

Vegtype survey

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CHIRICAHUA NATIONAL MONUMENT

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THE VEGETATION TYPE SURVEY
OF
CHIRICAHUA NATIONAL MONUMENT

by

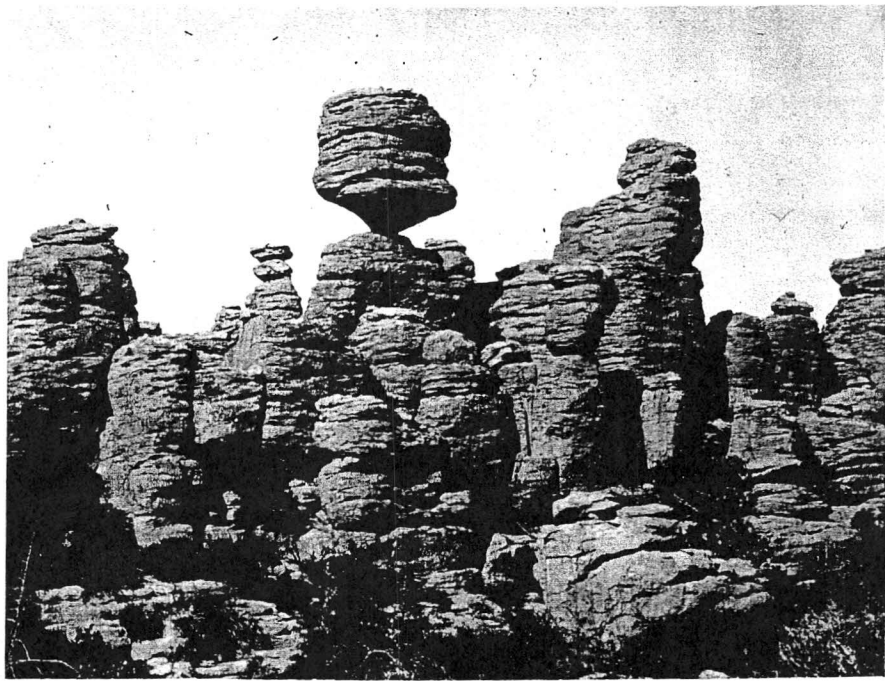
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and
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National Park Service
Branch of Forestry, C.C.C.
W.P.A. O.P. 705-3-5
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1937 - 1939

ON MICROFILM

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The Balanced Rock, most famous of all the weird and strange rock formations to be found in Chiricahua National Monument.

THE VEGETATION TYPE SURVEY
OF
CHIRICAHUA NATIONAL MONUMENT

Chiricahua National Monument is located in southeastern Arizona and contains the famed Wonderland of Rocks. This National Monument now comprises 10,887 acres and ranges in elevation from 5,000 to 7,300 feet. The area was first set aside as a national monument by Presidential Proclamation on April 18, 1924. The monument was under the jurisdiction of the U. S. Forest Service until 1934, when control was transferred to the National Park Service. The original monument area was much smaller than it is now, but a large additional area was added in the spring of 1938, bringing the monument up to its present size.

The Wonderland of Rocks consists of giant columns, slender spires, and weird shaped rocks, some of which are balanced on small pedicles. In geologic history the landscape which is now in the monument consisted of granites, gneiss, and schist. Thousands of years ago the area was under water and a layer of limestone was formed over the original surface. This was followed by violent volcanic activity which formed strata of varying hardness, texture, and mineral composition. The present rock formations are the result of weathering of these layers of rock materials.

Botanically speaking the area is a very interesting one. Several Mexican species of plants are found here as well as the typical southeastern Arizona vegetation. Most of the area is in the transition life zone except for the western edge which drops into the upper sonoran life zone. It contains all types of vegetation including woodland and coniferous species.

There are two main canyons in the central part of this area, Bonita and Rhyolite, into which numerous smaller canyons drain. The canyon walls rise almost vertically 500 feet above the stream beds to a gentle sloping plateau. The plateau is often badly broken up with numerous rocky outcrops. This is particularly true of the southeast part of the monument.

THE VEGETATION SURVEY

The field work for the type map and related studies was done in the spring of 1937 by R. D. Roseberry and N.E.Dole, Jr., Junior Foresters. This survey was made to meet an ever increasing need for a map showing the composition, extent, and character of the vegetation. The data obtained are to be used as a basis for:

1. Rating fire hazard and protection planning.
2. Planning insect and disease control.
3. Determining the proper use and treatment of land such as for recreation, camp ground development, wildlife, reforestation, erosion control, etc.
4. Augmenting the supply of knowledge concerning the floral and other natural features of the monument.

5. Providing an inventory of forest lands.

The vegetation type map was constructed by sketching in the boundaries of the vegetation on a topographic map. The mapper selects a vantage point where a good view of the adjoining country can be obtained. The vegetative types are then drawn on the map as they are found on the ground, using the topographic details as a control. The vegetation is divided first into its general self-evident types, i.e., grassland, shrubs, and trees, or combinations of these. The actual composition of any one type is denoted by placing the proper symbols within the type, on the map. All species appearing in the type to the extent of 20% or more are noted on the map, the symbols being placed in the order of decreasing dominance of the species that they represent.

Although the type boundaries are very distinct in many cases, particularly where there is a change from a tree type to a brush or grass type, the boundary is often indistinct and must be set more or less arbitrarily. Sometimes the transition from one type to another is so gradual that a separate type is set up to take care of the change.

It should be recognized that only such vegetation that can be seen from above is counted in determining the type. Understory species that cannot be seen from above, are not noted on the map.

Sample plots have been taken over the monument area to supply added detailed information that cannot be shown on the type map. These plots show all of the vegetation appearing on them, and can be used to determine the presence and extent of under cover species not appearing on the type map. Sample plots and photographs are located on the reference map. In the case of photographs, the direction in which the picture was taken is shown by an arrow.

In addition to sample plots and photographs, the reference map shows the location of individual plant and tree species that are not numerous enough to appear on the type map, but are of interest because of their species or location. These are denoted by the location of the proper symbols on the reference map.

A herbarium collection was made at this time, three specimens being taken of everything possible. A total of about 180 plants were collected, although this includes many duplicates. One set was sent to Mr. Jack Whitehead, then of the Boyce Thompson Southwestern Arboretum at Superior, Arizona, for identification. A list of all identified species is included in this report. The other two sets are incorporated in the National Park Service herbarium in the Department of Botany, University of California, Berkeley, California.

THE VEGETATION

The steep canyon slopes, valley floors, and plateaus contain a type of vegetation characteristic for each area. The

country on the western and southwestern edge just reaches the lower elevations which are predominantly grass types surrounded by woodland. In general the woodland types dominate the canyon bottoms. However, in the steeper areas they are then taken over by juniper, cypress, and pines respectively, with frequent interspersions of the shrub types. The slopes of the canyon are often dominated by shrub forms of oaks which blend into the woodland cover of the bottoms. Quite often on the upper parts, the vegetation is made up of pinyon pine, juniper, and shrubs. On the plateaus the general type is pinyon and chaparral, each varying in degree of dominance. On the steep slope at the eastern edge of the area there is a good stand of Douglas fir and chaparral. There is also a good stand of apache pine (Pinus ponderosa var. scopulorum) at the upper end of Bonita Canyon. The pine and Douglas fir types usually occur in relatively small areas throughout the eastern part of the area. A large part of the canyon walls are semi-barren due to the numerous outcrops of rocks. There is quite a large area of oaks and chihuahua pine (Pinus leiophylla) on the flat and gentle sloping country just west of the junction of Rhyolite and Bonita canyons.

There is relatively little grassland in this area due to the character of the topography. These grass areas are made up to a large extent of herbaceous species as well as

the grasses. These types occur in the flat country at the north of the canyons on the west and southwest side of the area. There is also a grass area on the top of Sugarloaf. Grass is found only in very few of the other vegetation types. It commonly occurs with the oaks and occasionally with the chaparral species on the western side of the monument.

THE CHAPARRAL TYPES

The chaparral types consist of the following species: manzanita, (Arctostaphylos pungens); mountain mahogany, (Cercocarpus paucidentatus); Arizona white oak, (Quercus arizonica) (shrub form); silver leaf oak, (Quercus hypoleuca) (shrub form); Quercus reticulata; Toumey's oak, (Quercus toumeyii); canyon oak, (Quercus wilcoxii); rabbit brush (Chrysoma laricifolia); Ceanothus greggii; silk-tassel bush, (Garrya wrightii); mesquite, (Prosopis juliflora glandulosa) and catclaw, (Acacia greggii).

Manzanita (Arctostaphylos pungens) is one of the most common of the shrubs as it, with Quercus toumeyii, makes up practically all of the chaparral in the pinyon types which cover well over half of the monument. These types are sometimes so dense with vegetation that they become almost impenetrable, but this is not the general case. Manzanita is also found in almost pure patches as well as with the oaks and mountain mahogany. This plant is usually about 5 feet tall and forms a broad,

dense round head.

Mountain mahogany (Cercocarpus paucidentatus) is not quite so abundant as the manzanita but is found scattered pretty well throughout the area. It is more commonly found along with manzanita, juniper, pinyon, and grass, as well as the shrubby forms of silver leaf oak and Arizona white oak. This shrub grows to a height of about six feet.

The shrubby form of silver leaf oak (Quercus hypoleuca) is a very common bush in the monument. It is generally found and often makes up the entire ground cover on the steep canyon walls. It is usually an associate of Arizona cypress (Cypressus arizonica) in the canyon bottoms, as well as with Douglas fir (Pseudotsuga taxifolia) and Arizona pine (Pinus ponderosa arizonica). In this form it usually grows to a height of 8 or 10 feet, forming a rather dense head with its many stems and rather heavy foliage.

Quercus reticulata does not form a dominant cover in any particular area but is generally found scattered pretty well throughout the more broken terrain. It is apparently adapted to steep slopes and shaded canyon bottoms. This oak has exceedingly large leaves and very seldom gets to be over 6 or 7 feet high. It commonly occurs with the other species of oaks.

Toumey's oak (Quercus toumeyii) is a very common shrub at higher elevations and, as mentioned before, along with manzanita,

it makes up the chaparral undercover to the pinyon pine types. This oak and manzanita also make up large areas of pure chaparral types. The height of this scrub oak is generally about 5 feet. It develops a broad, dense crown.

Canyon oak (Quercus wilcoxii) is not a very common oak and is only found in a few places. It generally grows in the cool, deep canyon bottoms and very seldom gets to tree size. It is usually about 8 to 10 feet high and forms a well foliated, round head.

Rabbit brush (Chrysoma laricifolia) and grass form a few types in the western part of the monument. The bushes are generally quite scattered. It also is found throughout some of the chaparral types in that vicinity. It is a small plant about 2 feet tall.

Ceanothus greggii is not a common shrub and does not enter into any of the types but occasionally is found in some of the chaparral types on the north side of the Monument. It is a shrub about 5 feet tall, and has a fairly dense, round crown.

Silk-tassel bush (Carrya wrightii) is a fairly common shrub entering into a number of the chaparral types at higher elevations. It very seldom becomes dominant in these types. It is a shrub about 5 feet high, well foliated, with a round crown.

Mesquite (Prosopis juliflora var. glandulosa) enters into this area only in the northwest corner where it occurs with grass. This plant gets to be 6 feet tall, is sparsely foliated

and well armed with long, stout spines.

Catclaw (Acacia greggii) is found in one type at the west entrance to the monument and is also sparsely scattered at lower elevations. It is 4 feet high, has little foliage, and is well armed with curved spines.

THE WOODLAND TYPES

The woodland types consist of the oaks, wild cherry, and sycamore. Of the oaks, Arizona white oak (Quercus arizonica), black oak (Quercus emoryi), and silver leaf oak (Quercus hypoleuca) make up all of the oak woodland types. At lower elevations and where the canyons become wider, the black oak is usually dominant with Arizona white oak entering into the type.

As one proceeds up the canyon the black oak becomes sparser, the white oak is dominant, and the silver leaf oak begins to enter the types. As the canyons become narrower the black oak drops out and the silver leaf oak becomes more conspicuous. At the upper end of the woodland belt, silver leaf oak often becomes dominant with the white oak secondary. On the gentle slopes at lower elevations both white oak and black oak often grow up the canyon sides, the white oak usually being dominant and extending beyond the black oak. Silver leaf oak

generally grows to tree size only in the canyon bottoms, and is restricted to shrub form on the canyon walls. There are several large areas of woodland types on the west side of the monument and also in the northeast corner. Most of the woodland types are rather densely covered with trees but on the western side of the monument there are quite large areas of woodland grass. These three species of oak reach a height of about thirty feet, sometimes growing slightly larger. The larger trees have large, well rounded crowns.

Arizona sycamore (Platanus wrightii), enters into types only along the stream at the mouth of Bonita canyon. It is also found in the larger canyons along the streams but only as scattered individuals.

Wild cherry (Prunus melanocarpa), enters into only one small type in one of the deep canyons on the north side of Sugarloaf. Single trees are also found scattered in the cooler canyon bottoms.

Pinyon pine (Pinus cembroides), is the dominant tree in the monument. It is found in almost every type in the higher parts of the area including some of the steep, semi-barren canyon walls. It is a tree that grows to be about 25 feet high and does not have a good form, but is usually twisted and distorted. It very seldom occurs as a pure stand but generally makes up a fairly large proportion of the type, usually with an understory of chaparral.

Alligator juniper (Juniperus pachyphloea) is a tree generally about the same size as the pinyon, but often growing larger. It often occurs with pinyon pine, and with the white and black oaks. Alligator juniper is easily distinguished by its rough broken bark which reminds one of alligator hide and readily separates it from Arizona cypress.

Arizona cypress (Cupressus arizonica) is another species that is often found growing with pinyon pine. This tree often grows to be 100 feet tall. It is usually found in canyon bottoms at higher elevations, but also on the gentle slopes of the plateau. It is occasionally found growing with Douglas fir.

THE TIMBER TYPES

The timber types are made up of three species of pine and Douglas fir. The pines are Chihuahua pine (Pinus leiophylla), Apache pine (Pinus ponderosa var. scopulorum), and Arizona yellow pine (Pinus ponderosa var. arizonica). The most common of these is Chihuahua pine which occurs at all elevations from near the lowest to almost the highest point in the monument. It is a tree that grows up to 75 feet. At lower elevations it occurs with the black and white oaks. At higher elevations, it is often found with pinyon pine and yellow pine. Although it does not seem to prefer any particular sites, it is generally found in canyon bottoms and on north-facing slopes where conditions for

growth are more favorable.

Apache pine (Pinus ponderosa var. scopulorum) is found at elevations between 5,500 and 6,000 feet in the monument. It has a long, clean well shaped bole which extends some 125 feet into the air. It does not occur in pure stands but usually has an understory of the three species of oak. Chihuahua pine often occurs with it, as do alligator juniper and pinyon pine.

Arizona pine (Pinus ponderosa var. arizonica) grows at higher elevations than do the other pines, from about 6,300 feet to the highest point in the monument. This tree is of particular interest because it is the only yellow pine in this country normally having five needles to a fascicle instead of two or three, as is commonly found. It does not occur in pure types but usually has an understory of chaparral species. It forms a well shaped tree that grows to be about 125 feet high.

Douglas fir (Pseudotsuga taxifolia) is commonly found on steep slopes and often occurs in semi-barren types. It does not grow as a pure type, but is found with cypress, yellow pine, and pinyon pine. The shrub form of silver-leaf oak is nearly always found with it. Douglas fir grows to be a tree some 125 feet high with a well shaped crown and bole.

As would be expected, there is considerable desert type vegetation, such as the yuccas, agaves, and cactii. While

these are not generally numerous, they are common enough to make an exceedingly interesting addition to the vegetation of the area. The maguey (Agave utahensis), is found in several types in the lower western part of the monument.

This monument as a whole does not have a particularly bad fire hazard. There is very little grass in most of the types except those on the extreme western edge of the area. The litter and duff on the ground is not very heavy and though there is considerable chaparral it is not of the high fire hazard type. There are a number of rock outcrops in many places to act as fire breaks.

From 50 to 75 years ago, one or more large fires burned over much of the monument area. Much of the pine stands were destroyed at this time, and the present smaller stands are but remnanta of former more extensive ones. Larger pine trees were to be found here than can be seen now, as evidenced by the fact that occasional charred pine logs can be found, especially in upper Bonita canyon, that are considerably larger than any standing trees growing now.

Some insect damage was found on a few of the pines; however, except for one or two very small areas, the infestation was very light. Mistletoe was found growing quite abundantly on the juniper.



Fig. 1 Photo 6

Rock formations looking south from Sugarloaf. A small stand of Douglas fir can be seen on the west side of Rhyolite Canyon in the center of the picture.



Fig. 2 Photo 7

Rock formations on the north side of Bonita Canyon, looking north from Sugarloaf. Toumey's oak, manzanita, and pinyon are the dominant species.

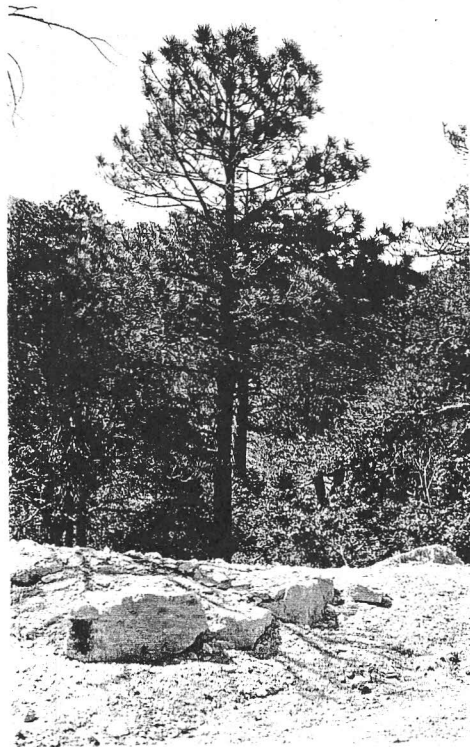


Fig. 3 Photo 3

Arizona yellow pine
(Pinus ponderosa var.
arizonica) along road
near Massai Point.

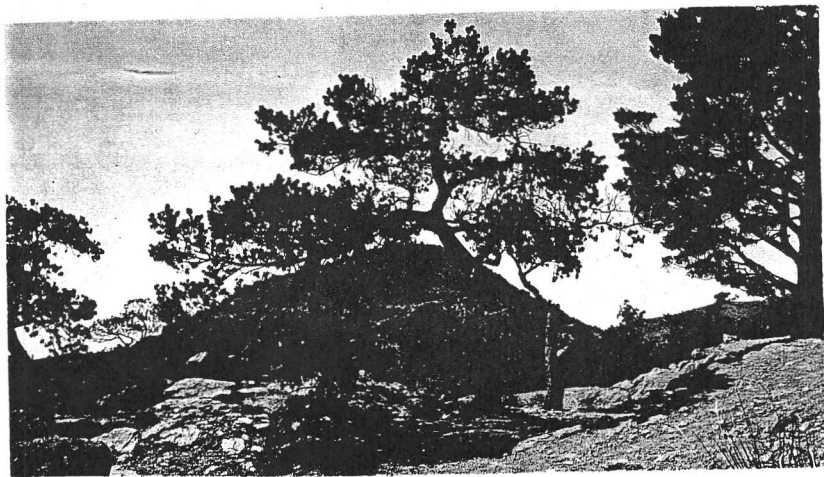


Fig. 4 Photo 2

Pinyon pine (Pinus cembroides) growing at Massai
Point. Sugarloaf is in the background.

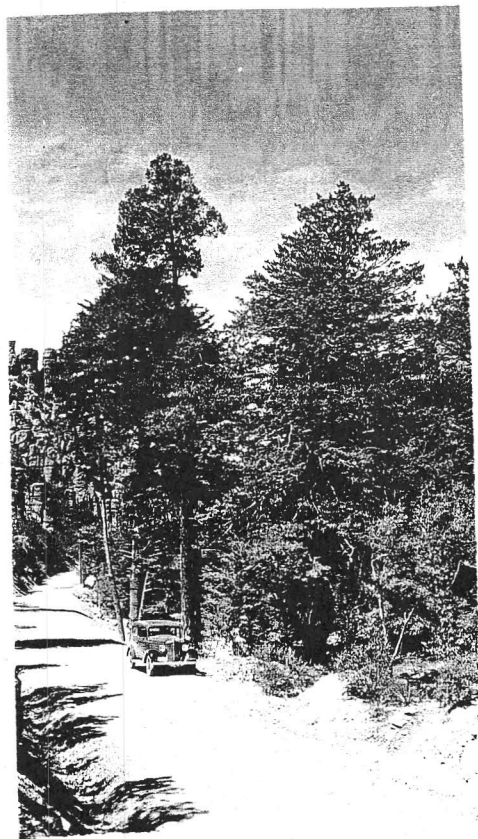


Fig. 5 Photo 1

Arizona cypress (Cupressus arizonica) and Douglas fir (Pseudotsuga taxifolia) along road in Bonita Canyon.

Fig. 6 Photo 24

Alligator juniper (Juniperus pachyphloea) growing in upper Bonita Canyon.



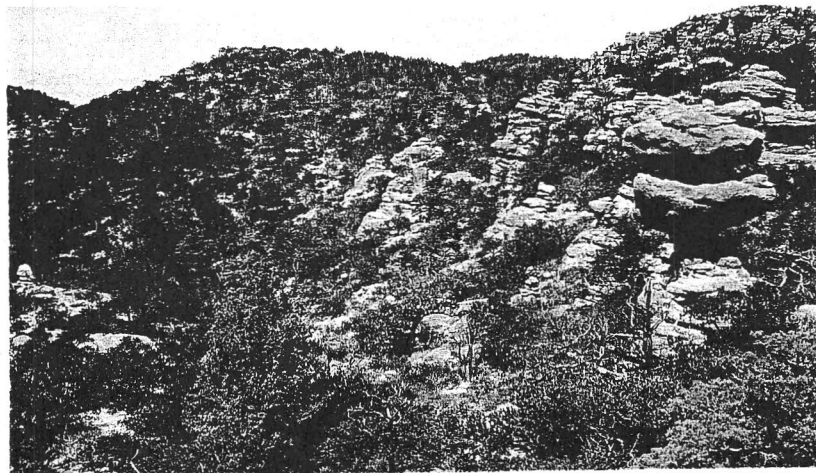


Fig. 7 Photo 31

Typical pinyon pine type. Pinyon pine, Arizona cypress, manzanita, and Toumey's oak are to be seen in this photograph. Notice the balanced rock in the right foreground.



Fig. 8 Phot 29

Typical open Chihuashua pine (Pinus leiophylla) type at head of Sarah Deming Canyon. Arizona cypress, manzanita, and silverleaf oak are admixtures in this type.

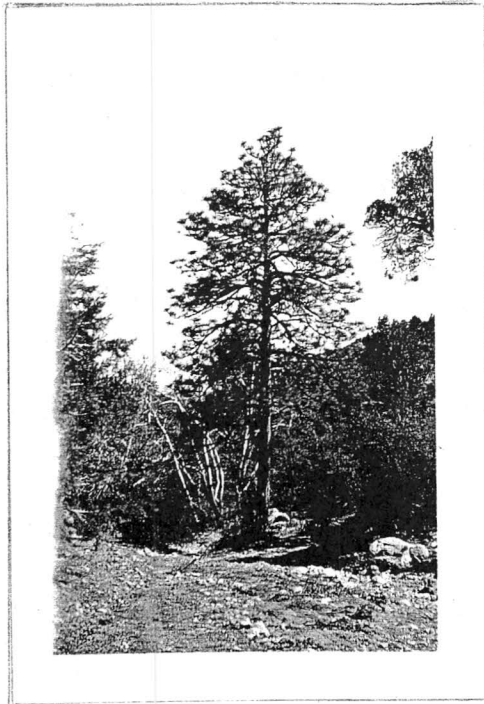


Fig. 9 Photo 23

Apache pine (Pinus ponderosa var. scorpuleum) growing in upper Bonita Canyon.

Fig.10 Photo 14

Typical stand of Arizona pine (Pinus ponderosa var. arizonica) at head of Jessie James Canyon. Note both mature trees and new sapling and seedling growth.

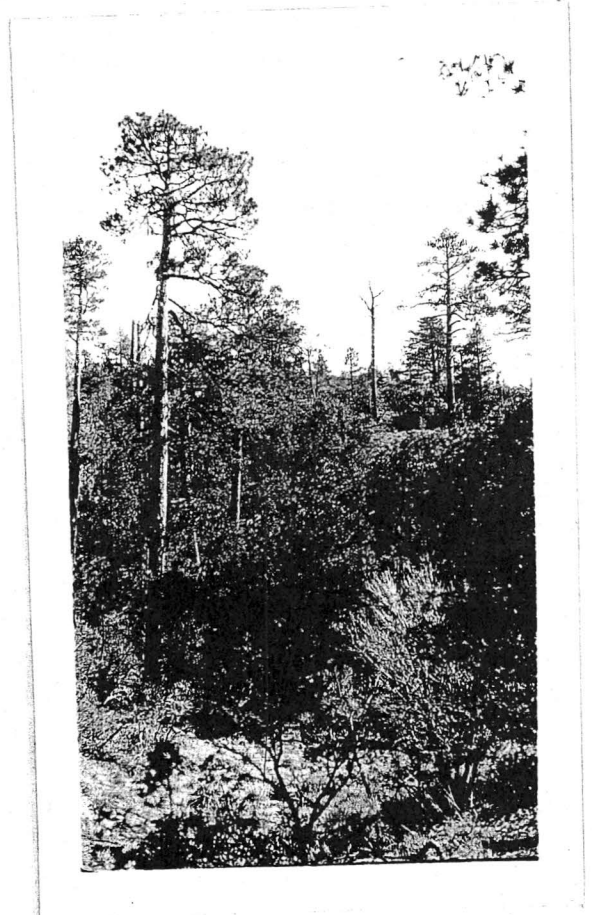




Fig.11 Photo 8

Strawberry cactus (Echinocereus coccineus),
basket grass (Nolina microcarpa), and spanish bayonet (Yucca schottii) growing on the southwest side
of Sugarloaf.

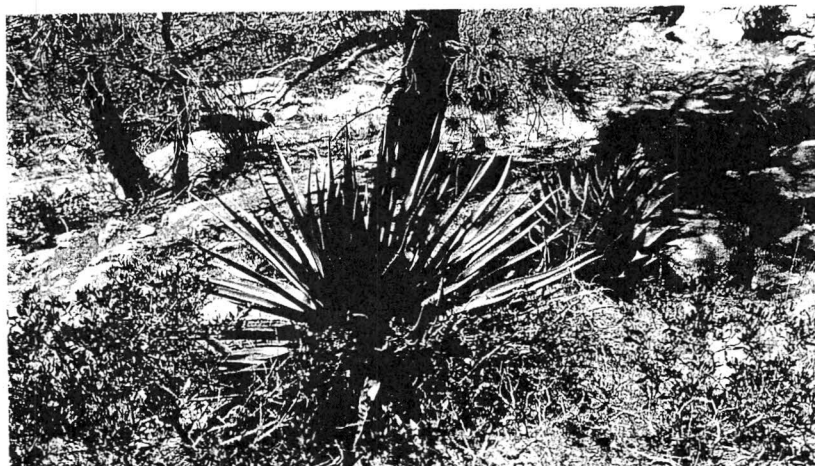


Fig.12 Photo 19

Two species of Agave or maguey growing in a
pinyon-juniper type near the head of Jessie James
Canyon.

LIST OF SYMBOLS

<u>Symbol</u>	<u>Scientific name</u>	<u>Common name</u>
AA	Arbutus arizonica	Madrone
Agr	Acacia greggii	Catclaw
Agt, Agx	Agave utahensis	Maguey
Apu	Arctostaphylos pungens	Manzanita
Ba		Barren
CA	Cupressus arizonica	Arizona cypress
Clar	Chrysoma laricifolia	
Clu	Calochortus muttallii	
Cpc, Cp, Cpl	Cercocarpus paucidentatus	Mountain mahogany
D	Pseudotsuga taxifolia	Douglas fir
Dw	Dasyllirion wheelerii	Sotol
<u>Gr</u>		Grass
Gwi	Garrya wrightii	Silk tassel tree
Hb		Herbs, herbaceous
JPA, Jpa	Juniperus pachyphlaea	Alligator juniper
Lit		Litter (on sample plots only)
Nm, Xx	Nolina microcarpa	Basket grass
P', <u>E</u>	Pinus cembroides	Pinyon pine
PA	Pinus ponderosa var. arizonica	Arizona yellow pine
PAP	Pinus ponderosa var. scorpuleum	Apache pine
Pj	Prosopis juliflora glandulosa	Mesquite

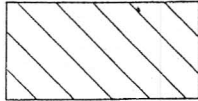
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<u>Symbol</u>	<u>Scientific name</u>	<u>Common name</u>
PL	Pinus leiophylla	Chihuahuana pine
PRM	Prunus melanocarpa	Wild cherry
PWR	Platanus wrightii	Sycamore
QA	Quercus arizonica(tree)	Arizona white oak
Qa	Quercus arizonica (shrub)	Arizona white oak
QE	Quercus emoryi (tree)	Black oak
Qe	Quercus emoryi (shrub)	Black oak
Qr	Quercus reticulata	Oak
Qto, Qt	Quercus toumeyii	Toumey's oak
Qwi, Qw	Quercus wilcoxii	Canyon oak
QY	Quercus hypoleuca (tree)	Silver-leaf oak
Qy	Quercus hypoleuca (shrub)	Silver-leaf oak
R		Rock (on sample plots only)
Res		Residential
RN	Robinia neomexicana	Mexican black locust
Sx	Salix species	Willow
X		Barren (on sample plots only)
Xcr	Salix cordata	Diamond willow
Xe	Salix exigua	Sandbar willow
Ym, Ymi	Yucca mohavensis	Spanish dagger
Ys, Yxr	Yucca schottii	Spanish bayonet

TYPE COLOR LEGEND



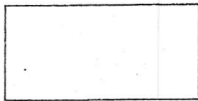
BARREN: Areas which have less than 20 percent of cover in vegetation.



SEMI-BARREN: Areas within any type where the vegetation covers 50 percent or less of the ground surface.



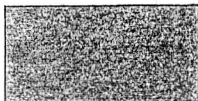
RESIDENTIAL: Areas that contain cultivated crops or that are set aside for residential purposes.



GRASSLAND: Dry grassland areas on which 80 percent or more of the vegetation consists of herbaceous species.



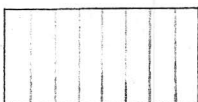
SAGEBRUSH: Areas on which sage species are predominant to the exclusion of tree species.



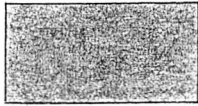
TRANSITION CHAPARRAL: Areas on which 20 percent or more of the vegetation consists of transition shrub species to the exclusion of tree species.



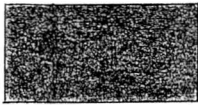
SEMI-DESERT CHAPARRAL: Areas which contain 20 percent or more of shrub species characteristic of desert areas.



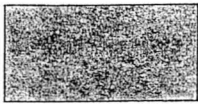
WOODLAND CHAPARRAL: Areas which contain broad-leaf tree and shrub species, each present to the extent of 20 percent or more. The color indicates the dominant class of vegetation.



WOODLAND-GRASS: Areas which contain both broad-leaf tree and herbaceous species, each occurring to extent of 20 percent.



WOODLAND: Areas that consist of 80 percent or more of broadleaf tree species.



PINYON-JUNIPER-CYPRESS: Areas that consist of 20 percent or more of either pinyon pine, juniper, or cypress species to the exclusion of pines and douglas fir.



DOUGLAS FIR: Areas that contain 20 percent or more of douglas fir to the exclusion of pine species.



PINE: Areas that contain 20 percent or more of pine species to the exclusion of douglas fir.



PINE-DOUGLAS FIR: Areas that contain 20 percent or more of both douglas fir and a pine species.

HERBERIUM COLLECTION

Plant species collected in connection with the Vegetation
Type Survey of Chiricahua National Monument, Cochise County,
Arizona..

Determinations by Jack Whitehead, formerly of the Boyce
Thompson Southwestern Arboretum, Superior, Arizona.

<u>Species</u>	<u>Family</u>	<u>Herbarium No.</u>
Acacia greggii A. Gray	Mimosaceae	92
Allionia coccinea (Torrey) Standley	Allioniaceae	145
Arbutus arizonica (A.Gray) Sarg.	Ericaceae	2
Arctostaphylos pungens H. B. K.	Ericaceae	13, 157
Asclepiodora decumbens (Nutt.) A.Gray	Asclepiadaceae	128
Asplenium resiliens Kunze.	Polypodiaceae	147
Berberis repens Lindl.	Berberidaceae	25
Brodiaea capitata pauciflora Torr.	Alliaceae	37
Calochortus nuttallii Torr. & Gray	Calochortaceae	16
Capmoides (Willd.) Kuntze.	Fumariaceae	23
Carpochaete bigelovii A. Gray	Asteraceae	26, 32
Castilleja lanata A. Gray.	Scrophulariaceae	56
Ceanothus fendleri A. Gray	Rhamnaceae	47
Ceanothus greggii A. Gray	Rhamnaceae	22
Cercocarpus paucidentatus (S.Wats.) Britton.	Rosaceae	134
Chrysoma loricifolia (A. Gray) Greene	Asteraceae	28, 88
Comandra pallida A. DC.	Santalaceae	97
Dasyllirion wheeleri S. Wats.	Dracaenaceae	154, 155
Descurainia sophia (L.) Webb	Brassicaceae	11
Erigeron flagellaris A. Gray	Asteraceae	64
Erodium cicutarium (L.) L'Her.	Geraniaceae	99
Evolvulus wilcoxianus House,	Convolvulaceae	123
Fallugia paradoxa (Don) Endl.	Rosaceae	87
Fendlera rupicola A. Gray.	Hydrangeaceae	24
Fraxinus cuspidata Torrey?	Oleaceae	95
Carrya wrightii Torr.	Cornaceae	158
Gilia inconspicua (Smith) Dougl.	Polemoniaceae	81
Gomphrena Caespitosa Torrey.	Amaranthaceae	116
Juglans major (Torr.) Heller.	Juglandaceae	146
Juniperus pachyphloea Torrey	Juniperaceae	8
Lonicera arizonica Rehder.	Caprifoliaceae	177
Lonicera species	Caprifoliaceae	98
Lupinus brevicaulis S. Wats.	Fabaceae	129
Lupinus micensis Jones.	Fabaceae	51

<u>Species</u>	<u>Family</u>	<u>Herbarium No.</u>
Malacothrix fendleri Gray.	Cichoriaceae	75
Microsteris micrantha (Kellogg) Greene	Polemoniaceae	52, 74
Nolina microcarpa S. Wats.	Dracaenaceae	159
Oreobatus neomexicanus (A.Gray) Rydb.	Rosaceae	132, 139
Pachystima myrsinites (Pursh) Raf.	Celastraceae	29
Padus melanocarpa (A. Nels.) Shafer	Amygdalaceae	142
Parosela wislizeni (A. Gray) Vail.	Fabaceae	30
Pentstemon pseudospectabilis Jones.	Scrophulariaceae	36
Phacelia crenulata Torr.	Hydrophyllaceae	42
Phacelia caerulea Greene?	Hydrophyllaceae	89
Pinus cembroides Zucc.	Pinaceae	7
Pinus brachyptera Engelman	Pinaceae	140
Plagiobothrys arizonicus (A. Gray) Greene	Boraginaceae	80
Plantago purshii R. & S.	Plantaginaceae	76
Platanus wrightii S. Wats.	Platanaceae	137
Prosopis glandulosa Torr.	Fabaceae	91
Pseudocymopterus purpureus (Coulter and Rose) Rydb.	Apiaceae	130
Pseudotsuga mucronata (Raf.) Sudw. or Pseudotsuga taxifolia, Britt.	Pinaceae	6
Pteridium aquilinum pubescens Underw.	Polypodiaceae	138
Quercus arizonia Sargent	Fagaceae	175
Quercus emoryi Torrey	Fagaceae	100
Quercus hypoleuca Engelm.	Fagaceae	3
Quercus reticulata Humb. & Bonpl.	Fagaceae	5
Quercus toumeyii Sarg.	Fagaceae	14
Quercus wilcoxii Rydb.	Fagaceae	4, 17
Rhamnus ursina Greene	Rhamnaceae	66
Rhamnus ursina Greene	Rhamnaceae	178
Rhamnus betulaeifolia Greene?	Rhamnaceae	65, 102
Rhus choriophylla Wooten & Standley	Anacardiaceae	60
Robinia neomexicana A. Gray	Fabaceae	31, 136
Salix exigua Nutt.	Salicaceae	135
Senecio longilobus Benth.	Asteraceae	20, 133
Schmaltzia emoryi Greene	Anacardiaceae	180
Sophia paryiflora Standl.	Brassicaceae	131
Sphaeralcea ambigua A. Gray	Malvaceae.	160
Thalictrum fendleri Engelman	Ranunculaceae	148
Thermopsis pinetorum Greene	Fabaceae	93
Thlaspi fendleri Gray	Brassicaceae	63
Tithymalus montanus (Engelm.) Small	Euphorbiaceae	141
Toxicodendron rydbergii (Small) Greene	Anacardiaceae	156
Vitis arizonica Engelman,	Vitaceae	152
Yucca baccata Torrey	Dracaenaceae	143
Yucca schottii Engelman	Dracaenaceae	150, 151

Condensed Type Acreage Summary

<u>Type</u>	<u>Acres</u>
Barren	33
Grassland	192
Residential	20
Sagebrush	32.45
Timberland-Chaparral	2,987.2
Semi-desert Chaparral	71.3
Woodland - Chaparral	158.
Woodland - Grass	147.
Woodland	665.
Douglas Fir	77.6
Pine	927.9
Pine-Douglas Fir	83.
Fir	<u>5,546.65</u>
Total	10,941.10

SPECIES ACREAGE SUMMARY

<u>Species</u>	<u>Acres</u>	
	<u>Dominant</u>	<u>Subdominant</u>
Arbutus arizonica	5.0	30.0
Agave utahensis		76.3
Arctostaphylos pungens	1759.9	3515.9
Cupressus arizonica	644.15	1323.2
Chrysoma laricifolia	7.45	25.0
Cercocarpus paucidentatus	248.15	781.3
Pseudotsuga taxifolia	60.0	95.3
Dasyllirion wheeleri		21.0
Grass	401.0	1243.6
Garrya wrightii	52.0	191.45
Herba-herbaceous	127.0	19.0
Juniperus pachyphloea	143.0	588.0
Nolina microcarpa		182.3
Pinus cembroides	2949.05	1914.0
Pinus ponderosa var.arizonica	209.0	177.0
Pinus ponderosa var.scorpuleum	57.0	124.0
Prosopis juliflora glandulosa		6.0
Pinus leiophylla	154.9	418.0
Prunus melanocarpa		4.0
Platanus wrightii	8.0	11.0
Quercus arizonica(shrub)	146.0	374.0
Quercus arizonica (tree)	1048.0	1761.0

Quercus emoryi (shrub)	15.0	267.0
Quercus emoryi (tree)	311.0	1042.0
Quercus reticulata	41.0	122.45
Quercus toumeyii	1469.15	4421.5
Quercus wilcoxi	33.0	40.0
Quercus hypoleuca (shrub)	773.75	2126.75
Quercus hypoleuca (tree)	178.0	797.3
Salix species		6.0
Yucca schottii		2.0

INDIVIDUAL TYPE SUMMARY

Note (S.B.) indicates acres semi-barren for preceding type.

<u>Type</u>	<u>Acres</u>	<u>Type</u>	<u>Acres</u>
<u>Barren</u> 33 Acres		Apu-Qto	503
<u>Grassland</u> 192 Acres		(S.B.)	61
<u>Gr</u>	18	Apu-Qto-Cpc	12
<u>Gr-Hb</u>	19	Apu-Qto-Cpc- <u>Gr</u>	5
<u>Gr-Nm</u>	28	Apu-Qto- <u>Gr</u>	22
<u>Hb-Gr</u>	120	Apu-Qto-Gwi	17
<u>Hb-Gr-Nm</u>	7	Apu-Qto-Qa- <u>Gr</u>	9
<u>Residential</u> 20 Acres		Apu-Qto-Qe	2
<u>Sagebrush</u> 32.45 Acres		Apu-Qto-Qe-Qa	4
<u>Clar-Agt</u>	7	Apu-Qto-Qy	99
<u>Clar-Cr</u>	.45	(S.B.)	5
<u>Gr-Agt-Clar</u>	6	Apu-Qto-Qy-Gwi	2
<u>Gr-Clar</u>	19	Apu-Qy	30
<u>Timberland Chaparral</u> 2,987.2 A.		Apu-Qy-Gwi	.45
<u>Apu</u>	75	Apu-Qy-Qr	4
(S.B.)	1	Apu-Qy-Qto	26
<u>Apu-Qa</u>	16	Apu-Qy-Qto-Qr	20
(S.B.)	1	Cpc-Apu- <u>Gr</u>	3
<u>Apu-Qa-Qe-Qto</u>	4	Cpc-Apu-Qto	4
<u>Apu-Qa-Qto-Gr</u>	10	Cpc- <u>Gr</u>	30
(S.B.)	1	Cpc-Qa-Qto-Apu	14

Cpc-Qa-Qy	3	Gr-Qto	26
Cpc-Qe-Gr	5	Gr-Qto-Apu	2
Cpc-Qto	5	Gr-Qto-Cpc	15
Cpc-Qto-Apu-Gr	24	Gr-Qto-Qa-Qe-Cpc	25
(S.B.)	2	Gr-Qto-Qe	7
Cpc-Qto-Gr	81	Gwi-Apu-Qto	7
Cpc-Gr-Qto (S.B.)	.15	Gwi-Qa-Qto-Gr	19
Cpc-Qto-Qe-Gr	24	Qa-Cpc-Gr	13
(S.B.)	1	Qa-Gr-Nm	2
Cpc-Qto-Gr-Qe	24	Qa-Qe-Gr-Cpc	8
(S.B.)	2	Qa-Qe-Qto	16
Cpc-Qto-Qy-Apu	10	(S.B.)	3
(S.B.)	3	Qa-Qe-Qto-Apu	8
Gr-Apu-Qa-Qto	8	Qa-Qe-Qy-Cpc-Gr	10
Gr-Apu-Qto-Qa	8	Qa-Qto	15
Gr-Cpc	25	(S.B.)	1
Gr-Cpc-Agt-Dw	4	Qa-Qto-Apu	28
Gr-Cpc-Qa	22	Qa-Qto-Apu-Gr	8
Gr-Cpc-Qto	5	Qa-Qto-Cpc	3
Gr-Cpc-Qto-Apu	6	Qa-Qto-Cpc-Gr	7
Gr-Nm-Cpc	16	Qa-Qto-Gwi-Gr	3
Gr-Qa-Cpc	2	Qa-Qto-Qe-Apu-Gr-Cpc	12
Gr-Qa-Qe-Qto-Nm	9	(S.B.)	1

Qa-Qy	6	Qto-Cpc-Gr	56
Qa-Qy-Qto	2	Qto-Gr	139
Qe-Apu-Gr	4	Qto-Gwi-Cpc-Apu	2
Qe-Qa-Upc	7	Qto-Qa	4
Qe-Qto	4	Qto-Qa-Apu-Cpc-Gr	3
Qr-Apu	1	Qto-Qa-Apu-Gr	19
(S.B.)	2	Qto-Qa-Upc	23
Qr-Apu-Cpc-Gwi	8	Qto-Qa-Cpc-Apu	10
Qr-Cpc-Gr	5	(S.B.)	1
Qr-Qy	11	Qto-Qa-Cpc-Gr	21
Qto	29	Qto-Qa-Gr	3
(S.B.)	5.15	Qto-Qe-Cpc-Qa-Gr	25
Qto-Apu	144	Qto-Qe-Gr	7
(S.B.)	42	Qto-Qe-Qa	9
Qto-Apu-Cpc	9	Qto-Qe-Qa-Cpc	27
Qto-Apu-Cpc-Gr	21	Qto-Qr-Apu	2
Qto-Apu-Gr	111	Qto-Qy	118
(S.B.)	7	(S.B.)	14
Qto-Apu-Qy	9	Qto-Qy-Apu	49
(S.B.)	21	(S.B.)	22
Qto-Apu-Qr	6	Qto-Qy-Upc	2
Qto-Upc	3	Qto-Qy-Qa-Apu	4
Qto-Cpc-Apu	19	Qwi-Qr	7

Qwi-Qy-Qr	14	<u>Gr-Nm-Sx-Agt</u>	6
Qwi-Qy-Qto-Apu	10	<u>Gr-Pj</u>	6
(S.B.)	2	<u>Woodland Chaparral</u> 158 Acres	
Qy	110.45	Apu-QA-QE-QY	2
(S.B.)	16	Cpc-QA	1
Qy-Apu	8	Cpc-QA-Gr	12
Qy-Apu-Qr	7	Gr-Qe-Qto-Cpc	8
Qto-Gwi-Apu	2	QA-Apu-QY	1
Qy-Qto-Qa	4	QA-Cpc-Gr	13
Qy-Apu-Qto-Qe	2	QA-Qe	1
Qy-Gr	1	QA-QE-Apu	18
Qy-Qa	57	QA-QE-Apu-Qto	4
Qy-Qa-Qto	16	QA-QE-Cpc-Gr	9
Qy-Qr	20	QA-QE-Qto-Apu	11
(S.B.)	2	QA-Qe-Qto-Apu	13
Qy-Qto	41	QA-Qto	26
(S.B.)	73	QA-Qto-Gr	5
Qy-Qto-Apu	50	QA-QY-Cpc	2
		(S.B.)	4
<u>Semi-Desert Chaparral</u> 71.3 A. QA-QY-Qto			3
<u>Gr-Agt</u>	28	QE-Apu-QY	7
<u>Gr-Dw-Agt</u>	7	QE-QA-Cpc-Gr	2
<u>Gr-Nm-Agt</u>	24	QE-Qto	2
(S.B.)	.3	Qto-Apu-QE-QA	6

Qto-QE	8	QA-QY-QE-AA	6
<u>Woodland Grass</u> 147 Acres		QE	35
<u>Gr-Nm-QA-QE</u>	20	QE-QA	84
<u>Gr-Qa</u>	45	QE-QY	7
<u>Gr-QA-QE</u>	6	QY	32
<u>Gr-QE-Qto</u>	5	QY-QA	61
<u>QA-Gr</u>	11	QY-QA-AA	3
<u>QA-Gr-Nm</u>	2	QY-QA-PRM	4
<u>QA-Nm-Gr</u>	3	QY-QA-QE	8
<u>QA-QE-Gr</u>	32	QY-QE	18
<u>QA-QE-Gr-Nm</u>	5	<u>Douglas Fir</u> 77.6 Acres	
		Apu-Qy-CA-D	.3
<u>QE-QA-Gr</u>	18	CA-D-P'	5
<u>Woodland</u> 665 Acres		CA-D-Qr	3
<u>PWR-QA</u>	8	CA-D-Qy	4
<u>QA-</u>	17	D-CA	4
<u>QA-QE</u>	125	D-Qr	1
<u>QA-QE-AA</u>	8	D-Qy	39
<u>QA-QE-PWR</u>	3	D-Qy-Qto (S.B.)	3
<u>QA-QE-PWR-CA</u>	1	QA-D-Qy	2
<u>QA-QE-QY</u>	64	QE-Qy-D	8
(S.B.)	1	(S.B.)	2
<u>QA-QY</u>	147	Qy-CA-D	3
<u>QA-QY-QE</u>	33	(S.B.)	.3

Qy-D	3	JPA-QA-QY-PL-Apu	5
<u>Pine</u> 927.9 Acres		P'-PL-CA-Apu	2
Apu-CA-PL	12	P'-PL-CA-Apu-Qy	3
Apu-JPA-PL	3	P'-PL-Qto	2
Apu-PA	3	PA	18
Apu-PL	6	PA-Apu	8
Apu-PL-CA	8	PA-CA	8
Apu-PL-PA	3	PA-CA-Qy	18
Apu-QE-QA-PL	1	PA-CA-QY	3
Apu-Qto-PL	11	PA-CA-Qy-Apu	9
Apu-Qy-P'-PL	4	PA-Gr	14
Apu-Qy-PA-CA	5	PA-JPA-Qy-Apu	3
Apu-Qy-PL	8	PA-PL-Qy-Qr	1
CA-PA	6	PA-Qy	92
CA-PA-Qe	2	PA-QY	1
CA-PA-Qy	2	PA-Qy-Gr	6
CA-PA-Qy-Apu	2	PAP	2
CA-PAP	1	PAP-PA	5
CA-PAP-PA-Qy	6	PAP-PL-JPA-QA-QY	28
CA-PL	9	PAP-PL-JPA-QY-QA	12
CA-PL-Apu	15	PAP-PL-QE-QA-QY-AA	6
CA-PL-QA-QY	10	PAP-QA-Qy	2
JPA-PL-Qy	1	PAP-QY-PL	2

PL-Apu	8.45	QA-QE-JPA-Apu	6
PL-Apu-Qto	1	QA-QE-PAP	6
PL-CA	2	QA-QE-PAP-PL-CA	5
PL-CA-Apu	3	QA-QE-PL	7
PL-CA-Apu-Qy	15	QA-QE-Qy-PA-P'-PL	2
PL-CA-PA	2	QA-QY-JPA-P'-PAP	21
PL-CA-Qy	17	QA-QY-JPA-P'-PL-PAP	24
PL-Gwi	.45	QA-QY-PAP-PL	11
PL-P'-CA	6	QA-QY-PL	30
PL-P'-JPA-Cpc	2	QA-QY-PL-CA	18
PL-PAP-CA	1	QA-QY-PL-P'	12
PL-PAP-QA	1	QA-QY-QE-PAP	21
PL-QA-QE	61	QA-QY-QE-PL	29
PL-QE-QA	15	QE-QA-PL	27
PL-Qy	3	QE-QA-QY-PAP-PL	12
PL-QY	2	Qy-Apu-PA	22
PL-Qy-QA	1	Qy-Apu-PL	5
PL-QY-QA	7	Qy-Apu-PL-JPA	5
PL-QY-QA-PAP	2	Qy-CA-PA	3
PL-Qy-Qto-Apu	4	Qy-CA-PL	2
QA-QE-AA-PL	8	QY-CA-PL	3
QA-QE-Apu-PL	5	Qy-PA	68

QY-PA	11	PA-D-Qy-Qr	4
QY-PA-CA	5	PL-D-CA	1
QY-PAP-PL	3	QA-QY-PL	3
Qy-PL	5	Qr-Qy-D-PA	6
Qy-PL-P'	3	Qy-Apu-D-PL	3
QY-QA-PAP-PL	2	QY-D-PA	2
QY-QA-PL	4	Qy-D-PA	1
QY-Qa-PL	5	Qy-PA-D	14
Qy-QA-PL	3	QY-PL-D	12
Qy-Qe-PAP-PL	8	<u>Pinyon-Juniper-Cypress</u> 5,546.65 A.	
QY-QE-PL	4	AA-QA-CA	5
Qy-Qto-PL	1	Apu-CA	102
<u>Pine-Douglas-Fir</u> 83 Acres		Apu-CA-P'	23
D-CA-PA	7	Apu-CA-Qto	.45
D-PL-CA-Qy-Apu	1	Apu-Cpc-P'	3
D-PL-JPA-Qy-Apu	3	Apu-Gwi-Qy-P'	5
D-PL-Qy	2	(S.B.)	2
PA-CA-D-Qy	4	Apu-JPA-QA-QE	19
PA-D	4	Apu-P'	75
PA-D-CA	4	(S.B.)	3
PA-D-CA-Qy	1	Apu-P'-CA	77
PA-D-Qy	11	(S.B.)	1

Apu-P'-JPA	4	Apu-Qy-Qto-CA-P'	6
Apu-P'-Qto-CA	5	(S.B.)	5
Apu-QA-QY-JPA	5	CA	24
Apu-QE-JPA	4	CA-Apu	9
Apu-Qto-CA	2	CA-Apu-Qto	11
Apu-Qto-Cpc-P'	88	CA-Apu-Qy	19
(S.B.)	7	CA-P'	49
Apu-Qto-P'	159	(S.B.)	9
(S.B.)	59	CA-P'-Apu	24
Apu-Qto-P'-CA	21	CA-P'-Apu-Qto-Qy	5
Apu-Qto-P'-JPA	10	CA-P'-Apu-Qy	8
Apu-Qto-Qy-P'	21	CA-P'-Apu-Qy-Qto	25
(S.B.)	1	CA-P'-QA-QY-	2
Apu-Qto-Qy-P'-CA	3	(S.B.)	13
Apu-Qy-CA	4	CA-P'-Qr	19
Apu-Qy-CA-P'	7	CA-P'-Qto	5
Apu-Qy-JPA-P'	5	CA-P'-Qy	120
Apu-Qy-P'	7	(S.B.)	7
Apu-Qy-P'-CA	35	CA-P'-Qy-Apu	53
(S.B.)	1	(S.B.)	3
Apu-Qy-QA-P'-JPA	2	CA-P'-Qy-Apu-Qto	22
Apu-Qy-Qto-CA	5	(S.B.)	1

CA-P'-Qy-Qto	4	<u>Gr-JPA-Qto</u>	3
CA-PWR	7	<u>Gr-P'-JPA</u>	1
CA-QA-QE	3	Gwi-Qto-Apu-P'	21
CA-QA-QY	9	JPA	2
CA-QA-Qy	2	(S.B.)	5
CA-Qr	3	JPA-Cpc	1
CA-Qto	1	JPA-Cpc- <u>Gr</u>	3
(S.B.)	.15	JPA-Cpc-Nm- <u>Gr</u>	23
CA-Qy	89	(S.B.)	1
(S.B.)	3	JPA- <u>Gr</u>	4
CA-Qy-Apu	3	JPA- <u>Gr</u> -Nm	13
CA-Qy-QA	3	JPA-P'	1
CA-QY-QA	24	JPA-P'-Cpc	6
Cpc-Qto-P'	8	(S.B.)	6
<u>Gr</u> -Agt-JPA	2	JPA-P'-Cpc-Nm	1
<u>Gr</u> -Agt-Dw-Cpc-JPA		JPA-P'-QA	17
(S.B.)	10	JPA-P'-QA-Cpc	2
<u>Gr</u> -Cpc-JPA	3	(S.B.)	3
<u>Gr</u> -Cpc-P'	6	JPA-P'-QA-QY	27
<u>Gr</u> -JPA (S.B.)	3	JPA-P'-QA-Qy	4
<u>Gr</u> -JPA-Nm	3	JPA-P'-QA-QY-Cpc-Nm	13
<u>Gr</u> -JPA-QA	1	(S.B.)	3
<u>Gr</u> -JPA-QA-QE	3	JPA-P'-QY-Qto	3

JPA-P'-QY-Qto (S.B.)	8	P'-CA	60
JPA-QA-QE-Apu	16	P'-CA-Apu	44
JPA-QA-QE-Gr	17	P'-CA-Apu-Qto	96
JPA-QA-QY-QE	9	P'-CA-Apu-Qto-Qy	7
JPA-QE-QA	3	(S.B.)	7
JPA-QE-QA-Apu	18	P'-CA-Apu-Qy	46
JPA-QE-QA-Gr	10	P'-CA-Apu-Qy-Qr-Qto	6
JPA-Qto-Apu	1	P'-CA-Qr	9
JPA-Qto-Gr	1	P'-CA-Qto	72
JPA-Qy-Qto	3	(S.B.)	2
P'	26	P'-CA-Qto-Apu	93
(S.B.)	1	(S.B.)	4
P'-Apu	128	P'-CA-Qto-Apu-Qr	.45
(S.B.)	6	P'-CA-Qto-Qwi-Apu	5
P'-Qto-Apu	291	P'-CA-Qto-Qwi-Qy-Apu	7
P'-Apu-Qto (S.B.)	30	P'-CA-Qto-Qr	2
P'-Apu-Qto-Qy	11	P'-CA-Qto-Qy	22
(S.B.)	11	P'-CA-Qto-Qy-Apu	4
P'-Apu-Qy	13	P'-CA-Qy	120
P'-Apu-Qy-Qto	6	(S.B.)	6
(S.B.)	6	P'-CA-Qy-Apu	27
P'-Apu-Qy-Qto-Qwi	15	P'-CA-Qy-Apu-Qto	14
		P'-CA-Qy-Qto	26

P'-CA-Qy-Qto (S.B.)	6	P'-Qto	163
P'-CA-Qy-Qto-Apu	24	(S.B.)	40
(S.B.)	2	P'-Qto-Apu	674
P'-Cpc-Apu	2	(S.B.)	107
P'-Cpc-Apu-Qto	11	P'-Qto-Apu-Gwi	8
(S.B.)	3	(S.B.)	1
P'-Cpc-Qto-Gr	6	P'-Qto-Apu-Qy	15
P'-JPA	8	(S.B.)	1
P'-JPA-Apu-Qto	34	P'-Qto-Cpc	14
P'-JPA-Apu-Qto-Qy	7	(S.B.)	.3
P'-JPA-Cpc	3	P'-Qto-Gr	40
P'-JPA-Cpc-Gwi-Qa	1	P'-Qto-Qy	42
P'-JPA-QA-Cpc	3	(S.B.)	.3
(S.B.)	2	P'-Qto-Qy-Apu	20
P'-JPA-QA-QE	28	(S.B.)	17
(S.B.)	1	P'-Qto-Qy-Gwi-Apu	8
P'-JPA-QA-QY (S.B.)	9	(S.B.)	25
P'-JPA-QA-QY-Apu-Cpc	6	P'-Qwi	2
P'-JPA-Qto-Apu(S.B.)	3	(S.B.)	5
P'-JPA-Qy-Qa	5	P'-Qy	51
P'-JPA-Qy-Qto	42	(S.B.)	43
P'-Qa-Qto	9	P'-Qy-Apu	8
P'-QA-QY	3	P'-Qy-Gwi-Qto-Apu	17

P'-Qy-Qto	10	QA-Qto-QE-JPA-Apu	2
P'-QY-Qto	6	QA-QY-Apu-P'-JPA	11
(S.B.)	40	QA-QY-CA	4
P'-Qy-Qto-Apu	31	QA-QY-Cpc-JPA	3
(S.B.)	69	QA-QY-JPA-P'	37
P'-Qy-Qto-Apu-Gwi	21	(S.B.)	2
(S.B.)	11	QA-QY-JPA-P'-Cpc	27
QA-AA-QY-JPA-P'(S.B.)	7	(S.B.)	9
QA-CA-Qto	3	QA-QY-P'	1
QA-Cpc-JPA- <u>Gr</u> -Nm	3	(S.B.)	1
QA-Cpc-P'-Ys	2	QA-QY-P'-Cpc	12
Qto-Qr-Qy-Apu-CA	11	QA-QY-P'-JPA	4
QA-JPA- <u>Gr</u>	5	QA-QY-QE-P'	6
QA-P'	2	QE-JPA	4
QA-QE-Apu-JPA-P'	8	QE-QA-JPA	18
QA-Qe-Cpc-JPA- <u>Gr</u>		QE-QA-JPA- <u>Gr</u>	42
(S.B.)	8	(S.B.)	4
QA-QE-JPA	19	Qr-CA	8
QA-QE-JPA- <u>Gr</u>	7	Qto-Apu-CA (S.B.)	8
QA-QE-JPA-P'	5	Qto-Apu-Cpc-Gwi-P'	17
QA-QE-P'	3	Qto-Apu-P'	165
QA-QE-QY-JPA	3	(S.B.)	5
QA-Qto-CA	1	Qto-Apu-Qy-P'	5

Qto-CA	13	Qy-CA	12
(S.B.)	1	QY-CA	2
Qto-CA-P'	9	Qy-CA-P'	1
Qto-Cpc-P'	12	QY-CA-QA	3
Qto-Gr-P'	6	Qy-P'	20
Qto-Gwi-P'	3	(S.B.)	5
Qto-JPA-Cpc-Gr	3	Qy-P'-CA	12
Qto-JPA-Gr	2	(S.B.)	2
Qto-P'	107	QY-QA-CA	2
(S.B.)	9	Qy-QA-CA	3
Qto-P'-Cpc-Gr	2	Qy-Qa-Qto-JPA-P'	6
Qto-P'-Gr	29	Qy-Qto-Apu-CA	14
(S.B.)	4	Qy-Qto-Apu-P'-CA	9
Qto-QA-Apu-JPA	13	Qy-Qto-CA	8
Qto-QE-P'	9	(S.B.)	6
Qto-Qy-Apu-P'-JPA	9	Qy-Qto-P'	23
Qto-Qy-P'	23	(S.B.)	23
(S.B.)	2	Qy-Qto-P'-Apu	8
Qy-Apu-Gr-P'	9	Qy-Qto-Qwi-CA(S.B.)	11
(S.B.)	1	P'-Qto-Apu-QA	9
Qy-Apu-JPA	9	P'-Qto-Apu-Qa	2
Qy-Apu-P'	18		
Qy-Apu-P'-CA	11		

We have the original Ranger sketch
map here at ARAR & large camera-
locked copies of the vegetation type
map located in our file also. I
found this stuff and thought you might
like a 1937 to 1974 comparative
baseline for environmental impacts of
visitation on the park.

Island Island