary, and along same ridge, approximately .46 miles (.74 km), to a peak with a shown elevation of 4795' (1461.5 m);
THENCE, southeasterly approximately .19 miles (.31 km) along crest of peak to a to a point with a contour elevation of 4640 ft (1414.3 m);
THENCE, northeasterly approximately .34 miles (.55 km) along a spur to a point of intersection with a side drainage, course southerly, said point is northerly approximately .21 miles (.34 km) from the confluence with Sycamore Canyon;
THENCE, northeasterly approximately .38 miles (.61 km) along a ridge to a point with a contour elevation of 4400 ft (1341.1 m), which is on the Goodding RNA Boundary;
THENCE, southeasterly approximately .45 miles (.72 km) on the Goodding RNA Boundary to the confluence of Sycamore and Penasco Canyons;
THENCE, southeasterly approximately .38 miles (.61 km) along Penasco Canyon to the intersection with a drainage, course northwesterly;
THENCE, southwesterly approximately .38 miles (.61 km) along said drainage to a point with a contour elevation of 4480 ft (1365.5 m);
THENCE, southwesterly approximately .22 miles (.35 km) along crest, to a knob with a contour elevation of 4480 ft (1365.5 m);
THENCE, westerly approximately .23 miles (.37 km) through a saddle to a point with a contour elevation of 4360 ft (1328.9 m);
THENCE, southerly approximately .21 miles (.34 km) along spur, to a point in a drainage, course westerly, where a lesser drainage, course northerly, intersects;
THENCE, southwesterly approximately .10 miles (.16 km) to a knob with a contour elevation of 3960 ft (1207 m);
THENCE, southwesterly approximately .21 miles (.34 m) to the confluence of two drainages, both course northwesterly;
THENCE, southerly approximately .37 miles (.59 km) to the northwest end of a ridge top, with a contour elevation of 4400 ft (1341.1 m);
THENCE, southerly approximately .38 miles (.61 km) along ridge to head of a drainage, course southeast;
THENCE, southeasterly approximately .23 miles (.37 km) along said side drainage to its intersection with Tonto Canyon, approximately .10 miles (.16 km) north of Manzanita Spring;
THENCE, southwesterly approximately .19 miles (.31 km) along Tonto Canyon to the intersection of a side drainage, course northeasterly;
THENCE, southeasterly approximately .06 miles (.10 km) along said side drainage to a point on the International Boundary Reserve of the United States of America;
THENCE, northwesterly approximately 1.19 miles (1.91 km), on the International Boundary Reserve of the United States of America, to the Point of Beginning.

Goodding (North Extension) Research Natural Area (comprising 200 acres (81 hectares)) is a tract of land within the administrative boundary of the Coronado National Forest in Santa Cruz County, State of Arizona, and more particularly described as follows:

Located in Sections 11, 14, and 15, Township 23 South, Range 11 East, Gila and Salt River Meridian.

Commencing at the Section Corner of 10, 11, 14, and 15, T. 23S., R. 11E., which is the Point of Beginning;

THENCE, southwesterly approximately .44 miles (.71 km) to a point on a ridge which is 100 ft (30.5 m) easterly of road 4180, and at intersection with the northern-most point of the Goodding RNA Boundary;
THENCE, southeasterly approximately .15 miles (.24 km) along said ridge and RNA boundary to a point on the Pajarita Wilderness Boundary;
THENCE, southeasterly approximately .73 miles (1.17 km) along said ridge and RNA boundary to the intersection with Trail #40;
THENCE, northeasterly approximately .38 miles (.61 km) along said trail to a point which is at the end of 4WD Road 4181;
THENCE, northeasterly approximately .10 miles (.16 km) along the westerly side of said road to an unnamed drainage;
THENCE, northwesterly approximately .38 miles (.61 km) along said drainage to a point with an approximate elevation of 4175 ft (1273.4 m);
THENCE, southwesterly, on the same bearing as from the POB to the point which is 100 ft east of road 4180, approximately .19 miles (.31 km) to the Section Corner 10, 11, 14, and 15 which is the Point of Beginning.

The RNA is 56 air miles (90 km) southwest of Tucson and 25 miles (40.2 km) (via Ruby Road) northwest of Nogales, Arizona. The RNA can be reached from U.S. Highway 89 by taking the Pena Blanca Lake-Ruby turnoff, approximately 59 miles (94 km) south of Tucson. The Ruby road is paved for 10 miles (16.6 km) west of Highway 89. Exactly 10 miles west of Highway 89, there is a fork in the road. The right fork goes to Pena Blanca Lake. To reach the RNA, one must take the unpaved left fork toward Ruby and Arivaca and travel 9.5 miles (15.2 km) to Sycamore Canyon. At Sycamore Canyon, there is a well-marked left fork (F.S. Road 218) which goes to Hank n' Yank Spring and Sycamore Canyon. The road ends shortly (approximately one-quarter mile) after one takes the turnoff. A short distance away is the a ruin site. The RNA begins immediately west of this ruin and continues down the canyon all the way to the Mexican border (from Smith, 1979:87).

F. AREA BY COVER TYPES

Information on cover types was obtained from the Southwestern Region RNA Progress Report (USDA Forest Service, 1984), Smith (1974), Toolin et al., (1979) and field reconnaissance.

Küchler

The primary cover types, (Küchler, 1966), are Oak-Juniper Woodland, K-027 and Grama-Tobosa Shrubsteppe, K-052 (Fig. 4).

Society of American Foresters

The primary cover type is Western Live Oak, SAF 241 (Eyre, 1980). The riparian forest and the non-forested portions of the RNA are not covered by SAF cover types.

Habitat Types or Plant Associations

The predominant habitat types found in the original RNA and extensions are the Quercus oblongifolia[1]/mixed Bouteloua spp. and the Quercus emoryi/Arctostaphylos pungens habitat types (USDA Forest Service, 1987b). The remaining communities are not covered by USFS habitat types.

G. PHYSICAL AND CLIMATIC CONDITIONS

From the Hank n' Yank ruin site, Sycamore Canyon extends for five miles to the U.S.-Mexico border. The canyon bottom and adjacent slopes form the GRNA. Steep slopes and rugged cliffs surround the canyon bottom and are dominated by rhyolites, shales and sandstones. Rugged rock formations include spires that approach 100 feet (30 meters) in height. The Sycamore Canyon stream channel provides intermittent flow the length of the RNA.

The climate of the area is semiarid with abundant rainfall only in July and August. During these two months, the nearby Ruby weather station, located three miles (4.8 km) to the northwest, is one of the wettest areas in the state with an average of more than nine inches (22.9 cm) of precipitation (Green and Sellers, 1964). Most of the remaining annual precipitation at Ruby, which averages 19.0 inches (48.3 cm), is concentrated in the winter months and results from widespread storms that move across Arizona from the Pacific Ocean. Snowfall occurs occasionally in the area but snow seldom remains on the ground for more than a day.

Temperatures at the RNA are seldom extreme in either direction. Summer highs occasionally exceed 100° F. (37.5° C) but the high frequency of afternoon showers in July, August and September helps ameliorate afternoon highs. Summer lows drop to the middle sixties at night. Afternoon highs in January and February are normally in the high fifties or low sixties and nighttime lows are more likely to be above than below freezing (climate information was reproduced from Smith, 1974:87-88).

Meteorologica data was recorded at the Ruby weather station from 1931-1944 and 1945-1955 (Green and Sellers, 1964).

H. DESCRIPTION OF VALUES

(1) Flora

The flora of Sycamore Canyon has been listed by Toolin et al. (1979) and the fungi by Gilbertson et al. (1972). In all, 624 species of vascular plants, 20 species of lichens, 40 species of mosses and 85 species of fungi have been found so far within the confines of Sycamore Canyon. Of the known fungi, 2 species are known for the United States only from Sycamore Canyon, and 5 species are known in Arizona only from this locality. Of

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[1]In this Establishment Record all trees are named following Little, E.L.Jr. 1979. Checklist of United States trees (native and naturalized). Agricultural Handbook No. 541. USDA. Washington, DC. All other plants are named following Lehr, J.H. 1978. A Catalog of the flora of Arizona. Northland Press. Flagstaff, AZ.

the known vascular plants, 10 species have been documented in the United States only here. These are:

Lobelia laxiflora (lobelia)
Dichondra repens var. sericea (dichondra)
Croton ciliatoglanduliferum (croton)
Aeschynomene villosa (joint vetch)
Lotus alamosanus (vetch)
Sida rhombifolia (axocatzin)
Passiflora bryonoides (passionflower)
Rhynchosia edulis
Henrya insularis (henrya)
Paspalum virletii (virlet paspalum)

Eleven vascular plant species are under study by the USFWS for protection under the Endangered Species Act as threatened or endangered. These are:

Agave parviflora
Anoda abutiloides
Amsonia grandiflora
Choisya mollis
Coryphantha recurvata
Cynanchum wigginsii
Dalea tentaculoides
Desmanthus bicornutus
Dichonra repens sericea
Graptopetalum bartramii
Phaseolus supinus

Several plants are interesting in their disjunct occurrence in Sycamore Canyon. Butterfly pea (Clitoria mariana) is common along the east coast to eastern Texas yet does not occur farther west apart from the Sycamore Canyon population. A spleenwort fern (Asplenium exiguum), known from Himalaya Mountains in Asia has been found in a few locations in Sonora, Mexico and in Sycamore Canyon, the only U.S. location. The nearest known location of Whisk fern (Psilotum nudum) is 300 miles (483 km) south in Mexico and 1200 miles (1931 km) east in Texas. Utah shadbrush (Amelanchier utahensis), a common component of the flora of Utah and Colorado skips most of Arizona after the Grand Canyon only to surface again in Sycamore Canyon.

Several cover types occur in the GRNA and extensions. The predominant vegetation is oak woodland, Quercus oblongifolia/ Bouteloua spp. habitat type as described by Moir (1986). This open canopy, oak woodland is dominated by blue oak with Emory oak (Quercus emoryi) and alligator juniper (Juniperus deppeana) present as canopy associates. Shrubs are rare and the herbaceous layer is dominated by a rich association of perennial grass species. Common grasses include several gramas (Bouteloua curtipendula, B. gracilis, B. chrondrosoides), Arizona muhly (Muhlenbergia arizonica), bullgrass (Muhlenbergia emersleyi), Plains lovegrass (Eragrostis intermedia), three awn (Aristida hamulosa), Elyoneurus barbiculmis and Trachypogon secundus. The entire northern extension includes this habitat type.

Other types, present in the original RNA and the southern extension, include: 1) the Quercus emoryi/Arctostaphylos pungens habitat type on north-facing steep slopes, which is dominated by red berry juniper (Juniperus erythrocarpa) and pointleaf manzanita (Arctostaphylos pungens); 2) deciduous broadleaf riparian forest dominated by Arizona sycamore (Platanus wrightii), Bonpland willow (Salix bonplandiana), and Fremont cottonwood (Populus fremontii); and 3) semidesert grassland dominated by a diverse set of temperate and subtropical shrubs with a herbaceous layer characterized by a rich association of perennial grasses that have been noted for the aforementioned, Quercus oblongifolia/Bouteloua spp. habitat type. This scrub - grassland type is found in the southern half of the southern extension on south-facing aspects and is difficult to classify. Floristic elements suggest that it may be best described as an ecotone between semidesert grassland and Sonoran desertscrub or as a currently undescribed habitat type found more commonly in Sonora, Mexico.

(2) Fauna

The fauna of Goodding Research Natural Area also exhibits noteworthy distribution patterns. A number of species with widespread distributions south of the international border have peripheral occurrences in the GRNA. Notable among these are the coppery-tailed trogon (Trogon elegans), the rose-throated becard (Platypsaris aglaiae), and the five-striped sparrow (Aimophila quinquestriata). The coppery-tailed trogon is a Central American species which occurs in the canyon and several other areas in southern Arizona. The rose-throated becard is common in Mexico but is found only in southern Arizona and the lower Rio Grande valley in the United States. The five-striped Sparrow, which is also widely distributed in Mexico, nests in Sycamore Canyon and several other sites near the border in southeast Arizona. These sites represent its northernmost occurrences. Other Mexican species, which occur in the Canyon, include the vine snake (Oxybelis aeneus), Mexican hooknosed snake (Gyalopion quadrangularis), the barking frog (Hylactophryne augusti), and the mountain skink (Eumeces callicephalus). The Sonoran chub (Gila ditaena), the only fish found in the Canyon, occurs in the United States only in GRNA. This latter species is listed as threatened by the USFWS and the entire Sycamore Canyon streamcourse has been identified as critical habitat (50 CFR 17.11 and 17.12, January 1, 1989). The Chiricahua leopard frog (Rana chiricahuaensis), a Category 2 candidate species (USDI Fish and Wildlife Service, 1991), occurs within the canyon and the Tarahumara frog (Rana tarahumarae), a candidate Category 1 species (USDI Fish and Wildlife Service, 1991), is known historically from the GRNA, but is now believed extirpated.

Reptiles with montane distributions found in the Canyon include the short-horned horned lizard (Phrynosoma douglassi) and the Arizona mountain kingsnake (Lampropeltis pyromelana) (Toolin, 1979; Mohlenbrock, 1984).

A list of potential vertebrates was derived from Smith (1974) and the Arizona Heritage Data Management System, maintained by the Arizona Game and Fish Department.

Potential Vertebrates of the Goodding RNA

Common Name	Latin Name
AMPHIBIANS	
Frog, barking	Hylactophryne augusti
Frog, Chiricahua leopard	Rana chiricahuensis
Frog, Tarahumara	Rana tarahumarae
Toad, red-spotted	Bufo punctatus
Toad, southwestern	Bufo microscaphus
Toad, woodland narrow-mouthed	Gastrophryne carolinensis
Treefrog, canyon	Hyla arenicolor
REPTILES	
Coachwhip	Masticophis flagellum
Lizard, collared	Crotaphytus collaris
Lizard, Madrean earless	Holbrookia elegans
Lizard, short-horned horned	Phyrnosoma douglassi
Lizard, side-blotched	Uta stansburiana
Lizard, Sonora spiny	Sceloporus clarki
Lizard, tree	Urosaurus ornatus
Rattlesnake, black-tailed	Crotalus molossus
Rattlesnake, diamondback western	Crotalus atrox
Skink, mountain	Eumeces callicephalus
Snake, Arizona coral	Micruroides euryxanthus
Snake, Arizona mountain king	Lampropeltis pyromelana
Snake, black-necked garter	Thamnophis cyrtopsis
Snake, checkered garter	Thamnophis marcianus
Snake, gopher	Pituophis melanoleucus
Snake, Mexican hooknosed	Gyalopion quadrangularis
Snake, night	Hypsiglena torquata
Snake, Sonora hook-nosed	Ficimia quadrangularis
Snake, southwestern lyre	Trimorphodon lyrophanes
Snake, vine	Oxybelis aneus
Snake, vine	Oxybelis microphthalmus
Turtle, Sonoran mud	Kinosternon sonoriense
Whipsnake, Sonora	Masticophis bilineatus
Whiptail, Sonora	Cnemidophorus burti
Whiptail, western	Cnemidophorus tigris
MAMMALS	
Bat, Mexican long-tongued	Choeronycteris mexicana
Bat, Peters' leaf-chinned	Moormops megalophylla
Bat, red	Lasiurus borealis
Bat, hoary Bat	Lasiurus cinereus

Bat, big brown	Eptesicus fuscus
Bat, Townsend's big-eared	Plecotus townsendii
Bat, long-nosed	Leptonycteris nivalis
Bat, pallid	Antrozous pallidus
Bat, Brazilian free-tailed	Taderida brasiliensis
Bobcat	Lynx rufus
Coati	Nasua narica
Cottontail, desert	Sylvilagus auduboni
Coyote	Canis latrans
Deer, black-tailed	Odocoileus hemionus
Deer, white-tailed	Odocoileus virginianus
Fox, gray	Urocyon cinereoargenteus
Gopher, southern pocket	Thomomys umbrinus
Jaguar	Felis onca
Jaquarundi	Felis yagouaroundi
Javelina	Tayassu tajacu
Lion, mountain	Felis concolor
Mouse, brush	Peromyscus boylei
Mouse, white-footed	Peromyscus leucopus
Mouse, deer	Peromyscus maniculatus
Mouse, cactus	Peromyscus eremicus
Mouse, fulvous harvest	Reithrodontomys fulvescens
Mouse, western harvest	Reithrodontomys megalotis
Mouse, rock pocket	Perognathus intermedius
Mouse, desert pocket	Perognathus penicillatus
Mouse, southern grasshopper	Onychomys torridus
Myotis, California	Myotis californicus
Myotis, long-eared	Myotis evotis
Myotis, cave	Myotis velifer
Myotis, small-footed	Myotis subulatus
Pipistrelle, western	Pipistrellus hespersus
Porcupine	Erethizon dorsatum
Rabbit, black-tailed jack	Lepus californicus
Raccoon	Procyon lotor
Rat, hispid cotton	Sigmodon hispidus
Rat, Merriam's kangaroo	Dipodomys merriami
Rat, White-throated wood	Neotoma albigula
Ringtail	Bassariscus astutus
Shrew, desert	Notiosorex crawfordi
Skunk, hog-nosed	Conopatus mesoleucus
Skunk, hooded	Mephitis macroura
Skunk, striped	Mephitis mephitis
Skunk, spotted	Spilogale putorius
Squirrel, Arizona gray	Sciurus arizonensis
Squirrel, rock	Citellus variegatus

BIRDS

Becard, rose-throated	Platypsaris aglaiae
Bluebird, mountain	Sialia currucoides
Bluebird, eastern	Sialia sialis
Bunting, lazuli	Passerina amoena
Bushtit, common	Psaltriparus minimus
Cardinal	Cardinalis cardinalis
Chat, yellow-breasted	Icteria virens
Cowbird, bronzed	Tangavius aeneus
Cowbird, brown-headed	Molothrus ater
Cuckoo, yellow-billed	Coccyzus americanus
Dove, ground	Columbina passerina
Dove, white-winged	Zenaida asiatica
Dove, mourning	Zenaida maeroura
Eagle, golden	Aquila chrysaetos
Finch, house	Carpodacus mexicanus
Flicker, red-shafted	Colaptes auratus
Flycatcher, dusky	Empidonax oberholseri
Flycatcher, ash-throated	Myiarchus cinerascens
Flycatcher, Couse's	Contopus pertinax
Flycatcher, olivaceous	Myiarchus tuberculifer
Flycatcher, gray	Empidonax wrightii
Flycatcher, beardless	Camptostoma imberbe
Flycatcher, Wied's crested	Myiarchus tyrannulus
Flycatcher, olive-sided	Nuttallornis borealis
Flycatcher, vermillion	Pyrocephalus rubinus
Flycatcher, western	Empidonax dificilis
Gnatcatcher, blue-gray	Polioptila caerulea
Goldfinch, lesser	Spinus psaltria
Grosbeak, black-headed	Pheucticus melanocephalus
Grosbeak, blue	Guiraca caerulea
Hawk, Cooper's	Accipiter cooperii
Hawk, marsh	Circus cyaneus
Hawk, zone-tailed	Buteo albonotatus
Hawk, sharp-shinned	Accipiter striatus
Hawk, red-tailed	Buteo jamaicensis
Hawk, sparrow	Falco sparvenus
Hummingbird, Anna's	Calypte anna
Hummingbird, Costa's	Calypte costae
Hummingbird, Lucifer	Calothorax lucifer
Hummingbird, broad-tailed	Cynanthus latirostris
Hummingbird, black-chinned	Archilochus alexandri
Jay, pinon	Gymnorhinus cyanocephalus
Jay, Steller's	Cyanocitta stelleri
Jay, scrub	Aphelocoma coerulescens
Jay, Mexican	Aphelocoma ultramarina
Junco, gray-headed	Junco caniceps

Junco, Oregon	Junco hyemalis
Kingbird, Cassin's	Tyrannus vociferans
Kingfish, western	Tyrannus verticalis
Kingfisher, green	Chloroceryle americana
Kinglet, ruby-crowned	Regulus calendula
Meadowlark, western	Sturnella neglecta
Mockingbird	Mimus polyglottos
Nighthawk, common	Chordeiles minor
Nuthatch, white-breasted	Sitta carolinensis
Oriole, Scott's	Icterus parisorum
Oriole, hooded	Icterus cucullatus
Oriole, Bullock's	Icterus galbula
Owl, long-eared	Asio otus
Owl, elf	Micrathene whitnevi
Owl, screech	Otus asio
Owl, great horned	Bubo virginianus
Pewee, western wood	Contopus sordidulus
Phainopepla	Phainopepla nitens
Phoebe, black	Sayornis nigricans
Phoebe, Say's	Sayornis saya
Pigeon, band-tailed	Columba fasciata
Poor-will	Phalaenoptilus nuttallii
Pyrrhuloxia	Pyrrhuloxia sinuata
Quail, harlequin	Cyrtonyx montezumae
Raven, common	Corvus corax
Raven, white-necked	Corvus cryptoleucus
Redstart, painted	Setophaga picta
Roadrunner	Geococcyx californianus
Robin, American	Turdus migratorius
Sapsucker, yellow-bellied	Sphyrapicus varius
Shrike, loggerhead	Lanius ludovicianus
Siskin, pine	Spinus pinus
Solitaire, Townsend's	Myadestes townsendi
Sparrow, vesper	Poocetes gramineus
Sparrow, lark	Chondestes grammacus
Sparrow, Lincoln's	Melospiza lincolnii
Sparrow, chipping	Spizella passerina
Sparrow, black-chinned	Spizella atrogularis
Sparrow, black-throated	Amphispiza bilineata
Sparrow, rufous-crowned	Aimophila ruficeps
Swallow, tree	Iridoprocne bicolor
Swallow, violet-green	Tachycineta thalassina
Swallow, rough-winged	Stelgidopteryx ruficollis
Swift, white-throated	Aeronautes saxatalis
Tanager, summer	Piranga rubra
Tanager, hepatic	Piranga flava
Tanager, western	Piranga ludoviciana
Thrasher, crissal	Toxostoma dorsale

Thrasher, curve-billed	Toxostoma curvirostre
Thrush, Swainson's	Catharus ustulatus
Thrush, hermit	Catharus guttatus
Titmouse, bridled	Parus wollweberi
Towhee, brown	Pipilo fuscus
Towhee, rufous-sided	Pipilo erythrophthalmus
Towhee, green-tailed	Chlorua chlorua
Verdin	Auriparus flaviceps
Vireo, warbling	Vireo gilvus
Vireo, solitary	Vireo solitarius
Vireo, Bell's	Vireo bellii
Vireo, Hutton's	Vireo huttoni
Vulture, turkey	Cathartes aura
Warbler, Wilson's	Wilsonia pusilla
Warbler, MacGillivray's	Oporonis tolmiei
Warbler, Grace's	Dendroica graciae
Warbler, hermit	Dendroica occidentalis
Warbler, Townsend's	Dendroica townsendi
Warbler, black-throated Gray	Dendroica nigrescens
Warbler, Audubon's	Dendroica coronata
Warbler, yellow	Dendroica petechia
Warbler, Lucy's	Vermivora luciae
Warbler, Virginia's	Vermivora virginiae
Warbler, Nashville	Vermivora ruficapilla
Warbler, orange-crowned	Vermivora celata
Warbler, black and White	Mniotilta varia
Waterthrush, Louisiana	Seiurus motacilla
Waterthrush, northern	Seiurus novaboracensis
Woodpecker, Gila	Centurus uropygialis
Woodpecker, Arizona	Dendrocopos arizonae
Woodpecker, ladder-backed	Dendrocopos scalaris
Woodpecker, Lewis's	Asyndesmus lewis
Woodpecker, acorn	Melanerpes formicivorus
Wren, rock	Salpinctes obsoletus
Wren, canyon	Catherpes mexicanus
Wren, cactus	Campylorhynchus brunneicapillus
Wren, Bewick's	Thryomanes bewickii
Wren, house	Troglodytes aedon
Yellowthroat	Geothlypis trichas

(3) Geology

The entire area is underlain by Tertiary age volcanics: rhyolite, andesite and basalt (Arizona Highway Department, 1966).

(4) Soils

The majority of the area is occupied by soils classified as

Lithic Ustorthents; loamy-skeletal, mixed and thermic. These are shallow somewhat excessively drained soils of low fertility (USDA Forest Service, 1986c).

(5) Lands

All lands within the GRNA are controlled by the Coronado National Forest. No private inholdings are involved.

(6) Cultural

No archaeological surveys have been conducted within the area although one prehistoric site (ARO-05-02-06) containing pictographs and a rockshelter has been recorded. Additional prehistoric sites probably occur in the Goodding area.

(7) Other

No other significant natural values which have not already been discussed occur in the GRNA.

I. IMPACTS AND POSSIBLE CONFLICTS

(1) Mineral Resources

No known mineral resources exist in this area. There are, however, mining claims adjacent to and surrounding the area. The possibility does exist for trespass prospectors.

(2) Grazing

No impacts or conflicts exist since this area already has been closed to grazing. Water gaps at the upper and lower end of Goodding do wash out periodically as does Jacks Canyon in the southeast portion of the RNA and in a few other spots on the U.S. - Mexico border. Additional fencing is required in these areas.

(3) Timber

No commercial forest is affected. This area consists primarily of oak, willow, sycamore, cottonwood, etc. The potential for firewood harvest in this area is very low due to its inaccessibility. Campers and recreationists do gather firewood for overnight stays at the upper end of the area around Hank 'n Yank Spring.

(4) Watershed

The area is contained in the Rio Altar watershed which drains into Mexico.

(5) Recreation Values

The area is popular worldwide among botanists for its diverse flora and among birders for the peripheral occurrance of more tropical species. It is also popular with picnickers and campers. There is a potential for conflict between these uses and RNA objectives, which should be monitored to insure natural and research values are not degraded.

(6) Wildlife and Plant Values

The area contains some of the most unique and diverse flora and fauna in the United States. The area contains habitat for the Sonoran Chub (Gila ditaenia), a listed

threatened species, along with numerous bird species that migrate from Mexico during the winter months. Several candidate plant species also occur in the area (see Flora above). Two additional Coronado National Forest sensitive plants which occur within the RNA are Goodding ash (Fraxinus gooddingii) and fleabane (Erigeron eriophyllus).

(7) Special Management Area Values

The original GRNA (excluding 7 acres (2.8 hecatares)) and the entire southern extension occur within the boundaries of the Pajarito wilderness. 47 acres (18.8 hectares) of the northern extension occur in the wilderness area. Designation of the GRNA will not conflict with the purposes or management of this wilderness area.

(8) Transportation Plans

This RNA is accessed by a spur originating from a Forest Service System road. There are approximately 0.5 mile (.8 km) of road within the RNA itself. There are no transportation plans which would adversely affect the RNA. No further roads shall be built within or adjacent to the RNA.

J. MANAGEMENT PRESCRIPTION

The GRNA extensions are recommended in the Coronado National Forest Plan Management Area 8 and 8A (see Appendix; USDI Forest Service 1986b/1987b). In the non-wilderness areas, the management emphasis is to provide opportunities for nondisruptive research and education. In the areas designated as wilderness, management emphasis is to manage for wilderness values and uses while providing for opportunities for nondisruptive research and education. in all areas, use restrictions will be imposed as necessary to keep the area in an unmodified or natural condition.

(1) Vegetation Management

There will be no harvest of forest products including fuelwood. Prescribed fire will be used to reduce risk and to permit lightning to more nearly play its natural role. All livestock use is excluded.

K. ADMINISTRATION RECORDS AND PROTECTION

Administration and protection of the Goodding RNA will be the responsibility of the Coronado National Forest. The District Ranger, Nogales Ranger District, 2251 N. Grand Ave., Nogales, AZ 88621, has direct responsibility.

Records for the GRNA will be maintained in the following offices:
Regional Forester, Southwestern Region, Albuquerque, NM
Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO
Coronado National Forest, Tucson, AZ
District Ranger, Nogales Ranger District, Nogales, AZ

L. ARCHIVING

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. Requests to conduct research in the area should be referred to him at 240 W. Prospect Rd., Ft. Collins, CO 80526-2098. He, or his designee, will evaluate research proposals and coordinate all studies and research in the area with the District Ranger and the RNA research coordinator. Plant specimens collected in the course of research in the area will be maintained at the University of Arizona, College of Agriculture herbaria in Tucson, Arizona, or at the Forest Supervisor's office. Animal specimens will be maintained at the Arizona State University, Department of Zoology vertebrate museum in Tempe, Arizona.

M. REFERENCES

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APPENDIX

These pages are reproduced from the Coronado National Forest Plan, including Amendment No.3

LEGAL DESCRIPTION

Case Name/No. Goodding RNA extensions

Forest/District Coronado/Nogales

Type of Case Research Natural Area Establishment

This documents that the attached legal description for the case referenced above was reviewed by me for use in an area designation.

The legal description that describes the Goodding (South and North Extension) Research Natural Areas is acceptable, and no potential problems were noted during my review.

Reviewed by: _____ Date: 10-14-92
Forest Land Surveyor

E. LOCATION

The GRNA and extensions are located within the Nogales Ranger District of the Coronado National Forest in Santa Cruz County, Arizona (Figs. 1, 2, & 3). The GRNA comprises approximately 1670 acres (676 hectares). Elevations range from 3480 ft at the Mexican border to 4795 feet at the western edge of the RNA (1061.4 meters to 1462.5 meters). The center of the area is at latitude 33° 49′ north and longitude 109° 26′ west.

Goodding (South Extension) Research Natural Area (comprising 1470 acres (595.4 hectares)) is a tract of land within the administrative boundary of the Coronado National forest in Santa Cruz county, State of Arizona, and more particularly described as follows:

Located in Sections 21, 22, 23, 24, 26, 27, 28, 33, and 34, Township 23 South, Range 11 East, and Section 3, Township 24 South, Range 11 East, Gila and Salt River Meridian.

Commencing at the Closing Corner common to Sections 32 and 33, T. 23S., R. 11 E. on the International Boundary Reserve of the United States of America;
THENCE, southeasterly approximately .34 miles (.55 km) along said boundary to a point on a saddle, which is also on the Pajarita Wilderness Boundary, and is the Point of Beginning;
THENCE, northwesterly approximately .38 miles (.61 km) on Pajarita Wilderness Boundary, to a peak with a shown elevation of 4222 ft (1287.7 m);
THENCE, northeasterly approximately .27 miles (.43 km) along a ridge through a saddle to a peak;
THENCE, easterly approximately .28 miles (.45 km) to a peak with a shown elevation of 4269 ft (1302.0 m);
THENCE, northerly approximately .13 miles (.21 km) through a saddle to a peak;
THENCE, northeasterly and northwesterly approximately .85 miles (1.36 km) along the crest of a ridge, west of Sycamore Canyon, to a knoll with a contour elevation of 4040′ (1231.4 m);
THENCE, northwesterly approximately .35 miles (.56 km) along Mule Ridge, to a point on the Pajarita Wilderness Boundary;
THENCE, northeasterly on said boundary, and along same ridge, approximately .46 miles (.74 km), to a peak with a shown elevation of 4795′ (1461.5 m);
THENCE, southeasterly approximately .19 miles (.31 km) along crest of peak to a to a point with a contour elevation of 4640 ft (1414.3 m);
THENCE, northeasterly approximately .34 miles (.55 km) along a spur to a point of intersection with a side drainage, course southerly, said point is northerly approximately .21 miles (.34 km) from the confluence with Sycamore Canyon;
THENCE, northeasterly approximately .38 miles (.61 km) along a ridge to a point with a contour elevation of 4400 ft (1341.1 m), which is on the Goodding RNA Boundary;
THENCE, southeasterly approximately .45 miles (.72 km) on the Goodding RNA Boundary to the confluence of Sycamore and Penasco Canyons;
THENCE, southeasterly approximately .38 miles (.61 km) along Penasco Canyon to the intersection with a drainage, course northwesterly;
THENCE, southwesterly approximately .38 miles (.61 km) along said drainage to a point with a contour elevation of 4480 ft (1365.5 m);
THENCE, southwesterly approximately .22 miles (.35 km) along crest, to a knob with a contour elevation of 4480 ft (1365.5 m);
THENCE, westerly approximately .23 miles (.37 km) through a saddle to a point with a contour elevation of 4360 ft (1328.9 m);

THENCE, southerly approximately .21 miles (.34 km) along spur, to a point in a drainage, course westerly, where a lesser drainage, course northerly, intersects;
THENCE, southwesterly approximately .10 miles (.16 km) to a knob with a contour elevation of 3960 ft (1207 m);
THENCE, southwesterly approximately .21 miles (.34 m) to the confluence of two drainages, both course northwesterly;
THENCE, southerly approximately .37 miles (.59 km) to the northwest end of a ridge top, with a contour elevation of 4400 ft (1341.1 m);
THENCE, southerly approximately .38 miles (.61 km) along ridge to head of a drainage, course southeast;
THENCE, southeasterly approximately .23 miles (.37 km) along said side drainage to its intersection with Tonto Canyon, approximately .10 miles (.16 km) north of Manzanita Spring;
THENCE, southwesterly approximately .19 miles (.31 km) along Tonto Canyon to the intersection of a side drainage, course northeasterly;
THENCE, southeasterly approximately .06 miles (.10 km) along said side drainage to a point on the International Boundary Reserve of the United States of America;
THENCE, northwesterly approximately 1.19 miles (1.91 km), on the International Boundary Reserve of the United States of America, to the Point of Beginning.

Goodding (North Extension) Research Natural Area (comprising 200 acres (81 hectares)) is a tract of land within the administrative boundary of the Coronado National Forest in Santa Cruz County, State of Arizona, and more particularly described as follows:

Located in Sections 11, 14, and 15, Township 23 South, Range 11 East, Gila and Salt River Meridian.

Commencing at the Section Corner of 10, 11, 14, and 15, T. 23S., R. 11E., which is the Point of Beginning;
THENCE, southwesterly approximately .44 miles (.71 km) to a point on a ridge which is 100 ft (30.5 m) easterly of road 4180, and at intersection with the northern-most point of the Goodding RNA Boundary;
THENCE, southeasterly approximately .15 miles (.24 km) along said ridge and RNA boundary to a point on the Pajarita Wilderness Boundary;
THENCE, southeasterly approximately .73 miles (1.17 km) along said ridge and RNA boundary to the intersection with Trail #40;
THENCE, northeasterly approximately .38 miles (.61 km) along said trail to a point which is at the end of 4WD Road 4181;
THENCE, northeasterly approximately .10 miles (.16 km) along the westerly side of said road to an unnamed drainage;
THENCE, northwesterly approximately .38 miles (.61 km) along said drainage to a point with an approximate elevation of 4175 ft (1273.4 m);
THENCE, southwesterly, on the same bearing as from the POB to the point which is 100 ft east of road 4180, approximately .19 miles (.31 km) to the Section Corner 10, 11, 14, and 15 which is the Point of Beginning.

The RNA is 56 air miles (90 km) southwest of Tucson and 25 miles (40.2 km) (via Ruby Road) northwest of Nogales, Arizona. The RNA can be reached from U.S. Highway 89 by taking the Pena Blanca Lake-Ruby turnoff, approximately 59 miles (94 km) south of Tucson. The Ruby road is paved for 10 miles (16.6 km) west of Highway 89. Exactly 10 miles west of Highway 89, there is a fork in the road. The right fork goes to Pena Blanca Lake. To reach the RNA, one must take the unpaved left fork toward Ruby and Arivaca and travel 9.5 miles (15.2 km) to Sycamore Canyon. At Sycamore Canyon, there is a well-marked left fork (F.S. Road 218) which goes to Hank n' Yank Spring and Sycamore

Canyon. The road ends shortly (approximately one-quarter mile) after one takes the turnoff. A short distance away is the a ruin site. The RNA begins immediately west of this ruin and continues down the canyon all the way to the Mexican border (from Smith, 1979:87).

DESIGNATION ORDER Sycamore Canyon

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 Goodding Research Natural Area. The Goodding Research Natural Area shall be comprised of the following land: Located in Sections 21, 22, 23, 24, 26, 27, 28, 33, and 34, Township 23 South, Range 11 East, and Section 3, Township 24 South, Range 11 East, Gila and Salt River Meridian. Commencing at the Closing Corner common to Sections 32 and 33, T. 23S., R. 11 E. on the International Boundary Reserve of the United States of America;
THENCE, southeasterly approximately .34 miles along said boundary to a point on a saddle which is the Point of Beginning;
THENCE, northwesterly approximately .38 miles along a ridge to a peak with a shown elevation of 4222';
THENCE, northeasterly approximtely .27 miles along a ridge through a saddle to a peak;
THENCE, easterly approximately .28 to a peak with a shown elevation of 4269';
THENCE, northerly approximately .13 through a saddle to a peak;
THENCE, northeasterly approximatley .04 miles to a point .30 miles westerly along the section line common to Sections 28 and 33, T. 23S., R.11 E.
THENCE, northeasterly approximately .81 miles along the high points of a ridgeline on the west side of Sycamore Canyon to a point which is on the section line between Sections 27 and 28, T. 23S., R. 11E., .30 miles from the section corner 21, 22, 27, and 28;
THENCE, northwesterly approximately .34 miles along the high points of Mule Ridge to a point which is on the section line between Sections 21, and 28, T. 23S., R. 11E., .15 miles from the section corner 21, 22, 27, and 28;
THENCE, northeasterly approximately .32 miles along said ridgeline to a point which is on the section line between Sections 21 and 23, T. 23S., R. 11e., .23 miles from the section corner 21, 22, 27, and 28;
THENCE, easterly approximately .13 miles to a peak with a shown elevation of 4795'
THENCE, southeasterly approximately .19 miles along high point of peak to a unnamed ridge;
THENCE, northeasterly approximately .34 miles along said ridge to a point of intersection with a side drainage that flows to Sycamore Canyon, said point is northerly approximately .25 miles from the sectio line between Sections 22 and 27, T. 23S., R. 11E;
THENCE, northeasterly approximately .25 miles along a ridge to a high point;
THENCE, northeasterly approximately .13 miles to a high point which is a intersection of the Goodding RNA Boundary.
THENCE, southeastery approximately .34 miles along a ridge and Goodding RNA Boundary to a point on the section line between

Sections 22 and 23, T. 23S., R. 11E., .22 miles from the section corner 22, 23, 26, and 27;
THENCE, easterly approximately .11 miles along the Goodding RNA Boundary to the intersection of Sycamore and Penasco Canyons;
THENCE, southeasterly approximately .38 miles along the centerline of Penasco Canyon to a point which a side drainage;
THENCE, southerly approximately .06 miles to a point which is on the section line between Sections 23 and 26, T.23S., R. 11E., .35 miles from the section corner 22, 23, 26, and 27;
THENCE, southwesterly approximately .32 miles along said drainage to a high point;
THENCE, southwesterly approximately .42 miles along said high point to a point which is on the section line between Sections 26 and 27, T. 23S., R. 11E., .34 miles from the section corner 22, 23, 26, and 27;
THENCE, southwesterly approximately .23 miles through a saddle to a high point
THENCE, southerly approximately .63 miles to a point on the section line between Sections 27 and 34, T. 23S., R. 11E., .36 miles from the section corner 26, 27, 34, and 35;
THENCE, southerly approximately .66 miles to a point in a side drainage;
THENCE, southeasterly approximately .23 miles along said side drainage to its intersection with Tonto Canyon;
THENCE, southwesterly approximately .19 miles along Tonto Canyon to the intersection of a side drainage.
THENCE, southeasterly approximately .02 miles along said side drainage to a point on the section line between Section 34, T. 23S., R. 11E., and Section 3, T. 24S., R. 11E., .04 miles from the 1/4 corner of 34 and 3;
THENCE, southerly approximately .04 miles to a point on the International Boundary Reserve of the United States of America, .09 miles from the closing corner of Section 34, T. 23S., R 11E., And Section 3, T. 24S., R. 11E;
THENCE, northwesterly approximately .09 miles along said boundary to the closing corner of Section 34, T. 23S., R.11E.;
THENCE, northwesterly .38 miles along said boundary to the closing corner of Sections 33 and 34, T. 23S., R. 11E;
THENCE, northwesterly .72 miles along the International Boundary Reserve of the United States of America to the Point of Beginning..

Regional Forester, Sotero Muniz, recommended the establishment of the Goodding Research Natural Area in the Coronado 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 Goodding Research Natural Area will be managed in compliance with all relevant laws, regulations, and manual direction

regarding Research Natural Areas. The Goodding Research Natural Area will be administered in accordance with the management direction identified in the Establishment Record.
The Coronado 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. Dir ections on pages ___of the Coronado National Forest Land and Resource Management Plan are replaced by the directions on pages____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 Coronado National Forest Land and Resource Management Plan.

The Forest Supervisor of the Coronado 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 Coronado 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 Goodding 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

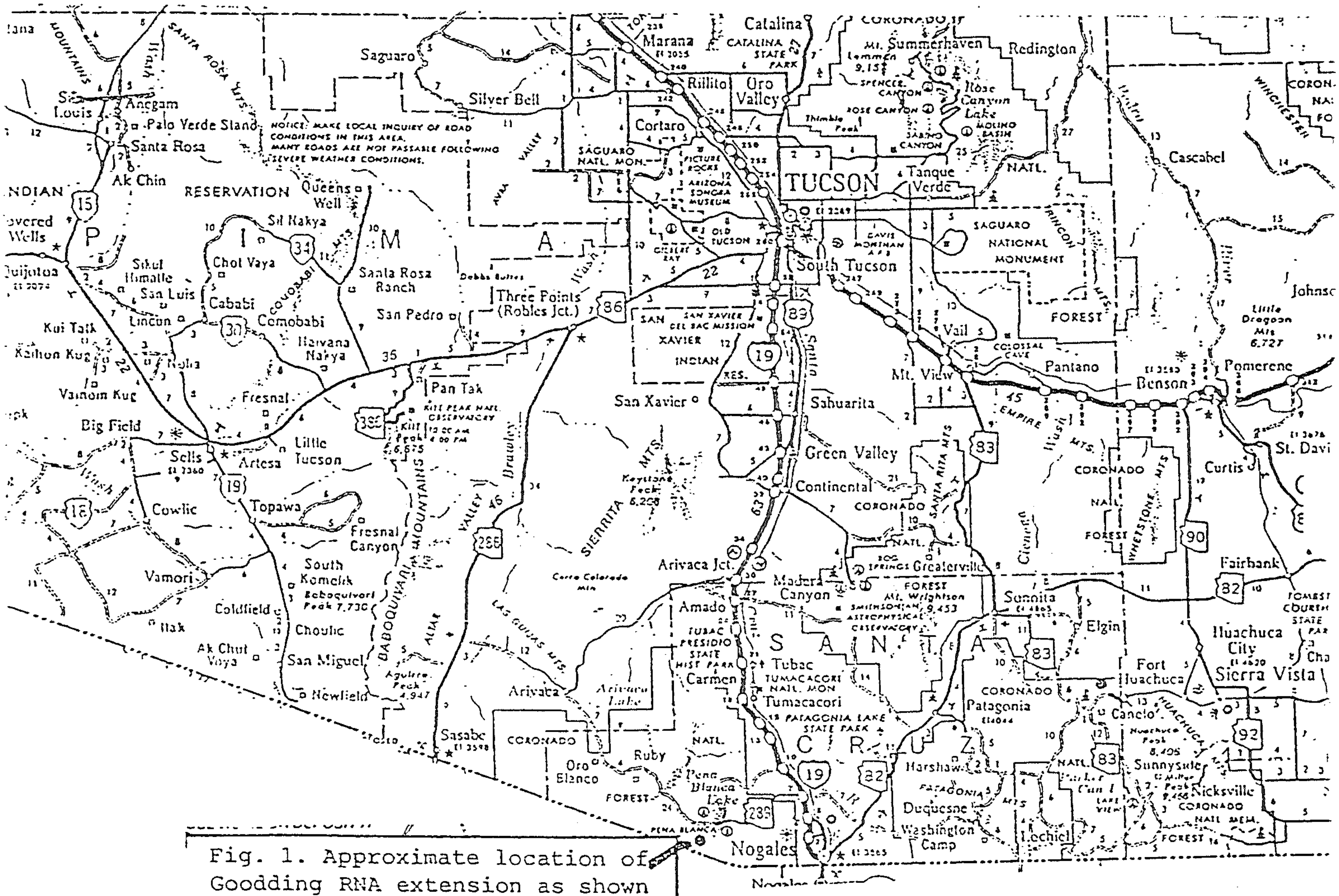
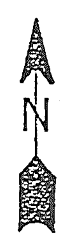


Fig. 1. Approximate location of Goodding RNA extension as shown on an Arizona State Highway map.



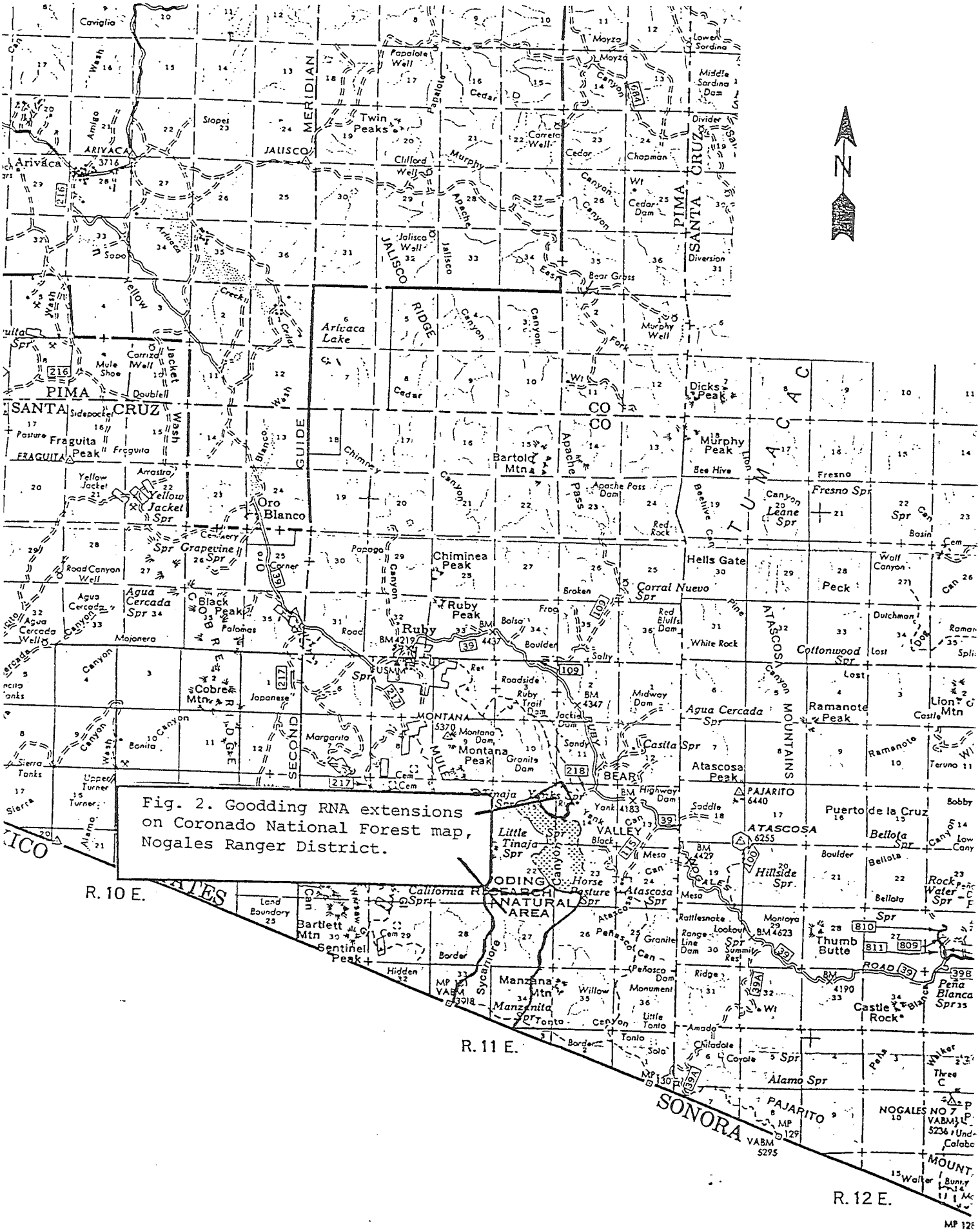


Fig. 2. Goodding RNA extensions on Coronado National Forest map, Nogales Ranger District.

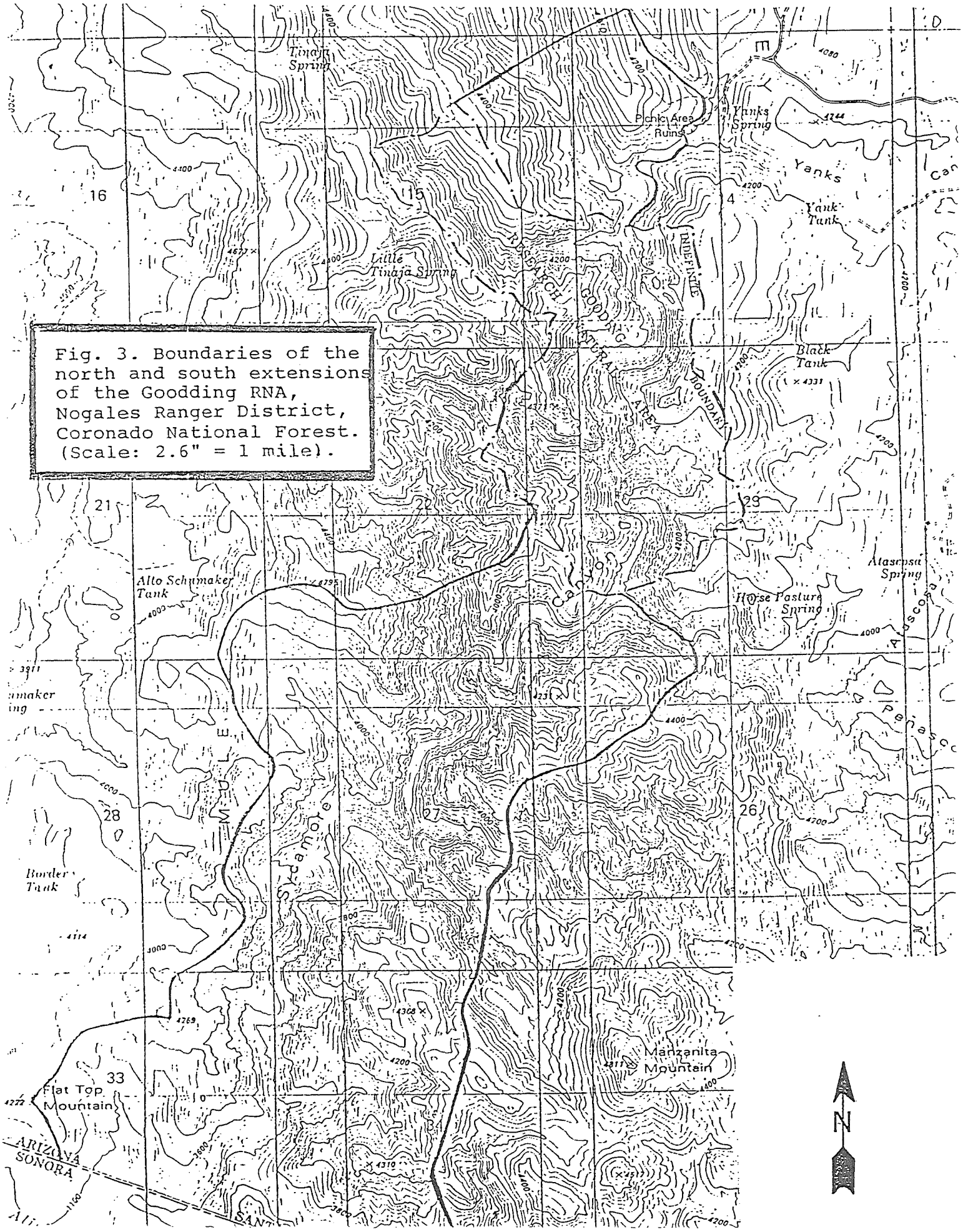


Fig. 3. Boundaries of the north and south extensions of the Goodding RNA, Nogales Ranger District, Coronado National Forest. (Scale: 2.6" = 1 mile).

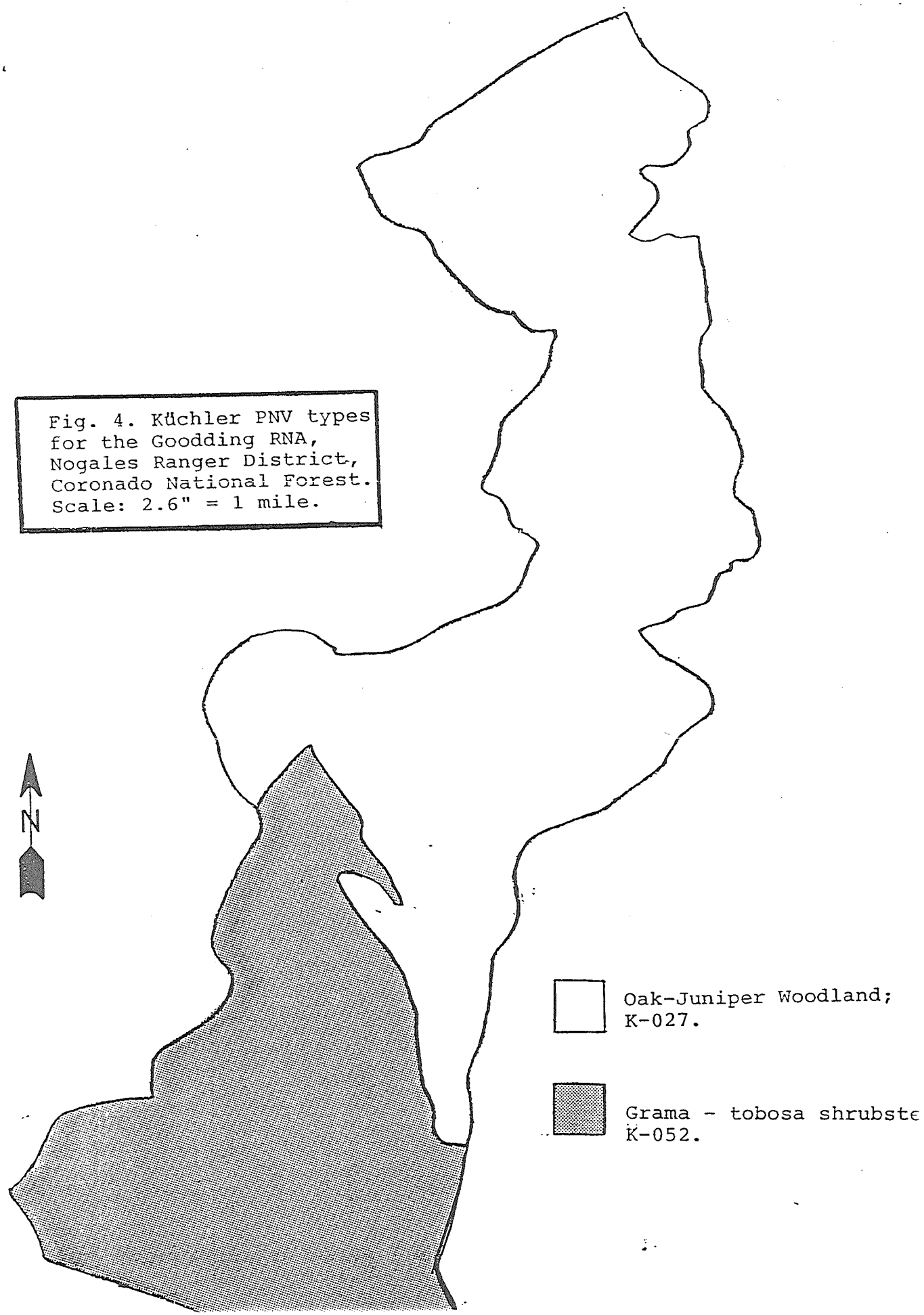


Fig. 4. Küchler PNV types for the Goodding RNA, Nogales Ranger District, Coronado National Forest. Scale: 2.6" = 1 mile.

DECISION NOTICE/DESIGNATION ORDER

Decision Notice
Finding of No Significant Impact
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 Goodding Research Natural Area. The Goodding Research Natural Area shall be comprised of lands described in the section of the Establishment Record entitled "Location."

The Regional Forester, Larry Henson, recommended the establishment of the Goodding Research Natural Area and extensions in the Coronado National Forest Land and Resource Plan and Plan Amendment No. 3. 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 Coronado National Forest Land and Resource Management Plan and Plan Amendment No. 3 and Final Environmental Impact Statement which are available to the public.

The Goodding Research Natural Area will be managed in compliance with all relevant laws, regulations, and Forest Service Manual direction regarding Research Natural Areas. It will be administered in accordance with the management direction/prescription identified in the Establishment Record.

I have reviewed the Coronado National Forest Land and Resource Management Plan (LRMP) direction for this RNA and find that the management direction cited in the previous paragraph is consistent with the LRMP and that a Plan amendment is not required.

The Forest Supervisor of the Coronado National Forest shall notify the public of this decision and will mail a copy of the Decision Notice/Designation Order and amended direction to all persons on the Coronado Land and Resource Management Plan mailing list.

Based on the Environmental Analysis, I find that the designation of the Goodding 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 Part 217. A Notice of Appeal must be in writing and submitted to:

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

and simultaneously to the Deciding Officer:

Chief (1570)
USDA, Forest Service
P.O. Box 96090
Washington, D.C. 20090-6090

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

SIGNATURE PAGE

for

RESEARCH NATURAL AREA ESTABLISHMENT RECORD

Goodding Research Natural Area and Extensions

Coronado National Forest

Santa Cruz, Arizona

Prepared by Andrew W. Laurenzi Date 11/3/87
Mark H. Cochran, The Arizona Nature Conservancy
Andrew W. Laurenzi, The Arizona Nature Conservancy

Recommended by Jerry Lockwood Date 5/17/88
Jerry Lockwood, District Ranger,
Nogales Ranger District

Recommended by R.B. Tippeconnic Date 5.16.88
R.B. Tippeconnic, Forest Supervisor,
Coronado National Forest

Recommended by John W. Russell Date 5-26-88
John W. Russell, Chairperson,
Southwestern Research Natural
Area Committee

Recommended by David Kelly Date 6/16/88
for Sotero Muniz, Regional Forester,
Southwestern Region

Recommended by Charles M. Loveless Date Sept. 28, 1988
Charles M. Loveless, Station Director,
Rocky Mountain Forest and Range
Experiment Station

TITLE PAGE

Establishment Record for Goodding
Research Natural Area within Coronado
National Forest, Santa Cruz County, Arizona.

A. INTRODUCTION

The original Goodding Research Natural Area (GRNA) and two boundary extensions comprise 1670 acres (676 hectares) in the Nogales Ranger District of the Coronado National Forest in Santa Cruz county, Arizona, on reserved public domain, National Forest land. The two extensions are contiguous with the established GRNA and contain the remainder of Sycamore Canyon as it flows to the border with Mexico and a small area of oak woodland to the northwest of the original RNA boundary. The southern extension and part of the northern extension and established RNA lie within the boundaries of the Pajarito Wilderness which was designated by Congress in 1984. Please note that for the purposes of this Establishment Record, Sycamore Canyon refers to the entire GRNA including the extensions. This record describes the entire area with specific reference to the extensions.

(1) Land Management Planning

The Southwest RNA Progress Report (USDA Forest Service, 1983) and the Coronado National Forest Plan and Environmental Impact Statement (USDA Forest Service, 1986a/1986b) include the southern GRNA extension. The environmental analysis conducted as part of the planning process supports the recommendation to establish this extension to the GRNA.

The northern extension was recommended by The Arizona Nature Conservancy during and after the comment period on the Coronado National Forest Plan. The Coronado National Forest Plan was amended on October 1987 to include this northern extension (USDA Forest Service, 1987a).

B. OBJECTIVES

The primary objective in augmenting the Goodding RNA is the protection of significant botanical and zoological genetic diversity.

C. JUSTIFICATION FOR ESTABLISHMENT OF AREA

The extensions essentially fulfill the argument originally put forth by Goodding (1961) to establish Sycamore Canyon as a natural area due to the area's significant botanical diversity. Data provided by the Heritage Data Management System (HDMS) of the Arizona Game and Fish Department, a centralized, ecological inventory of the state's rarest plants and animals, identified areas adjacent to the original RNA boundary which included populations of rare species for which the area is noted. Both the Southwest RNA Progress Report (USDA Forest Service, 1984) and the Coronado National Forest Plan and Amendment No. 3 (1986/1987a) identify the need to extend the GRNA to include these populations of rare species.

D. PRINCIPAL DISTINGUISHING FEATURES

Sycamore Canyon is one of the most biologically diverse sites in the United States. More than 600 vascular plant species and 72 species of fungi have been documented from the area (Toolin et al., 1979; Gilbertson et al., 1972). Among these are more than 30 species of special interest because of their limited distribution globally, in the United States, and in Arizona. Eleven plants currently under study by the USFWS for consideration as Federally threatened or endangered plant species, (USDI Fish and Wildlife Service, 1990), reside in the GRNA.

The canyon also includes more than 16 Arizona threatened vertebrate species: 7 birds, 9 reptiles and amphibians and 1 fish. The area has been identified as critical habitat for the Sonoran chub (Gila ditaenia), a species which is listed threatened by the United States Fish & Wildlife Service. Tarahumara frog (Rana tarhumarae), which is under consideration for Federal listing as threatened (USDI Fish and Wildlife Service, 1991), was previously known to occur in Sycamore Canyon but is now believed extirpated.

The majority of these special interest species are known primarily, if not exclusively, from the extension areas. Refer to Toolin et al. (1979) for a more complete description of the distinguishing features of Sycamore Canyon.

E. LOCATION

The GRNA and extensions are located within the Nogales Ranger District of the Coronado National Forest in Santa Cruz County, Arizona (Figs. 1, 2, & 3). The GRNA comprises approximately 1670 acres (676 hectares). Elevations range from 3480 ft at the Mexican border to 4795 feet at the western edge of the RNA (1061.4 meters to 1462.5 meters). The center of the area is at latitude 33° 49′ north and longitude 109° 26′ west.

Goodding (South Extension) Research Natural Area (comprising 1470 acres (595.4 hectares)) is a tract of land within the administrative boundary of the Coronado National forest in Santa Cruz county, State of Arizona, and more particularly described as follows:

Located in Sections 21, 22, 23, 24, 26, 27, 28, 33, and 34, Township 23 South, Range 11 East, and Section 3, Township 24 South, Range 11 East, Gila and Salt River Meridian.

Commencing at the Closing Corner common to Sections 32 and 33, T. 23S., R. 11 E. on the International Boundary Reserve of the United States of America;
THENCE, southeasterly approximately .34 miles (.55 km) along said boundary to a point on a saddle, which is also on the Pajarita Wilderness Boundary, and is the Point of Beginning;
THENCE, northwesterly approximately .38 miles (.61 km) on Pajarita Wilderness Boundary, to a peak with a shown elevation of 4222 ft (1287.7 m);
THENCE, northeasterly approximately .27 miles (.43 km) along a ridge through a saddle to a peak;
THENCE, easterly approximately .28 miles (.45 km) to a peak with a shown elevation of 4269 ft (1302.0 m);
THENCE, northerly approximately .13 miles (.21 km) through a saddle to a peak;
THENCE, northeasterly and northwesterly approximately .85 miles (1.36 km) along the crest of a ridge, west of Sycamore Canyon, to a knoll with a contour elevation of 4040′ (1231.4 m);

THENCE, northwesterly approximately .35 miles (.56 km) along Mule Ridge, to a point on the Pajarita Wilderness Boundary;
THENCE, northeasterly on said boundary, and along same ridge, approximately .46 miles (.74 km), to a peak with a shown elevation of 4795' (1461.5 m);
THENCE, southeasterly approximately .19 miles (.31 km) along crest of peak to a to a point with a contour elevation of 4640 ft (1414.3 m);
THENCE, northeasterly approximately .34 miles (.55 km) along a spur to a point of intersection with a side drainage, course southerly, said point is northerly approximately .21 miles (.34 km) from the confluence with Sycamore Canyon;
THENCE, northeasterly approximately .38 miles (.61 km) along a ridge to a point with a contour elevation of 4400 ft (1341.1 m), which is on the Goodding RNA Boundary;
THENCE, southeasterly approximately .45 miles (.72 km) on the Goodding RNA Boundary to the confluence of Sycamore and Penasco Canyons;
THENCE, southeasterly approximately .38 miles (.61 km) along Penasco Canyon to the intersection with a drainage, course northwesterly;
THENCE, southwesterly approximately .38 miles (.61 km) along said drainage to a point with a contour elevation of 4480 ft (1365.5 m);
THENCE, southwesterly approximately .22 miles (.35 km) along crest, to a knob with a contour elevation of 4480 ft (1365.5 m);
THENCE, westerly approximately .23 miles (.37 km) through a saddle to a point with a contour elevation of 4360 ft (1328.9 m);
THENCE, southerly approximately .21 miles (.34 km) along spur, to a point in a drainage, course westerly, where a lesser drainage, course northerly, intersects;
THENCE, southwesterly approximately .10 miles (.16 km) to a knob with a contour elevation of 3960 ft (1207 m);
THENCE, southwesterly approximately .21 miles (.34 m) to the confluence of two drainages, both course northwesterly;
THENCE, southerly approximately .37 miles (.59 km) to the northwest end of a ridge top, with a contour elevation of 4400 ft (1341.1 m);
THENCE, southerly approximately .38 miles (.61 km) along ridge to head of a drainage, course southeast;
THENCE, southeasterly approximately .23 miles (.37 km) along said side drainage to its intersection with Tonto Canyon, approximately .10 miles (.16 km) north of Manzanita Spring;
THENCE, southwesterly approximately .19 miles (.31 km) along Tonto Canyon to the intersection of a side drainage, course northeasterly;
THENCE, southeasterly approximately .06 miles (.10 km) along said side drainage to a point on the International Boundary Reserve of the United States of America;
THENCE, northwesterly approximately 1.19 miles (1.91 km), on the International Boundary Reserve of the United States of America, to the Point of Beginning.

Goodding (North Extension) Research Natural Area (comprising 200 acres (81 hectares)) is a tract of land within the administrative boundary of the Coronado National Forest in Santa Cruz County, State of Arizona, and more particularly described as follows:

Located in Sections 11, 14, and 15, Township 23 South, Range 11 East, Gila and Salt River Meridian.

Commencing at the Section Corner of 10, 11, 14, and 15, T. 23S., R. 11E., which is the Point of Beginning;

THENCE, southwesterly approximately .44 miles (.71 km) to a point on a ridge which is 100 ft (30.5 m) easterly of road 4180, and at intersection with the northern-most point of the Goodding RNA Boundary;
THENCE, southeasterly approximately .15 miles (.24 km) along said ridge and RNA boundary to a point on the Pajarita Wilderness Boundary;
THENCE, southeasterly approximately .73 miles (1.17 km) along said ridge and RNA boundary to the intersection with Trail #40;
THENCE, northeasterly approximately .38 miles (.61 km) along said trail to a point which is at the end of 4WD Road 4181;
THENCE, northeasterly approximately .10 miles (.16 km) along the westerly side of said road to an unnamed drainage;
THENCE, northwesterly approximately .38 miles (.61 km) along said drainage to a point with an approximate elevation of 4175 ft (1273.4 m);
THENCE, southwesterly, on the same bearing as from the POB to the point which is 100 ft east of road 4180, approximately .19 miles (.31 km) to the Section Corner 10, 11, 14, and 15 which is the Point of Beginning.

The RNA is 56 air miles (90 km) southwest of Tucson and 25 miles (40.2 km) (via Ruby Road) northwest of Nogales, Arizona. The RNA can be reached from U.S. Highway 89 by taking the Pena Blanca Lake-Ruby turnoff, approximately 59 miles (94 km) south of Tucson. The Ruby road is paved for 10 miles (16.6 km) west of Highway 89. Exactly 10 miles west of Highway 89, there is a fork in the road. The right fork goes to Pena Blanca Lake. To reach the RNA, one must take the unpaved left fork toward Ruby and Arivaca and travel 9.5 miles (15.2 km) to Sycamore Canyon. At Sycamore Canyon, there is a well-marked left fork (F.S. Road 218) which goes to Hank n' Yank Spring and Sycamore Canyon. The road ends shortly (approximately one-quarter mile) after one takes the turnoff. A short distance away is the a ruin site. The RNA begins immediately west of this ruin and continues down the canyon all the way to the Mexican border (from Smith, 1979:87).

F. AREA BY COVER TYPES

Information on cover types was obtained from the Southwestern Region RNA Progress Report (USDA Forest Service, 1984), Smith (1974), Toolin et al., (1979) and field reconnaissance.

Küchler

The primary cover types, (Küchler, 1966), are Oak-Juniper Woodland, K-027 and Grama-Tobosa Shrubsteppe, K-052 (Fig. 4).

Society of American Foresters

The primary cover type is Western Live Oak, SAF 241 (Eyre, 1980). The riparian forest and the non-forested portions of the RNA are not covered by SAF cover types.

Habitat Types or Plant Associations

The predominant habitat types found in the original RNA and extensions are the Quercus oblongifolia[1]/mixed Bouteloua spp. and the Quercus emoryi/Arctostaphylos pungens habitat types (USDA Forest Service, 1987b). The remaining communities are not covered by USFS habitat types.

G. PHYSICAL AND CLIMATIC CONDITIONS

From the Hank n' Yank ruin site, Sycamore Canyon extends for five miles to the U.S.-Mexico border. The canyon bottom and adjacent slopes form the GRNA. Steep slopes and rugged cliffs surround the canyon bottom and are dominated by rhyolites, shales and sandstones. Rugged rock formations include spires that approach 100 feet (30 meters) in height. The Sycamore Canyon stream channel provides intermittent flow the length of the RNA.

The climate of the area is semiarid with abundant rainfall only in July and August. During these two months, the nearby Ruby weather station, located three miles (4.8 km) to the northwest, is one of the wettest areas in the state with an average of more than nine inches (22.9 cm) of precipitation (Green and Sellers, 1964). Most of the remaining annual precipitation at Ruby, which averages 19.0 inches (48.3 cm), is concentrated in the winter months and results from widespread storms that move across Arizona from the Pacific Ocean. Snowfall occurs occasionally in the area but snow seldom remains on the ground for more than a day.

Temperatures at the RNA are seldom extreme in either direction. Summer highs occasionally exceed 100° F. (37.5° C) but the high frequency of afternoon showers in July, August and September helps ameliorate afternoon highs. Summer lows drop to the middle sixties at night. Afternoon highs in January and February are normally in the high fifties or low sixties and nighttime lows are more likely to be above than below freezing (climate information was reproduced from Smith, 1974:87-88).

Meteorologica data was recorded at the Ruby weather station from 1931-1944 and 1945-1955 (Green and Sellers, 1964).

H. DESCRIPTION OF VALUES

(1) Flora

The flora of Sycamore Canyon has been listed by Toolin et al. (1979) and the fungi by Gilbertson et al. (1972). In all, 624 species of vascular plants, 20 species of lichens, 40 species of mosses and 85 species of fungi have been found so far within the confines of Sycamore Canyon. Of the known fungi, 2 species are known for the United States only from Sycamore Canyon, and 5 species are known in Arizona only from this locality. Of

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[1]In this Establishment Record all trees are named following Little, E.L.Jr. 1979. Checklist of United States trees (native and naturalized). Agricultural Handbook No. 541. USDA. Washington, DC. All other plants are named following Lehr, J.H. 1978. A Catalog of the flora of Arizona. Northland Press. Flagstaff, AZ.

the known vascular plants, 10 species have been documented in the United States only here. These are:

Lobelia laxiflora (lobelia)
Dichondra repens var. sericea (dichondra)
Croton ciliatoglanduliferum (croton)
Aeschynomene villosa (joint vetch)
Lotus alamosanus (vetch)
Sida rhombifolia (axocatzin)
Passiflora bryonoides (passionflower)
Rhynchosia edulis
Henrya insularis (henrya)
Paspalum virletii (virlet paspalum)

Eleven vascular plant species are under study by the USFWS for protection under the Endangered Species Act as threatened or endangered. These are:

Agave parviflora
Anoda abutiloides
Amsonia grandiflora
Choisya mollis
Coryphantha recurvata
Cynanchum wigginsii
Dalea tentaculoides
Desmanthus bicornutus
Dichonra repens sericea
Graptopetalum bartramii
Phaseolus supinus

Several plants are interesting in their disjunct occurrence in Sycamore Canyon. Butterfly pea (Clitoria mariana) is common along the east coast to eastern Texas yet does not occur farther west apart from the Sycamore Canyon population. A spleenwort fern (Asplenium exiguum), known from Himalaya Mountains in Asia has been found in a few locations in Sonora, Mexico and in Sycamore Canyon, the only U.S. location. The nearest known location of Whisk fern (Psilotum nudum) is 300 miles (483 km) south in Mexico and 1200 miles (1931 km) east in Texas. Utah shadbrush (Amelanchier utahensis), a common component of the flora of Utah and Colorado skips most of Arizona after the Grand Canyon only to surface again in Sycamore Canyon.

Several cover types occur in the GRNA and extensions. The predominant vegetation is oak woodland, Quercus oblongifolia/ Bouteloua spp. habitat type as described by Moir (1986). This open canopy, oak woodland is dominated by blue oak with Emory oak (Quercus emoryi) and alligator juniper (Juniperus deppeana) present as canopy associates. Shrubs are rare and the herbaceous layer is dominated by a rich association of perennial grass species. Common grasses include several gramas (Bouteloua curtipendula, B. gracilis, B. chrondrosoides), Arizona muhly (Muhlenbergia arizonica), bullgrass (Muhlenbergia emersleyi), Plains lovegrass (Eragrostis intermedia), three awn (Aristida hamulosa), Elyoneurus barbiculmis and Trachypogon secundus. The entire northern extension includes this habitat type.

Other types, present in the original RNA and the southern extension, include: 1) the Quercus emoryi/Arctostaphylos pungens habitat type on north-facing steep slopes, which is dominated by red berry juniper (Juniperus erythrocarpa) and pointleaf manzanita (Arctostaphylos pungens); 2) deciduous broadleaf riparian forest dominated by Arizona sycamore (Platanus wrightii), Bonpland willow (Salix bonplandiana), and Fremont cottonwood (Populus fremontii); and 3) semidesert grassland dominated by a diverse set of temperate and subtropical shrubs with a herbaceous layer characterized by a rich association of perennial grasses that have been noted for the aforementioned, Quercus oblongifolia/Bouteloua spp. habitat type. This scrub - grassland type is found in the southern half of the southern extension on south-facing aspects and is difficult to classify. Floristic elements suggest that it may be best described as an ecotone between semidesert grassland and Sonoran desertscrub or as a currently undescribed habitat type found more commonly in Sonora, Mexico.

(2) Fauna

The fauna of Goodding Research Natural Area also exhibits noteworthy distribution patterns. A number of species with widespread distributions south of the international border have peripheral occurrences in the GRNA. Notable among these are the coppery-tailed trogon (Trogon elegans), the rose-throated becard (Platypsaris aglaiae), and the five-striped sparrow (Aimophila quinquestriata). The coppery-tailed trogon is a Central American species which occurs in the canyon and several other areas in southern Arizona. The rose-throated becard is common in Mexico but is found only in southern Arizona and the lower Rio Grande valley in the United States. The five-striped Sparrow, which is also widely distributed in Mexico, nests in Sycamore Canyon and several other sites near the border in southeast Arizona. These sites represent its northernmost occurrences. Other Mexican species, which occur in the Canyon, include the vine snake (Oxybelis aeneus), Mexican hooknosed snake (Gyalopion quadrangularis), the barking frog (Hylactophryne augusti), and the mountain skink (Eumeces callicephalus). The Sonoran chub (Gila ditaena), the only fish found in the Canyon, occurs in the United States only in GRNA. This latter species is listed as threatened by the USFWS and the entire Sycamore Canyon streamcourse has been identified as critical habitat (50 CFR 17.11 and 17.12, January 1, 1989). The Chiricahua leopard frog (Rana chiricahuaensis), a Category 2 candidate species (USDI Fish and Wildlife Service, 1991), occurs within the canyon and the Tarahumara frog (Rana tarahumarae), a candidate Category 1 species (USDI Fish and Wildlife Service, 1991), is known historically from the GRNA, but is now believed extirpated.

Reptiles with montane distributions found in the Canyon include the short-horned horned lizard (Phrynosoma douglassi) and the Arizona mountain kingsnake (Lampropeltis pyromelana) (Toolin, 1979; Mohlenbrock, 1984).

A list of potential vertebrates was derived from Smith (1974) and the Arizona Heritage Data Management System, maintained by the Arizona Game and Fish Department.

Potential Vertebrates of the Goodding RNA

Common Name	Latin Name
AMPHIBIANS	
Frog, barking	Hylactophryne augusti
Frog, Chiricahua leopard	Rana chiricahuensis
Frog, Tarahumara	Rana tarahumarae
Toad, red-spotted	Bufo punctatus
Toad, southwestern	Bufo microscaphus
Toad, woodland narrow-mouthed	Gastrophryne carolinensis
Treefrog, canyon	Hyla arenicolor
REPTILES	
Coachwhip	Masticophis flagellum
Lizard, collared	Crotaphytus collaris
Lizard, Madrean earless	Holbrookia elegans
Lizard, short-horned horned	Phyrnosoma douglassi
Lizard, side-blotched	Uta stansburiana
Lizard, Sonora spiny	Sceloporus clarki
Lizard, tree	Urosaurus ornatus
Rattlesnake, black-tailed	Crotalus molossus
Rattlesnake, diamondback western	Crotalus atrox
Skink, mountain	Eumeces callicephalus
Snake, Arizona coral	Micruroides euryxanthus
Snake, Arizona mountain king	Lampropeltis pyromelana
Snake, black-necked garter	Thamnophis cyrtopsis
Snake, checkered garter	Thamnophis marcianus
Snake, gopher	Pituophis melanoleucus
Snake, Mexican hooknosed	Gyalopion quadrangularis
Snake, night	Hypsiglena torquata
Snake, Sonora hook-nosed	Ficimia quadrangularis
Snake, southwestern lyre	Trimorphodon lyrophanes
Snake, vine	Oxybelis aneus
Snake, vine	Oxybelis microphthalmus
Turtle, Sonoran mud	Kinosternon sonoriense
Whipsnake, Sonora	Masticophis bilineatus
Whiptail, Sonora	Cnemidophorus burti
Whiptail, western	Cnemidophorus tigris
MAMMALS	
Bat, Mexican long-tongued	Choeronycteris mexicana
Bat, Peters' leaf-chinned	Moormops megalophylla
Bat, red	Lasiurus borealis
Bat, hoary Bat	Lasiurus cinereus

Bat, big brown	Eptesicus fuscus
Bat, Townsend's big-eared	Plecotus townsendii
Bat, long-nosed	Leptonycteris nivalis
Bat, pallid	Antrozous pallidus
Bat, Brazilian free-tailed	Taderida brasiliensis
Bobcat	Lynx rufus
Coati	Nasua narica
Cottontail, desert	Sylvilagus auduboni
Coyote	Canis latrans
Deer, black-tailed	Odocoileus hemionus
Deer, white-tailed	Odocoileus virginianus
Fox, gray	Urocyon cinereoargenteus
Gopher, southern pocket	Thomomys umbrinus
Jaguar	Felis onca
Jaquarundi	Felis yagouaroundi
Javelina	Tayassu tajacu
Lion, mountain	Felis concolor
Mouse, brush	Peromyscus boylei
Mouse, white-footed	Peromyscus leucopus
Mouse, deer	Peromyscus maniculatus
Mouse, cactus	Peromyscus eremicus
Mouse, fulvous harvest	Reithrodontomys fulvescens
Mouse, western harvest	Reithrodontomys megalotis
Mouse, rock pocket	Perognathus intermedius
Mouse, desert pocket	Perognathus penicillatus
Mouse, southern grasshopper	Onychomys torridus
Myotis, California	Myotis californicus
Myotis, long-eared	Myotis evotis
Myotis, cave	Myotis velifer
Myotis, small-footed	Myotis subulatus
Pipistrelle, western	Pipistrellus hespersus
Porcupine	Erethizon dorsatum
Rabbit, black-tailed jack	Lepus californicus
Raccoon	Procyon lotor
Rat, hispid cotton	Sigmodon hispidus
Rat, Merriam's kangaroo	Dipodomys merriami
Rat, White-throated wood	Neotoma albigula
Ringtail	Bassariscus astutus
Shrew, desert	Notiosorex crawfordi
Skunk, hog-nosed	Conopatus mesoleucus
Skunk, hooded	Mephitis macroura
Skunk, striped	Mephitis mephitis
Skunk, spotted	Spilogale putorius
Squirrel, Arizona gray	Sciurus arizonensis
Squirrel, rock	Citellus variegatus

BIRDS

Becard, rose-throated	Platypsaris aglaiae
Bluebird, mountain	Sialia currucoides
Bluebird, eastern	Sialia sialis
Bunting, lazuli	Passerina amoena
Bushtit, common	Psaltriparus minimus
Cardinal	Cardinalis cardinalis
Chat, yellow-breasted	Icteria virens
Cowbird, bronzed	Tangavius aeneus
Cowbird, brown-headed	Molothrus ater
Cuckoo, yellow-billed	Coccyzus americanus
Dove, ground	Columbina passerina
Dove, white-winged	Zenaida asiatica
Dove, mourning	Zenaida maeroura
Eagle, golden	Aquila chrysaetos
Finch, house	Carpodacus mexicanus
Flicker, red-shafted	Colaptes auratus
Flycatcher, dusky	Empidonax oberholseri
Flycatcher, ash-throated	Myiarchus cinerascens
Flycatcher, Couse's	Contopus pertinax
Flycatcher, olivaceous	Myiarchus tuberculifer
Flycatcher, gray	Empidonax wrightii
Flycatcher, beardless	Camptostoma imberbe
Flycatcher, Wied's crested	Myiarchus tyrannulus
Flycatcher, olive-sided	Nuttallornis borealis
Flycatcher, vermillion	Pyrocephalus rubinus
Flycatcher, western	Empidonax dificilis
Gnatcatcher, blue-gray	Polioptila caerulea
Goldfinch, lesser	Spinus psaltria
Grosbeak, black-headed	Pheucticus melanocephalus
Grosbeak, blue	Guiraca caerulea
Hawk, Cooper's	Accipiter cooperii
Hawk, marsh	Circus cyaneus
Hawk, zone-tailed	Buteo albonotatus
Hawk, sharp-shinned	Accipiter striatus
Hawk, red-tailed	Buteo jamaicensis
Hawk, sparrow	Falco sparvenus
Hummingbird, Anna's	Calypte anna
Hummingbird, Costa's	Calypte costae
Hummingbird, Lucifer	Calothorax lucifer
Hummingbird, broad-tailed	Cynanthus latirostris
Hummingbird, black-chinned	Archilochus alexandri
Jay, pinon	Gymnorhinus cyanocephalus
Jay, Steller's	Cyanocitta stelleri
Jay, scrub	Aphelocoma coerulescens
Jay, Mexican	Aphelocoma ultramarina
Junco, gray-headed	Junco caniceps

Junco, Oregon	Junco hyemalis
Kingbird, Cassin's	Tyrannus vociferans
Kingfish, western	Tyrannus verticalis
Kingfisher, green	Chlorocerule americana
Kinglet, ruby-crowned	Regulus calendula
Meadowlark, western	Sturnella neglecta
Mockingbird	Mimus polyglottos
Nighthawk, common	Chordeiles minor
Nuthatch, white-breasted	Sitta carolinensis
Oriole, Scott's	Icterus parisorum
Oriole, hooded	Icterus cucullatus
Oriole, Bullock's	Icterus galbula
Owl, long-eared	Asio otus
Owl, elf	Micrathene whitnevi
Owl, screech	Otus asio
Owl, great horned	Bubo virginianus
Pewee, western wood	Contopus sordidulus
Phainopepla	Phainopepla nitens
Phoebe, black	Sayornis nigricans
Phoebe, Say's	Sayornis saya
Pigeon, band-tailed	Columba fasciata
Poor-will	Phalaenoptilus nuttallii
Pyrrhuloxia	Pyrrhuloxia sinuata
Quail, harlequin	Cyrtonyx montezumae
Raven, common	Corvus corax
Raven, white-necked	Corvus cryptoleucus
Redstart, painted	Setophaga picta
Roadrunner	Geococcyx californianus
Robin, American	Turdus migratorius
Sapsucker, yellow-bellied	Sphyrapicus varius
Shrike, loggerhead	Lanius ludovicianus
Siskin, pine	Spinus pinus
Solitaire, Townsend's	Myadestes townsendi
Sparrow, vesper	Poocetes gramineus
Sparrow, lark	Chondestes grammacus
Sparrow, Lincoln's	Melospiza lincolnii
Sparrow, chipping	Spizella passerina
Sparrow, black-chinned	Spizella atrogularis
Sparrow, black-throated	Amphispiza bilineata
Sparrow, rufous-crowned	Aimophila ruficeps
Swallow, tree	Iridoprocne bicolor
Swallow, violet-green	Tachycineta thalassina
Swallow, rough-winged	Stelgidopteryx ruficollis
Swift, white-throated	Aeronautes saxatalis
Tanager, summer	Piranga rubra
Tanager, hepatic	Piranga flava
Tanager, western	Piranga ludoviciana
Thrasher, crissal	Toxostoma dorsale

Thrasher, curve-billed	Toxostoma curvirostre
Thrush, Swainson's	Catharus ustulatus
Thrush, hermit	Catharus guttatus
Titmouse, bridled	Parus wollweberi
Towhee, brown	Pipilo fuscus
Towhee, rufous-sided	Pipilo erythrophthalmus
Towhee, green-tailed	Chlorua chlorua
Verdin	Auriparus flaviceps
Vireo, warbling	Vireo gilvus
Vireo, solitary	Vireo solitarius
Vireo, Bell's	Vireo bellii
Vireo, Hutton's	Vireo huttoni
Vulture, turkey	Cathartes aura
Warbler, Wilson's	Wilsonia pusilla
Warbler, MacGillivray's	Oporonis tolmiei
Warbler, Grace's	Dendroica graciae
Warbler, hermit	Dendroica occidentalis
Warbler, Townsend's	Dendroica townsendi
Warbler, black-throated Gray	Dendroica nigrescens
Warbler, Audubon's	Dendroica coronata
Warbler, yellow	Dendroica petechia
Warbler, Lucy's	Vermivora luciae
Warbler, Virginia's	Vermivora virginiae
Warbler, Nashville	Vermivora ruficapilla
Warbler, orange-crowned	Vermivora celata
Warbler, black and White	Mniotilta varia
Waterthrush, Louisiana	Seiurus motacilla
Waterthrush, northern	Seiurus novaboracensis
Woodpecker, Gila	Centurus uropygialis
Woodpecker, Arizona	Dendrocopos arizonae
Woodpecker, ladder-backed	Dendrocopos scalaris
Woodpecker, Lewis's	Asyndesmus lewis
Woodpecker, acorn	Melanerpes formicivorus
Wren, rock	Salpinctes obsoletus
Wren, canyon	Catherpes mexicanus
Wren, cactus	Campylorhynchus brunneicapillus
Wren, Bewick's	Thryomanes bewickii
Wren, house	Troglodytes aedon
Yellowthroat	Geothlypis trichas

(3) Geology

The entire area is underlain by Tertiary age volcanics: rhyolite, andesite and basalt (Arizona Highway Department, 1966).

(4) Soils

The majority of the area is occupied by soils classified as

Lithic Ustorthents; loamy-skeletal, mixed and thermic. These are shallow somewhat excessively drained soils of low fertility (USDA Forest Service, 1986c).

(5) Lands

All lands within the GRNA are controlled by the Coronado National Forest. No private inholdings are involved.

(6) Cultural

No archaeological surveys have been conducted within the area although one prehistoric site (ARO-05-02-06) containing pictographs and a rockshelter has been recorded. Additional prehistoric sites probably occur in the Goodding area.

(7) Other

No other significant natural values which have not already been discussed occur in the GRNA.

I. IMPACTS AND POSSIBLE CONFLICTS

(1) Mineral Resources

No known mineral resources exist in this area. There are, however, mining claims adjacent to and surrounding the area. The possibility does exist for trespass prospectors.

(2) Grazing

No impacts or conflicts exist since this area already has been closed to grazing. Water gaps at the upper and lower end of Goodding do wash out periodically as does Jacks Canyon in the southeast portion of the RNA and in a few other spots on the U.S. - Mexico border. Additional fencing is required in these areas.

(3) Timber

No commercial forest is affected. This area consists primarily of oak, willow, sycamore, cottonwood, etc. The potential for firewood harvest in this area is very low due to its inaccessibility. Campers and recreationists do gather firewood for overnight stays at the upper end of the area around Hank 'n Yank Spring.

(4) Watershed

The area is contained in the Rio Altar watershed which drains into Mexico.

(5) Recreation Values

The area is popular worldwide among botanists for its diverse flora and among birders for the peripheral occurrance of more tropical species. It is also popular with picnickers and campers. There is a potential for conflict between these uses and RNA objectives, which should be monitored to insure natural and research values are not degraded.

(6) Wildlife and Plant Values

The area contains some of the most unique and diverse flora and fauna in the United States. The area contains habitat for the Sonoran Chub (Gila ditaenia), a listed

threatened species, along with numerous bird species that migrate from Mexico during the winter months. Several candidate plant species also occur in the area (see Flora above). Two additional Coronado National Forest sensitive plants which occur within the RNA are Goodding ash (Fraxinus gooddingii) and fleabane (Erigeron eriophyllus).

(7) Special Management Area Values

The original GRNA (excluding 7 acres (2.8 hecatares)) and the entire southern extension occur within the boundaries of the Pajarito wilderness. 47 acres (18.8 hectares) of the northern extension occur in the wilderness area. Designation of the GRNA will not conflict with the purposes or management of this wilderness area.

(8) Transportation Plans

This RNA is accessed by a spur originating from a Forest Service System road. There are approximately 0.5 mile (.8 km) of road within the RNA itself. There are no transportation plans which would adversely affect the RNA. No further roads shall be built within or adjacent to the RNA.

J. MANAGEMENT PRESCRIPTION

The GRNA extensions are recommended in the Coronado National Forest Plan Management Area 8 and 8A (see Appendix; USDI Forest Service 1986b/1987b). In the non-wilderness areas, the management emphasis is to provide opportunities for nondisruptive research and education. In the areas designated as wilderness, management emphasis is to manage for wilderness values and uses while providing for opportunities for nondisruptive research and education. in all areas, use restrictions will be imposed as necessary to keep the area in an unmodified or natural condition.

(1) Vegetation Management

There will be no harvest of forest products including fuelwood. Prescribed fire will be used to reduce risk and to permit lightning to more nearly play its natural role. All livestock use is excluded.

K. ADMINISTRATION RECORDS AND PROTECTION

Administration and protection of the Goodding RNA will be the responsibility of the Coronado National Forest. The District Ranger, Nogales Ranger District, 2251 N. Grand Ave., Nogales, AZ 88621, has direct responsibility.

Records for the GRNA will be maintained in the following offices:
Regional Forester, Southwestern Region, Albuquerque, NM
Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO
Coronado National Forest, Tucson, AZ
District Ranger, Nogales Ranger District, Nogales, AZ

L. ARCHIVING

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. Requests to conduct research in the area should be referred to him at 240 W. Prospect Rd., Ft. Collins, CO 80526-2098. He, or his designee, will evaluate research proposals and coordinate all studies and research in the area with the District Ranger and the RNA research coordinator. Plant specimens collected in the course of research in the area will be maintained at the University of Arizona, College of Agriculture herbaria in Tucson, Arizona, or at the Forest Supervisor's office. Animal specimens will be maintained at the Arizona State University, Department of Zoology vertebrate museum in Tempe, Arizona.

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APPENDIX

These pages are reproduced from the Coronado National Forest Plan, including Amendment No.3

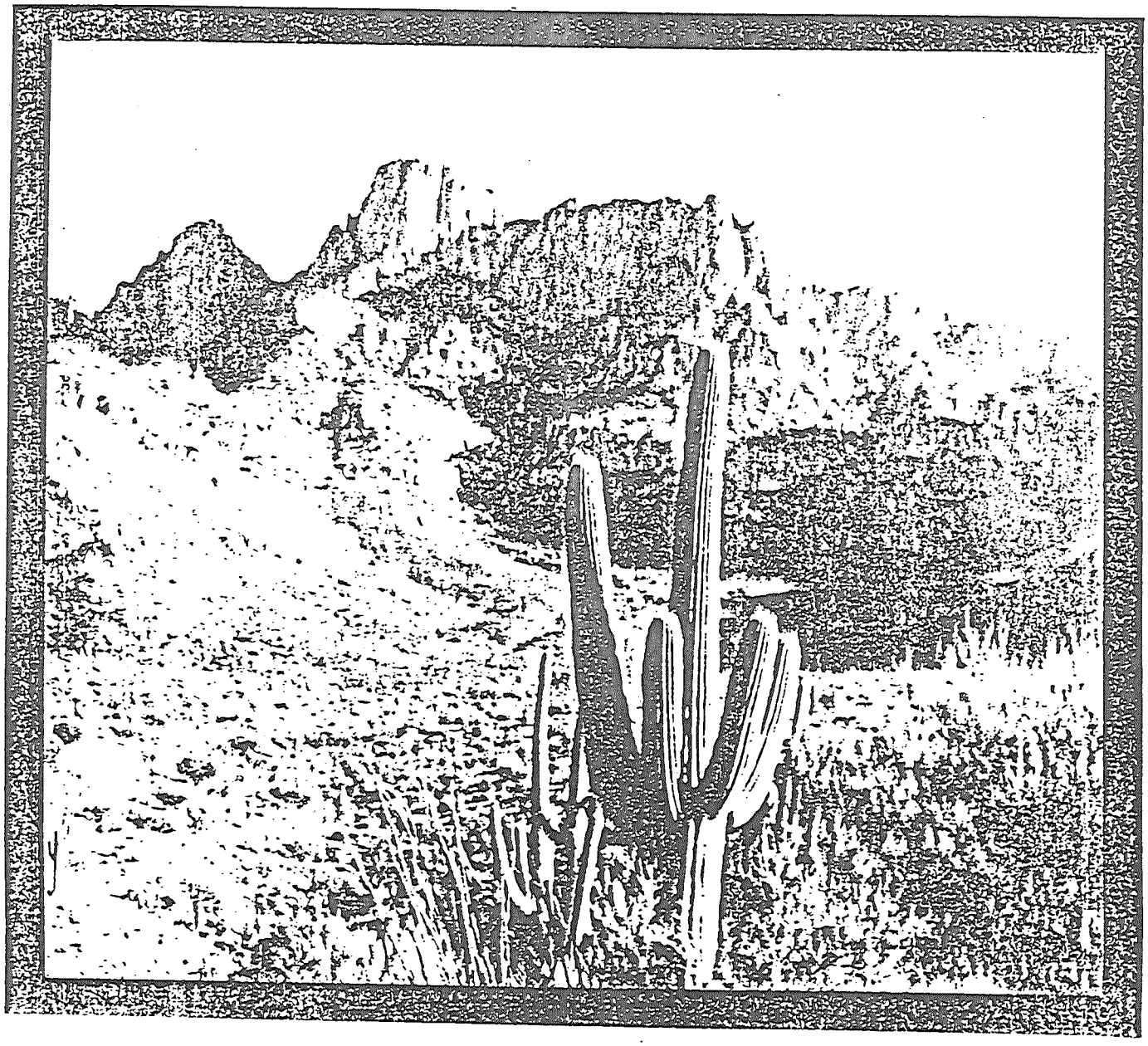
United States
Department of
Agriculture

Forest
Service

Southwestern
Region

July 1986

Coronado National Forest Plan



MANAGEMENT AREA 8

Management Emphasis and Intensity: Manage to provide opportunities for nondisruptive research and education. Use restrictions will be imposed as necessary to keep areas in their climax state. There will be no harvest of forest products including fuelwood.

Management Area Description: Includes those lands that have been determined to be suitable for designation as research natural areas. Includes the following areas:

Existing RNA	Acres
Butterfly	1000
Goudy Canyon*	370
Elgin	290
Goodding (North End)*	7

New RNA Proposal	Acres
Canelo	350
Goodding (North Extension)*	153

Other	Acres
Research Ranch	1635

* Remainder in Wilderness (MA8A)

The Research Ranch will not be designated as an official research natural area but will be managed under a memorandum of understanding to meet similar objectives except some vegetative manipulation will be allowed for research projects.

Capability Area Types: 6P, 6P/H, 6H/M, 6M, 9CH/M, and 11AR.
Total acres = 3805.

Specific Standards and Guidelines

Timber Suitability: All Acres Unsuitable.

Management Practices	Activities	Standards and Guidelines
Dispersed Recreation O&M (DU 1)	A14, A15 L23	1. Maintain 50% of trails at level 2 and 50% at level 3. See Appendix E for a definition of levels. 2. Motor vehicles are not permitted in research natural areas. Within the Research Ranch, use of motorized vehicles is permitted only on designated roads and trails. Some trails may be closed to use by motor vehicles for safety reasons, to eliminate conflicting uses or to further protect resources. 3. Attempt to maintain semiprimitive nonmotorized opportunities that exist within the Research Ranch. If any existing roads are determined to be unneeded, close them to create more opportunities for primitive or semiprimitive nonmotorized experience. 4. Manage dispersed use at less than standard.
Visual Resource Management (DU 2)	A03	Manage the following acres at the indicated Visual Quality Objectives: 2,170 Acres Retention 57% (RNAs) 1,635 Acres Partial Retention 43% (Research Ranch)
Wildlife & Fish O&M (DU 10)	C01, C02 C12	Specific standards and guidelines for management of wildlife are shown in the Forest-wide prescription for activities appropriate to this Management Area. They are intended to meet the following objectives:

MANAGEMENT AREA 8 (Continued)

Management Practices	Activities	Standards and Guidelines
		1. Maintain or improve occupied habitat for federally and state listed animals.
		2. Maintain or improve current populations of endangered and threatened plants.
T&E Plant Habitat Improvement (DU 12) Fish Habitat Improvement (DU 13) Game Habitat Improvement (DU 14) Nongame Habitat Improvement (DU 15)	C03, C04 C05	Nonstructural habitat improvement projects will be based on guidelines in the Forest-wide prescription. They are intended to meet the following objectives: 1. Delist threatened and endangered species following guidelines of approved recovery plans and memorandums of understanding.
Range Management O&M (DU 16)	D02	1. Manage rangeland at level A (no livestock). Management excludes livestock grazing to protect other values or eliminate conflicts with other uses.
Watershed Maintenance & Improvement (DU 33, 34)	F03, F05	1. Watershed treatment is a low priority in this management area. If treatment is appropriate, activities are described in Appendix D. 2. These areas will be monitored for watershed condition trends as relic areas.
Minerals Management (DU 36)	G07	1. There will be no removal of mineral materials. 2. Maintain withdrawals from mineral entry for all areas. 3. Recommend withdrawals from mineral entry for new areas. 4. No surface occupancy for leasable minerals.
Road Maintenance (DU 48)	L19	1. Bring existing roads that are to be retained on the system to a maintenance standard which is suitable for the planned use and provides for safety and resource protection. Maintain roads to maintenance level 2. See Appendix E for a definition of levels. 2. Close, drain, and revegetate roads that are determined to be unneeded for further use.
Fire Management (DU 56)	P08, P09	1. The management area is divided into fire suppression zones 1 and 2 based on objectives for resource protection and cost of suppression. See Section 5 for definition of zones. 2. Use prescribed fire to reduce risk and to permit lightning to more nearly play its natural role.
Insect & Disease Management		1. Outbreaks of insects or disease will not be controlled, except where there is a clear and imminent danger to timber of other values outside the research natural area.

MANAGEMENT AREA 8A

Management Emphasis and Intensity: Manage for wilderness values and uses while providing opportunities for nondisruptive research and education. Use restrictions will be imposed as necessary to keep areas in their climax state. There will be no harvest of forest products including fuelwood.

Management Area Description: Includes those lands that have been determined to be suitable for both wilderness designation and designation as research natural areas. Includes the following areas:

Existing RNA	Acres
Pole Bridge	460
Santa Catalina (reduced)	890
Goodding*	538
Goudy Canyon*	190

New RNA Proposal	Acres
Goodding extension: South	1470
North*	47
Pole Bridge extension	90

* Remainder is outside Wilderness (MA8)

The Santa Catalina RNA will be reduced from 4131 acres to 890 acres. This will give a more manageable size while maintaining viable populations of targeted species.

Pole Bridge RNA is enlarged to include a more representative example of Chihuahua pine. The Goodding RNA is enlarged to include additional examples of Southwestern vegetative types as well as rare and threatened or endangered species.

Capability Area Types: 6H/M, 6M, 9AH/M, and 11AR.
Total acres = 3685

Specific Management Prescription

Timber Suitability: All Acres Unsuitable

Management Practices	Activities	Standards and Guidelines
Visual Resource Management (DU 2)	AO3	Manage the following acres at the indicated Visual Quality Objectives: 3,685 Acres Preservation 100%
Wilderness Recreation O&M (DU 8)	BO2, BO3	1. Maintain trails to level 1 and level 3. See Appendix E for a definition of levels. 2. Use of motorized vehicles is prohibited except as approved for emergency or other special needs. 3. Manage wilderness use at less than standard. 4. Maintain existing ROS class composition.
Wildlife & Fish O&M (DU 10)	CO1, CO2 C12	Specific standards and guidelines for management of wildlife are shown in the Forest-wide prescription for activities appropriate to this Management Area. They are intended to meet the following objectives: 1. Maintain or improve occupied habitat for federally and state listed animals. 2. Maintain or improve current populations of endangered and threatened plants.

MANAGEMENT AREA 8A (Continued)

Management Practices	Activities	Standards and Guidelines
T&E Plant Habitat Improvement (DU 12)	C03, C04 C05	Nonstructural habitat improvement projects will be based on guidelines in the Forest-wide prescription. They are intended to meet the following objective:
Fish Habitat Improvement (DU 13) Game Habitat Improvement (DU 14) Nongame Habitat Improvement		1. Delist threatened and endangered species following guidelines of approved recovery plans and memorandums of understanding.
Range Management O&M (DU 16)	D02	1. Manage rangeland at level A (no livestock). Management excludes livestock grazing to protect other values or eliminate conflicts with other uses.
Watershed Maintenance & Improvement (DU 33, 34)	F03, F05 K04	1. Watershed treatment is a low priority in this management area. If treatment is appropriate, activity selection criteria is described in Appendix D. 2. Monitor these areas for watershed condition trends as relic areas.
Minerals Management (DU 36)	G07	1. There will be no removal of mineral materials. Mineral withdrawals will be unnecessary because the segregative effect of wilderness designation exceeds that of a withdrawal.
Fire Management (DU 56)	P08, P09	1. The management area is in fire suppression zones one and two based on objectives for resource protection. See Section 5 for definition of zones. 2. Use prescribed fire to reduce risk and to permit lightning to more nearly play its natural role.
Insect & Disease Management		1. Outbreaks of insects or disease will not be controlled, except where there is a clear and imminent danger to timber or other values outside the research natural area.

LEGAL DESCRIPTION

Case Name/No. Goodding RNA extensions

Forest/District Coronado/Nogales

Type of Case Research Natural Area Establishment

This documents that the attached legal description for the case referenced above was reviewed by me for use in an area designation.

The legal description that describes the Goodding (South and North Extension) Research Natural Areas is acceptable, and no potential problems were noted during my review.

Reviewed by: _____ Date: 10-14-92
Forest Land Surveyor

E. LOCATION

The GRNA and extensions are located within the Nogales Ranger District of the Coronado National Forest in Santa Cruz County, Arizona (Figs. 1, 2, & 3). The GRNA comprises approximately 1670 acres (676 hectares). Elevations range from 3480 ft at the Mexican border to 4795 feet at the western edge of the RNA (1061.4 meters to 1462.5 meters). The center of the area is at latitude 33° 49′ north and longitude 109° 26′ west.

Goodding (South Extension) Research Natural Area (comprising 1470 acres (595.4 hectares)) is a tract of land within the administrative boundary of the Coronado National forest in Santa Cruz county, State of Arizona, and more particularly described as follows:

Located in Sections 21, 22, 23, 24, 26, 27, 28, 33, and 34, Township 23 South, Range 11 East, and Section 3, Township 24 South, Range 11 East, Gila and Salt River Meridian.

Commencing at the Closing Corner common to Sections 32 and 33, T. 23S., R. 11 E. on the International Boundary Reserve of the United States of America;
THENCE, southeasterly approximately .34 miles (.55 km) along said boundary to a point on a saddle, which is also on the Pajarita Wilderness Boundary, and is the Point of Beginning;
THENCE, northwesterly approximately .38 miles (.61 km) on Pajarita Wilderness Boundary, to a peak with a shown elevation of 4222 ft (1287.7 m);
THENCE, northeasterly approximately .27 miles (.43 km) along a ridge through a saddle to a peak;
THENCE, easterly approximately .28 miles (.45 km) to a peak with a shown elevation of 4269 ft (1302.0 m);
THENCE, northerly approximately .13 miles (.21 km) through a saddle to a peak;
THENCE, northeasterly and northwesterly approximately .85 miles (1.36 km) along the crest of a ridge, west of Sycamore Canyon, to a knoll with a contour elevation of 4040′ (1231.4 m);
THENCE, northwesterly approximately .35 miles (.56 km) along Mule Ridge, to a point on the Pajarita Wilderness Boundary;
THENCE, northeasterly on said boundary, and along same ridge, approximately .46 miles (.74 km), to a peak with a shown elevation of 4795′ (1461.5 m);
THENCE, southeasterly approximately .19 miles (.31 km) along crest of peak to a to a point with a contour elevation of 4640 ft (1414.3 m);
THENCE, northeasterly approximately .34 miles (.55 km) along a spur to a point of intersection with a side drainage, course southerly, said point is northerly approximately .21 miles (.34 km) from the confluence with Sycamore Canyon;
THENCE, northeasterly approximately .38 miles (.61 km) along a ridge to a point with a contour elevation of 4400 ft (1341.1 m), which is on the Goodding RNA Boundary;
THENCE, southeasterly approximately .45 miles (.72 km) on the Goodding RNA Boundary to the confluence of Sycamore and Penasco Canyons;
THENCE, southeasterly approximately .38 miles (.61 km) along Penasco Canyon to the intersection with a drainage, course northwesterly;
THENCE, southwesterly approximately .38 miles (.61 km) along said drainage to a point with a contour elevation of 4480 ft (1365.5 m);
THENCE, southwesterly approximately .22 miles (.35 km) along crest, to a knob with a contour elevation of 4480 ft (1365.5 m);
THENCE, westerly approximately .23 miles (.37 km) through a saddle to a point with a contour elevation of 4360 ft (1328.9 m);

THENCE, southerly approximately .21 miles (.34 km) along spur, to a point in a drainage, course westerly, where a lesser drainage, course northerly, intersects;
THENCE, southwesterly approximately .10 miles (.16 km) to a knob with a contour elevation of 3960 ft (1207 m);
THENCE, southwesterly approximately .21 miles (.34 m) to the confluence of two drainages, both course northwesterly;
THENCE, southerly approximately .37 miles (.59 km) to the northwest end of a ridge top, with a contour elevation of 4400 ft (1341.1 m);
THENCE, southerly approximately .38 miles (.61 km) along ridge to head of a drainage, course southeast;
THENCE, southeasterly approximately .23 miles (.37 km) along said side drainage to its intersection with Tonto Canyon, approximately .10 miles (.16 km) north of Manzanita Spring;
THENCE, southwesterly approximately .19 miles (.31 km) along Tonto Canyon to the intersection of a side drainage, course northeasterly;
THENCE, southeasterly approximately .06 miles (.10 km) along said side drainage to a point on the International Boundary Reserve of the United States of America;
THENCE, northwesterly approximately 1.19 miles (1.91 km), on the International Boundary Reserve of the United States of America, to the Point of Beginning.

Goodding (North Extension) Research Natural Area (comprising 200 acres (81 hectares)) is a tract of land within the administrative boundary of the Coronado National Forest in Santa Cruz County, State of Arizona, and more particularly described as follows:

Located in Sections 11, 14, and 15, Township 23 South, Range 11 East, Gila and Salt River Meridian.

Commencing at the Section Corner of 10, 11, 14, and 15, T. 23S., R. 11E., which is the Point of Beginning;
THENCE, southwesterly approximately .44 miles (.71 km) to a point on a ridge which is 100 ft (30.5 m) easterly of road 4180, and at intersection with the northern-most point of the Goodding RNA Boundary;
THENCE, southeasterly approximately .15 miles (.24 km) along said ridge and RNA boundary to a point on the Pajarita Wilderness Boundary;
THENCE, southeasterly approximately .73 miles (1.17 km) along said ridge and RNA boundary to the intersection with Trail #40;
THENCE, northeasterly approximately .38 miles (.61 km) along said trail to a point which is at the end of 4WD Road 4181;
THENCE, northeasterly approximately .10 miles (.16 km) along the westerly side of said road to an unnamed drainage;
THENCE, northwesterly approximately .38 miles (.61 km) along said drainage to a point with an approximate elevation of 4175 ft (1273.4 m);
THENCE, southwesterly, on the same bearing as from the POB to the point which is 100 ft east of road 4180, approximately .19 miles (.31 km) to the Section Corner 10, 11, 14, and 15 which is the Point of Beginning.

The RNA is 56 air miles (90 km) southwest of Tucson and 25 miles (40.2 km) (via Ruby Road) northwest of Nogales, Arizona. The RNA can be reached from U.S. Highway 89 by taking the Pena Blanca Lake-Ruby turnoff, approximately 59 miles (94 km) south of Tucson. The Ruby road is paved for 10 miles (16.6 km) west of Highway 89. Exactly 10 miles west of Highway 89, there is a fork in the road. The right fork goes to Pena Blanca Lake. To reach the RNA, one must take the unpaved left fork toward Ruby and Arivaca and travel 9.5 miles (15.2 km) to Sycamore Canyon. At Sycamore Canyon, there is a well-marked left fork (F.S. Road 218) which goes to Hank n' Yank Spring and Sycamore

Canyon. The road ends shortly (approximately one-quarter mile) after one takes the turnoff. A short distance away is the a ruin site. The RNA begins immediately west of this ruin and continues down the canyon all the way to the Mexican border (from Smith, 1979:87).

Fig. 3. Boundaries of the north and south extensions of the Goodding RNA, Nogales Ranger District, Coronado National Forest. (Scale: 2.6" = 1 mile).

Decision Notice
Finding of No Significant Impact
Designation Order

Goodding Research Natural Area (Extension)
Coronado National Forest
Nogales Ranger District
Santa Cruz County, Arizona

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 extend the Goodding Research Natural Area (RNA). The extension shall be comprised of 1670 acres (676 hectares) of lands in Santa Cruz County, Arizona, on the Nogales Ranger District of the Coronado National Forest, as described in the section of the Establishment Record entitled "Location".

The Regional Forester recommended the southern extension in the Record of Decision for the Coronado National Forest Land and Resource Management Plan (Forest Plan) in 1986. In 1987, the Forest Supervisor amended the Forest Plan to recommend a northern extension to include a population of Phaseolus supinus. These recommendations were 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. Forest Plan Amendment No. 3, dated October 13, 1987, contains results of the Forest Supervisor analysis.

The Regional Forester has reexamined the Goodding/Sycamore Canyon area to ensure the environmental effects of expanding the existing RNA have not changed since 1986. This analysis is documented in the attached environmental assessment. Based on the analysis in the environmental assessment, it is my decision to adopt Alternative A, to extend Goodding RNA. Alternative A is selected because it provides a long-term protection and recognition of a canyon that supports significant biological diversity; including USFWS threatened fish, the Sonoran chub (Gila ditaenia). Goodding RNA will be managed in compliance with all relevant laws, regulation, and Forest Service Manual direction regarding RNA's and in accordance with the management direction identified in the Forest Plan.

The alternative considered was Alternative B, the "No Action" alternative which would continue management of the extension of Goodding/Sycamore Canyon as a "proposed" RNA. Alternative B was not selected because it would only provide short-term protection for these lands. Alternative B is consistent with the Forest Plan. Although the proposed action (Alternative A) is consistent with the management direction, it is not consistent with the land allocation for the Goodding/Sycamore Canyon area in the Forest Plan. The Coronado Forest Plan is hereby amended to change the allocation of the extension of the Goodding/Sycamore Canyon area from "Proposed" to Established RNA. 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 Coronado 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 Coronado National Forest mailing list.

It has been determined through the environmental assessment 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) 40 CFR 1508.27):

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.

1. There are no known effects on public health and safety.

2. There are no known effects on historic or cultural resources, actual or eligible National Register of Historic places sites, Park lands, prime farmlands, wetland, wild and scenic rivers. Effects on ecologically critical areas are minimal.

3. Effects on the human environment are not uncertain, do not involve unique or unknown risks, and are not likely to be highly controversial.

4. The action is not likely to establish a precedent for future actions with significant effects.

5. There are no known cumulative effects.

6. The proposed action would not adversely affect an endangered or threatened species or its critical habitat.

7. The proposed action is consistent with Federal, State, and local laws and requirements for the protection of the environment.

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

The Secretary of Agriculture
14th and 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

Environmental Assessment
Goodding Research Natural Area (Extension)

Coronado National Forest
Nogales Ranger District
Santa Cruz County, Arizona

Proposed Action

The proposed action is to extend the existing Goodding RNA. The extension was identified as a "proposed" Research Natural Area (RNA) in the Land and Resource Management Plan (Forest Plan) for the Coronado National Forest. It will be managed according to the direction provided in the Forest Plan (Management Areas 8 and 8A). The proposed action, formal designation of the extension as an RNA by the Chief of the Forest Service, will amend the Forest Plan.

Purpose and Need for Action

The purpose of extending the Goodding RNA is to contribute to a series of RNA's designated to "illustrate adequately or typify for research or education purposes, the important forest and range types in each forest region, as well as other plant communities that have special or unique characteristics of scientific interest and importance" (36 CFR 251.23). Goodding RNA was established in 1970 to protect an area that has a very high level of biological diversity. An evaluation by the Regional RNA Committee, pursuant to direction in Forest Service Manual (FSM) 4063.04b, identified that establishment of the RNA was needed to protect the rare plants and animals that occur in this unique canyon. Extending the Goodding RNA provides long-term protection for these species, including Dalea tentaculoides, a USFWS Category 1 plant that occurs only in this canyon, as well as other species such as Phaseolus supinus also Category 1, and the threatened Sonoran chub, Gilia ditaenia.

The extension of the Goodding RNA was identified in the Forest Plan as a "proposed" RNA based on the location of several rare plant and animal populations that are found only in Goodding RNA/Sycamore Canyon. Comments received from interested and affected members of the public supported extending the existing RNA. Site conditions and public concerns have been reviewed; no important changes have occurred.

Conditions and environmental effects of designation are the same as described in the EIS for the Forest Plan. Site specific conditions and effects are as follows:

-The majority of the Goodding RNA is within the Pajarito Wilderness and grazing has been eliminated in the area since 1986. There will be no change to this mangement.

-The Goodding Research Natural Area is in the process of being withdrawn from mineral entry.

-Recreation use is light and limited to existing trails.

Designation of alternate RNA's for protection of this type was considered during Forest Plan development. The extension of the Goodding/Sycamore Canyon RNA was determined at that time to provide the most appropriate site for inclusion in the national network for protection of the biological diversity that occurs in the area.

Alternatives and Environmental Consequences

Alternative A, Proposed Action

Alternative A would extend the Goodding RNA, comprising 1670 acres (676 hectares). This alternative will provide long-term protection for the area. Management of the area will limit recreation use to non-motorized dispersed recreation at a low intensity and reduced service level, and no harvest of forest products (including fuelwood) will be allowed. Wildfires outside the area that endanger the area will be extinguished in an appropriate manner, as will person-caused fires within the area. Unplanned ignitions within the area will receive appropriate suppression action. Use restrictions will be imposed as necessary to keep areas in their natural or unmodified condition (Forest Plan). Goodding RNA is in the process of being withdrawn from mineral entry.

The environmental consequences of Alternative A are described in the EIS for the Coronado Forest Plan. There are no adverse or irreversible environmental effects. Irretrievable effects result from resource outputs either reduced or lost as a result of special area designation. There are no significant cumulative effects of establishing the RNA.

Alternative B, No Action

This alternative continues management according to direction in the Forest Plan for the "proposed" extension. Only short-term protection of the area, dependent on the life of the Forest Plan, will be provided. Management of the area will be the same as in Alternative A. Management emphasis is to provide opportunities for nondisruptive research and education. Use restrictions will be imposed as necessary to keep the area in an unmodified or natural condition.

The environmental consequences of Alternative B, the "No Action" alternative are as described in the EIS for the Coronado Forest Plan. No adverse or irreversible environmental effects are anticipated. Irretrievable effects result from resource outputs either reduced or lost as a result of special area designation.

Agencies and Persons Consulted

In the process of updating information to determine whether or not conditions had changed since adoption of the Forest Plan, several groups and individuals who may have additional information regarding the extension of Goodding RNA were contacted. Representatives from the national office of The Nature Conservancy, the Arizona Chapter of The Nature Conservancy, Arizona Heritage Program, Arizona Game and Fish Department, and Arizona Cattle Growers groups. Documentation of the contacts made and summaries of the comments are attached to this Environmental Assessment.

Supplemental Public Contacts

During the months of August-September 1993, the following groups, agencies, and individuals were contacted, by phone, regarding the establishment of the Canelo Research Natural Area. No negative comments regarding the establishment of this RNA were received. Phone contacts were made by Emilia Parra, Forest Botanist on the Coronado National Forest.

Arizona Chapter of Nature Conservancy - Andy Laurenzi, Peter Warren
Tucson Audubon Society - Doug Koppinger
Arizona State Parks, Natural Areas Association Committee - Jean Tripiano

MESSAGE SCAN FOR REGGIE A. FLETCHER

To RNA

From: REGGIE A. FLETCHER
Postmark: Apr 01,93 8:41 AM Delivered: Apr 01,93 8:41 AM
Status: Certified Confidential Previously read Urgent
Subject: Forwarded:

Comments:
From: REGGIE A. FLETCHER:R03A
Date: Apr 01,93 8:41 AM
Enclosed is a summary of contacts Gerald Henke made with the livestock industry on our submitting the draft RNA establishment reports to the Chief for his signature. While it is not spelled out in the summary, Gerald informs me that none of the persons contacted voiced objections to proceeding with those RNA's in the Forest Plans in either state. For new RNA's we will need to contact these individuals once again and if boundaries are changed to any degree we will need to do likewise. Please consider these contacts as adequate for public involvement for these individuals and the organizations they represent. This should be placed in the project file for all of the draft ER's covered by Forest Plans as of this date and for which we are doing public involvement.
Reggie Fletcher, Regional Ecologist April, 1, 1993

Previous comments:
From: GERALD HENKE
Date: Mar 31,93 2:48 PM
names added

----------X----------

RESEARCH NATURAL AREAS'S

Discussions have occured within the past two months with the Arizona Cattle Growers' Association (C.B. Lane) and individuals that attended the annual meeting of the New Mexico Range Improvement Task Force concerning those identified Research Natural Areas in Forest Land and Resource Management Plans in Region 3. Discussions focused around the present National Forest public involvement process and that those identified Research Natural Areas in Forest Plans would be forwarded to the Chief's for inclusion into the National Research Natural Areas system. One such discussion with the Arizona Cattle Growers occured by phone on March 30, 1993 while the conversation with the New Mexico Range Improvement Task Force (John Fowler, Jim Knight, Kirk McDaniel, Karl Wood, Dean John Owens) and attendees (David Kincade, Bill Ball, Stearling Carter, Ray Margo, Linden Parker) of that meeting occured on February 18, 1993.

MESSAGE SCAN FOR REGGIE A. FLETCHER

To RNA

From: REGGIE A. FLETCHER
Postmark: Apr 02,93 11:29 AM Delivered: Apr 02,93 11:31 AM
Status: Confidential
Subject: supplemental public input

Comments:
The enclosed is provided for those conducting public involvement on the RNA's for the NEPA step to use if needed. If used, please place in the project file. Thanks. Reggie

-------========X========-------

As supplementary material to public involvement on formalizing the proposed Research Natural Areas which are contained in current Forest Land and Resource Management Plans through signature of the Chief of the Forest Service, the following record is provided. On August 13-14, 1992, John Humke, representing the national office of The Nature Conservancy; Dan Campbell, Peter Warren and Mark Heitlinger, representing the Arizona Chapter of The Nature Conservancy; Fenton Kay representing the Arizona Heritage Program, Arizona Game and Fish Department; Rick Johnson and Bill Waldman representing the New Mexico chapter of The Nature Conservancy and the New Mexico Natural Heritage Program met with Larry Henson, Regional Forester, Forrest Carpenter, Deputy Regional Forester, Teresa Prendusi, Regional Botanist, Art Briggs, Director Land Management Planning and Reggie Fletcher, Regional Ecologist.

Among the topics discussed was the pursuit of the formalization of the Region's proposed Research Natural Areas. The Nature Conservancy and Heritage Program officials urged the Region's representatives to pursue whatever means necessary to satisfy the new RNA establishment report requirements in order to obtain the Chief's signature. The representatives also encouraged continued investigation into the possibility of locating additional suitable RNA's and securing their establishment.

Reggie Fletcher
Regional Ecologist

TITLE PAGE

Establishment Record for Goodding
Research Natural Area within Coronado
National Forest, Santa Cruz County, Arizona.

SIGNATURE PAGE

for

RESEARCH NATURAL AREA ESTABLISHMENT RECORD

Goodding Research Natural Area and Extensions

Coronado National Forest

Santa Cruz, Arizona

Prepared by Andrew W. Laurenzi Date 11/3/87
Mark H. Cochran, The Arizona Nature Conservancy
Andrew W. Laurenzi, The Arizona Nature Conservancy

Recommended by Jerry Lockwood Date 5/17/88
Jerry Lockwood, District Ranger,
Nogales Ranger District

Recommended by R.B. Tippeconnic Date 5.16.88
R.B. Tippeconnic, Forest Supervisor,
Coronado National Forest

Recommended by John W Russell Date 5-26-88
John W. Russell, Chairperson,
Southwestern Research Natural
Area Committee

Recommended by David Gallo Date 6/16/88
for Sotero Muniz, Regional Forester,
Southwestern Region

Recommended by Charles M. Loveless Date Sept. 28, 1988
Charles M. Loveless, Station Director,
Rocky Mountain Forest and Range
Experiment Station

A. INTRODUCTION

The original Goodding Research Natural Area (GRNA) and two boundary extensions comprise 1670 acres (676 hectares) in the Nogales Ranger District of the Coronado National Forest in Santa Cruz county, Arizona, on reserved public domain, National Forest land. The two extensions are contiguous with the established GRNA and contain the remainder of Sycamore Canyon as it flows to the border with Mexico and a small area of oak woodland to the northwest of the original RNA boundary. The southern extension and part of the northern extension and established RNA lie within the boundaries of the Pajarito Wilderness which was designated by Congress in 1984. Please note that for the purposes of this Establishment Record, Sycamore Canyon refers to the entire GRNA including the extensions. This record describes the entire area with specific reference to the extensions.

(1) Land Management Planning

The Southwest RNA Progress Report (USDA Forest Service, 1983) and the Coronado National Forest Plan and Environmental Impact Statement (USDA Forest Service, 1986a/1986b) include the southern GRNA extension. The environmental analysis conducted as part of the planning process supports the recommendation to establish this extension to the GRNA.

The northern extension was recommended by The Arizona Nature Conservancy during and after the comment period on the Coronado National Forest Plan. The Coronado National Forest Plan was amended on October 1987 to include this northern extension (USDA Forest Service, 1987a).

B. OBJECTIVES

The primary objective in augmenting the Goodding RNA is the protection of significant botanical and zoological genetic diversity.

C. JUSTIFICATION FOR ESTABLISHMENT OF AREA

The extensions essentially fulfill the argument originally put forth by Goodding (1961) to establish Sycamore Canyon as a natural area due to the area's significant botanical diversity. Data provided by the Heritage Data Management System (HDMS) of the Arizona Game and Fish Department, a centralized, ecological inventory of the state's rarest plants and animals, identified areas adjacent to the original RNA boundary which included populations of rare species for which the area is noted. Both the Southwest RNA Progress Report (USDA Forest Service, 1984) and the Coronado National Forest Plan and Amendment No. 3 (1986/1987a) identify the need to extend the GRNA to include these populations of rare species.

D. PRINCIPAL DISTINGUISHING FEATURES

Sycamore Canyon is one of the most biologically diverse sites in the United States. More than 600 vascular plant species and 72 species of fungi have been documented from the area (Toolin et al., 1979; Gilbertson et al., 1972). Among these are more than 30 species of special interest because of their limited distribution globally, in the United States, and in Arizona. Eleven plants currently under study by the USFWS for consideration as Federally threatened or endangered plant species, (USDI Fish and Wildlife Service, 1990), reside in the GRNA.

The canyon also includes more than 16 Arizona threatened vertebrate species: 7 birds, 9 reptiles and amphibians and 1 fish. The area has been identified as critical habitat for the Sonoran chub (Gila ditaenia), a species which is listed threatened by the United States Fish & Wildlife Service. Tarahumara frog (Rana tarhumarae), which is under consideration for Federal listing as threatened (USDI Fish and Wildlife Service, 1991), was previously known to occur in Sycamore Canyon but is now believed extirpated.

The majority of these special interest species are known primarily, if not exclusively, from the extension areas. Refer to Toolin et al. (1979) for a more complete description of the distinguishing features of Sycamore Canyon.

E. LOCATION

The GRNA and extensions are located within the Nogales Ranger District of the Coronado National Forest in Santa Cruz County, Arizona (Figs. 1, 2, & 3). The GRNA comprises approximately 1670 acres (676 hectares). Elevations range from 3480 ft at the Mexican border to 4795 feet at the western edge of the RNA (1061.4 meters to 1462.5 meters). The center of the area is at latitude 33° 49′ north and longitude 109° 26′ west.

Goodding (South Extension) Research Natural Area (comprising 1470 acres (595.4 hectares)) is a tract of land within the administrative boundary of the Coronado National forest in Santa Cruz county, State of Arizona, and more particularly described as follows:

Located in Sections 21, 22, 23, 24, 26, 27, 28, 33, and 34, Township 23 South, Range 11 East, and Section 3, Township 24 South, Range 11 East, Gila and Salt River Meridian.

Commencing at the Closing Corner common to Sections 32 and 33, T. 23S., R. 11 E. on the International Boundary Reserve of the United States of America;
THENCE, southeasterly approximately .34 miles (.55 km) along said boundary to a point on a saddle, which is also on the Pajarita Wilderness Boundary, and is the Point of Beginning;
THENCE, northwesterly approximately .38 miles (.61 km) on Pajarita Wilderness Boundary, to a peak with a shown elevation of 4222 ft (1287.7 m);
THENCE, northeasterly approximately .27 miles (.43 km) along a ridge through a saddle to a peak;
THENCE, easterly approximately .28 miles (.45 km) to a peak with a shown elevation of 4269 ft (1302.0 m);
THENCE, northerly approximately .13 miles (.21 km) through a saddle to a peak;
THENCE, northeasterly and northwesterly approximately .85 miles (1.36 km) along the crest of a ridge, west of Sycamore Canyon, to a knoll with a contour elevation of 4040′ (1231.4 m);

THENCE, northwesterly approximately .35 miles (.56 km) along Mule Ridge, to a point on the Pajarita Wilderness Boundary;
THENCE, northeasterly on said boundary, and along same ridge, approximately .46 miles (.74 km), to a peak with a shown elevation of 4795' (1461.5 m);
THENCE, southeasterly approximately .19 miles (.31 km) along crest of peak to a to a point with a contour elevation of 4640 ft (1414.3 m);
THENCE, northeasterly approximately .34 miles (.55 km) along a spur to a point of intersection with a side drainage, course southerly, said point is northerly approximately .21 miles (.34 km) from the confluence with Sycamore Canyon;
THENCE, northeasterly approximately .38 miles (.61 km) along a ridge to a point with a contour elevation of 4400 ft (1341.1 m), which is on the Goodding RNA Boundary;
THENCE, southeasterly approximately .45 miles (.72 km) on the Goodding RNA Boundary to the confluence of Sycamore and Penasco Canyons;
THENCE, southeasterly approximately .38 miles (.61 km) along Penasco Canyon to the intersection with a drainage, course northwesterly;
THENCE, southwesterly approximately .38 miles (.61 km) along said drainage to a point with a contour elevation of 4480 ft (1365.5 m);
THENCE, southwesterly approximately .22 miles (.35 km) along crest, to a knob with a contour elevation of 4480 ft (1365.5 m);
THENCE, westerly approximately .23 miles (.37 km) through a saddle to a point with a contour elevation of 4360 ft (1328.9 m);
THENCE, southerly approximately .21 miles (.34 km) along spur, to a point in a drainage, course westerly, where a lesser drainage, course northerly, intersects;
THENCE, southwesterly approximately .10 miles (.16 km) to a knob with a contour elevation of 3960 ft (1207 m);
THENCE, southwesterly approximately .21 miles (.34 m) to the confluence of two drainages, both course northwesterly;
THENCE, southerly approximately .37 miles (.59 km) to the northwest end of a ridge top, with a contour elevation of 4400 ft (1341.1 m);
THENCE, southerly approximately .38 miles (.61 km) along ridge to head of a drainage, course southeast;
THENCE, southeasterly approximately .23 miles (.37 km) along said side drainage to its intersection with Tonto Canyon, approximately .10 miles (.16 km) north of Manzanita Spring;
THENCE, southwesterly approximately .19 miles (.31 km) along Tonto Canyon to the intersection of a side drainage, course northeasterly;
THENCE, southeasterly approximately .06 miles (.10 km) along said side drainage to a point on the International Boundary Reserve of the United States of America;
THENCE, northwesterly approximately 1.19 miles (1.91 km), on the International Boundary Reserve of the United States of America, to the Point of Beginning.

Goodding (North Extension) Research Natural Area (comprising 200 acres (81 hectares)) is a tract of land within the administrative boundary of the Coronado National Forest in Santa Cruz County, State of Arizona, and more particularly described as follows:

Located in Sections 11, 14, and 15, Township 23 South, Range 11 East, Gila and Salt River Meridian.

Commencing at the Section Corner of 10, 11, 14, and 15, T. 23S., R. 11E., which is the Point of Beginning;

THENCE, southwesterly approximately .44 miles (.71 km) to a point on a ridge which is 100 ft (30.5 m) easterly of road 4180, and at intersection with the northern-most point of the Goodding RNA Boundary;
THENCE, southeasterly approximately .15 miles (.24 km) along said ridge and RNA boundary to a point on the Pajarita Wilderness Boundary;
THENCE, southeasterly approximately .73 miles (1.17 km) along said ridge and RNA boundary to the intersection with Trail #40;
THENCE, northeasterly approximately .38 miles (.61 km) along said trail to a point which is at the end of 4WD Road 4181;
THENCE, northeasterly approximately .10 miles (.16 km) along the westerly side of said road to an unnamed drainage;
THENCE, northwesterly approximately .38 miles (.61 km) along said drainage to a point with an approximate elevation of 4175 ft (1273.4 m);
THENCE, southwesterly, on the same bearing as from the POB to the point which is 100 ft east of road 4180, approximately .19 miles (.31 km) to the Section Corner 10, 11, 14, and 15 which is the Point of Beginning.

The RNA is 56 air miles (90 km) southwest of Tucson and 25 miles (40.2 km) (via Ruby Road) northwest of Nogales, Arizona. The RNA can be reached from U.S. Highway 89 by taking the Pena Blanca Lake-Ruby turnoff, approximately 59 miles (94 km) south of Tucson. The Ruby road is paved for 10 miles (16.6 km) west of Highway 89. Exactly 10 miles west of Highway 89, there is a fork in the road. The right fork goes to Pena Blanca Lake. To reach the RNA, one must take the unpaved left fork toward Ruby and Arivaca and travel 9.5 miles (15.2 km) to Sycamore Canyon. At Sycamore Canyon, there is a well-marked left fork (F.S. Road 218) which goes to Hank n' Yank Spring and Sycamore Canyon. The road ends shortly (approximately one-quarter mile) after one takes the turnoff. A short distance away is the a ruin site. The RNA begins immediately west of this ruin and continues down the canyon all the way to the Mexican border (from Smith, 1979:87).

F. AREA BY COVER TYPES

Information on cover types was obtained from the Southwestern Region RNA Progress Report (USDA Forest Service, 1984), Smith (1974), Toolin et al., (1979) and field reconnaissance.

Küchler

The primary cover types, (Küchler, 1966), are Oak-Juniper Woodland, K-027 and Grama-Tobosa Shrubsteppe, K-052 (Fig. 4).

Society of American Foresters

The primary cover type is Western Live Oak, SAF 241 (Eyre, 1980). The riparian forest and the non-forested portions of the RNA are not covered by SAF cover types.

Habitat Types or Plant Associations

The predominant habitat types found in the original RNA and extensions are the Quercus oblongifolia[1]/mixed Bouteloua spp. and the Quercus emoryi/Arctostaphylos pungens habitat types (USDA Forest Service, 1987b). The remaining communities are not covered by USFS habitat types.

G. PHYSICAL AND CLIMATIC CONDITIONS

From the Hank n' Yank ruin site, Sycamore Canyon extends for five miles to the U.S.-Mexico border. The canyon bottom and adjacent slopes form the GRNA. Steep slopes and rugged cliffs surround the canyon bottom and are dominated by rhyolites, shales and sandstones. Rugged rock formations include spires that approach 100 feet (30 meters) in height. The Sycamore Canyon stream channel provides intermittent flow the length of the RNA.

The climate of the area is semiarid with abundant rainfall only in July and August. During these two months, the nearby Ruby weather station, located three miles (4.8 km) to the northwest, is one of the wettest areas in the state with an average of more than nine inches (22.9 cm) of precipitation (Green and Sellers, 1964). Most of the remaining annual precipitation at Ruby, which averages 19.0 inches (48.3 cm), is concentrated in the winter months and results from widespread storms that move across Arizona from the Pacific Ocean. Snowfall occurs occasionally in the area but snow seldom remains on the ground for more than a day.

Temperatures at the RNA are seldom extreme in either direction. Summer highs occasionally exceed 100° F. (37.5° C) but the high frequency of afternoon showers in July, August and September helps ameliorate afternoon highs. Summer lows drop to the middle sixties at night. Afternoon highs in January and February are normally in the high fifties or low sixties and nighttime lows are more likely to be above than below freezing (climate information was reproduced from Smith, 1974:87-88).

Meteorologica data was recorded at the Ruby weather station from 1931-1944 and 1945-1955 (Green and Sellers, 1964).

H. DESCRIPTION OF VALUES

(1) Flora

The flora of Sycamore Canyon has been listed by Toolin et al. (1979) and the fungi by Gilbertson et al. (1972). In all, 624 species of vascular plants, 20 species of lichens, 40 species of mosses and 85 species of fungi have been found so far within the confines of Sycamore Canyon. Of the known fungi, 2 species are known for the United States only from Sycamore Canyon, and 5 species are known in Arizona only from this locality. Of

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[1]In this Establishment Record all trees are named following Little, E.L.Jr. 1979. Checklist of United States trees (native and naturalized). Agricultural Handbook No. 541. USDA. Washington, DC. All other plants are named following Lehr, J.H. 1978. A Catalog of the flora of Arizona. Northland Press. Flagstaff, AZ.

the known vascular plants, 10 species have been documented in the United States only here. These are:

Lobelia laxiflora (lobelia)
Dichondra repens var. sericea (dichondra)
Croton ciliatoglanduliferum (croton)
Aeschynomene villosa (joint vetch)
Lotus alamosanus (vetch)
Sida rhombifolia (axocatzin)
Passiflora bryonoides (passionflower)
Rhynchosia edulis
Henrya insularis (henrya)
Paspalum virletii (virlet paspalum)

Eleven vascular plant species are under study by the USFWS for protection under the Endangered Species Act as threatened or endangered. These are:

Agave parviflora
Anoda abutiloides
Amsonia grandiflora
Choisya mollis
Coryphantha recurvata
Cynanchum wigginsii
Dalea tentaculoides
Desmanthus bicornutus
Dichonra repens sericea
Graptopetalum bartramii
Phaseolus supinus

Several plants are interesting in their disjunct occurrence in Sycamore Canyon. Butterfly pea (Clitoria mariana) is common along the east coast to eastern Texas yet does not occur farther west apart from the Sycamore Canyon population. A spleenwort fern (Asplenium exiguum), known from Himalaya Mountains in Asia has been found in a few locations in Sonora, Mexico and in Sycamore Canyon, the only U.S. location. The nearest known location of Whisk fern (Psilotum nudum) is 300 miles (483 km) south in Mexico and 1200 miles (1931 km) east in Texas. Utah shadbrush (Amelanchier utahensis), a common component of the flora of Utah and Colorado skips most of Arizona after the Grand Canyon only to surface again in Sycamore Canyon.

Several cover types occur in the GRNA and extensions. The predominant vegetation is oak woodland, Quercus oblongifolia/ Bouteloua spp. habitat type as described by Moir (1986). This open canopy, oak woodland is dominated by blue oak with Emory oak (Quercus emoryi) and alligator juniper (Juniperus deppeana) present as canopy associates. Shrubs are rare and the herbaceous layer is dominated by a rich association of perennial grass species. Common grasses include several gramas (Bouteloua curtipendula, B. gracilis, B. chrondrosoides), Arizona muhly (Muhlenbergia arizonica), bullgrass (Muhlenbergia emersleyi), Plains lovegrass (Eragrostis intermedia), three awn (Aristida hamulosa), Elyoneurus barbiculmis and Trachypogon secundus. The entire northern extension includes this habitat type.

Other types, present in the original RNA and the southern extension, include: 1) the Quercus emoryi/Arctostaphylos pungens habitat type on north-facing steep slopes, which is dominated by red berry juniper (Juniperus erythrocarpa) and pointleaf manzanita (Arctostaphylos pungens); 2) deciduous broadleaf riparian forest dominated by Arizona sycamore (Platanus wrightii), Bonpland willow (Salix bonplandiana), and Fremont cottonwood (Populus fremontii); and 3) semidesert grassland dominated by a diverse set of temperate and subtropical shrubs with a herbaceous layer characterized by a rich association of perennial grasses that have been noted for the aforementioned, Quercus oblongifolia/Bouteloua spp. habitat type. This scrub - grassland type is found in the southern half of the southern extension on south-facing aspects and is difficult to classify. Floristic elements suggest that it may be best described as an ecotone between semidesert grassland and Sonoran desertscrub or as a currently undescribed habitat type found more commonly in Sonora, Mexico.

(2) Fauna

The fauna of Goodding Research Natural Area also exhibits noteworthy distribution patterns. A number of species with widespread distributions south of the international border have peripheral occurrences in the GRNA. Notable among these are the coppery-tailed trogon (Trogon elegans), the rose-throated becard (Platypsaris aglaiae), and the five-striped sparrow (Aimophila quinquestriata). The coppery-tailed trogon is a Central American species which occurs in the canyon and several other areas in southern Arizona. The rose-throated becard is common in Mexico but is found only in southern Arizona and the lower Rio Grande valley in the United States. The five-striped Sparrow, which is also widely distributed in Mexico, nests in Sycamore Canyon and several other sites near the border in southeast Arizona. These sites represent its northernmost occurrences. Other Mexican species, which occur in the Canyon, include the vine snake (Oxybelis aeneus), Mexican hooknosed snake (Gyalopion quadrangularis), the barking frog (Hylactophryne augusti), and the mountain skink (Eumeces callicephalus). The Sonoran chub (Gila ditaena), the only fish found in the Canyon, occurs in the United States only in GRNA. This latter species is listed as threatened by the USFWS and the entire Sycamore Canyon streamcourse has been identified as critical habitat (50 CFR 17.11 and 17.12, January 1, 1989). The Chiricahua leopard frog (Rana chiricahuaensis), a Category 2 candidate species (USDI Fish and Wildlife Service, 1991), occurs within the canyon and the Tarahumara frog (Rana tarahumarae), a candidate Category 1 species (USDI Fish and Wildlife Service, 1991), is known historically from the GRNA, but is now believed extirpated.

Reptiles with montane distributions found in the Canyon include the short-horned horned lizard (Phrynosoma douglassi) and the Arizona mountain kingsnake (Lampropeltis pyromelana) (Toolin, 1979; Mohlenbrock, 1984).

A list of potential vertebrates was derived from Smith (1974) and the Arizona Heritage Data Management System, maintained by the Arizona Game and Fish Department.

Potential Vertebrates of the Goodding RNA

Common Name	Latin Name
AMPHIBIANS	
Frog, barking	Hylactophryne augusti
Frog, Chiricahua leopard	Rana chiricahuensis
Frog, Tarahumara	Rana tarahumarae
Toad, red-spotted	Bufo punctatus
Toad, southwestern	Bufo microscaphus
Toad, woodland narrow-mouthed	Gastrophryne carolinensis
Treefrog, canyon	Hyla arenicolor
REPTILES	
Coachwhip	Masticophis flagellum
Lizard, collared	Crotaphytus collaris
Lizard, Madrean earless	Holbrookia elegans
Lizard, short-horned horned	Phyrnosoma douglassi
Lizard, side-blotched	Uta stansburiana
Lizard, Sonora spiny	Sceloporus clarki
Lizard, tree	Urosaurus ornatus
Rattlesnake, black-tailed	Crotalus molossus
Rattlesnake, diamondback western	Crotalus atrox
Skink, mountain	Eumeces callicephalus
Snake, Arizona coral	Micruroides euryxanthus
Snake, Arizona mountain king	Lampropeltis pyromelana
Snake, black-necked garter	Thamnophis cyrtopsis
Snake, checkered garter	Thamnophis marcianus
Snake, gopher	Pituophis melanoleucus
Snake, Mexican hooknosed	Gyalopion quadrangularis
Snake, night	Hypsiglena torquata
Snake, Sonora hook-nosed	Ficimia quadrangularis
Snake, southwestern lyre	Trimorphodon lyrophanes
Snake, vine	Oxybelis aneus
Snake, vine	Oxybelis microphthalmus
Turtle, Sonoran mud	Kinosternon sonoriense
Whipsnake, Sonora	Masticophis bilineatus
Whiptail, Sonora	Cnemidophorus burti
Whiptail, western	Cnemidophorus tigris
MAMMALS	
Bat, Mexican long-tongued	Choeronycteris mexicana
Bat, Peters' leaf-chinned	Moormops megalophylla
Bat, red	Lasiurus borealis
Bat, hoary Bat	Lasiurus cinereus

Bat, big brown	Eptesicus fuscus
Bat, Townsend's big-eared	Plecotus townsendii
Bat, long-nosed	Leptonycteris nivalis
Bat, pallid	Antrozous pallidus
Bat, Brazilian free-tailed	Taderida brasiliensis
Bobcat	Lynx rufus
Coati	Nasua narica
Cottontail, desert	Sylvilagus auduboni
Coyote	Canis latrans
Deer, black-tailed	Odocoileus hemionus
Deer, white-tailed	Odocoileus virginianus
Fox, gray	Urocyon cinereoargenteus
Gopher, southern pocket	Thomomys umbrinus
Jaguar	Felis onca
Jaquarundi	Felis yagouaroundi
Javelina	Tayassu tajacu
Lion, mountain	Felis concolor
Mouse, brush	Peromyscus boylei
Mouse, white-footed	Peromyscus leucopus
Mouse, deer	Peromyscus maniculatus
Mouse, cactus	Peromyscus eremicus
Mouse, fulvous harvest	Reithrodontomys fulvescens
Mouse, western harvest	Reithrodontomys megalotis
Mouse, rock pocket	Perognathus intermedius
Mouse, desert pocket	Perognathus penicillatus
Mouse, southern grasshopper	Onychomys torridus
Myotis, California	Myotis californicus
Myotis, long-eared	Myotis evotis
Myotis, cave	Myotis velifer
Myotis, small-footed	Myotis subulatus
Pipistrelle, western	Pipistrellus hespersus
Porcupine	Erethizon dorsatum
Rabbit, black-tailed jack	Lepus californicus
Raccoon	Procyon lotor
Rat, hispid cotton	Sigmodon hispidus
Rat, Merriam's kangaroo	Dipodomys merriami
Rat, White-throated wood	Neotoma albigula
Ringtail	Bassariscus astutus
Shrew, desert	Notiosorex crawfordi
Skunk, hog-nosed	Conopatus mesoleucus
Skunk, hooded	Mephitis macroura
Skunk, striped	Mephitis mephitis
Skunk, spotted	Spilogale putorius
Squirrel, Arizona gray	Sciurus arizonensis
Squirrel, rock	Citellus variegatus

BIRDS

Becard, rose-throated	Platypsaris aglaiae
Bluebird, mountain	Sialia currucoides
Bluebird, eastern	Sialia sialis
Bunting, lazuli	Passerina amoena
Bushtit, common	Psaltriparus minimus
Cardinal	Cardinalis cardinalis
Chat, yellow-breasted	Icteria virens
Cowbird, bronzed	Tangavius aeneus
Cowbird, brown-headed	Molothrus ater
Cuckoo, yellow-billed	Coccyzus americanus
Dove, ground	Columbina passerina
Dove, white-winged	Zenaida asiatica
Dove, mourning	Zenaida maeroura
Eagle, golden	Aquila chrysaetos
Finch, house	Carpodacus mexicanus
Flicker, red-shafted	Colaptes auratus
Flycatcher, dusky	Empidonax oberholseri
Flycatcher, ash-throated	Myiarchus cinerascens
Flycatcher, Couse's	Contopus pertinax
Flycatcher, olivaceous	Myiarchus tuberculifer
Flycatcher, gray	Empidonax wrightii
Flycatcher, beardless	Camptostoma imberbe
Flycatcher, Wied's crested	Myiarchus tyrannulus
Flycatcher, olive-sided	Nuttallornis borealis
Flycatcher, vermillion	Pyrocephalus rubinus
Flycatcher, western	Empidonax dificilis
Gnatcatcher, blue-gray	Polioptila caerulea
Goldfinch, lesser	Spinus psaltria
Grosbeak, black-headed	Pheucticus melanocephalus
Grosbeak, blue	Guiraca caerulea
Hawk, Cooper's	Accipiter cooperii
Hawk, marsh	Circus cyaneus
Hawk, zone-tailed	Buteo albonotatus
Hawk, sharp-shinned	Accipiter striatus
Hawk, red-tailed	Buteo jamaicensis
Hawk, sparrow	Falco sparvenus
Hummingbird, Anna's	Calypte anna
Hummingbird, Costa's	Calypte costae
Hummingbird, Lucifer	Calothorax lucifer
Hummingbird, broad-tailed	Cynanthus latirostris
Hummingbird, black-chinned	Archilochus alexandri
Jay, pinon	Gymnorhinus cyanocephalus
Jay, Steller's	Cyanocitta stelleri
Jay, scrub	Aphelocoma coerulescens
Jay, Mexican	Aphelocoma ultramarina
Junco, gray-headed	Junco caniceps

Junco, Oregon	Junco hyemalis
Kingbird, Cassin's	Tyrannus vociferans
Kingfish, western	Tyrannus verticalis
Kingfisher, green	Chloroceryle americana
Kinglet, ruby-crowned	Regulus calendula
Meadowlark, western	Sturnella neglecta
Mockingbird	Mimus polyglottos
Nighthawk, common	Chordeiles minor
Nuthatch, white-breasted	Sitta carolinensis
Oriole, Scott's	Icterus parisorum
Oriole, hooded	Icterus cucullatus
Oriole, Bullock's	Icterus galbula
Owl, long-eared	Asio otus
Owl, elf	Micrathene whitnevi
Owl, screech	Otus asio
Owl, great horned	Bubo virginianus
Pewee, western wood	Contopus sordidulus
Phainopepla	Phainopepla nitens
Phoebe, black	Sayornis nigricans
Phoebe, Say's	Sayornis saya
Pigeon, band-tailed	Columba fasciata
Poor-will	Phalaenoptilus nuttallii
Pyrrhuloxia	Pyrrhuloxia sinuata
Quail, harlequin	Cyrtonyx montezumae
Raven, common	Corvus corax
Raven, white-necked	Corvus cryptoleucus
Redstart, painted	Setophaga picta
Roadrunner	Geococcyx californianus
Robin, American	Turdus migratorius
Sapsucker, yellow-bellied	Sphyrapicus varius
Shrike, loggerhead	Lanius ludovicianus
Siskin, pine	Spinus pinus
Solitaire, Townsend's	Myadestes townsendi
Sparrow, vesper	Poocetes gramineus
Sparrow, lark	Chondestes grammacus
Sparrow, Lincoln's	Melospiza lincolnii
Sparrow, chipping	Spizella passerina
Sparrow, black-chinned	Spizella atrogularis
Sparrow, black-throated	Amphispiza bilineata
Sparrow, rufous-crowned	Aimophila ruficeps
Swallow, tree	Iridoprocne bicolor
Swallow, violet-green	Tachycineta thalassina
Swallow, rough-winged	Stelgidopteryx ruficollis
Swift, white-throated	Aeronautes saxatalis
Tanager, summer	Piranga rubra
Tanager, hepatic	Piranga flava
Tanager, western	Piranga ludoviciana
Thrasher, crissal	Toxostoma dorsale

Thrasher, curve-billed	Toxostoma curvirostre
Thrush, Swainson's	Catharus ustulatus
Thrush, hermit	Catharus guttatus
Titmouse, bridled	Parus wollweberi
Towhee, brown	Pipilo fuscus
Towhee, rufous-sided	Pipilo erythrophthalmus
Towhee, green-tailed	Chlorua chlorua
Verdin	Auriparus flaviceps
Vireo, warbling	Vireo gilvus
Vireo, solitary	Vireo solitarius
Vireo, Bell's	Vireo bellii
Vireo, Hutton's	Vireo huttoni
Vulture, turkey	Cathartes aura
Warbler, Wilson's	Wilsonia pusilla
Warbler, MacGillivray's	Oporonis tolmiei
Warbler, Grace's	Dendroica graciae
Warbler, hermit	Dendroica occidentalis
Warbler, Townsend's	Dendroica townsendi
Warbler, black-throated Gray	Dendroica nigrescens
Warbler, Audubon's	Dendroica coronata
Warbler, yellow	Dendroica petechia
Warbler, Lucy's	Vermivora luciae
Warbler, Virginia's	Vermivora virginiae
Warbler, Nashville	Vermivora ruficapilla
Warbler, orange-crowned	Vermivora celata
Warbler, black and White	Mniotilta varia
Waterthrush, Louisiana	Seiurus motacilla
Waterthrush, northern	Seiurus novaboracensis
Woodpecker, Gila	Centurus uropygialis
Woodpecker, Arizona	Dendrocopos arizonae
Woodpecker, ladder-backed	Dendrocopos scalaris
Woodpecker, Lewis's	Asyndesmus lewis
Woodpecker, acorn	Melanerpes formicivorus
Wren, rock	Salpinctes obsoletus
Wren, canyon	Catherpes mexicanus
Wren, cactus	Campylorhynchus brunneicapillus
Wren, Bewick's	Thryomanes bewickii
Wren, house	Troglodytes aedon
Yellowthroat	Geothlypis trichas

(3) Geology

The entire area is underlain by Tertiary age volcanics: rhyolite, andesite and basalt (Arizona Highway Department, 1966).

(4) Soils

The majority of the area is occupied by soils classified as

Lithic Ustorthents; loamy-skeletal, mixed and thermic. These are shallow somewhat excessively drained soils of low fertility (USDA Forest Service, 1986c).

(5) Lands

All lands within the GRNA are controlled by the Coronado National Forest. No private inholdings are involved.

(6) Cultural

No archaeological surveys have been conducted within the area although one prehistoric site (ARO-05-02-06) containing pictographs and a rockshelter has been recorded. Additional prehistoric sites probably occur in the Goodding area.

(7) Other

No other significant natural values which have not already been discussed occur in the GRNA.

I. IMPACTS AND POSSIBLE CONFLICTS

(1) Mineral Resources

No known mineral resources exist in this area. There are, however, mining claims adjacent to and surrounding the area. The possibility does exist for trespass prospectors.

(2) Grazing

No impacts or conflicts exist since this area already has been closed to grazing. Water gaps at the upper and lower end of Goodding do wash out periodically as does Jacks Canyon in the southeast portion of the RNA and in a few other spots on the U.S. - Mexico border. Additional fencing is required in these areas.

(3) Timber

No commercial forest is affected. This area consists primarily of oak, willow, sycamore, cottonwood, etc. The potential for firewood harvest in this area is very low due to its inaccessibility. Campers and recreationists do gather firewood for overnight stays at the upper end of the area around Hank 'n Yank Spring.

(4) Watershed

The area is contained in the Rio Altar watershed which drains into Mexico.

(5) Recreation Values

The area is popular worldwide among botanists for its diverse flora and among birders for the peripheral occurrance of more tropical species. It is also popular with picnickers and campers. There is a potential for conflict between these uses and RNA objectives, which should be monitored to insure natural and research values are not degraded.

(6) Wildlife and Plant Values

The area contains some of the most unique and diverse flora and fauna in the United States. The area contains habitat for the Sonoran Chub (Gila ditaenia), a listed

threatened species, along with numerous bird species that migrate from Mexico during the winter months. Several candidate plant species also occur in the area (see Flora above). Two additional Coronado National Forest sensitive plants which occur within the RNA are Goodding ash (Fraxinus gooddingii) and fleabane (Erigeron eriophyllus).

(7) Special Management Area Values

The original GRNA (excluding 7 acres (2.8 hecatares)) and the entire southern extension occur within the boundaries of the Pajarito wilderness. 47 acres (18.8 hectares) of the northern extension occur in the wilderness area. Designation of the GRNA will not conflict with the purposes or management of this wilderness area.

(8) Transportation Plans

This RNA is accessed by a spur originating from a Forest Service System road. There are approximately 0.5 mile (.8 km) of road within the RNA itself. There are no transportation plans which would adversely affect the RNA. No further roads shall be built within or adjacent to the RNA.

J. MANAGEMENT PRESCRIPTION

The GRNA extensions are recommended in the Coronado National Forest Plan Management Area 8 and 8A (see Appendix; USDI Forest Service 1986b/1987b). In the non-wilderness areas, the management emphasis is to provide opportunities for nondisruptive research and education. In the areas designated as wilderness, management emphasis is to manage for wilderness values and uses while providing for opportunities for nondisruptive research and education. in all areas, use restrictions will be imposed as necessary to keep the area in an unmodified or natural condition.

(1) Vegetation Management

There will be no harvest of forest products including fuelwood. Prescribed fire will be used to reduce risk and to permit lightning to more nearly play its natural role. All livestock use is excluded.

K. ADMINISTRATION RECORDS AND PROTECTION

Administration and protection of the Goodding RNA will be the responsibility of the Coronado National Forest. The District Ranger, Nogales Ranger District, 2251 N. Grand Ave., Nogales, AZ 88621, has direct responsibility.

Records for the GRNA will be maintained in the following offices:
Regional Forester, Southwestern Region, Albuquerque, NM
Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO
Coronado National Forest, Tucson, AZ
District Ranger, Nogales Ranger District, Nogales, AZ

L. ARCHIVING

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. Requests to conduct research in the area should be referred to him at 240 W. Prospect Rd., Ft. Collins, CO 80526-2098. He, or his designee, will evaluate research proposals and coordinate all studies and research in the area with the District Ranger and the RNA research coordinator. Plant specimens collected in the course of research in the area will be maintained at the University of Arizona, College of Agriculture herbaria in Tucson, Arizona, or at the Forest Supervisor's office. Animal specimens will be maintained at the Arizona State University, Department of Zoology vertebrate museum in Tempe, Arizona.

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APPENDIX

These pages are reproduced from the Coronado National Forest Plan, including Amendment No.3

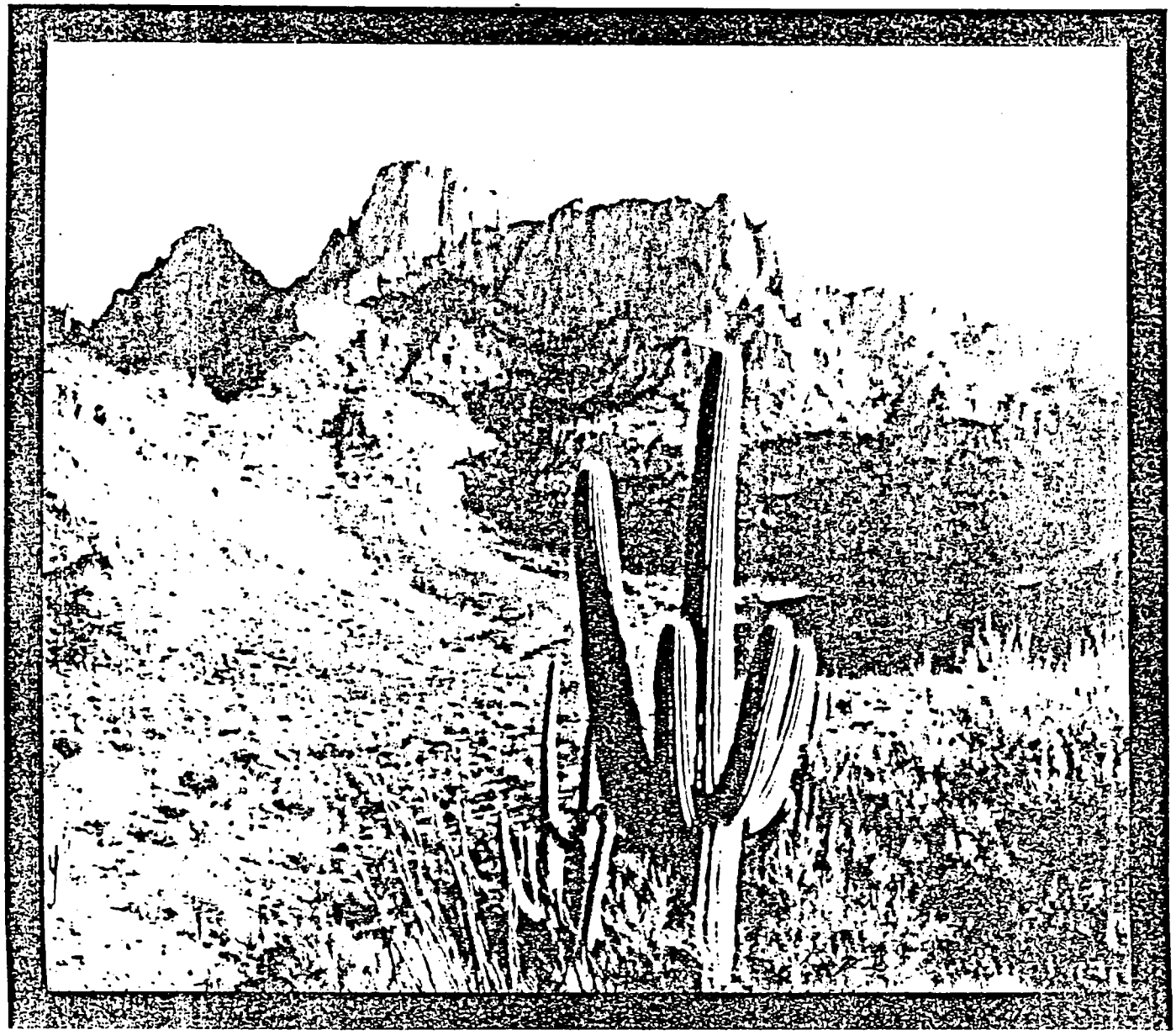
United States
Department of
Agriculture

**Forest
Service**

Southwestern
Region

July 1986

Coronado National Forest Plan



MANAGEMENT AREA 8

Management Emphasis and Intensity: Manage to provide opportunities for nondisruptive research and education. Use restrictions will be imposed as necessary to keep areas in their climax state. There will be no harvest of forest products including fuelwood.

Management Area Description: Includes those lands that have been determined to be suitable for designation as research natural areas. Includes the following areas:

Existing RNA	Acres
Butterfly	1000
Goudy Canyon*	370
Elgin	290
Goodding (North End)*	7

New RNA Proposal	Acres
Canelo	350
Goodding (North Extension)*	153

Other	Acres
Research Ranch	1635

* Remainder in Wilderness (MA8A)

The Research Ranch will not be designated as an official research natural area but will be managed under a memorandum of understanding to meet similar objectives except some vegetative manipulation will be allowed for research projects.

Capability Area Types: 6P, 6P/H, 6H/M, 6M, 9CH/M, and 11AR.
Total acres = 3805.

Specific Standards and Guidelines

Timber Suitability: All Acres Unsuitable.

Management Practices	Activities	Standards and Guidelines
Dispersed Recreation O&M (DU 1)	A14, A15 L23	1. Maintain 50% of trails at level 2 and 50% at level 3. See Appendix E for a definition of levels. 2. Motor vehicles are not permitted in research natural areas. Within the Research Ranch, use of motorized vehicles is permitted only on designated roads and trails. Some trails may be closed to use by motor vehicles for safety reasons, to eliminate conflicting uses or to further protect resources. 3. Attempt to maintain semiprimitive nonmotorized opportunities that exist within the Research Ranch. If any existing roads are determined to be unneeded, close them to create more opportunities for primitive or semiprimitive nonmotorized experience. 4. Manage dispersed use at less than standard.
Visual Resource Management (DU 2)	A03	Manage the following acres at the indicated Visual Quality Objectives: 2,170 Acres Retention 57% (RNAs) 1,635 Acres Partial Retention 43% (Research Ranch)
Wildlife & Fish O&M (DU 10)	C01, C02 C12	Specific standards and guidelines for management of wildlife are shown in the Forest-wide prescription for activities appropriate to this Management Area. They are intended to meet the following objectives:

MANAGEMENT AREA 8 (Continued)

Management Practices	Activities	Standards and Guidelines
		1. Maintain or improve occupied habitat for federally and state listed animals.
		2. Maintain or improve current populations of endangered and threatened plants.
T&E Plant Habitat Improvement (DU 12) Fish Habitat Improvement (DU 13) Game Habitat Improvement (DU 14) Nongame Habitat Improvement (DU 15)	C03, C04 C05	Nonstructural habitat improvement projects will be based on guidelines in the Forest-wide prescription. They are intended to meet the following objectives: 1. Delist threatened and endangered species following guidelines of approved recovery plans and memorandums of understanding.
Range Management O&M (DU 16)	D02	1. Manage rangeland at level A (no livestock). Management excludes livestock grazing to protect other values or eliminate conflicts with other uses.
Watershed Maintenance & Improvement (DU 33, 34)	F03, F05	1. Watershed treatment is a low priority in this management area. If treatment is appropriate, activities are described in Appendix D. 2. These areas will be monitored for watershed condition trends as relic areas.
Minerals Management (DU 36)	G07	1. There will be no removal of mineral materials. 2. Maintain withdrawals from mineral entry for all areas. 3. Recommend withdrawals from mineral entry for new areas. 4. No surface occupancy for leasable minerals.
Road Maintenance (DU 48)	L19	1. Bring existing roads that are to be retained on the system to a maintenance standard which is suitable for the planned use and provides for safety and resource protection. Maintain roads to maintenance level 2. See Appendix E for a definition of levels. 2. Close, drain, and revegetate roads that are determined to be unneeded for further use.
Fire Management (DU 56)	P08, P09	1. The management area is divided into fire suppression zones 1 and 2 based on objectives for resource protection and cost of suppression. See Section 5 for definition of zones. 2. Use prescribed fire to reduce risk and to permit lightning to more nearly play its natural role.
Insect & Disease Management		1. Outbreaks of insects or disease will not be controlled, except where there is a clear and imminent danger to timber of other values outside the research natural area.

MANAGEMENT AREA 8A

Management Emphasis and Intensity: Manage for wilderness values and uses while providing opportunities for nondisruptive research and education. Use restrictions will be imposed as necessary to keep areas in their climax state. There will be no harvest of forest products including fuelwood.

Management Area Description: Includes those lands that have been determined to be suitable for both wilderness designation and designation as research natural areas. Includes the following areas:

Existing RNA	Acres
Pole Bridge	460
Santa Catalina (reduced)	890
Goodding*	538
Goudy Canyon*	190

New RNA Proposal	Acres
Goodding extension: South	1470
North*	47
Pole Bridge extension	90

* Remainder is outside Wilderness (MA8)

The Santa Catalina RNA will be reduced from 4131 acres to 890 acres. This will give a more manageable size while maintaining viable populations of targeted species.

Pole Bridge RNA is enlarged to include a more representative example of Chihuahua pine. The Goodding RNA is enlarged to include additional examples of Southwestern vegetative types as well as rare and threatened or endangered species.

Capability Area Types: 6H/M, 6M, 9AH/M, and 11AR.
Total acres = 3685

Specific Management Prescription

Timber Suitability: All Acres Unsuitable

Management Practices	Activities	Standards and Guidelines
Visual Resource Management (DU 2)	A03	Manage the following acres at the indicated Visual Quality Objectives: 3,685 Acres Preservation 100%
Wilderness Recreation O&M (DU 8)	B02, B03	1. Maintain trails to level 1 and level 3. See Appendix E for a definition of levels. 2. Use of motorized vehicles is prohibited except as approved for emergency or other special needs. 3. Manage wilderness use at less than standard. 4. Maintain existing ROS class composition.
Wildlife & Fish O&M (DU 10)	C01, C02 C12	Specific standards and guidelines for management of wildlife are shown in the Forest-wide prescription for activities appropriate to this Management Area. They are intended to meet the following objectives: 1. Maintain or improve occupied habitat for federally and state listed animals. 2. Maintain or improve current populations of endangered and threatened plants.

MANAGEMENT AREA 8A (Continued)

Management Practices	Activities	Standards and Guidelines
T&E Plant Habitat Improvement (DU 12)	C03, C04 C05	Nonstructural habitat improvement projects will be based on guidelines in the Forest-wide prescription. They are intended to meet the following objective:
Fish Habitat Improvement (DU 13)		1. Delist threatened and endangered species following guidelines of approved recovery plans and memorandums of understanding.
Game Habitat Improvement (DU 14)		
Nongame Habitat Improvement		
Range Management O&M (DU 16)	D02	1. Manage rangeland at level A (no livestock). Management excludes livestock grazing to protect other values or eliminate conflicts with other uses.
Watershed Maintenance & Improvement (DU 33, 34)	F03, F05 K04	1. Watershed treatment is a low priority in this management area. If treatment is appropriate, activity selection criteria is described in Appendix D.
		2. Monitor these areas for watershed condition trends as relic areas.
Minerals Management (DU 36)	G07	1. There will be no removal of mineral materials. Mineral withdrawals will be unnecessary because the segregative effect of wilderness designation exceeds that of a withdrawal.
Fire Management (DU 56)	P08, P09	1. The management area is in fire suppression zones one and two based on objectives for resource protection. See Section 5 for definition of zones.
		2. Use prescribed fire to reduce risk and to permit lightning to more nearly play its natural role.
Insect & Disease Management		1. Outbreaks of insects or disease will not be controlled, except where there is a clear and imminent danger to timber or other values outside the research natural area.

LEGAL DESCRIPTION

Case Name/No. Goodding RNA extensions

Forest/District Coronado/Nogales

Type of Case Research Natural Area Establishment

This documents that the attached legal description for the case referenced above was reviewed by me for use in an area designation.

The legal description that describes the Goodding (South and North Extension) Research Natural Areas is acceptable, and no potential problems were noted during my review.

Reviewed by: _____ Date: 10-14-92
Forest Land Surveyor

E. LOCATION

The GRNA and extensions are located within the Nogales Ranger District of the Coronado National Forest in Santa Cruz County, Arizona (Figs. 1, 2, & 3). The GRNA comprises approximately 1670 acres (676 hectares). Elevations range from 3480 ft at the Mexican border to 4795 feet at the western edge of the RNA (1061.4 meters to 1462.5 meters). The center of the area is at latitude 33° 49′ north and longitude 109° 26′ west.

Goodding (South Extension) Research Natural Area (comprising 1470 acres (595.4 hectares)) is a tract of land within the administrative boundary of the Coronado National forest in Santa Cruz county, State of Arizona, and more particularly described as follows:

Located in Sections 21, 22, 23, 24, 26, 27, 28, 33, and 34, Township 23 South, Range 11 East, and Section 3, Township 24 South, Range 11 East, Gila and Salt River Meridian.

Commencing at the Closing Corner common to Sections 32 and 33, T. 23S., R. 11 E. on the International Boundary Reserve of the United States of America;
THENCE, southeasterly approximately .34 miles (.55 km) along said boundary to a point on a saddle, which is also on the Pajarita Wilderness Boundary, and is the Point of Beginning;
THENCE, northwesterly approximately .38 miles (.61 km) on Pajarita Wilderness Boundary, to a peak with a shown elevation of 4222 ft (1287.7 m);
THENCE, northeasterly approximately .27 miles (.43 km) along a ridge through a saddle to a peak;
THENCE, easterly approximately .28 miles (.45 km) to a peak with a shown elevation of 4269 ft (1302.0 m);
THENCE, northerly approximately .13 miles (.21 km) through a saddle to a peak;
THENCE, northeasterly and northwesterly approximately .85 miles (1.36 km) along the crest of a ridge, west of Sycamore Canyon, to a knoll with a contour elevation of 4040′ (1231.4 m);
THENCE, northwesterly approximately .35 miles (.56 km) along Mule Ridge, to a point on the Pajarita Wilderness Boundary;
THENCE, northeasterly on said boundary, and along same ridge, approximately .46 miles (.74 km), to a peak with a shown elevation of 4795′ (1461.5 m);
THENCE, southeasterly approximately .19 miles (.31 km) along crest of peak to a to a point with a contour elevation of 4640 ft (1414.3 m);
THENCE, northeasterly approximately .34 miles (.55 km) along a spur to a point of intersection with a side drainage, course southerly, said point is northerly approximately .21 miles (.34 km) from the confluence with Sycamore Canyon;
THENCE, northeasterly approximately .38 miles (.61 km) along a ridge to a point with a contour elevation of 4400 ft (1341.1 m), which is on the Goodding RNA Boundary;
THENCE, southeasterly approximately .45 miles (.72 km) on the Goodding RNA Boundary to the confluence of Sycamore and Penasco Canyons;
THENCE, southeasterly approximately .38 miles (.61 km) along Penasco Canyon to the intersection with a drainage, course northwesterly;
THENCE, southwesterly approximately .38 miles (.61 km) along said drainage to a point with a contour elevation of 4480 ft (1365.5 m);
THENCE, southwesterly approximately .22 miles (.35 km) along crest, to a knob with a contour elevation of 4480 ft (1365.5 m);
THENCE, westerly approximately .23 miles (.37 km) through a saddle to a point with a contour elevation of 4360 ft (1328.9 m);

THENCE, southerly approximately .21 miles (.34 km) along spur, to a point in a drainage, course westerly, where a lesser drainage, course northerly, intersects;
THENCE, southwesterly approximately .10 miles (.16 km) to a knob with a contour elevation of 3960 ft (1207 m);
THENCE, southwesterly approximately .21 miles (.34 m) to the confluence of two drainages, both course northwesterly;
THENCE, southerly approximately .37 miles (.59 km) to the northwest end of a ridge top, with a contour elevation of 4400 ft (1341.1 m);
THENCE, southerly approximately .38 miles (.61 km) along ridge to head of a drainage, course southeast;
THENCE, southeasterly approximately .23 miles (.37 km) along said side drainage to its intersection with Tonto Canyon, approximately .10 miles (.16 km) north of Manzanita Spring;
THENCE, southwesterly approximately .19 miles (.31 km) along Tonto Canyon to the intersection of a side drainage, course northeasterly;
THENCE, southeasterly approximately .06 miles (.10 km) along said side drainage to a point on the International Boundary Reserve of the United States of America;
THENCE, northwesterly approximately 1.19 miles (1.91 km), on the International Boundary Reserve of the United States of America, to the Point of Beginning.

Goodding (North Extension) Research Natural Area (comprising 200 acres (81 hectares)) is a tract of land within the administrative boundary of the Coronado National Forest in Santa Cruz County, State of Arizona, and more particularly described as follows:

Located in Sections 11, 14, and 15, Township 23 South, Range 11 East, Gila and Salt River Meridian.

Commencing at the Section Corner of 10, 11, 14, and 15, T. 23S., R. 11E., which is the Point of Beginning;
THENCE, southwesterly approximately .44 miles (.71 km) to a point on a ridge which is 100 ft (30.5 m) easterly of road 4180, and at intersection with the northern-most point of the Goodding RNA Boundary;
THENCE, southeasterly approximately .15 miles (.24 km) along said ridge and RNA boundary to a point on the Pajarita Wilderness Boundary;
THENCE, southeasterly approximately .73 miles (1.17 km) along said ridge and RNA boundary to the intersection with Trail #40;
THENCE, northeasterly approximately .38 miles (.61 km) along said trail to a point which is at the end of 4WD Road 4181;
THENCE, northeasterly approximately .10 miles (.16 km) along the westerly side of said road to an unnamed drainage;
THENCE, northwesterly approximately .38 miles (.61 km) along said drainage to a point with an approximate elevation of 4175 ft (1273.4 m);
THENCE, southwesterly, on the same bearing as from the POB to the point which is 100 ft east of road 4180, approximately .19 miles (.31 km) to the Section Corner 10, 11, 14, and 15 which is the Point of Beginning.

The RNA is 56 air miles (90 km) southwest of Tucson and 25 miles (40.2 km) (via Ruby Road) northwest of Nogales, Arizona. The RNA can be reached from U.S. Highway 89 by taking the Pena Blanca Lake-Ruby turnoff, approximately 59 miles (94 km) south of Tucson. The Ruby road is paved for 10 miles (16.6 km) west of Highway 89. Exactly 10 miles west of Highway 89, there is a fork in the road. The right fork goes to Pena Blanca Lake. To reach the RNA, one must take the unpaved left fork toward Ruby and Arivaca and travel 9.5 miles (15.2 km) to Sycamore Canyon. At Sycamore Canyon, there is a well-marked left fork (F.S. Road 218) which goes to Hank n' Yank Spring and Sycamore

Canyon. The road ends shortly (approximately one-quarter mile) after one takes the turnoff. A short distance away is the a ruin site. The RNA begins immediately west of this ruin and continues down the canyon all the way to the Mexican border (from Smith, 1979:87).

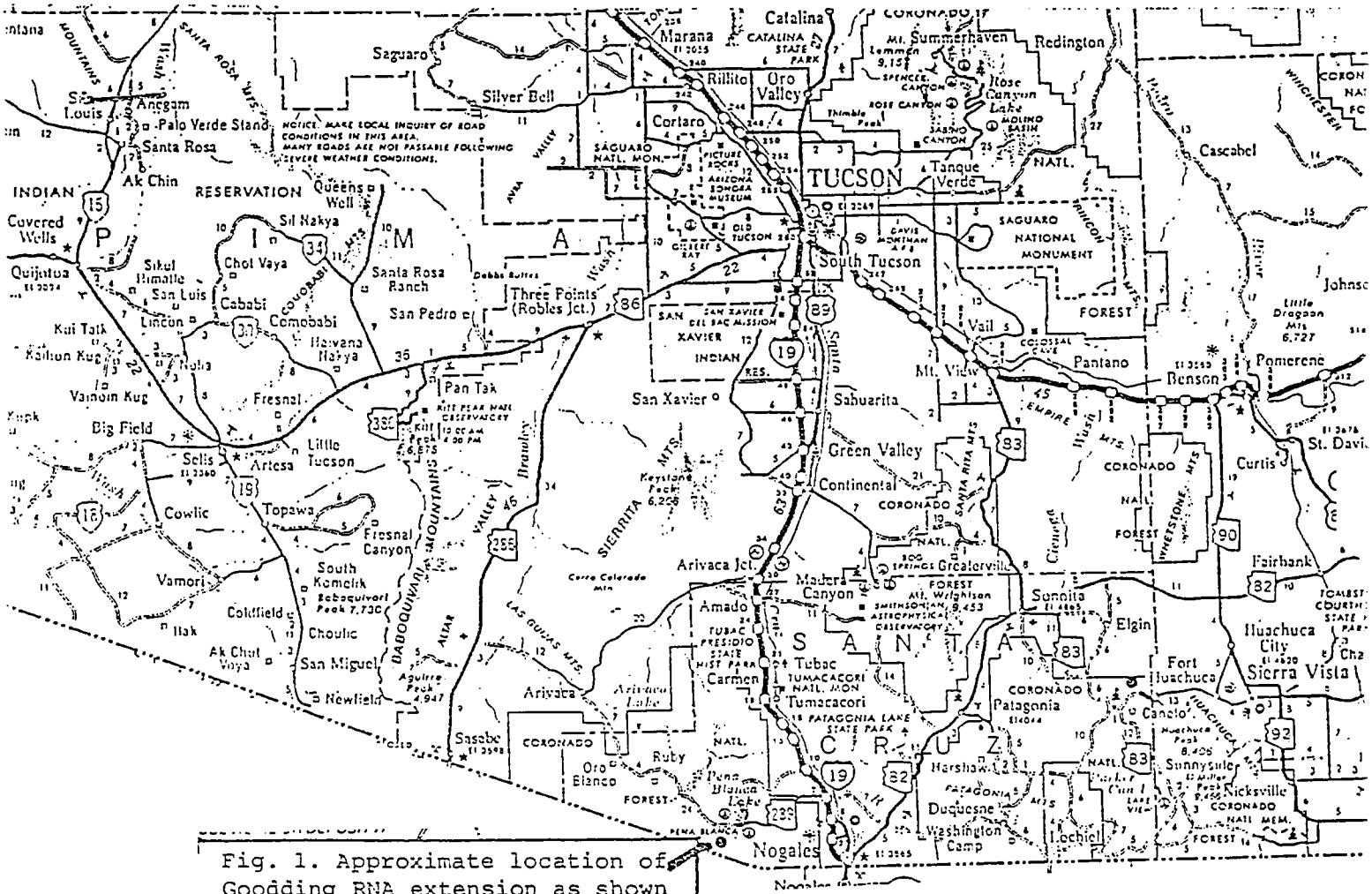


Fig. 1. Approximate location of Goodding RNA extension as shown on an Arizona State Highway map.

Fig. 2. Goodding RNA extensions on Coronado National Forest map, Nogales Ranger District.

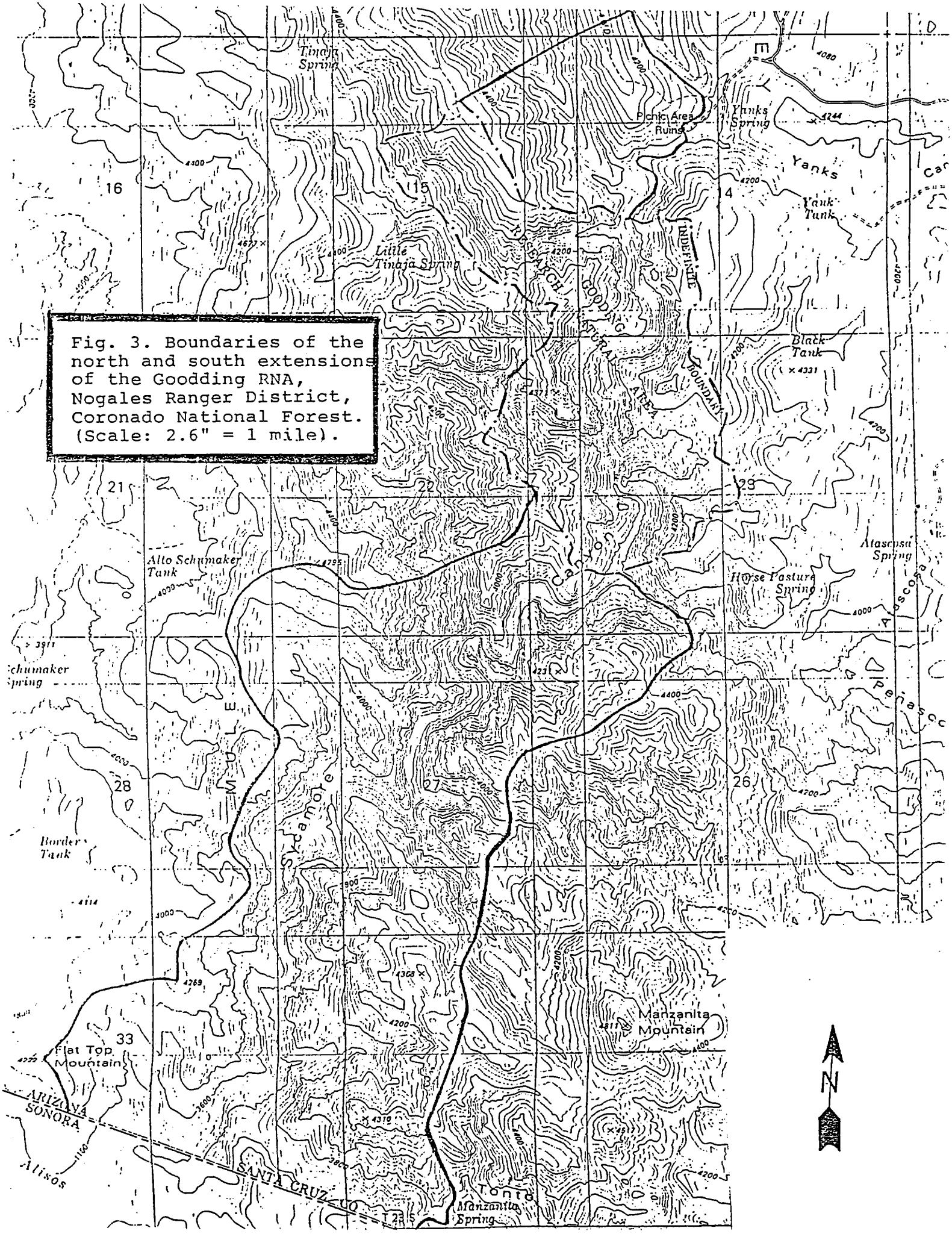


Fig. 3. Boundaries of the north and south extensions of the Goodding RNA, Nogales Ranger District, Coronado National Forest. (Scale: 2.6" = 1 mile).

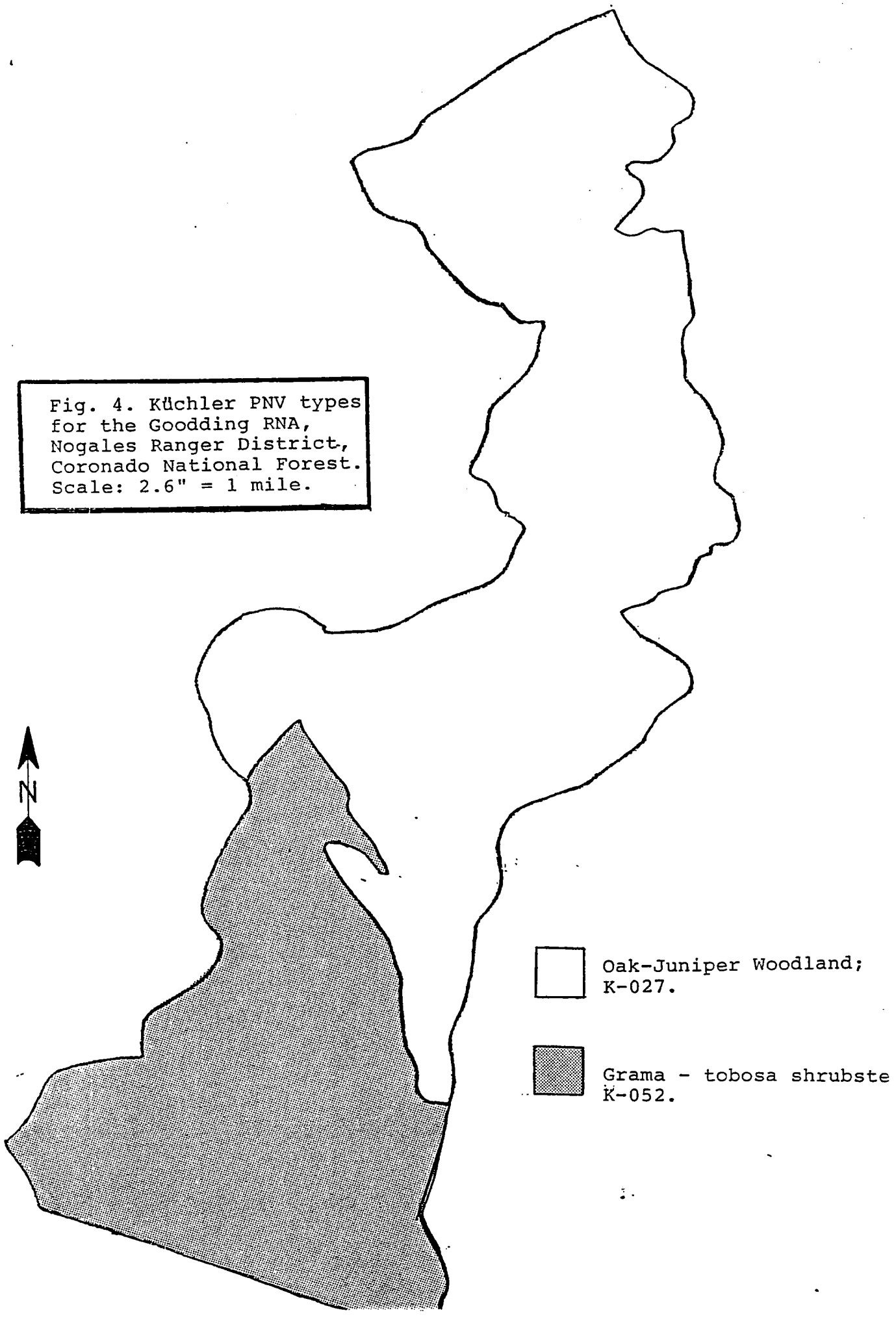


Fig. 4. Küchler PNV types for the Goodding RNA, Nogales Ranger District, Coronado National Forest. Scale: 2.6" = 1 mile.

USDA-FOREST SERVICE

PHOTOGRAPHIC RECORD

(See FSM 1643.52)

PHOTOGRAPHER: Mark Severson

DATE SUBMITTED: 12/22/92

HEADQUARTERS UNIT:

LOCATION:

INITIAL DISTRIBUTION OF PRINTS AND FORM 1800-11:

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

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

PHOTOGRAPH NUMBER		SELECTED FOR W.O. PHOTO LIBRARY	DATE OF EXPOSURE	LOCATION (State, Forest, District and County)	CONCISE DESCRIPTION OF VIEW	NEGATIVE (Show size and BW for black and white or C for color)
TEMP. (1)	PERMANENT (To be filled in by the WO) (2)	(3)	(4)	(5)	(6)	(7)
			10/25/92	ALL Arizona, Coronado NF, Nogales District Santa Cruz County	Goodding RNA	All 24 x 36m color slides
1.					Open oak woodland in northern extension, Blue oak (Quercus oblongifolia)/ mixed grama (Bouteloua spp.) habitat type.	
2.					Open oak woodland in northern extension, Blue oak (Quercus oblongifolia)/ mixed grama (Bouteloua spp.) habitat type.	
3.					Steep north-facing hillsides above Sycamore Canyon, Emory oak (Quercus emoryi)/ pointleaf manzanita (Arctostaphylos pungens) habitat type.	
4.					Narrow riparian corridor of Sycamore Canyon, mixed-decidous broadleaf riparian forest dominated by Arizona Sycamore (Platanus wrightii), Bonpland willow (Salix bonplandiana) and Arizona ash (Fraxinus pennsylvanica var velutina).	
5.					Narrow riparian corridor of Sycamore Canyon, mixed-decidous broadleaf riparian forest dominated by Arizona Sycamore (Platanus wrightii), Bonpland willow (Salix bonplandiana) and Arizona ash (Fraxinus pennsylvanica var velutina).	
6.					Scrub-grassland type on south-facing slopes in southern extension. Saguaro cactus (Cereus giganteus) occur sporadically.	
7.					Scrub-grassland type on south-facing slopes in southern extension. Saguaro cactus (Cereus giganteus) occur sporadically.	

1800-1 (8/87)

USDA-FOREST SERVICE

PHOTOGRAPHIC RECORD

(See FSM 1643.52)

PHOTOGRAPHER: Mark Severson

DATE SUBMITTED: 12/22/92

HEADQUARTERS UNIT:

LOCATION:

INITIAL DISTRIBUTION OF PRINTS AND FORM 1600-11

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

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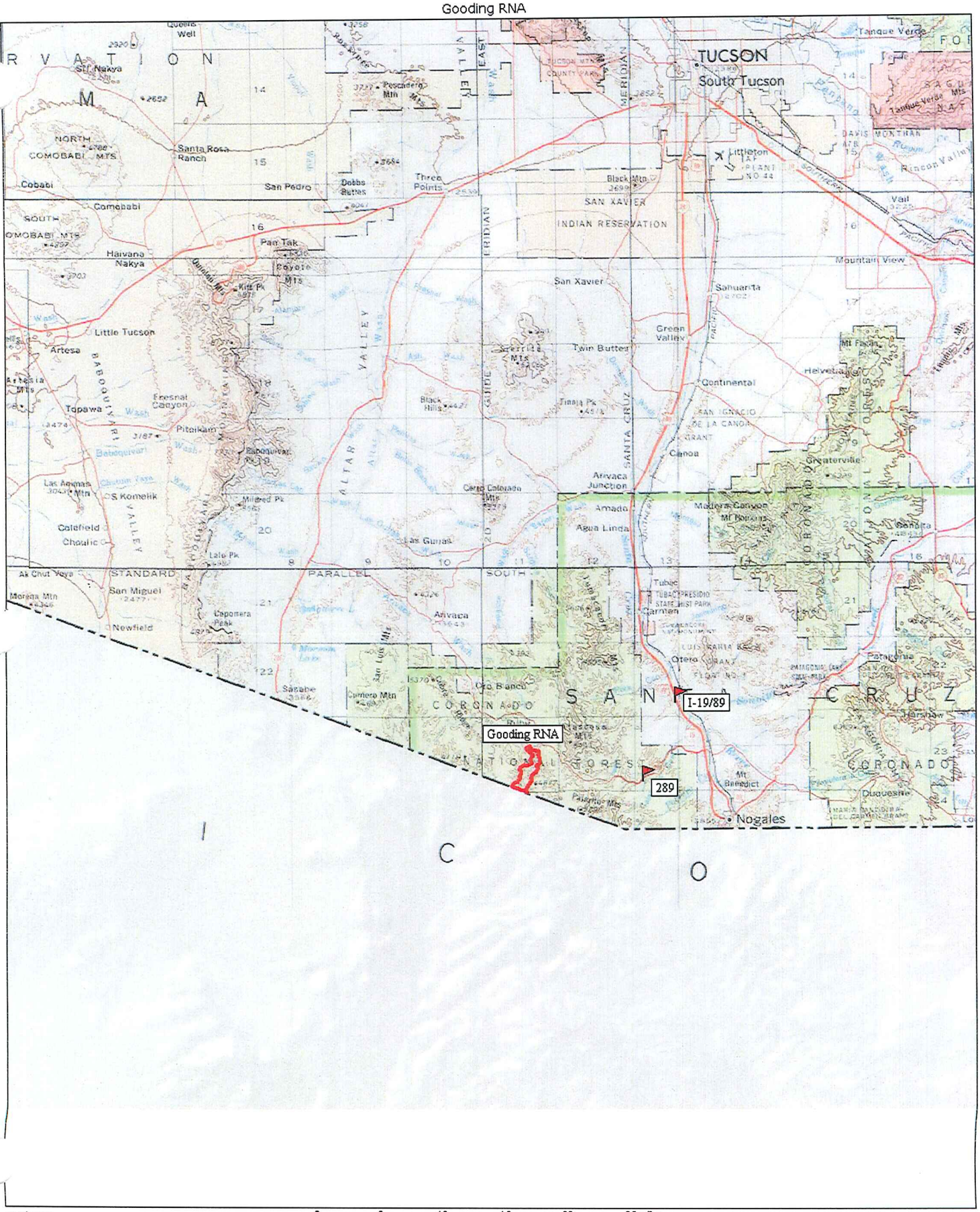
PHOTOGRAPH NUMBER		SELECTED FOR W.O. PHOTO LIBRARY	DATE OF EXPOSURE	LOCATION (State, Forest, District and County)	CONCISE DESCRIPTION OF VIEW	NEGATIVE (Show size and BW for black and white or C for color)
TOMR (1)	PERMANENT (To be filled in by the WO) (2)	(3)	(4)	(5)	(6)	(7)
8.					Open oak woodland and scrub-grassland ecotone, southern extension.	
9.					Corypantha recurvata, rare cactus within Goodding RNA	

Gooding RNA



TN 11½° MN

0 5 10 15 20 25 miles
0 5 10 15 20 25 30 35 40 km

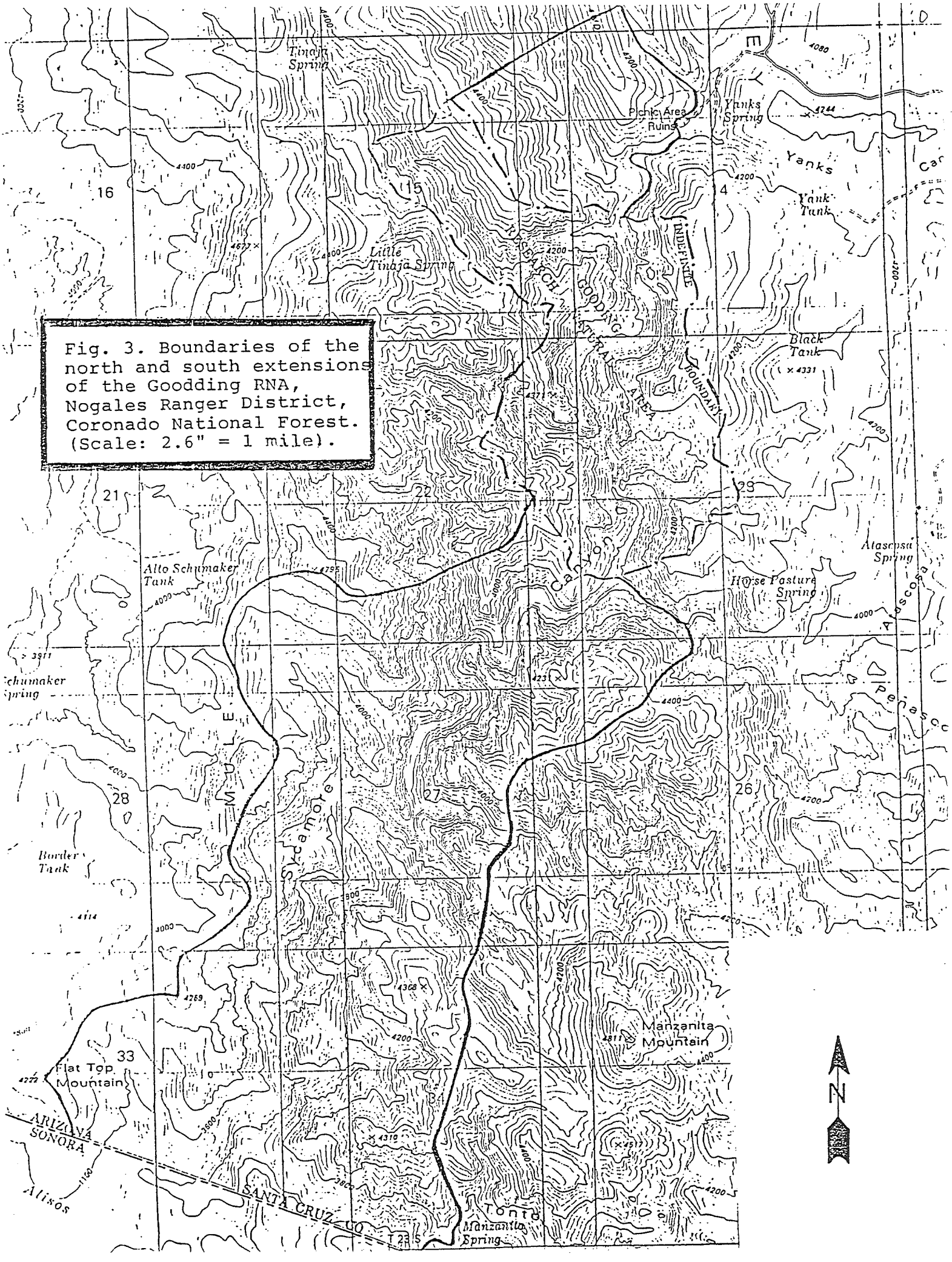


Fig. 3. Boundaries of the north and south extensions of the Goodding RNA, Nogales Ranger District, Coronado National Forest. (Scale: 2.6" = 1 mile).

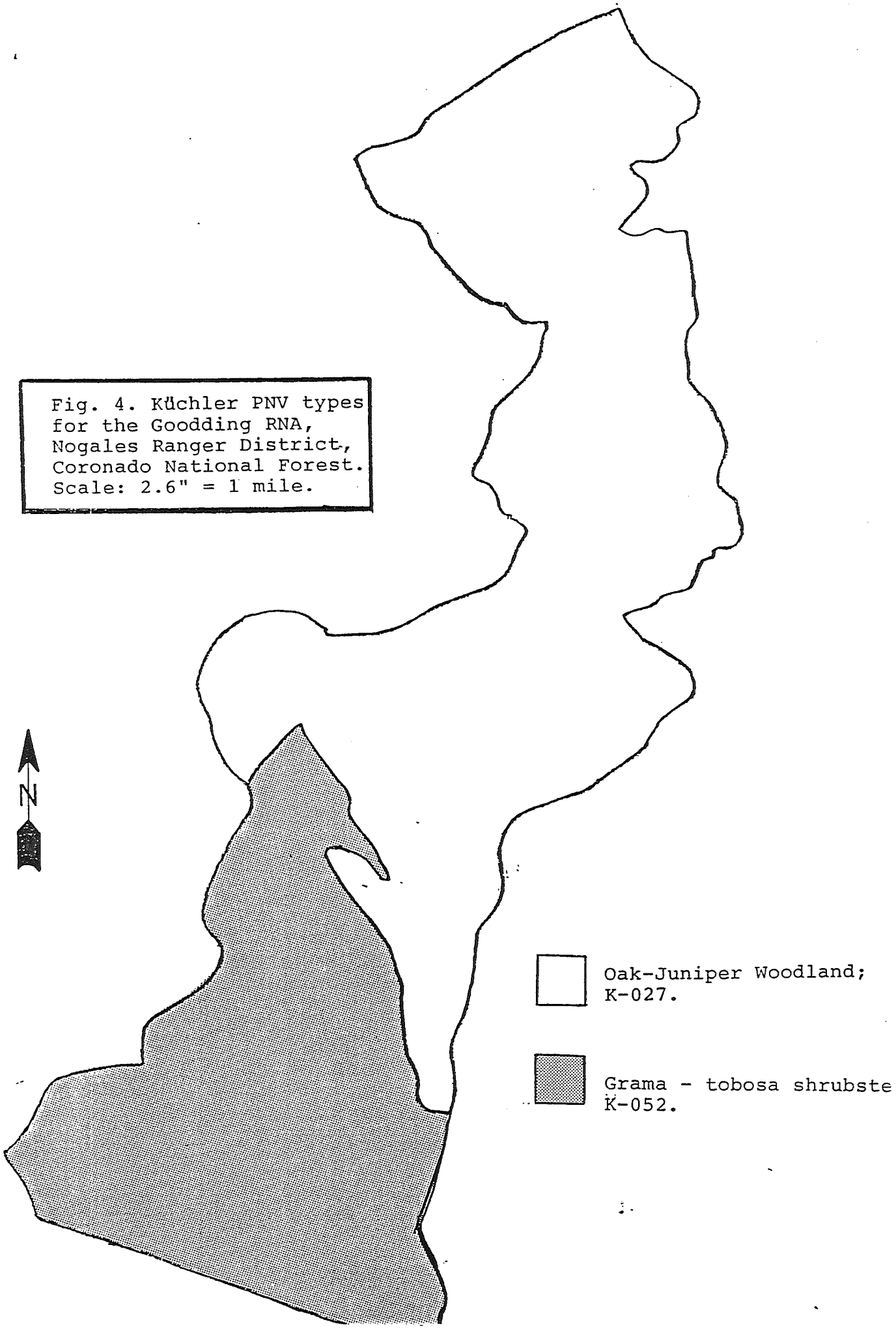


Fig. 4. Küchler PNV types for the Goodding RNA, Nogales Ranger District, Coronado National Forest. Scale: 2.6" = 1 mile.

USDA-FOREST SERVICE

PHOTOGRAPHIC RECORD

(See FSM 1643.52)

PHOTOGRAPHER	DATE SUBMITTED
Mark Severson	12/22/92
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)
			10/25/92	ALL Arizona, Coronado NF, Nogales District Santa Cruz County	Goodding RNA	All 24 x 36m color slides
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2.					Open oak woodland in northern extension, Blue oak (Quercus oblongifolia)/ mixed grama (Bouteloua spp.) habitat type.	
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4.					Narrow riparian corridor of Sycamore Canyon, mixed-decidous broadleaf riparian forest dominated by Arizona Sycamore (Platanus wrightii), Bonpland willow (Salix bonplandiana) and Arizona ash (Fraxinus pennsylvanica var velutina).	
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USDA-FOREST SERVICE

PHOTOGRAPHIC RECORD

(See FSM 1643.52)

PHOTOGRAPHER: Mark Severson

DATE SUBMITTED: 12/22/92

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)	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)
8.					Open oak woodland and scrub-grassland ecotone, southern extension.	
9.					Corypantha recurvata, rare cactus within Goodding RNA	

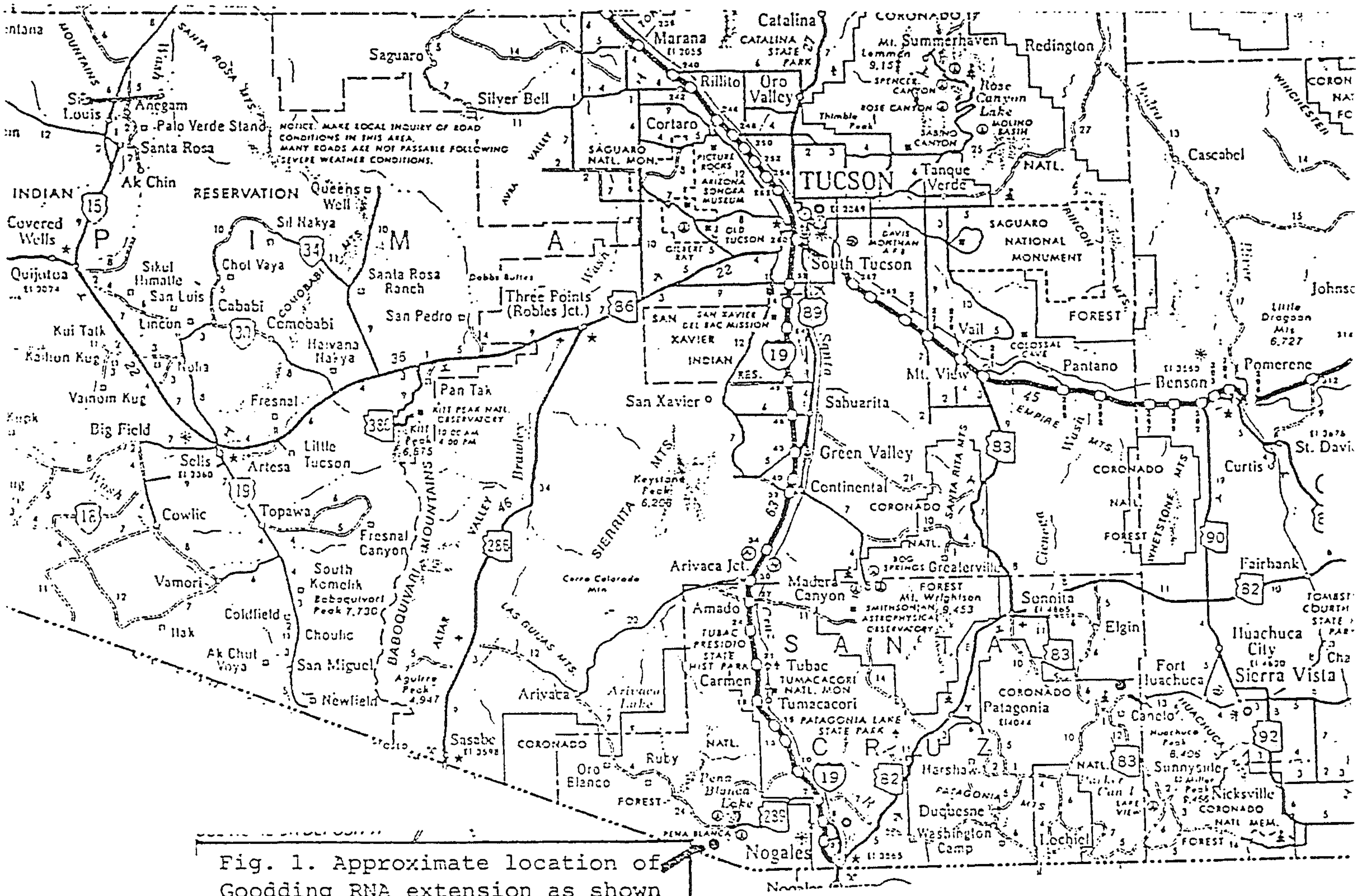

Fig. 1. Approximate location of Goodding RNA extension as shown on an Arizona State Highway map.

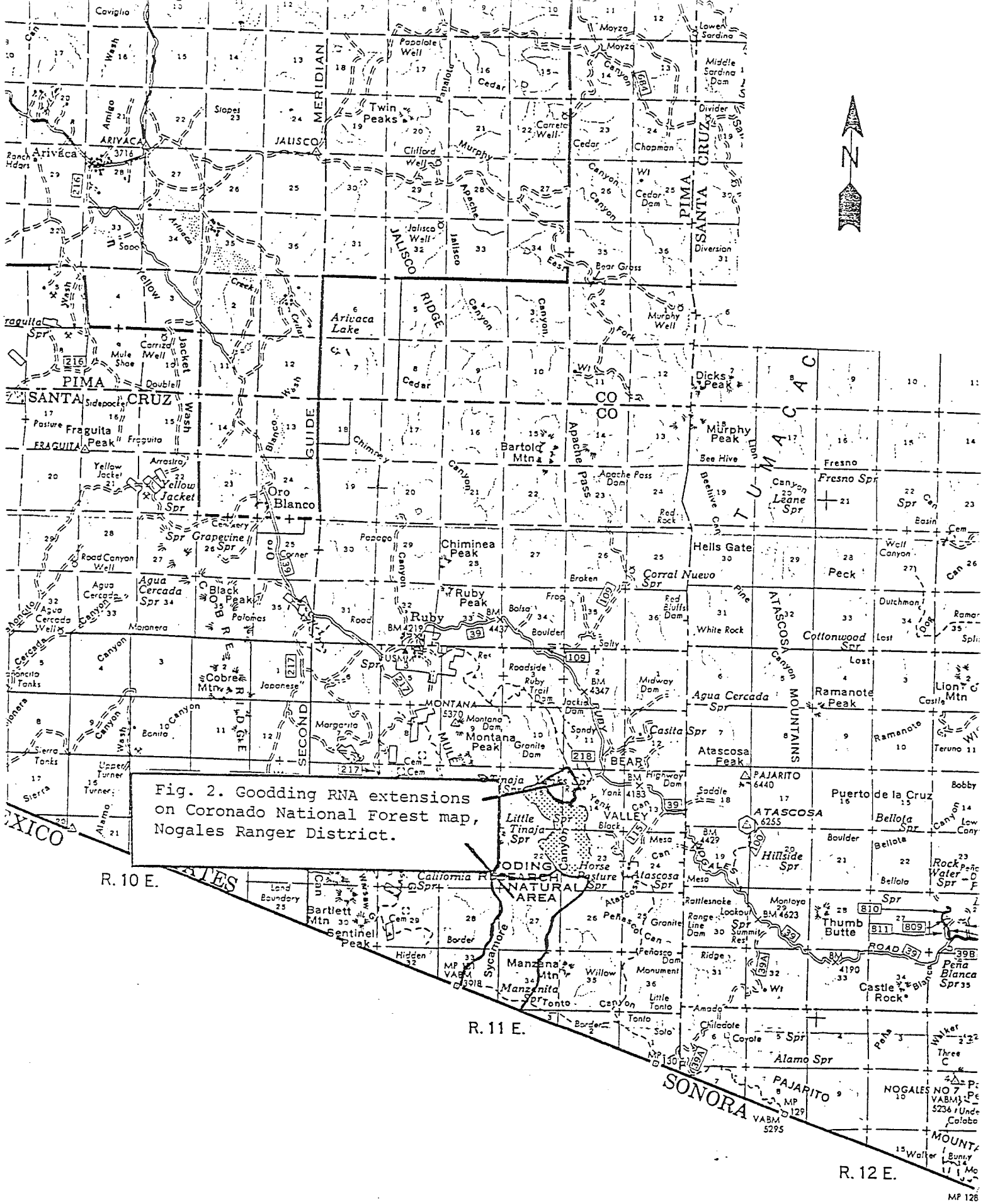

Fig. 2. Goodding RNA extensions on Coronado National Forest map, Nogales Ranger District.

Goodding Cmts

COMMENTS ON GOODDING RNA
Peg Boland

EA

Page 1, Paragraph 4--"There will be no change to this mangement" should be "management."

Page 2, Alternative A, first paragraph--"Goodding RNA is in the process of being withdrawn from mineral entry." Might be wise to add "Effects of mineral withdrawal will be considered in the environmental analysis of the proposed decision to withdraw minerals."

Whitmore Comments
12/27/93

1. Confusion on size. Spell it out:
   Orig. RNA = 545 acres
   South ext.= 1470 "
   North ext.= 200 "

   Total = 2215 acres

   P1. of DN/DO says extension comprised of 1676 acres
   but: p. 2 of ER says "The original Goodding---and two boundary extensions comprise 1670 acres".
   also: p. 2 of EA says "Alternative A would extend the Goodding RNA, comprising 1670 acres". Confusing!

2. Maps are very poor. Send originals or color photocopies. as you did for Upper Forks & Pole Bridge.

3. No indication of number of acres & ha. for each SAF & Kuchler type.

4. Title page: should state "extension of"??

5. "Supplemental Public Contacts" page refers to Canelo RNA, not Goodding ext.

6. P. 2 of ER, para 1: GRNA refers to the original RNA, or to that plus the 2 extensions? It's used both ways. In fact, on p. 3, para 4, GRNA refers to the extensions only (1670 acres)!

7. P. 3 of ER, para 2: tarahumarae is mispelled.

8. References: inconsistencies between text & References section;
   Smith 1979 or 1974? Moir 1986 not listed. Toolin needs an et al. on p. 8. P. 17, delete Forest Service 1986 (listed later under USDA).

9. USDI Forest Service?? P. 15.

Cheers!
--Les--

Society of American Foresters
Committee on Natural Areas

Proposed Natural Area

Name of Proposed Natural Area Goodding

Location: State Arizona County Santa Cruz

Nearest Town Nogales, Arizona

Nearest Federal, State or county highway Forest highway 39, Ruby Road and Ariz. 289

Permanence Afforded Through What Means Regulation
(law, regulation, will, endowment, Board of Directors, etc.)

Name of Administration Unit Coronado NF, Tucson, Arizona
(National forest, national park, national wildlife refuge, State, university, etc.)

Listing of Timber Types on Area:

S.A.F. Type No.	Acres	Average Age
Arizona white oak	mixed	100
Gregg ash	"	
Velvet ash	"	
Emory oak	"	
Barren, water, buffer zone, etc.		
Total	455 acres	

Range in Elevation: Low 3800 Feet High 4000 Feet

Topography Rough rocky canyon bottom and steep cliffs
(Level, rolling steep, broken, etc.)

Geology Small caves, volcanic
(Volcanic, alluvial, moraine, etc.)

Average Height and Diameter of each major species:

Species	Average Height	Average Diameter
Arizona white oak	30'	8"
Velvet ash	45'	26"

Submitted by Earl F. Aldon Title Project Leader

Mailing Address Rocky Mtn. Forest & Range Exp. Sta.
5423 Federal Bldg., 517 Gold Ave., SW
Albuquerque, New Mexico 87101

Date April 10, 1969