

Research Natural Areas

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

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PHELPS CABIN

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General Information S.USNAHP*79

- Created: 1970
- Size: 312 (acres)
- Elevation Range: 9200 - 9600ft
- Location: *The RNA is located in the White Mountains of eastern Arizona, about 24 miles southwest of Springerville. A small portion of the RNA lies within Mt. Baldy Wilderness.*

Site Description

Phelps Cabin RNA features high elevation wet meadow systems and associated forests. The area has been under special management for botanical and research values since 1910. The overall terrain is gently rolling. Wetland communities contain several plant species of special interest including the Arizona willow (*Salix arizonica*) and Mogollon paintbrush (*Castilleja mogollonica*). Mixed conifer forests with spruce, fir and aspen are present on uplands adjacent to the wet meadows.

Climate and Enviromental Information

Data not Available

Vegetation - Phelps Cabin

Engelmann Spruce-Subalpine Fir (SAF 206) Interior Douglas-fir (SAF 210) Aspen (SAF 217)

A cooperative project of the

USDA Forest Service
Northern Region,
Rocky Mountain Region,
Southwestern Region,
Intermountain Region,
Rocky Mountain Research
Station,
and the
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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 Phelps Cabin Research Natural Area the lands described in the preceding report by the Region 3 Research Natural Area Committee dated August 7, 1969, said lands shall hereafter be administered as a Research Natural Area, subject to the said Regulations and instructions thereunder

November 25, 1970
Date

Edward P. Cliff
Chief, Forest Service

ESTABLISHMENT REPORT

PHELPS CABIN RESEARCH NATURAL AREA

Apache National Forest

Apache County, Arizona

August 7, 1969

NARRATIVE REPORT

a. Principal Distinguishing Features

The Phelps Cabin Research Natural Area is representative of several high mountain types. These are spruce-fir, wet meadow, high mountain grassland, and aspen grouped on a relatively small area. The suitability for research of natural conditions has been recognized for many years and much of the area has been managed as a botanical area. The University of Arizona and perhaps others have done considerable work on the unit. The spruce-fir type is not Engelmann spruce-alpine fir as in SAF 206, nor is it on steep, rough topography. It is principally Engelmann and Colorado blue spruce on relatively gentle topography.

RAB
LMG

b. Location

The area is located in Sections 9, 10, 15, and 16, T 6 N, R 27 E. It is some 24 miles southwest of Springerville within the Springerville Ranger District of the Apache National Forest.

c. Area By Cover Type

The principal type is a mixture of Engelmann and Colorado spruces with aspen (OVT). Other minor types are mixed conifer (SAF-210 - Interior Douglas fir), wet meadow (K-52), fescue-wheatgrass (K-50), and aspen (SAF-217). The area by types is as follows:

^{Best Est m} = SAF 206	Spruce (OVT) ✓	-	194 acres
	Interior Douglas fir (SAF-210)	-	38 acres
1966 K45	Wet Meadow (K-52)	-	35 acres
1966 K43	Fescue-wheatgrass (K-50)	-	30 acres
	Aspen (SAF-217)	-	15 acres
	Total		312 acres

✓ OVT = other vegetation type i.e. not SAF or KUCHLER cover types

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d Physical and Climatrical Conditions

The topography is gently rolling to relatively level and is drained by the Little Colorado which is a live stream through the area, running to the east at this point. The elevation is approximately 9,400 feet above sea level.

The climate is relatively cool, with rather severe winters. Killing frosts can be expected any month of the year. Temperatures range from -30° F in winter to approximately 80° F in summer. The annual precipitation is approximately 28 inches and 60% falls in the form of snow which remains on the area from 4 to 5 months of each year.

e Description of Values

Much of the Phelps Cabin Research Natural Area has been managed more or less as a botanical area since about 1910. The University of Arizona has done considerable work on the unit. The types found there are quite representative of considerable area within the high mountain country of the Southwest. A list of the species collected by W. S. and T. K. Phillips is attached in the appendix.

The base rock is all basalt. The soils are a rather heavy clay loam of the Western Brown Forest Group. There is also some Alpine Meadow. All of the soils are relatively deep with good fertility.

There is no evidence of mineral deposits in the vicinity of the proposed area. Neither are there cinder cones, and no conflicts with mineral interests are foreseen.

Recreation use is limited to some fishing. There is a beaver pond on the tract which probably is an attraction. However, there are numerous other fishing areas in the vicinity, the road is bad, and there is no evidence of overuse along the stream bed.

The Phelps Cabin pasture is completely within the area and fenced. It contains much of the grassland in the wet meadow and protects these areas from over-utilization. The small areas of grassland outside show some signs of overgrazing. However, most of this outside area is heavily timbered and considered unusable range. It is believed that the fencing need not be adjusted to make the entire area useful for research purposes.

All of the water from the Little Colorado has been adjudicated for use downstream from the proposed area. There should be no further

diversions or interference with the stream at this point A portion of the area is within the proposed Mount Baldy Wilderness Area and this classification will not interfere with the use as a research natural area No other special uses are foreseen in this vicinity

H. L. Cox
Apache Forest Supervisor

W. D. Hunt
Regional Forester

[Signature]
Director, Rocky Mountain Station

[Signature]
Director, Div of R & W O

[Signature]
Deputy Chief, Research

2025 RELEASE UNDER E.O. 14176

PLANTS COLLECTED BY W S & T K PHILLIPS

IN THE

PHELPS CABIN RESEARCH NATURAL AREA

WOODY PLANTS

Thin-leaf alder - *Alnus tenuifolia*
Common Juniper - *Juniperus communis*
Wintergreen - *Moneses uniflora*
Engelmann Spruce - *P engelmannii*
Colorado Blue Spruce - *Picea pungens*
Ponderosa Pine - *Pinus ponderosa*
Mexican White Pine - *Pinus flexilis* var *reflexa*
Quaking Aspen - *Populus tremuloides*
Shrubby Cinquefoil - *Potentilla fruticosa*
Western Thimbleberry - *Rubus parviflorus*
Coyote Willow - *Salix exigua*
Whiplash Willow - *Salix caudata*
Sculer Willow - *Salix scouleriana*
Elderberry - *Sambucus racemosa*
Rocky Mountain Whortleberry - *Vaccinium oreophilum*

GRASSES

Idaho Bentgrass - *Agrostis idahoensis*
Rough Bentgrass - *Agrostis scabra*
Pine Dropseed - *Blepharoneuron tricholepis*
Nodding Brome - *Bromus anomalus*
Fringed Brome - *Bromus ciliatus*
Blue Joint Reed Grass - *Calamagrostis canadensis*
Idaho Fescue - *Festuca idahoensis*
Sheep Fescue - *Festuca ovina*
Barley - *Hordeum nodosum*
Prairie Junegrass - *Koeleria cristata*
Muhly - *Muhlenbergia pulcherrima*
Red Muhly - *Muhlenbergia wolfii*
Alpine Timothy - *Phleum alpinum*
Plains Bluegrass - *P arida*
Kentucky Bluegrass - *Poa pratensis*

FORBS

Yarrow - *Achillea lanulosa* var *alpicola*
Columbia Monkshood - *Aconitum columbianum*
Horse Mint - *Agastache pallidiflora*
Palo Dandelion - *Agoseris glauca*

Red Onion - *Allium rubrum*
Rocky Mountain Pussytoes - *Antennaria aprica*
Goldenweed - *Aplopappus croceus* var *genuflexus*
Golden Columbine - *Aquilegia chrysantha*
Columbine - *Aquilegia triternata*
Sandwort - *Arenaria saxosa*
Ragweed Sage - *Artemisia franserioides*
Leafy-bract Aster - *Aster foliaceus*
Ladyfern - *Athyrium filix-femina*
Erect pod wintercress - *Barbarea orthoceras*
Elkslip Marsh marigold - *Calypso bulbosa*
Bluebell - *Campanula rotundifolia*
Heartleaf Bittercress - *Cardamine cordifolia*
Paintbrush - *Castilleja austromontana*
Paintbrush - *Castilleja confusa*
Paintbrush - *Castilleja lineata*
Paintbrush - *Castilleja lutescens*
Starry Mouse-ear - *Cerastium arvense*
Mouse-ear - *Cerastium brachypodium*
Powderhorn Mouse-ear - *Cerastium nutans* var *obtectum*
Goosefoot - *Chenopodium berlandieri* var *pseudopetiolare*
Strawberry-blite Goosefoot - *Chenopodium capitatum*
Fremont Goosefoot - *Chenopodium fremontii*
Creamy Thistle - *Cirsium drummondii*
Thistle - *Cirsium parryi*
Wavyleaf Thistle - *Cirsium undulatum*
Hemlock Parsley - *Conioselinum scopulorum*
Spotted Coralroot - *Corallorhiza*
Larkspur - *Delphinium andesicola*
Western Tansy Mustard - *Descurainia richardsonii* subsp *viscosa*
Wartberry Fairybells - *Disporum trachycarpum*
Southern Shootingstar - *Dodecathon radicum*
Shield Fern - *Dryopteris filix-mas*
Waterwort - *Elatine brachysperma*
Fireweed - *Epilobium angustifolium*
Willowweed - *Epilobium californicum*
Willowweed - *Epilobium halleanum*
Willowweed - *Epilobium oregonense*
Willowweed - *Epilobium saximontanum*
Trailing Fleabane - *Erigeron flagellaris*
Fleabane - *E. formosissimus*
Winged Eriogonum - *Eriogonum alatum*
Western Erysimum - *Erysimum capitatum*
Spurge - *Euphorbia palmeri*
Strawberry - *Fragaria cuneifolia*
Swertia - *Frasera speciosa*
Northern Bedstraw - *Galium boreale*
Rocky Mountain Pleated Gentian - *Gentiana affinis*

Gentian - *Gentiana fremontii*
Gentian - *Gentiana heterosepala*
Gentian - *Gentiana parryi*
Gentian - *Gentiana strictiflora*
Gentian - *Geranium richardsonii*
Grandfathers beard - *Geum ciliatum*
Grandfathers beard - *Geum macrophyllum*
Yellow Grandfathers beard - *Geum strictum*
Cudweed - *G grayi*
Bog Orchid - *H saccata*
Spur-Gentian - *Halenia recurva*
Orange Sneezeweed - *Helenium hoopesii*
Wood-Sunflower - *Helianthella quinquenervis*
Sweetgrass - *Hierochloa odorata*
Mexican White-ragweed - *Hymenopappus mexicanus*
Southwestern St Johns wort - *Hypericum formosum*
Rocky Mountain Iris - *Iris missouriensis*
Arizona Peavine - *Lathyrus arizonicus*
Flax - *Linum lewisii*
Stoneseed - *Lithospermum multiflorum*
Bearberry Honeysuckle - *Lonicera involucrata*
Mint - *Mentha arvensis* var *villosa*
Bluebells - *Mertensia franciscana*
Yellow Monkey flower - *Mimulus guttatus*
Primrose Monkey flower - *M primuloides*
Indian Lettuce - *Montia chamissoi*
Hooker Evening-Primrose - *Oenothera hookeri* subsp *hirsutissima*
Woodsorrel - *Oxalis grayi*
Four O'clock - *Oxybaphus linearis* var *decepiens*
Fendler Cowbane - *Oxybaphus fendleri*
Gray's Fernleaf - *Pedicularis grayi*
Sickletop - *Pedicularis racemosa*
Wandbloom Penstemon - *Penstemon virgatus* subsp *arizonicus*
Wild Caraway - *Perideridia gairdneri*
Phacelia - *Phacelia magellanica*
Jacobs ladder - *Polemonium foliosissimum*
Bistort - *Polygonum bistortoides*
Knotweed - *Polygonum sawatchense*
Elegant Cinquefoil - *Potentilla concinna*
Varileaf Cinquefoil - *Potentilla diversifolia*
Horse Cinquefoil - *Potentilla hippiana*
Common Selfheal - *Prunella vulgaris*
Wild Parsnip - *Pseudocymopterus montanus*
Western Bracken - *Pteridium aquilinum* var *pubescens*
Pyrola - *Pyrola chlorantha*
Pyrola - *Pyrola secunda*
Aquatic Buttercup - *Ranunculus aquatilis*
Aquatic Buttercup - *Ranunculus cardiophyllus*
Small-leaf Water Buttercup - *R hydrocharoides*
Gooseberry Currant - *R montigenum*
Watercress - *Rorippa islandica*
Dock - *Rumex triangulivalvis*
Dock - *Rumex*

Saxifrage - *Saxifraga arguta*
Saxifrage - *Saxifraga rhomboidea*
Skullcap - *Scutellaria galericulata*
Stonecrop - *Sedum rhodanthum*
Senecio - *Senecio bigelovii*
Senecio - *Senecio cynthioides*
Senecio - *Senecio wootonii*
New Mexico Checkermallow - *Sidalcea neomexicana*
Scouler Silene - *Silene scouleri* subsp *pringlei*
Blue-eyed Grass - *Sisyrinchium demissum*
Blue-eyed Grass - *Sisyrinchium longipes*
False Solomonseal - *Smilacina racemosa*
Starry Smilac - *Smilacina stellata*
Goldenrod - *Solidago ciliosa*
Ladies-Tresses - *Spiranthes romanzoffiana*
Longleaf Starwort - *Stellaria longifolia*
Longstalk Starwort - *Stellaria longipes*
Alpine-bog Swertia - *Swertia perennis*
Deer-ears Swertia - *Swertia radiata* var *macrophylla*
Dandelion - *Taraxicum laevigatum*
Meadowrue - *Thalictrum fendleri*
Mustard - *Thelypodium longifolium*
Daisy - *Townsendia formosa*
Clover - *Trifolium fendleri*
Tobacco root - *Valeriana acutiloba*
Tobacco root - *V edulis*
California False-hellebore - *Veratrum californicum*
American Speedwell - *Veronica americana*
Veronica - *Veronica serpyllifolia* var *humifusa*
American Vetch - *Vicia americana*
Hook Violet - *Viola adunca*
Canada Violet - *Viola canadensis*
Wanderer Violet - *Viola nephrophylla*
Showy Goldeneye - *Viguiera multiflora*
Rock Fern - *Woodsia mexicana*
Arizona Wyethia - *Wyethia arizonica*
Meadow Deathcamas - *Zygadenus venenosus*
Water Foxtail - *Alopecurus geniculatus*
Tufted Hairgrass - *Deschampsia caespitosa*

SEDGES

Water Sedge - *Carex aquatilis*
Sedge - *Carex canescens*
Ebony Sedge - *Carex ebenea*
Ovalhead Sedge - *Carex festivella*
Cloud Sedge - *Carex haydeniana*
Nebraska Sedge - *Carex nebraskensis*

Sedge - *Carex petasata*
Beaked Sedge - *Carex rostrata*
Silvertop Sedge - *C foenea* Dewey
Sedge - *Carex simulata*
Wooton Sedge - *Carex wootoni*
Spikerush - *Eleocharis macrostachya*
Rush - *Juncus longistylis*
Rocky Mountain Rush - *Juncus saximontanus*

PHELPS CABIN RESEARCH NATURAL AREA

ABSTRACT

The Phelps Cabin Research Natural Area encompasses 312 acres (126 ha) composed primarily (194 acres) of mixed blue and Engelmann spruce at 9,400 feet elevation. The site also includes a high, wet alpine meadow and mountain grassland. The area has a very high floral diversity and has been managed for many years as a botanical area by the U.S. Forest Service.

The site is located in the Apache National Forest, 24 miles southwest of Springerville, Arizona, in Sections 9, 10, 15 and 16 of T. 6N, R. 27E at 33° 56' N. Lat., 109° 30' W. Long.

Location

The Phelps Cabin Research Natural Area (PCRNA) is located in Sections 9, 10, 15 and 16 of T. 6N., R. 27E. It is 24 miles (28.6 km) southwest of Springerville within the Springerville Ranger District of the Apache National Forest, Apache County, Arizona (See Figure 1).

Access and Accommodations

The area may be reached from McNary, Arizona by traveling east on State Highway 73 (= 260 E) for 16.3 miles (26.2 km) from the eastern city limit (= 19.9 miles or 32.0 km from the Whiteriver-McNary intersection on State Highway 173 from Pinetop). At this point, there is a right turn onto the Big Lake Road (= State Highway 273). The Big Lake Road is not paved. The PCRNA turnoff is 12.0 miles (19.3 km) from the point where the Big Lake Road intersects State Highway 73. The turnoff is a small, inconspicuous dirt road to the right that runs for 0.2 mile (0.3 km) and terminates at a fence with a gate through which one must pass to gain access to PCRNA and the Mt. Baldy Primitive Area.

The area may also be reached by traveling west on State Highway 73 from Springerville to the Big Lake turnoff (about 21 miles or 33.8 km). The area may also be reached from U.S. Highway 666 by turning off on Highway 273 nine miles north of Hannagan Meadows or from U.S. Highway 180 two miles north of Alpine. The latter two routes involve considerable travel (about 34 and 21 miles respectively) on rough, dirt roads and a good map of the area would facilitate reaching PCRNA from either Alpine or Hannagan Meadows.

The nearest accommodations are at Winn Campground about two miles northwest of Phelps Cabin on Highway 273. There are numerous other campgrounds in the vicinity which is a very popular summer recreation area. The nearest indoor accommodations are at Sunrise Lodge which is on the Big Lake Road about three miles south of its junction with Highway 73. There are also numerous motels, trailer parks and campgrounds in nearby Pinetop, Lakeside, McNary, Springerville and Greer.

Climate

The climate of PCRNA is quite cool. Winter low temperatures drop to -30° F. and summer highs fluctuate around 80° F. Killing frost may be expected during any month of the year and winters are quite severe. Snow may be expected in the area four or five months (Oct.-March) of the year. Annual precipitation is about 28 inches and 60% falls in the form of snow. The remainder of the annual precipitation falls in the form of rain and is concentrated in the months of July and August when almost daily thundershowers occur. The latter result from warm, moist air masses moving across the state from the Gulf of Mexico. Such thundershowers develop quickly and are frequently accompanied by strong winds and torrential rains.

Topography and Landform

PCRNA is characterized by gently rolling to relative flat topography and drainage is via the east fork of the Little Colorado River which passes through the area. The average elevation of the area is about 9,400 feet above sea level.

The base rock is basaltic in origin and there is no evidence of mineral deposits or cinder cones in the vicinity of PCRNA. The soils are relatively deep and fertile and consist primarily of rather heavy clay loam of the Western Brown Forest Group.

Biota

The PCRNA consists of several high mountain vegetation types. The primary type is a mixture of Engelmann spruce (*Picea engelmanni*) and blue spruce (*Picea pungens*). This vegetation type covers 194 acres of the 312 acres that comprise the PCRNA. The remainder of the site is occupied by interior Douglas fir (38 acres), wet meadows (35 acres) grassland (30 acres) and aspen (15 acres). A map of the distribution of these types within PCRNA is presented in Figure 2.

The area exhibits a very high floral diversity (E. Lehto - personal communication) which underscores its value as a botanical research area. A large number of the plant species listed in Table 1 are associated with the wet meadow and grassland habitat types within the fenced area of the pasture.

The Phelps Cabin pasture contains much of the grassland in the wet meadow and has been fenced and managed as a botanical area for many years. Areas of grassland outside the fence show some evidence of overgrazing.

The vertebrate fauna of PCRNA is also characteristic of high montane forest. Major affinities of breeding species are with Rocky Mountain faunas. Characteristic mammals include Elk (*Cervus canadensis*), Beaver (*Castor canadensis*) and Golden-mantled Ground Squirrel (*Spermophilus lateralis*). Breeding birds of this area include Audubon's Warbler (*Dendroica coronata*), Gray Jay (*Perisoreus canadensis*) and Red-breasted Nuthatch (*Sitta canadensis*). The herpetofauna is quite depauperate due to the limiting nature of the climate. Lists of vertebrate species likely to be encountered in the Phelps Cabin area are presented in Table 2.

Research History

The Phelps Cabin area has been studied rather extensively by members of Arizona universities and research institutions. The floral list included in the report is largely a product of the efforts of W. S. Phillips and T. K. Phillips (University of Arizona). The mammalian fauna has been sampled by G. C. Bateman of Northern Arizona University (unpublished) and the breeding bird fauna has been studied by Carothers et. al. (1973).

Maps and Aerial Photographs

PCRNA is located on the Big Lake, Arizona Topographic Quadrangle published (1958) by the U.S. Geological Survey. Information on maps and recent aerial photographic coverage of this site may be obtained from the District Ranger, Apache National Forest, Springerville, Arizona or from the Director of the Rocky Mountain Forest and Range Experiment Station.

TABLE 1. List of plant species that have been collected from the Phelps Botanical Area. Specimens are filed in the herbaria at the University of Arizona and Arizona State University. Plants were collected and identified between 1949 and 1973 by W. S. and T. K. Phillips, R. R. Humphrey, T. N. Kearney and E. Lehto. Most specimens were verified by T. N. Kearney and *Cyperaceae* specimens were checked by F. J. Mermann.

POLYPODIACEAE - Fern Family	
<i>Pteridium aquilinum</i>	bracken
<i>Woodsia mexicana</i>	rock fern
<i>Dryopteris filix-mas</i>	shield fern
<i>Athyrium filix-femina</i>	lady fern
PINACEAE - Pine Family	
<i>Pinus strobiformis</i>	southwestern white pine
<i>Picea engelmanni</i>	Engelmann spruce
<i>Picea Pungens</i>	blue spruce
<i>Pseudotsuga menziesii</i>	Douglas fir
GRAMINEAE - Grass Family	
<i>Bromus anomalus</i>	brome
<i>Festuca ovina</i>	fescue
<i>Festuca idahoensis</i>	fescue
<i>Poa pratensis</i>	Kentucky blue grass
<i>Poa arida</i>	plains blue grass
<i>Poa fendleriana</i>	mutton grass
<i>Hordeum nodosum</i>	barley
<i>Koeleria cristata</i>	june grass
<i>Deschampsia caespitosa</i>	hair grass-
<i>Deschampsia richardsonii</i>	hair grass
<i>Calamagrostis canadensis</i>	reed grass
<i>Agrostris scabra</i>	tickle grass
<i>Agrostris idahoensis</i>	bent grass
<i>Alopecurus geniculatus</i>	fox tail
<i>Muhlenbergia wolfii</i>	muhly
<i>Muhlenbergia pulcherrima</i>	muhly
<i>Blepharoneuron tricholepis</i>	pine drop-seed
<i>Hierochloe odorata</i>	sweet grass
CYPERACEAE - Sedge Family	
<i>Eleocharis macrostachya</i>	spike rush
<i>Carex simulata</i>	sedge
<i>Carex siccata</i>	sedge
<i>Carex canescens</i>	sedge
<i>Carex festivella</i>	sedge
<i>Carex ebenea</i>	sedge
<i>Carex haydeniana</i>	sedge
<i>Carex petasata</i>	sedge
<i>Carex nebraskensis</i>	sedge
<i>Carex rostrata</i>	sedge
JUNCACEAE - Rush Family	
<i>Juncus longistylis</i>	rush
<i>Juncus saximontanus</i>	rush
<i>Luzula parviflora</i>	wood rush
LILIACEAE - Lily Family	
<i>Zigadenus virescens</i>	death camas
<i>Veratrum californicum</i>	skunk cabbage

TABLE 1 (Continued)

LILIACEAE - Lily Family (Continued)	
<i>Allium rubrum</i>	red onion
<i>Smilacena racemosa</i>	false Solomon-seal
<i>Smilacena stellata</i>	starflower
<i>Disporum trachycarpum</i>	disporum
IRIDACEAE - Iris Family	
<i>Iris missouriensis</i>	Rocky Mountain iris
<i>Sisyrinchium longipes</i>	sisyrinchium
ORCHIDACEAE - Orchis Family	
<i>Habenaria saccata</i>	bog orchid
<i>Spiranthes romanzoffiana</i>	lady's tresses
<i>Corallorhiza maculata</i>	coral root
<i>Calypso bulbosa</i>	calypso
SALICACEAE - Willow Family	
<i>Populus tremuloides</i>	quaking aspen
<i>Salix exigua</i>	coyote willow
<i>Salix scouleriana</i>	Scouler willow
<i>Salix pseudocordata</i>	whiplash willow
BETULACEAE - Birch Family	
<i>Alnus tenuifolia</i>	thin-leaf alder
URTICACEAE - Nettle Family	
<i>Urtica gracilis</i>	nettle
POLYGONACEAE - Buckwheat Family	
<i>Eriogonum alatum</i>	winged eriogonum
<i>Rumex triangulivalvis</i>	sorrel
<i>Rumex occidentalis</i>	sorrel
<i>Polygonum sawatchense</i>	smartweed
<i>Polygonum bistortoides</i>	smartweek
CHENOPODIACEAE - Goosefoot Family	
<i>Chenopodium capitatum</i>	strawberry blight
<i>Chenopodium berlandieri</i>	goosefoot
<i>Chenopodium fremontii</i>	goosefoot
AMARANTHACEAE - Four O'clock Family	
<i>Oxybaphus linearis</i>	oxybaphus
PORTULACACEAE - Portulaca Family	
<i>Montia chamissoi</i>	indian lettuce
CARYOPHYLLACEAE - Pink Family	
<i>Stellaria longipes</i>	starwort
<i>Stellaria longifolia</i>	starwort
<i>Cerastium brachypodum</i>	mouse-ear chickweed
<i>Cerastium nutans</i>	mouse-ear chickweed
<i>Cerastium arvense</i>	mouse-ear chickweed
<i>Sagina saginoides</i>	pearl-wort
<i>Arenaria saxosa</i>	sandwort
<i>Silene scouleri</i>	catchfly
RANUNCULACEAE - Crowfoot Family	
<i>Caltha leptosepala</i>	marsh marigold
<i>Aquilegia triternata</i>	columbine
<i>Aquilegia chrysantha</i>	columbine
<i>Delphinium andesicola</i>	larkspur
<i>Aconitum columbianum</i>	monks-hood
<i>Ranunculus aquatilis</i>	buttercup

TABLE 1 (Continued)

RANUNCULACEAE - Crowfoot Family (Continued)	
<i>Ranunculus hydrocharoides</i>	buttercup
<i>Ranunculus cardiophyllus</i>	buttercup
<i>Thalictrum fendleri</i>	meadow-rue
CRUCIFERAE - Mustard Family	
<i>Thelypodium longifolium</i>	thelypodium
<i>Barbarea orthoceras</i>	winter cress
<i>Rorippa islandica</i>	water cress
<i>Cardamine cordifolia</i>	bitter cress
<i>Erysimum capitatum</i>	western wallflower
CRASSULACEAE - Orpine Family	
<i>Sedum rhodanthum</i>	stonecrop
SAXIFRAGACEAE - Saxifrage Family	
<i>Saxifraga rhomboidea</i>	saxifrage
<i>Heuchera parvifolia</i>	alum-root
<i>Ribes montigenum</i>	gooseberry currant
<i>Ribes pinetorum</i>	orange gooseberry
ROSACEAE - Rose Family	
<i>Rubus parviflorus</i>	thimble berry
<i>Fragaria cuncifolia</i>	strawberry
<i>Potentilla fruticosa</i>	bush cinquefoil
<i>Potentilla hippiana</i>	cinquefoil
<i>Potentilla diversifolia</i>	cinquefoil
<i>Potentilla concinna</i>	cinquefoil
<i>Geum strictum</i>	avens
LEGUMINOSEAE - Pea Family	
<i>Trifolium fendleri</i>	clover
<i>Vicia americana</i>	vetch
<i>Lathyrus arizonicus</i>	pea-vine
GERANIACEAE - Geranium Family	
<i>Geranium richardsonii</i>	cranesbill
OXALIDACEAE - Wood-Sorrel Family	
<i>Oxalis grayi</i>	wood-sorrel
LINACEAE - Flax Family	
<i>Linum lewisii</i>	flax
EUPHORBIACEAE - Spurge Family	
<i>Euphorbia palmeri</i>	spurge
MALVACEAE - Mallow Family	
<i>Sidalcea neomexicana</i>	checker mallow
GUTTIFERAE - St. John's Wort Family	
<i>Hypericum formosum</i>	St. John's wort
ELATINACEAE - Water Wort Family	
<i>Elatine brachysperma</i>	water wort
VIOLACEAE - Violet Family	
<i>Viola nephrophylla</i>	violet
<i>Viola canadensis</i>	violet
<i>Viola adunca</i>	violet
ONAGRACEAE - Evening Primrose Family	
<i>Epilobium angustifolium</i>	fire-weed
<i>Epilobium halleianum</i>	willow-weed
<i>Epilobium saxinotatum</i>	willow-weed
<i>Epilobium oregonense</i>	willow-weed

TABLE 1 (Continued)

ONAGRACEAE - Evening Primrose Family (Continued)	
<i>Epilobium californicum</i>	willow-weed
<i>Oenothera hookeri</i>	evening primrose
<i>Gaura ciliatum</i>	gaura
<i>Gaura macrophyllum</i>	gaura
UMBELLIFERAE - Parsley Family	
<i>Osmorhiza obtusa</i>	sweet-root
<i>Perideridia gairdneri</i>	wild caraway
<i>Pseudocymopterus montanus</i>	wild parsnip
<i>Conioselinum scopulorum</i>	hemlock parsley
<i>Oxypolis fendleri</i>	Fendler cowbane
ERICACEAE - Heather Family	
<i>Pyrola chlorantha</i>	shinleaf
<i>Pyrola secunda</i>	shinleaf
<i>Moneses uniflora</i>	wintergreen
<i>Vaccinium oreophilum</i>	Rocky Mountain whortleberry
PRIMULACEAE - Primrose Family	
<i>Dodecatheon radicans</i>	shooting star
GENTIANACEAE - Gentian Family	
<i>Gentiana fremontii</i>	gentian
<i>Gentiana parryi</i>	gentian
<i>Gentiana affinis</i>	pleated gentian
<i>Gentiana heterosepala</i>	gentian
<i>Gentiana strictiflora</i>	gentian
<i>Swertia perennis</i>	elkweed
<i>Swertia radiata</i>	deers-ears
<i>Halenia recurva</i>	spur gentian
POLEMONIACEAE - Phlox Family	
<i>Collomia linearis</i>	collomia
<i>Polemonium foliosissimum</i>	jacob's ladder
HYDROPHYLLACEAE - Water-leaf Family	
<i>Phacelia alpinum</i>	phacelia
BORAGINACEAE - Borage Family	
<i>Hackelia floribunda</i>	hackelia
<i>Mertensia franciscana</i>	bluebells
<i>Lithospermum multiflorum</i>	gromwell
LABIATAE - Mint Family	
<i>Scutellaria galericulata</i>	skull cap
<i>Agastache pallidiflora</i>	giant hyssop
<i>Prunella vulgaris</i>	self-heal
<i>Mentha arvensis</i>	mint
SCROPHULARIACEAE - Figwort Family	
<i>Penstemon virgatus</i>	beardtongue
<i>Mimulus guttatus</i>	monkey flower
<i>Mimulus primuloides</i>	monkey flower
<i>Veronica serpyllifolia</i>	speedwell
<i>Veronica americana</i>	speedwell
<i>Besseyia plataginea</i>	bessya
<i>Castilleja lineata</i>	paint brush
<i>Castilleja austromontana</i>	paint brush
<i>Castilleja lutescens</i>	paint brush
<i>Pedicularis racemosa</i>	lousewort

TABLE 1 (Continued)

SCROPHULARIACEAE - Figwort Family (Continued)	
<i>Pedicularis parryi</i>	lousewort
<i>Pedicularis grayi</i>	lousewort
RUBIACEAE - Madder Family	
<i>Galium tinctorium</i>	bedstraw
<i>Galium boreale</i>	bedstraw
CAPRIFOLIACEAE - Honeysuckle Family	
<i>Sambucus racemosa</i>	elderberry
<i>Lonicera involucrata</i>	bear-berry honeysuckle
VALERIANACEAE - Valerian Family	
<i>Valeriana edulis</i>	valerian
<i>Valeriana acutiloba</i>	valerian
CAMPANULACEAE - Bellflower Family	
<i>Campanula rotundifolia</i>	harebell
COMPOSITAE - Sunflower Family	
<i>Solidago ciliosa</i>	goldenrod
<i>Haplopappus croceus</i>	goldenweed
<i>Achaetogeron chihuahuensis</i>	achaetogeron
<i>Townsendia formosa</i>	daisy
<i>Aster foliaceus</i>	aster
<i>Aster aquifolius</i>	aster
<i>Erigeron flagellaris</i>	fleabane
<i>Erigeron pecosensis</i>	fleabane
<i>Erigeron schiedeana</i>	fleabane
<i>Antennaria aprica</i>	pussy toes
<i>Gnaphalium gravi</i>	cud-weed
<i>Wyethia arizonica</i>	mules-ears
<i>Viquiera multiflora</i>	golden-eye
<i>Helianthella quinquenervis</i>	wood sunflower
<i>Hymenopappus mexicanus</i>	mexican white ragweed
<i>Helenium hoopesii</i>	orange sneeze weed
<i>Achillea lanulosa</i>	yarrow
<i>Artemisia franserioides</i>	sagebrush
<i>Senecio bigelovii</i>	groundsel
<i>Senecio wootonii</i>	groundsel
<i>Senecio cynthioides</i>	groundsel
<i>Cirsium parryi</i>	thistle
<i>Cirsium drummondii</i>	thistle
<i>Cirsium undulatum</i>	thistle
<i>Taraxacum laevigatum</i>	dandelion
<i>Agoseris glauca</i>	mountain dandelion

TABLE 2. Vertebrate species that are likely to be encountered in the Phelps Cabin Research Natural Area. Sources used in compiling this list include Lowe (1964), Phillips, Marshall and Monson (1964), Cockrum (1960) and Carothers et. al. (1973). Bird species marked with an asterisk are known to breed in the area.

I. Fishes

Brown Trout	<i>Salmo trutta</i>
Brook Trout	<i>Salvelinus fontinalis</i>
Fathead Minnow	<i>Pimephales promelas</i>
Little Colorado Spinedace (extinct?)	<i>Lepidomeda vittata</i>

TABLE 2 (Continued)

II. Amphibians and Reptiles	
Tiger Salamander	<i>Ambystoma tigrinum</i>
Leopard Frog	<i>Rana pipiens</i>
Short-horned Lizard	<i>Phrynosoma douglassi</i>
Western Garter Snake	<i>Thamnophis elegans</i>
Gopher Snake	<i>Pituophis melanoleucus</i>
Western Rattlesnake	<i>Crotalus viridis</i>
III. Birds	
* Turkey Vulture	<i>Cathartes aura</i>
Goshawk	<i>Accipiter gentilis</i>
* Sharp-shinned Hawk	<i>Accipiter striatus</i>
Red-tailed Hawk	<i>Buteo jamaicensis</i>
Bald Eagle	<i>Haliaeetus leucocephalus</i>
* Sparrow Hawk	<i>Falco sparverius</i>
* Blue Grouse	<i>Dendragapus obscurus</i>
* Turkey	<i>Meleagris gallopavo</i>
Band-tailed Pigeon	<i>Columba fasciata</i>
Mourning Dove	<i>Zenaida macroura</i>
Great Horned Owl	<i>Bubo virginianus</i>
Spotted Owl	<i>Strix occidentalis</i>
Saw-whet Owl	<i>Aegolius acadicus</i>
Common Nighthawk	<i>Chordeiles minor</i>
* Broad-tailed Hummingbird	<i>Selasphorus platycercus</i>
Rufous Hummingbird	<i>Selasphorus rufus</i>
* Red-shafted Flicker	<i>Colaptes auratus</i>
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>
Williamson's Sapsucker	<i>Sphyrapicus thyroideus</i>
* Hairy Woodpecker	<i>Dendrocopos villosus</i>
* Northern Three-toed Woodpecker	<i>Picoides tridactylus</i>
Dusky Flycatcher	<i>Empidonax oberholseri</i>
* Western Flycatcher	<i>Empidonax difficilis</i>
Olive-sided Flycatcher	<i>Nuttallornis borealis</i>
Horned Lark	<i>Eremophila alpestris</i>
Violet-green Swallow	<i>Tachycineta thalassina</i>
Barn Swallow	<i>Hirundo rustica</i>
* Gray Jay	<i>Perisoreus canadensis</i>
* Steller's Jay	<i>Cyanocitta stelleri</i>
* Common Raven	<i>Corvus corax</i>
Common Crow	<i>Corvus brachyrhynchos</i>
* Clark's Nutcracker	<i>Nucifraga columbiana</i>
* Mountain Chickadee	<i>Parus gambeli</i>
* Red-breasted Nuthatch	<i>Sitta canadensis</i>
* Brown Creeper	<i>Certhia familiaris</i>
Dipper	<i>Cinclus mexicanus</i>
House Wren	<i>Troglodytes aedon</i>
* American Robin	<i>Turdus migratorius</i>
* Hermit Thrush	<i>Catharus guttatus</i>
Mountain Bluebird	<i>Sialia currucoides</i>
* Townsend's Solitaire	<i>Myadestes townsendi</i>
* Golden-crowned Kinglet	<i>Regulus satrapa</i>
* Ruby-crowned Kinglet	<i>Regulus calendula</i>

TABLE 2 (Continued)

III. Birds (Continued)

Warbling Vireo	<i>Vireo gilvus</i>
Orange-crowned Warbler	<i>Vermivora celata</i>
* Audubon's Warbler	<i>Dendroica coronata</i>
Townsend's Warbler	<i>Dendroica townsendi</i>
Hermit Warbler	<i>Dendroica occidentalis</i>
MacGillivray's Warbler	<i>Oporornis tolmiei</i>
Wilson's Warbler	<i>Wilsonia pusilla</i>
Eastern Meadowlark	<i>Sturnella magna</i>
Brewer's Blackbird	<i>Euphagus cyanocephalus</i>
* Western Tanager	<i>Piranga ludoviciana</i>
Pine Grosbeak	<i>Pinicola enucleator</i>
* Pine Siskin	<i>Spinus pinus</i>
Red Crossbill	<i>Loxia curvirostra</i>
* Green-tailed Towhee	<i>Chlorua chlorua</i>
Savannah Sparrow	<i>Passerculus sandwichensis</i>
Vesper Sparrow	<i>Pooecetes gramineus</i>
* Gray-headed Junco	<i>Junco caniceps</i>
Dark-eyed Junco	<i>Junco hyemalis</i>
Chipping Sparrow	<i>Spizella passerina</i>
* Lincoln's Sparrow	<i>Melospiza lincolni</i>
Chestnut-collared Longspur	<i>Calcarius ornatus</i>

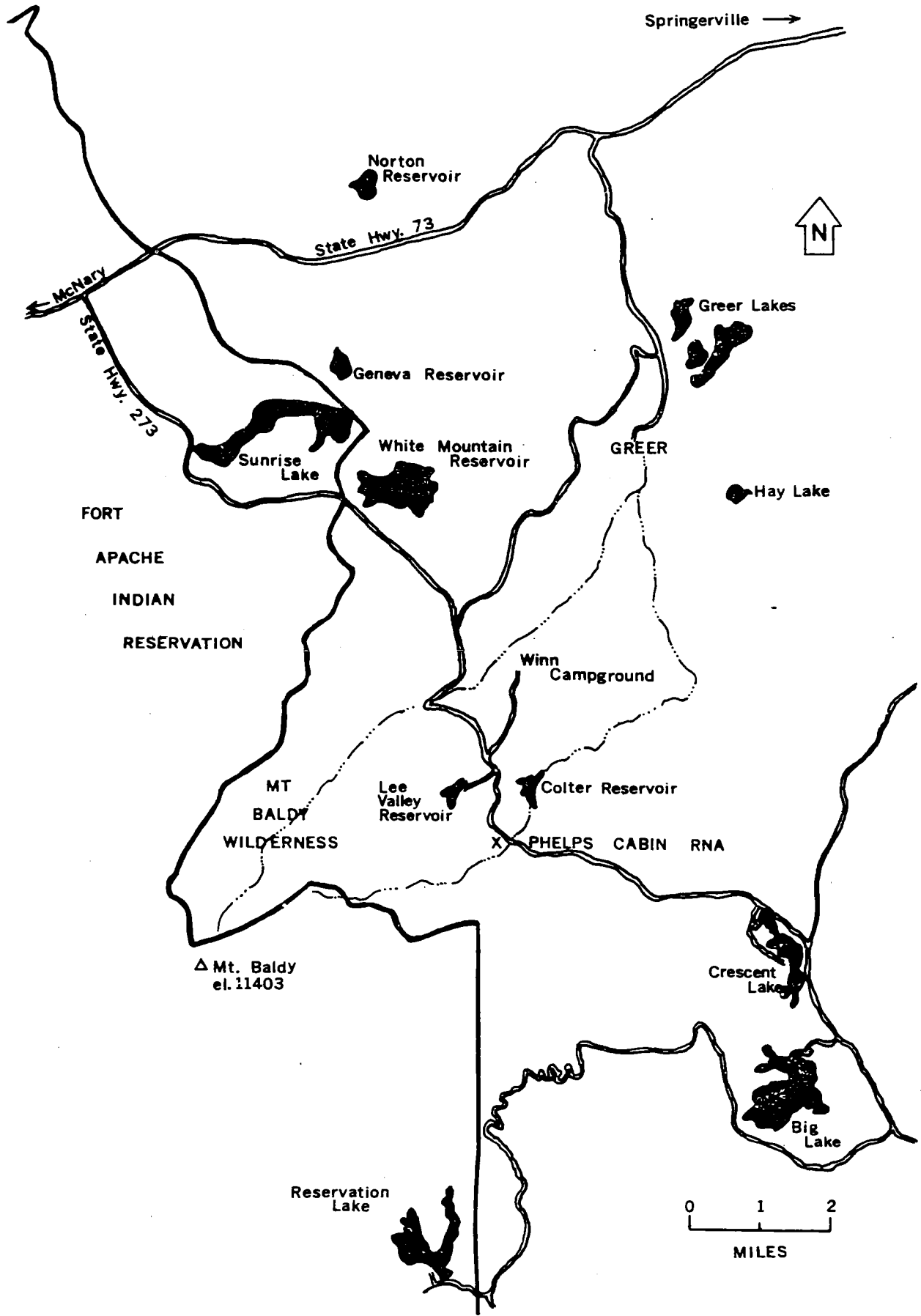
IV. Mammals

Merriam's Shrew	<i>Sorex merriami</i>
Vagrant Shrew	<i>Sorex vagrans</i>
Water Shrew	<i>Sorex palustris</i>
Fringed Myotis	<i>Myotis thysanodes</i>
Long-legged Myotis	<i>Myotis volans</i>
California Myotis	<i>Myotis californicus</i>
Small-footed Myotis	<i>Myotis subulatus</i>
Big Brown Bat	<i>Eptesicus fuscus</i>
Hoary Bat	<i>Lasiurus cinereus</i>
Brazilian Free-tailed Bat	<i>Taderida brasiliensis</i>
Nuttall's Cottontail	<i>Sylvilagus nuttallii</i>
Rock Squirrel	<i>Spermophilus variegatus</i>
Golden-mantled Ground Squirrel	<i>Spermophilus lateralis</i>
Least Chipmunk	<i>Eutamias minimus</i>
Gray-collared chipmunk	<i>Eutamias cinereicollis</i>
Red Squirrel	<i>Tamiasciurus hudsonicus</i>
Valley Pocket Gopher	<i>Thomomys bottae</i>
Beaver	<i>Castor canadensis</i>
Deer Mouse	<i>Peromyscus maniculatus</i>
Mexican Wood Rat	<i>Neotoma mexicana</i>
Gapper's Red-backed Mouse	<i>Clethrionomys gapperi</i>
Montane Vole	<i>Microtus montanus</i>
Long-tailed Vole	<i>Microtus longicaudus</i>
Mexican Vole	<i>Microtus mexicanus</i>
Western Jumping Mouse	<i>Zapus princeps</i>
Porcupine	<i>Erethizon dorsatum</i>
Coyote	<i>Canis latrans</i>
Black Bear	<i>Euarctos americanus</i>

TABLE 2 (Continued)

IV. Mammals (Continued)

Long-tailed Weasel	<i>Mustela frenata</i>
Striped Skunk	<i>Mephitis mephitis</i>
Mountain Lion	<i>Felis concolor</i>
Bobcat	<i>Lynx rufus</i>
Elk	<i>Cervis canadensis</i>
Mule Deer	<i>Odocoileus hemionus</i>



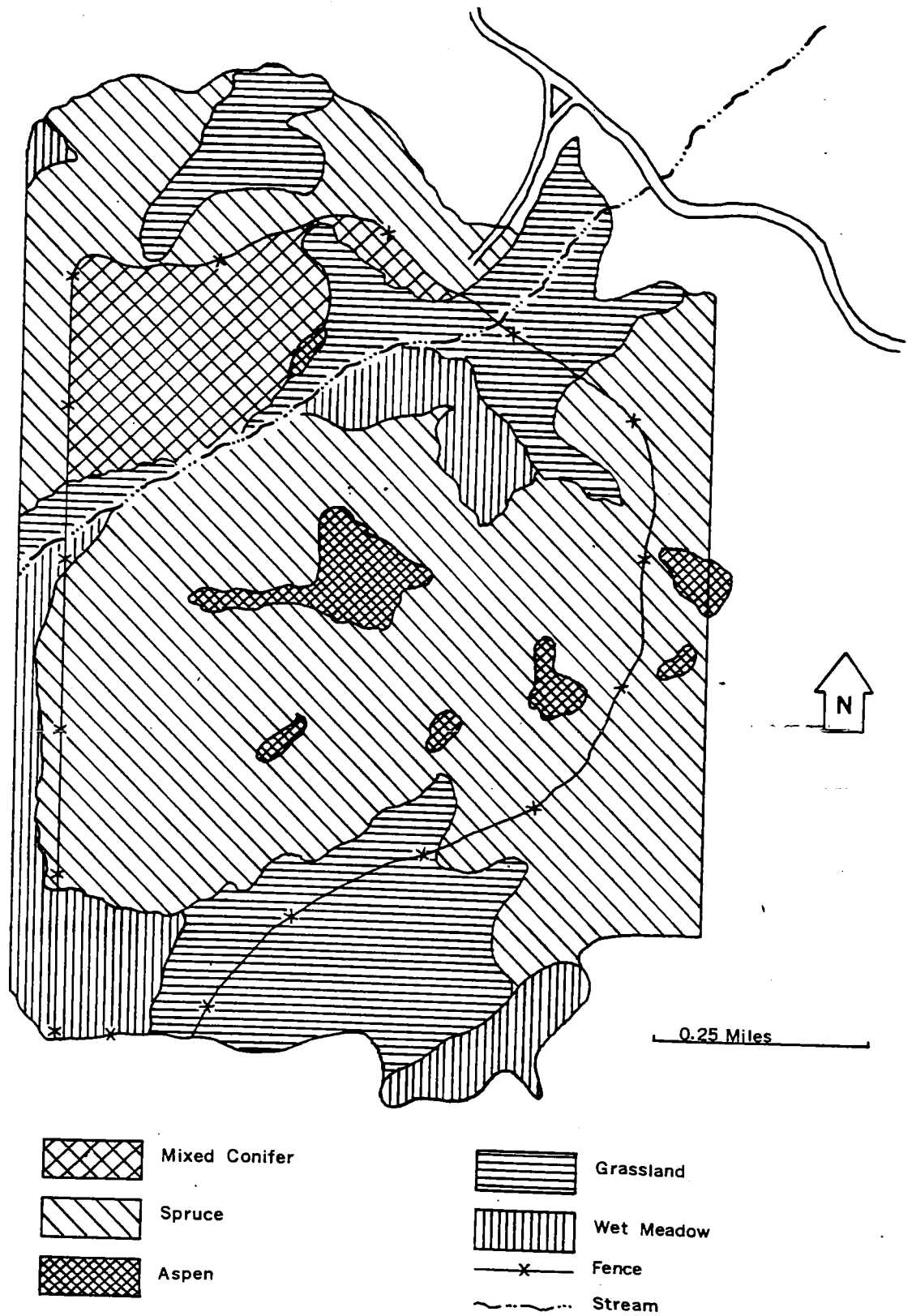


FIGURE 2. Vegetation Map of PCRNA.



Photo 1. Phelps pasture in the Phelps Botanical Area. The line of Willows through the pasture indicates the route of the East Fork of the Little Colorado River. Cattle in the background are fenced out of the pasture.

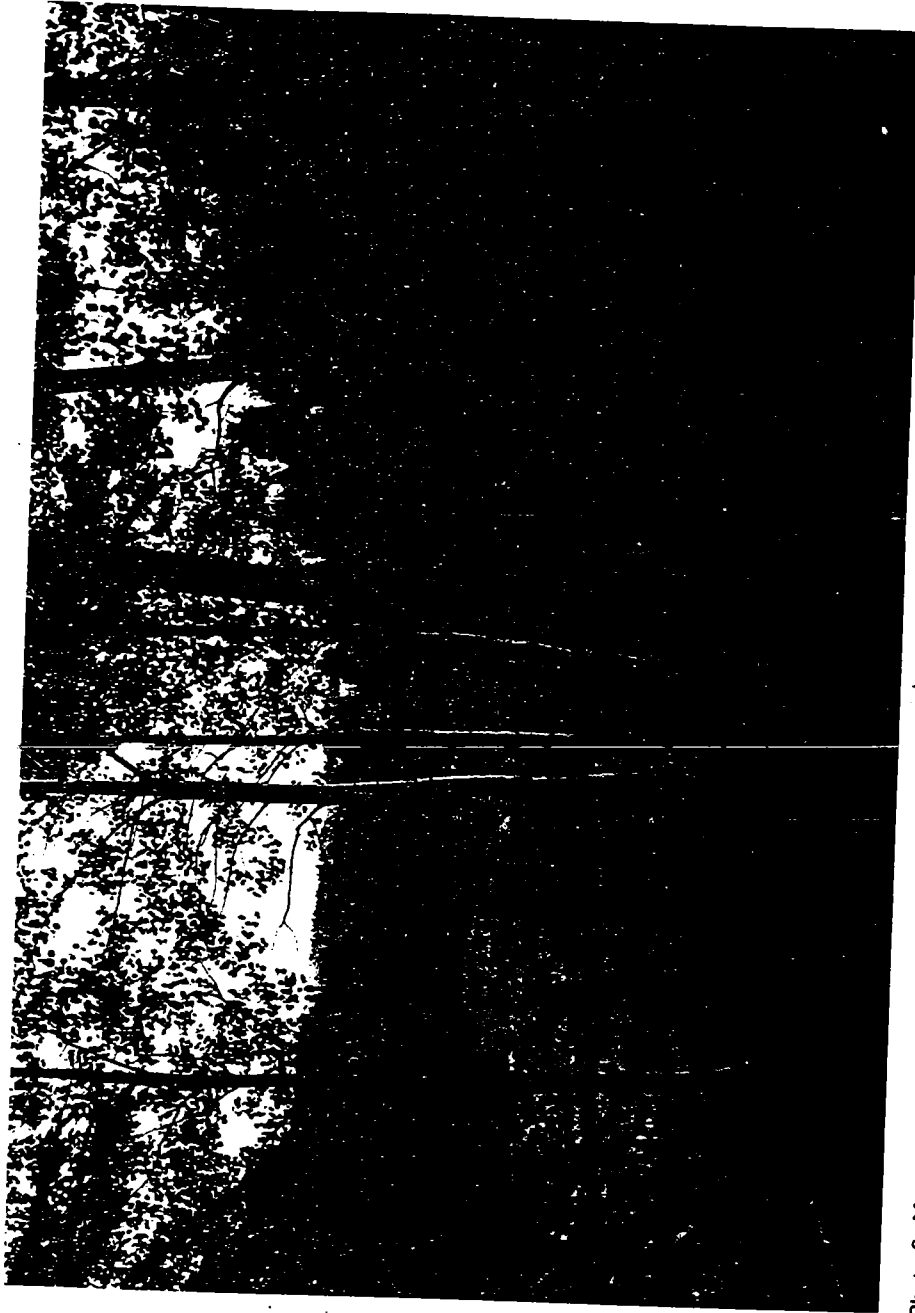


Photo 2. Mountain grassland on the Phelps Botanical Area. Photo is looking towards the mt. Baldy Primitive Area. Dominant trees include spruces and Aspen with a small ponderosa pine in the right center.

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Range Report

ESTABLISHED NATURAL AREAS IN ARIZONA



STATE OF ARIZONA

**ESTABLISHED NATURAL
AREAS IN ARIZONA**

*A Guidebook for Scientists
and Educators*

**PLANNING DIVISION
OFFICE OF ECONOMIC PLANNING AND DEVELOPMENT
OFFICE OF THE GOVERNOR**

1974

PHELPS CABIN RESEARCH NATURAL AREA

ABSTRACT

The Phelps Cabin Research Natural Area encompasses 312 acres (126 ha) composed primarily (194 acres) of mixed blue and Engelmann spruce at 9,400 feet elevation. The site also includes a high, wet alpine meadow and mountain grassland. The area has a very high floral diversity and has been managed for many years as a botanical area by the U.S. Forest Service.

The site is located in the Apache National Forest, 24 miles southwest of Springerville, Arizona, in Sections 9, 10, 15 and 16 of T. 6N, R. 27E at 33° 56' N. Lat., 109° 30' W. Long.

Location

The Phelps Cabin Research Natural Area (PCRNA) is located in Sections 9, 10, 15 and 16 of T. 6N., R. 27E. It is 24 miles (28.6 km) southwest of Springerville within the Springerville Ranger District of the Apache National Forest, Apache County, Arizona (See Figure 1).

Access and Accommodations

The area may be reached from McNary, Arizona by traveling east on State Highway 73 (= 260 E) for 16.3 miles (26.2 km) from the eastern city limit (= 19.9 miles or 32.0 km from the Whiteriver-McNary intersection on State Highway 173 from Pinetop). At this point, there is a right turn onto the Big Lake Road (= State Highway 273). The Big Lake Road is not paved. The PCRNA turnoff is 12.0 miles (19.3 km) from the point where the Big Lake Road intersects State Highway 73. The turnoff is a small, inconspicuous dirt road to the right that runs for 0.2 mile (0.3 km) and terminates at a fence with a gate through which one must pass to gain access to PCRNA and the Mt. Baldy Primitive Area.

The area may also be reached by traveling west on State Highway 73 from Springerville to the Big Lake turnoff (about 21 miles or 33.8 km). The area may also be reached from U.S. Highway 666 by turning off on Highway 273 nine miles north of Hannagan Meadows or from U.S. Highway 180 two miles north of Alpine. The latter two routes involve considerable travel (about 34 and 21 miles respectively) on rough, dirt roads and a good map of the area would facilitate reaching PCRNA from either Alpine or Hannagan Meadows.

The nearest accommodations are at Winn Campground about two miles northwest of Phelps Cabin on Highway 273. There are numerous other campgrounds in the vicinity which is a very popular summer recreation area. The nearest indoor accommodations are at Sunrise Lodge which is on the Big Lake Road about three miles south of its junction with Highway 73. There are also numerous motels, trailer parks and campgrounds in nearby Pinetop, Lakeside, McNary, Springerville and Greer.

Climate

The climate of PCRNA is quite cool. Winter low temperatures drop to -30° F. and summer highs fluctuate around 80° F. Killing frost may be expected during any month of the year and winters are quite severe. Snow may be expected in the area four or five Months (Oct.-March) of the year. Annual precipitation is about 28 inches and 60% falls in the form of snow. The remainder of the annual precipitation falls in the form of rain and is concentrated in the months of July and August when almost daily thundershowers occur. The latter result from warm, moist air masses moving across the state from the Gulf of Mexico. Such thundershowers develop quickly and are frequently accompanied by strong winds and torrential rains.

Topography and Landform

PCRNA is characterized by gently rolling to relative flat topography and drainage is via the east fork of the Little Colorado River which passes through the area. The average elevation of the area is about 9,400 feet above sea level.

The base rock is basaltic in origin and there is no evidence of mineral deposits or cinder cones in the vicinity of PCRNA. The soils are relatively deep and fertile and consist primarily of rather heavy clay loam of the Western Brown Forest Group.

Biota

The PCRNA consists of several high mountain vegetation types. The primary type is a mixture of Engelmann spruce (*Picea engelmanni*) and blue spruce (*Picea pungens*). This vegetation type covers 194 acres of the 312 acres that comprise the PCRNA. The remainder of the site is occupied by interior Douglas fir (38 acres), wet meadows (35 acres) grassland (30 acres) and aspen (15 acres). A map of the distribution of these types within PCRNA is presented in Figure 2.

The area exhibits a very high floral diversity (E. Lehto - personal communication) which underscores its value as a botanical research area. A large number of the plant species listed in Table 1 are associated with the wet meadow and grassland habitat types within the fenced area of the pasture.

The Phelps Cabin pasture contains much of the grassland in the wet meadow and has been fenced and managed as a botanical area for many years. Areas of grassland outside the fence show some evidence of overgrazing.

The vertebrate fauna of PCRNA is also characteristic of high montane forest. Major affinities of breeding species are with Rocky Mountain faunas. Characteristic mammals include Elk (*Cervus canadensis*), Beaver (*Castor canadensis*) and Golden-mantled Ground Squirrel (*Spermophilus lateralis*). Breeding birds of this area include Audubon's Warbler (*Dendroica coronata*), Gray Jay (*Perisoreus canadensis*) and Red-breasted Nuthatch (*Sitta canadensis*). The herpetofauna is quite depauperate due to the limiting nature of the climate. Lists of vertebrate species likely to be encountered in the Phelps Cabin area are presented in Table 2.

Research History

The Phelps Cabin area has been studied rather extensively by members of Arizona universities and research institutions. The floral list included in the report is largely a product of the efforts of W. S. Phillips and T. K. Phillips (University of Arizona). The mammalian fauna has been sampled by G. C. Bateman of Northern Arizona University (unpublished) and the breeding bird fauna has been studied by Carothers et. al. (1973).

Maps and Aerial Photographs

PCRNA is located on the Big Lake, Arizona Topographic Quadrangle published (1958) by the U.S. Geological Survey. Information on maps and recent aerial photographic coverage of this site may be obtained from the District Ranger, Apache National Forest, Springerville, Arizona or from the Director of the Rocky Mountain Forest and Range Experiment Station.

TABLE 1. List of plant species that have been collected from the Phelps Botanical Area. Specimens are filed in the herbaria at the University of Arizona and Arizona State University. Plants were collected and identified between 1949 and 1973 by W. S. and T. K. Phillips, R. R. Humphrey, T. N. Kearney and E. Lehto. Most specimens were verified by T. N. Kearney and *Cyperaceae* specimens were checked by F. J. Mermann.

POLYPODIACEAE - Fern Family		
<i>Pteridium aquilinum</i>	.....	bracken
<i>Woodsia mexicana</i>	.....	rock fern
<i>Dryopteris filix-mas</i>	.....	shield fern
<i>Athyrium filix-femina</i>	.....	lady fern
PINACEAE - Pine Family		
<i>Pinus strobiformis</i>	.....	southwestern white pine
<i>Picea engelmanni</i>	.....	Engelmann spruce
<i>Picea Pungens</i>	.....	blue spruce
<i>Pseudotsuga menziesii</i>	.....	Douglas fir
GRAMINEAE - Grass Family		
<i>Bromus anomalus</i>	.....	brome
<i>Festuca ovina</i>	.....	fescue
<i>Festuca idahoensis</i>	.....	fescue
<i>Poa pratensis</i>	.....	Kentucky blue grass
<i>Poa arida</i>	.....	plains blue grass
<i>Poa fendleriana</i>	.....	mutton grass
<i>Hordeum nodosum</i>	.....	barley
<i>Koeleria cristata</i>	.....	june grass
<i>Deschampsia caespitosa</i>	.....	hair grass-
<i>Deschampsia richardsonii</i>	.....	hair grass
<i>Calamagrostis canadensis</i>	.....	reed grass
<i>Agrostis scabra</i>	.....	tickle grass
<i>Agrostis idahoensis</i>	.....	bent grass
<i>Alopecurus geniculatus</i>	.....	fox tail
<i>Muhlenbergia wolfii</i>	.....	muhly
<i>Muhlenbergia pulcherrima</i>	.....	muhly
<i>Blepharoneuron tricholepis</i>	.....	pine drop-seed
<i>Hierochloe odorata</i>	.....	sweet grass
CYPERACEAE - Sedge Family		
<i>Eleocharis macrostachya</i>	.....	spike rush
<i>Carex simulata</i>	.....	sedge
<i>Carex siccata</i>	.....	sedge
<i>Carex canescens</i>	.....	sedge
<i>Carex festivella</i>	.....	sedge
<i>Carex ebenea</i>	.....	sedge
<i>Carex haydeniana</i>	.....	sedge
<i>Carex petasata</i>	.....	sedge
<i>Carex nebraskensis</i>	.....	sedge
<i>Carex rostrata</i>	.....	sedge
JUNACEAE - Rush Family		
<i>Juncus longistylis</i>	.....	rush
<i>Juncus saximontanus</i>	.....	rush
<i>Luzula parviflora</i>	.....	wood rush
LILIACEAE - Lily Family		
<i>Zigadenus virescens</i>	.....	death camas
<i>Veratrum californicum</i>	.....	skunk cabbage

TABLE 1 (Continued)

LILIACEAE - Lily Family (Continued)	
<i>Allium rubrum</i>	red onion
<i>Smilacena racemosa</i>	false Solomon-seal
<i>Smilacena stellata</i>	starflower
<i>Disporum trachycarpum</i>	disporum
IRIDACEAE - Iris Family	
<i>Iris missouriensis</i>	Rocky Mountain iris
<i>Sisyrichium longipes</i>	sisyrichium
ORCHIDACEAE - Orchis Family	
<i>Habenaria saccata</i>	bog orchid
<i>Spiranthes romanzoffiana</i>	lady's tresses
<i>Corallorhiza maculata</i>	coral root
<i>Calypso bulbosa</i>	calypso
SALICACEAE - Willow Family	
<i>Populus tremuloides</i>	quaking aspen
<i>Salix exigua</i>	coyote willow
<i>Salix scouleriana</i>	Scouler willow
— <i>Salix pseudocordata</i>	whiplash willow
BETULACEAE - Birch Family	
<i>Alnus tenuifolia</i>	thin-leaf alder
URTICACEAE - Nettle Family	
<i>Urtica gracilis</i>	nettle
POLYGONACEAE - Buckwheat Family	
<i>Eriogonum alatum</i>	winged eriogonum
<i>Rumex triangulivalvis</i>	sorrel
<i>Rumex occidentalis</i>	sorrel
<i>Polygonum sawatchense</i>	smartweed
<i>Polygonum bistortoides</i>	smartweek
CHENOPODIACEAE - Goosefoot Family	
<i>Chenopodium capitatum</i>	strawberry blight
<i>Chenopodium berlandieri</i>	goosefoot
<i>Chenopodium fremontii</i>	goosefoot
AMARANTHACEAE - Four O'clock Family	
<i>Oxybaphus linearis</i>	oxybaphus
PORTULACACEAE - Portulaca Family	
<i>Montia chamissoi</i>	indian lettuce
CARYOPHYLLACEAE - Pink Family	
<i>Stellaria longipes</i>	starwort
<i>Stellaria longifolia</i>	starwort
<i>Cerastium brachypodum</i>	mouse-ear chickweed
<i>Cerastium nutans</i>	mouse-ear chickweed
<i>Cerastium arvense</i>	mouse-ear chickweed
<i>Sagina saginoides</i>	pearl-wort
<i>Arenaria saxosa</i>	sandwort
<i>Silene scouleri</i>	catchfly
RANUNCULACEAE - Crowfoot Family	
<i>Caltha leptosepala</i>	marsh marigold
<i>Aquilegia triternata</i>	columbine
<i>Aquilegia chrysantha</i>	columbine
<i>Delphinium andesicola</i>	larkspur
<i>Aconitum columbianum</i>	monks-hood
<i>Ranunculus aquatilis</i>	buttercup

TABLE 1 (Continued)

RANUNCULACEAE - Crowfoot Family (Continued)	
<i>Ranunculus hydrocharoides</i>	buttercup
<i>Ranunculus cardiophyllus</i>	buttercup
<i>Thalictrum fendleri</i>	meadow-rue
CRUCIFERAE - Mustard Family	
<i>Thelypodium longifolium</i>	thelypodium
<i>Barbarea orthoceras</i>	winter cress
<i>Rorippa islandica</i>	water cress
<i>Cardamine cordifolia</i>	bitter cress
<i>Erysimum capitatum</i>	western wallflower
CRASSULACEAE - Orpine Family	
<i>Sedum rhodanthum</i>	stonecrop
SAXIFRAGACEAE - Saxifrage Family	
<i>Saxifraga rhomboidea</i>	saxifrage
<i>Heuchera parvifolia</i>	alum-root
<i>Ribes montigenum</i>	gooseberry currant
<i>Ribes pinetorum</i>	orange gooseberry
ROSACEAE - Rose Family	
<i>Rubus parviflorus</i>	thimble berry
<i>Fragaria cuneifolia</i>	strawberry
<i>Potentilla fruticosa</i>	bush cinquefoil
<i>Potentilla hippiana</i>	cinquefoil
<i>Potentilla diversifolia</i>	cinquefoil
<i>Potentilla concinna</i>	cinquefoil
<i>Geum strictum</i>	avens
LEGUMINOSEAE - Pea Family	
<i>Trifolium fendleri</i>	clover
<i>Vicia americana</i>	vetch
<i>Lathyrus arizonicus</i>	pea-vine
GERANIACEAE - Geranium Family	
<i>Geranium richardsonii</i>	cranesbill
OXALIDACEAE - Wood-Sorrel Family	
<i>Oxalis grayi</i>	wood-sorrel
LINACEAE - Flax Family	
<i>Linum lewisii</i>	flax
EUPHORBIACEAE - Spurge Family	
<i>Euphorbia palmeri</i>	spurge
MALVACEAE - Mallow Family	
<i>Sidalcea neomexicana</i>	checker mallow
GUTTIFERAE - St. John's Wort Family	
<i>Hypericum formosum</i>	St. John's wort
ELATINACEAE - Water Wort Family	
<i>Elatine brachysperma</i>	water wort
VIOLACEAE - Violet Family	
<i>Viola nephrophylla</i>	violet
<i>Viola canadensis</i>	violet
<i>Viola adunca</i>	violet
ONAGRACEAE - Evening Primrose Family	
<i>Epilobium angustifolium</i>	fire-weed
<i>Epilobium halleianum</i>	willow-weed
<i>Epilobium saxinotatum</i>	willow-weed
<i>Epilobium oregonense</i>	willow-weed

TABLE 1 (Continued)

ONAGRACEAE - Evening Primrose Family (Continued)	
<i>Epilobium californicum</i>	willow-weed
<i>Oenothera hookeri</i>	evening primrose
<i>Gaura ciliatum</i>	gaura
<i>Gaura macrophyllum</i>	gaura
UMBELLIFERAE - Parsley Family	
<i>Osmorhiza obtusa</i>	sweet-root
<i>Perideridia gairdneri</i>	wild caraway
<i>Pseudocymopterus montanus</i>	wild parsnip
<i>Conioselinum scopulorum</i>	hemlock parsley
<i>Oxypolis fendleri</i>	Fendler cowbane
ERICACEAE - Heather Family	
<i>Pyrola chlorantha</i>	shinleaf
<i>Pyrola secunda</i>	shinleaf
<i>Moneses uniflora</i>	wintergreen
<i>Vaccinium oreophilum</i>	Rocky Mountain whortleberry
PRIMULACEAE - Primrose Family	
<i>Dodecatheon radicans</i>	shooting star
GENTIANACEAE - Gentian Family	
<i>Gentiana fremontii</i>	gentian
<i>Gentiana parryi</i>	gentian
<i>Gentiana affinis</i>	pleated gentian
<i>Gentiana heterosepala</i>	gentian
<i>Gentiana strictiflora</i>	gentian
<i>Swertia perennis</i>	elkweed
<i>Swertia radiata</i>	deers-ears
<i>Halenia recurva</i>	spur gentian
POLEMONIACEAE - Phlox Family	
<i>Collomia linearis</i>	collomia
<i>Polemonium foliosissimum</i>	jacob's ladder
HYDROPHYLLACEAE - Water-leaf Family	
<i>Phacelia alpinum</i>	phacelia
BORAGINACEAE - Borage Family	
<i>Hackelia floribunda</i>	hackelia
<i>Mertensia franciscana</i>	bluebells
<i>Lithospermum multiflorum</i>	gromwell
LABIATAE - Mint Family	
<i>Scutellaria galericulata</i>	skull cap
<i>Agastache pallidiflora</i>	giant hyssop
<i>Prunella vulgaris</i>	self-heal
<i>Mentha arvensis</i>	mint
SCROPHULARIACEAE - Figwort Family	
<i>Penstemon virgatus</i>	beardtongue
<i>Mimulus guttatus</i>	monkey flower
<i>Mimulus primuloides</i>	monkey flower
<i>Veronica serpyllifolia</i>	speedwell
<i>Veronica americana</i>	speedwell
<i>Besseya plataginea</i>	bessya
<i>Castilleja lineata</i>	paint brush
<i>Castilleja austromontana</i>	paint brush
<i>Castilleja lutescens</i>	paint brush
<i>Pedicularis racemosa</i>	lousewort

TABLE 1 (Continued)

SCROPHULARIACEAE - Figwort Family (Continued)	
<i>Pedicularis parryi</i>	lousewort
<i>Pedicularis grayi</i>	lousewort
RUBIACEAE - Madder Family	
<i>Galium tinctorium</i>	bedstraw
<i>Galium boreale</i>	bedstraw
CAPRIFOLIACEAE - Honeysuckle Family	
<i>Sambucus racemosa</i>	elderberry
<i>Lonicera involucrata</i>	bear-berry honeysuckle
VALERIANACEAE - Valerian Family	
<i>Valeriana edulis</i>	valerian
<i>Valeriana acutiloba</i>	valerian
CAMPANULACEAE - Bellflower Family	
<i>Campanula rotundifolia</i>	harebell
COMPOSITAE - Sunflower Family	
<i>Solidago ciliosa</i>	goldenrod
<i>Haplopappus croceus</i>	goldenweed
<i>Achaetogeron chihuahuensis</i>	achaetogeron
<i>Townsendia formosa</i>	daisy
<i>Aster foliaceus</i>	aster
<i>Aster aquifolius</i>	aster
<i>Erigeron flagellaris</i>	fleabane
<i>Erigeron pecosensis</i>	fleabane
<i>Erigeron schiedeanus</i>	fleabane
<i>Antennaria aprica</i>	pussy toes
<i>Gnaphalium gravi</i>	cud-weed
<i>Wyethia arizonica</i>	mules-ears
<i>Viguiera multiflora</i>	golden-eye
<i>Helianthella quinquenervis</i>	wood sunflower
<i>Hymenopappus mexicanus</i>	mexican white ragweed
<i>Helenium hoopesii</i>	orange sneeze weed
<i>Achillea lanulosa</i>	yarrow
<i>Artemisia franserioides</i>	sagebrush
<i>Senecio bigelovii</i>	groundsel
<i>Senecio wootonii</i>	groundsel
<i>Senecio cynthioides</i>	groundsel
<i>Cirsium parryi</i>	thistle
<i>Cirsium drummondii</i>	thistle
<i>Cirsium undulatum</i>	thistle
<i>Taraxacum laevigatum</i>	dandelion
<i>Agoseris glauca</i>	mountain dandelion

TABLE 2. Vertebrate species that are likely to be encountered in the Phelps Cabin Research Natural Area. Sources used in compiling this list include Lowe (1964), Phillips, Marshall and Monson (1964), Cockrum (1960) and Carothers et. al. (1973). Bird species marked with an asterisk are known to breed in the area.

I. Fishes	
Brown Trout	<i>Salmo trutta</i>
Brook Trout	<i>Salvelinus fontinalis</i>
Fathead Minnow	<i>Pimephales promelas</i>
Little Colorado Spinedace (extinct?)	<i>Lepidomeda vittata</i>

TABLE 2 (Continued)

II. Amphibians and Reptiles	
Tiger Salamander	<i>Ambystoma tigrinum</i>
Leopard Frog	<i>Rana pipiens</i>
Short-horned Lizard	<i>Phrynosoma douglassi</i>
Western Garter Snake	<i>Thamnophis elegans</i>
Gopher Snake	<i>Pituophis melanoleucus</i>
Western Rattlesnake	<i>Crotalus viridis</i>
III. Birds	
* Turkey Vulture	<i>Cathartes aura</i>
Goshawk	<i>Accipiter gentilis</i>
* Sharp-shinned Hawk	<i>Accipiter striatus</i>
Red-tailed Hawk	<i>Buteo jamaicensis</i>
Bald Eagle	<i>Haliaeetus leucocephalus</i>
* Sparrow Hawk	<i>Falco sparverius</i>
* Blue Grouse	<i>Dendragapus obscurus</i>
* Turkey	<i>Meleagris gallopavo</i>
Band-tailed Pigeon	<i>Columba fasciata</i>
Mourning Dove	<i>Zenaida macroura</i>
Great Horned Owl	<i>Bubo virginianus</i>
Spotted Owl	<i>Strix occidentalis</i>
Saw-whet Owl	<i>Aegolius acadicus</i>
Common Nighthawk	<i>Chordeiles minor</i>
* Broad-tailed Hummingbird	<i>Selasphorus platycercus</i>
Rufous Hummingbird	<i>Selasphorus rufus</i>
* Red-shafted Flicker	<i>Colaptes auratus</i>
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>
Williamson's Sapsucker	<i>Sphyrapicus thyroideus</i>
* Hairy Woodpecker	<i>Dendrocopos villosus</i>
* Northern Three-toed Woodpecker	<i>Picoides tridactylus</i>
Dusky Flycatcher	<i>Empidonax oberholseri</i>
* Western Flycatcher	<i>Empidonax difficilis</i>
Olive-sided Flycatcher	<i>Nuttallornis borealis</i>
Horned Lark	<i>Eremophila alpestris</i>
Violet-green Swallow	<i>Tachycineta thalassina</i>
Barn Swallow	<i>Hirundo rustica</i>
* Gray Jay	<i>Perisoreus canadensis</i>
* Steller's Jay	<i>Cyanocitta stelleri</i>
* Common Raven	<i>Corvus corax</i>
Common Crow	<i>Corvus brachyrhynchos</i>
* Clark's Nutcracker	<i>Nucifraga columbiana</i>
* Mountain Chickadee	<i>Parus gambeli</i>
* Red-breasted Nuthatch	<i>Sitta canadensis</i>
* Brown Creeper	<i>Certhia familiaris</i>
Dipper	<i>Cinclus mexicanus</i>
House Wren	<i>Troglodytes aedon</i>
* American Robin	<i>Turdus migratorius</i>
* Hermit Thrush	<i>Catharus guttatus</i>
Mountain Bluebird	<i>Sialia currucoides</i>
* Townsend's Solitaire	<i>Myadestes townsendi</i>
* Golden-crowned Kinglet	<i>Regulus satrapa</i>
* Ruby-crowned Kinglet	<i>Regulus calendula</i>

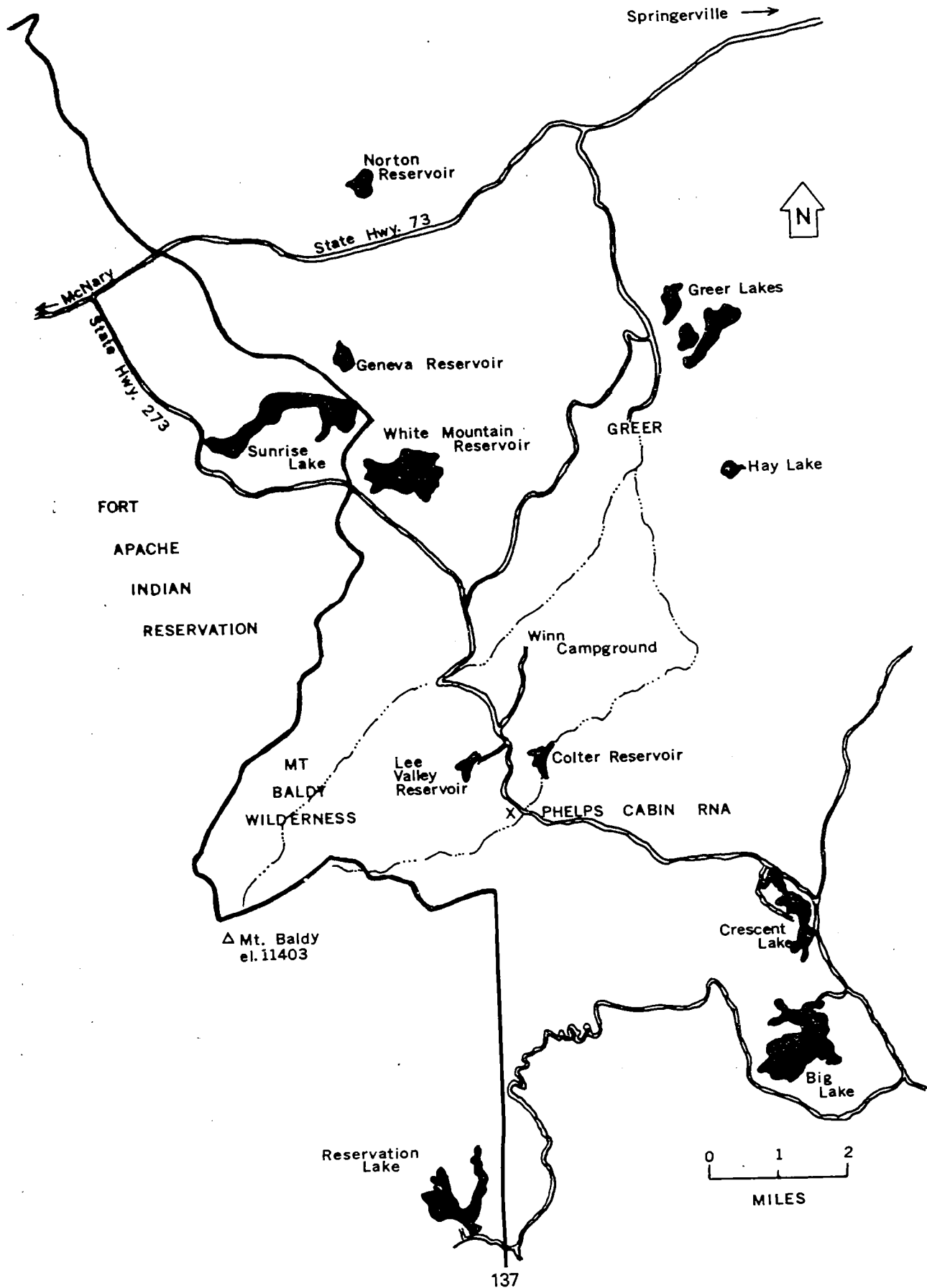
TABLE 2 (Continued)

III. Birds (Continued)	<i>Vireo gilvus</i>
Warbling Vireo	<i>Vermivora celata</i>
Orange-crowned Warbler	<i>Dendroica coronata</i>
* Audubon's Warbler	<i>Dendroica townsendi</i>
Townsend's Warbler	<i>Dendroica occidentalis</i>
Hermit Warbler	<i>Oporornis tolmiei</i>
MacGillivray's Warbler	<i>Wilsonia pusilla</i>
Wilson's Warbler	<i>Sturnella magna</i>
Eastern Meadowlark	<i>Euphagus cyanocephalus</i>
Brewer's Blackbird	<i>Piranga ludoviciana</i>
* Western Tanager	<i>Pinicola enucleator</i>
Pine Grosbeak	<i>Spinus pinus</i>
* Pine Siskin	<i>Loxia curvirostra</i>
Red Crossbill	<i>Chlorua chlorua</i>
* Green-tailed Towhee	<i>Passerculus sandwichensis</i>
Savannah Sparrow	<i>Pooecetes gramineus</i>
Vesper Sparrow	<i>Junco caniceps</i>
* Gray-headed Junco	<i>Junco hyemalis</i>
Dark-eyed Junco	<i>Spizella passerina</i>
Chipping Sparrow	<i>Melospiza lincolni</i>
* Lincoln's Sparrow	<i>Calcarius ornatus</i>
Chestnut-collared Longspur	
IV. Mammals	<i>Sorex merriami</i>
Merriam's Shrew	<i>Sorex vagrans</i>
Vagrant Shrew	<i>Sorex palustris</i>
Water Shrew	<i>Myotis thysanodes</i>
Fringed Myotis	<i>Myotis volans</i>
Long-legged Myotis	<i>Myotis californicus</i>
California Myotis	<i>Myotis subulatus</i>
Small-footed Myotis	<i>Eptesicus fuscus</i>
Big Brown Bat	<i>Lasiurus cinereus</i>
Hoary Bat	<i>Taderida brasiliensis</i>
Brazilian Free-tailed Bat	<i>Sylvilagus nuttallii</i>
Nuttall's Cottontail	<i>Spermophilus variegatus</i>
Rock Squirrel	<i>Spermophilus lateralis</i>
Golden-mantled Ground Squirrel	<i>Eutamias minimus</i>
Least Chipmunk	<i>Eutamias cinereicollis</i>
Gray-collared chipmunk	<i>Tamiasciurus hudsonicus</i>
Red Squirrel	<i>Thomomys bottae</i>
Valley Pocket Gopher	<i>Castor canadensis</i>
Beaver	<i>Peromyscus maniculatus</i>
Deer Mouse	<i>Neotoma mexicana</i>
Mexican Wood Rat	<i>Clethrionomys gapperi</i>
Gapper's Red-backed Mouse	<i>Microtus montanus</i>
Montane Vole	<i>Microtus longicaudus</i>
Long-tailed Vole	<i>Microtus mexicanus</i>
Mexican Vole	<i>Zapus princeps</i>
Western Jumping Mouse	<i>Erethizon dorsatum</i>
Porcupine	<i>Canis latrans</i>
Coyote	<i>Euarctos americanus</i>
Black Bear	

TABLE 2 (Continued)

IV. Mammals (Continued)

Long-tailed Weasel	<i>Mustela frenata</i>
Striped Skunk	<i>Mephitis mephitis</i>
Mountain Lion	<i>Felis concolor</i>
Bobcat	<i>Lynx rufus</i>
Elk	<i>Cervis canadensis</i>
Mule Deer	<i>Odocoileus hemionus</i>



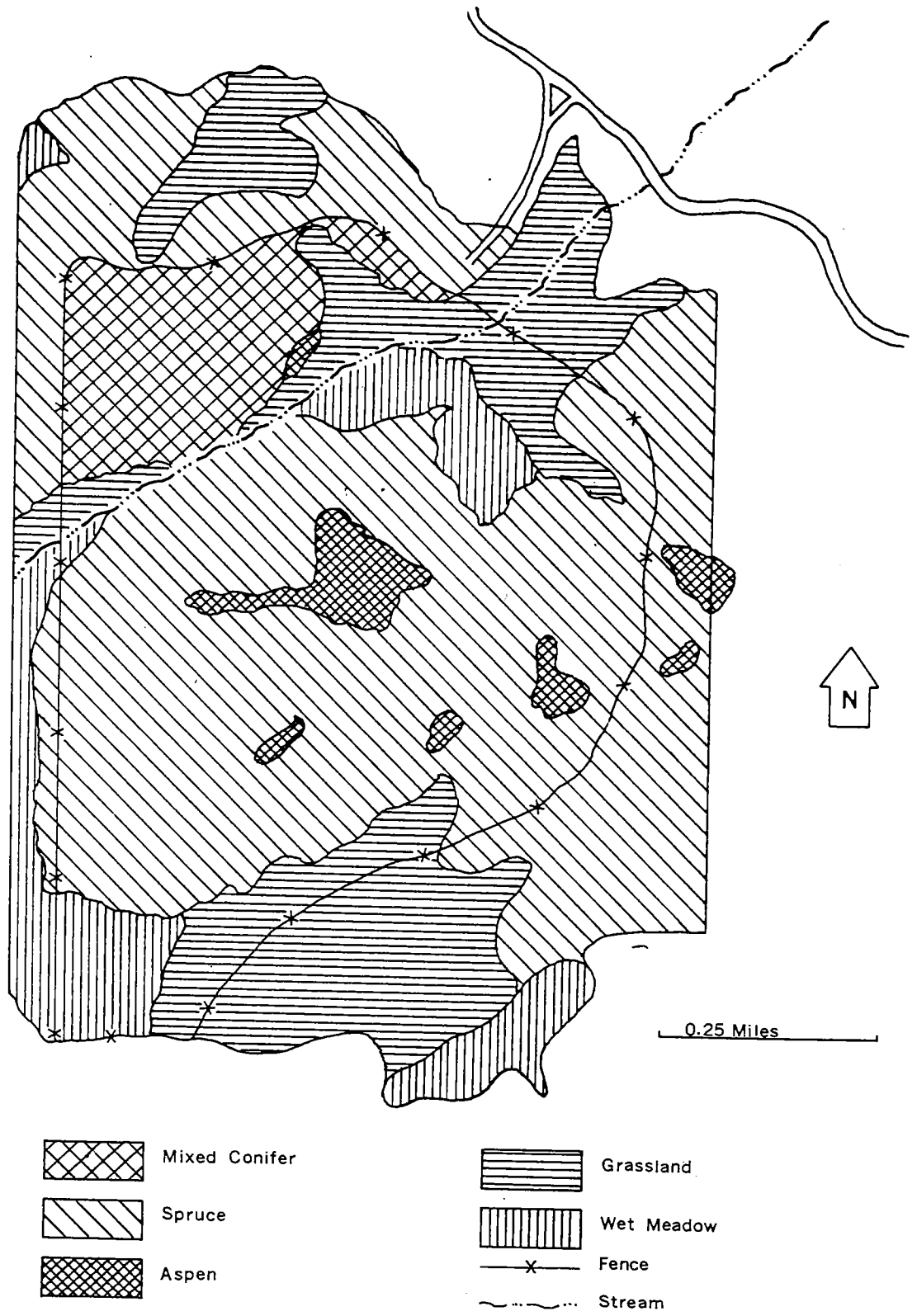
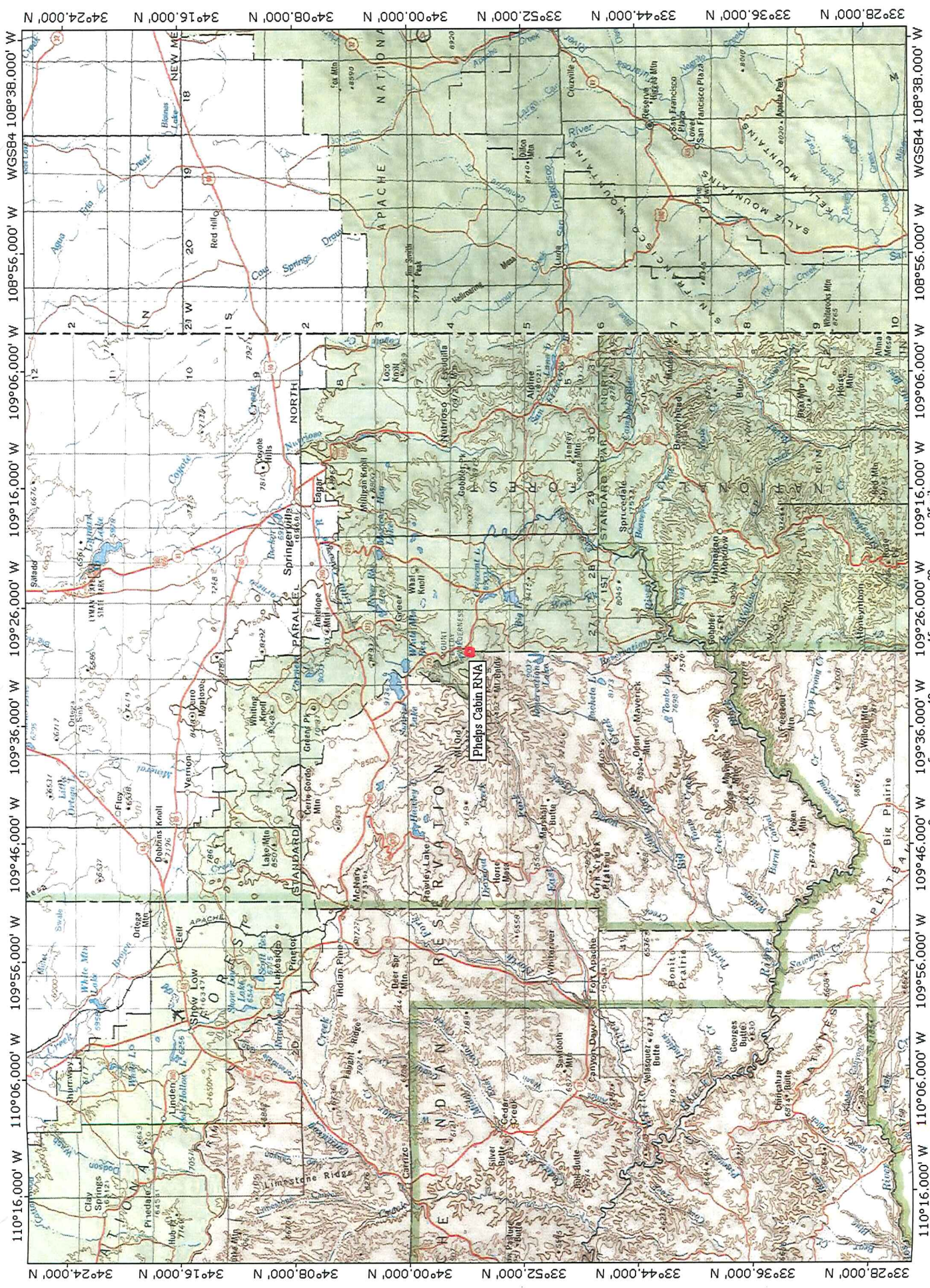
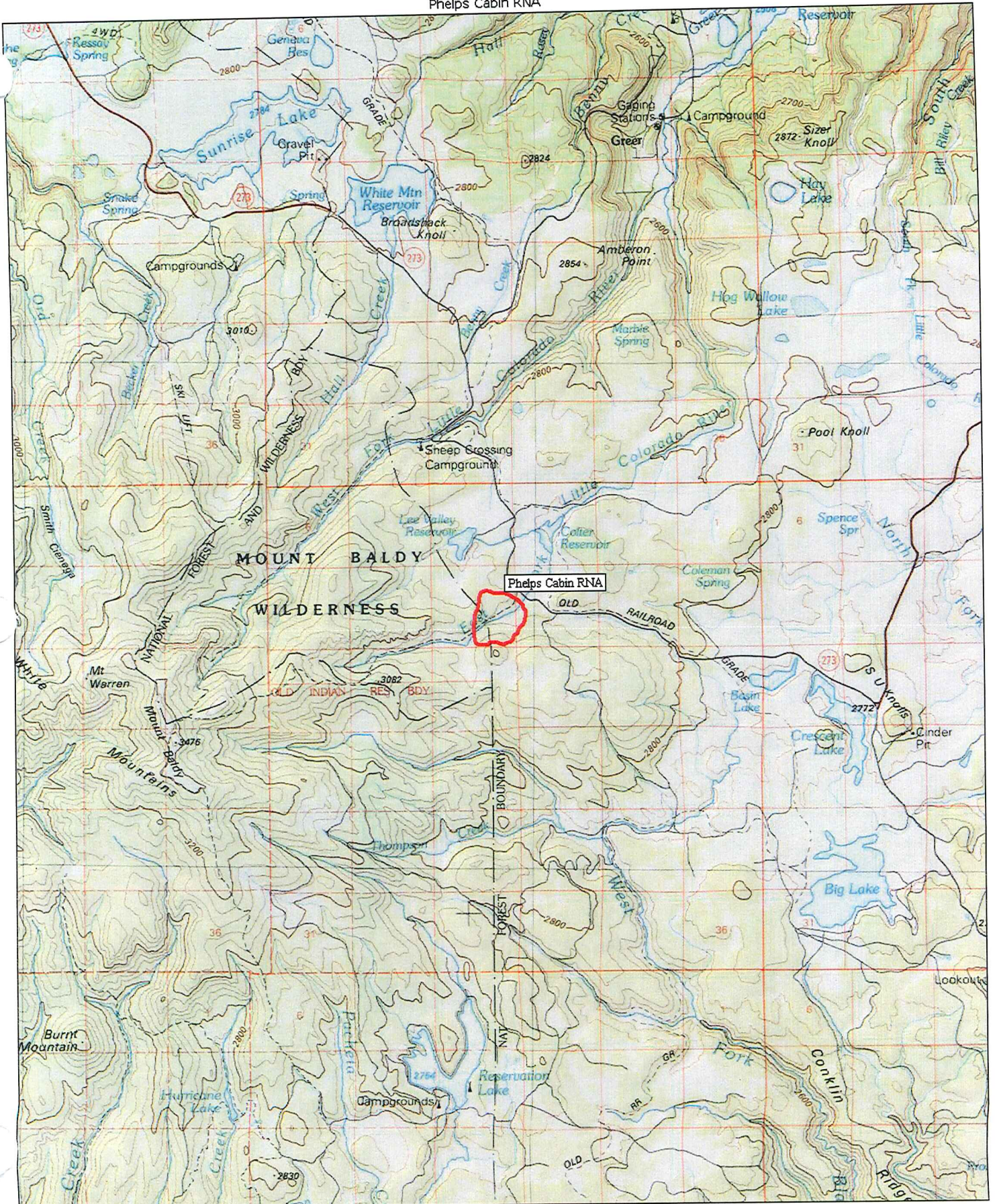


FIGURE 2. Vegetation Map of PCRNA.



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Phelps Cabin RNA

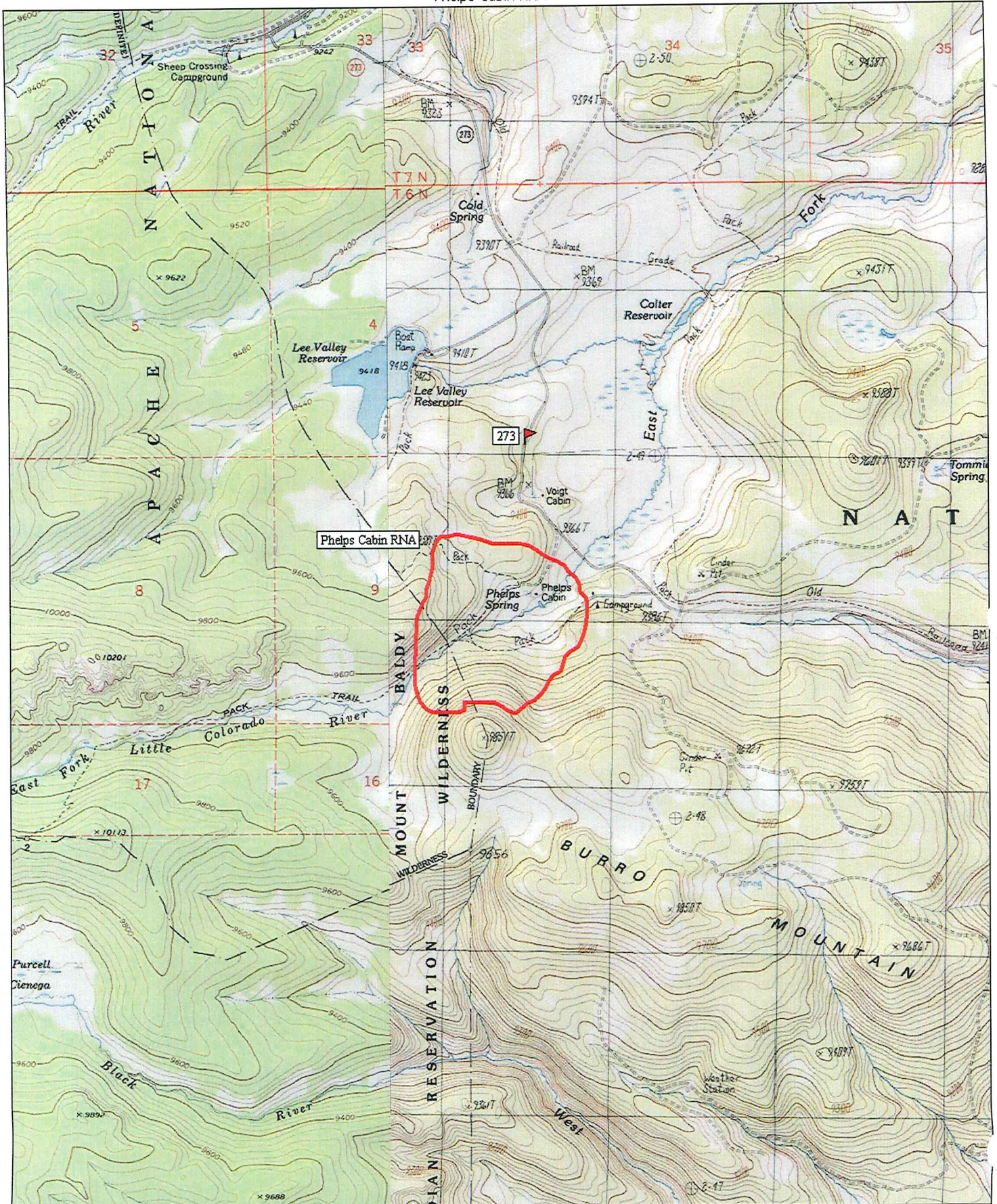


TN * MN
11°

0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 miles
0 1 2 3 4 5 km

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Phelps Cabin RNA



TN 11°

0 5 1 MILE
0 1000 FEET 0 500 1000 METERS

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PLANTS COLLECTED BY W. S. & T. K. PHILLIPS

IN THE

PHELPS CABIN RESEARCH NATURAL AREA

WOODY PLANTS

Thin-leaf alder - *Alnus tenuifolia*
Common Juniper - *Juniperus communis*
Wintergreen - *Moneses uniflora*
Engelmann Spruce - *P. engelmannii*
Colorado Blue Spruce - *Picea pungens*
Ponderosa Pine - *Pinus ponderosa*
Mexican White Pine - *Pinus flexilis* var. *reflexa*
Quaking Aspen - *Populus tremuloides*
Shrubby Cinquefoil - *Potentilla fruticosa*
Western Thimbleberry - *Rubus parviflorus*
Coyote Willow - *Salix exigua*
Whiplash Willow - *Salix caudata*
Scouler Willow - *Salix scouleriana*
Elderberry - *Sambucus racemosa*
Rocky Mountain Whortleberry - *Vaccinium oreophilum*

GRASSES

Idaho Bentgrass - *Agrostis idahoensis*
Rough Bentgrass - *Agrostis scabra*
Pine Dropseed - *Blepharoneuron tricholepis*
Nodding Brome - *Bromus anomalus*
Fringed Brome - *Bromus ciliatus*
Blue Joint Reed Grass - *Calamagrostis canadensis*
Idaho Fescue - *Festuca idahoensis*
Sheep Fescue - *Festuca ovina*
Barley - *Hordeum nodosum*
Prairie Junegrass - *Koeleria cristata*
Muhly - *Muhlenbergia pulcherrima*
Red Muhly - *Muhlenbergia wolfii*
Alpine Timothy - *Phleum alpinum*
Plains Bluegrass - *P. arida*
Kentucky Bluegrass - *Poa pratensis*

FORBS

Yarrow - *Achillea lanulosa* var. *alpicola*
Columbia Monkshood - *Aconitum columbianum*
Horse Mint - *Agastache pallidiflora*
Palo Dandelion - *Agoseris glauca*

Red Onion - *Allium rubrum*
Rocky Mountain Pussytoes - *Antennaria aprica*
Goldenweed - *Aplopappus croceus* var. *genuflexus*
Golden Columbine - *Aquilegia chrysantha*
Columbine - *Aquilegia triternata*
Sandwort - *Arenaria saxosa*
Ragweed Sage - *Artemisia franserioides*
Leafy-bract Aster - *Aster foliaceus*
Ladyfern - *Athyrium filix-femina*
Erect pod wintercress - *Barbarea orthoceras*
Elkslip Marsh marigold - *Calypso bulbosa*
Bluebell - *Campanula rotundifolia*
Heartleaf Bittercress - *Cardamine cordifolia*
Paintbrush - *Castilleja austromontana*
Paintbrush - *Castilleja confusa*
Paintbrush - *Castilleja lineata*
Paintbrush - *Castilleja lutescens*
Starry Mouse-ear - *Cerastium arvense*
Mouse-ear - *Cerastium brachypodium*
Powderhorn Mouse-ear - *Cerastium nutans* var. *obtectum*
Goosefoot - *Chenopodium berlandieri* var. *pseudopetiolaris*
Strawberry-blite Goosefoot - *Chenopodium capitatum*
Fremont Goosefoot - *Chenopodium fremontii*
Creamy Thistle - *Cirsium drummondii*
Thistle - *Cirsium parryi*
Wavyleaf Thistle - *Cirsium undulatum*
Hemlock Parsley - *Conioselinum scopulorum*
Spotted Coralroot - *Corallorrhiza*
Larkspur - *Delphinium andesicola*
Western Tansy Mustard - *Descurainia richardsonii* subsp. *viscosa*
Wartberry Fairybells - *Disporum trachycarpum*
Southern Shootingstar - *Dodecatheon radicans*
Shield Fern - *Dryopteris filix-mas*
Waterwort - *Elatine brachysperma*
Fireweed - *Epilobium angustifolium*
Willowweed - *Epilobium californicum*
Willowweed - *Epilobium halleianum*
Willowweed - *Epilobium oregonense*
Willowweed - *Epilobium saximontanum*
Trailing Fleabane - *Erigeron flagellaris*
Fleabane - *E. formosissimus*
Winged Eriogonum - *Eriogonum alatum*
Western Erysimum - *Erysimum capitatum*
Spurge - *Euphorbia palmeri*
Strawberry - *Fragaria cuneifolia*
Swertia - *Frasera speciosa*
Northern Bedstraw - *Galium boreale*
Rocky Mountain Pleated Gentian - *Gentiana affinis*

Gentian - *Gentiana fremontii*
 Gentian - *Gentiana heterosepala*
 Gentian - *Gentiana parryi*
 Gentian - *Gentiana strictiflora*
 Gentian - *Geranium richardsonii*
 Grandfathers beard - *Geum ciliatum*
 Grandfathers beard - *Geum macrophyllum*
 Yellow Grandfathers beard - *Geum strictum*
 Cudweed - *G. grayi*
 Bog Orchid - *H. saccata*
 Spur-Gentian - *Halenia recurva*
 Orange Sneezeweed - *Helenium hoopesii*
 Wood-Sunflower - *Helianthella quinquenervis*
 Sweetgrass - *Hierochloa odorata*
 Mexican White-ragweed - *Hymenopappus mexicanus*
 Southwestern St. Johns wort - *Hypericum formosum*
 Rocky Mountain Iris - *Iris missouriensis*
 Arizona Peavine - *Lathyrus arizonicus*
 Flax - *Linum lewisii*
 Stoneseed - *Lithospermum multiflorum*
 Bearberry Honeysuckle - *Lonicera involucrata*
 Mint - *Mentha arvensis* var. *villosa*
 Bluebells - *Mertensia franciscana*
 Yellow Monkey flower - *Mimulus guttatus*
 Primrose Monkey flower - *M. primuloides*
 Indian Lettuce - *Montia chamissoi*
 Hooker Evening-Primrose - *Oenothera hookeri* subsp. *hirsutissima*
 Woodsorrel - *Oxalis grayi*
 Four O'clock - *Oxybaphus linearis* var. *decipiens*
 Fendler Cowbane - *Oxypolis fendleri*
 Gray's Fernleaf - *Pedicularis grayi*
 Sickletop - *Pedicularis racemosa*
 Wandbloom Penstemon - *Penstemon virgatus* subsp. *arizonicus*
 Wild Caraway - *Perideridia gairdneri*
 Phacelia - *Phacelia magellanica*
 Jacobs ladder - *Polemonium foliosissimum*
 Bistort - *Polygonum bistortoides*
 Knotweed - *Polygonum sawatchense*
 Elegant Cinquefoil - *Potentilla concinna*
 Varileaf Cinquefoil - *Potentilla diversifolia*
 Horse Cinquefoil - *Potentilla hippiana*
 Common Selfheal - *Prunella vulgaris*
 Wild Parsnip - *Pseudocymopterus montanus*
 Western Bracken - *Pteridium aquilinum* var. *pubescens*
 Pyrola - *Pyrola chlorantha*
 Pyrola - *Pyrola secunda*
 Aquatic Buttercup - *Ranunculus aquatilis*
 Aquatic Buttercup - *Ranunculus cardiophyllus*
 Small-leaf Water Buttercup - *R. hydrocharoides*
 Gooseberry Currant - *R. montigenum*
 Watercress - *Rorippa islandica*
 Dock - *Rumex triangulivalvis*
 Dock - *Rumex*

Saxifrage - *Saxifraga arguta*
 Saxifrage - *Saxifraga rhomboidea*
 Skullcap - *Scutellaria galericulata*
 Stonecrop - *Sedum rhodanthum*
 Senecio - *Senecio bigelovii*
 Senecio - *Senecio cynthioides*
 Senecio - *Senecio wootonii*
 New Mexico Checkermallow - *Sidalcea neomexicana*
 Scouler Silene - *Silene scouleri* subsp. *pringlei*
 Blue-eyed Grass - *Sisyrinchium demissum*
 Blue-eyed Grass - *Sisyrinchium longipes*
 False Solomonseal - *Smilacina racemosa*
 Starry Smilac - *Smilacina stellata*
 Goldenrod - *Solidago ciliosa*
 Ladies-Tresses - *Spiranthes romanzoffiana*
 Longleaf Starwort - *Stellaria longifolia*
 Longstalk Starwort - *Stellaria longipes*
 Alpine-bog Swertia - *Swertia perennis*
 Deer-ears Swertia - *Swertia radiata* var. *macrophylla*
 Dandelion - *Taraxicum laevigatum*
 Meadowrue - *Thalictrum fendleri*
 Mustard - *Thelypodium longifolium*
 Daisy - *Townsendia formosa*
 Clover - *Trifolium fendleri*
 Tobacco root - *Valeriana acutiloba*
 Tobacco root - *V. edulis*
 California False-hellebore - *Veratrum californicum*
 American Speedwell - *Veronica americana*
 Veronica - *Veronica serpyllifolia* var. *humifusa*
 American Vetch - *Vicia americana*
 Hook Violet - *Viola adunca*
 Canada Violet - *Viola canadensis*
 Wanderer Violet - *Viola nephrophylla*
 Showy Goldeneye - *Viguiera multiflora*
 Rock Fern - *Woodsia mexicana*
 Arizona Wyethia - *Wyethia arizonica*
 Meadow Deathcamas - *Zygadenus venenosus*
 Water Foxtail - *Alopecurus geniculatus*
 Tufted Hairgrass - *Deschampsia caespitosa*

SEDGES

Water Sedge - *Carex aquatilis*
 Sedge - *Carex canescens*
 Ebony Sedge - *Carex ebenea*
 Ovalhead Sedge - *Carex festivella*
 Cloud Sedge - *Carex haydeniana*
 Nebraska Sedge - *Carex nebraskensis*

Sedge - *Carex petasata*
Beaked Sedge - *Carex rostrata*
Silvertop Sedge - *C. foenea* Dewey
Sedge - *Carex simulata*
Wooton Sedge - *Carex wootoni*
Spikerush - *Eleocharis macrostachya*
Rush - *Juncus longistylis*
Rocky Mountain Rush - *Juncus saximontanus*

TABLE I. List of plant species that have been collected from the Phelps Botanical Area. Specimens are filed in the herbaria at the University of Arizona and Arizona State University. Plants were collected and identified between 1949 and 1973 by W. S. and T. K. Phillips, R. R. Humphrey, T. N. Kearney and E. Lehto. Most specimens were verified by T. N. Kearney and Cyperaceae specimens were checked by F. J. Mermann.

POLYPODIACEAE - Fern Family

<u>Pteridium aquilinum</u>	bracken
<u>Woodsia mexicana</u>	rock fern
<u>Dryopteris filix-mas</u>	shield fern
<u>Athyrium filix-femina</u>	lady fern

PINACEAE - Pine Family

<u>Pinus reflexa</u>	southwestern white pine
<u>Picea engelmanni</u>	Engelmann spruce
<u>Picea pungens</u>	blue spruce
<u>Pseudotsuga menziesii</u>	Douglas fir

GRAMINEAE - Grass Family

<u>Bromus anomalus</u>	brome
<u>Festuca ovina</u>	fescue
<u>Festuca idahoensis</u>	fescue
<u>Poa pratensis</u>	Kentucky blue grass
<u>Poa arida</u>	plains blue grass
<u>Poa fendleriana</u>	mutton grass
<u>Hordeum nodosum</u>	barley
<u>Koeleria cristata</u>	june grass
<u>Deschampsia caespitosa</u>	hair grass
<u>Deschampsia richardsonii</u>	hair grass
<u>Calamagrostis canadensis</u>	reed grass
<u>Agrostis scabra</u>	tickle grass
<u>Agrostis idahoensis</u>	bent grass
<u>Alopecurus geniculatus</u>	fox tail
<u>Muhlenbergia wolfii</u>	muhly
<u>Muhlenbergia pulcherrima</u>	muhly
<u>Blepharoneuron tricholepis</u>	pine drop-seed
<u>Hierochloe odorata</u>	sweet grass

CYPERACEAE - Sedge Family

<u>Eleocharis macrostachya</u>	spike rush
<u>Carex simulata</u>	sedge
<u>Carex siccata</u>	sedge
<u>Carex canescens</u>	sedge
<u>Carex festivella</u>	sedge
<u>Carex ebenea</u>	sedge
<u>Carex haydeniana</u>	sedge
<u>Carex petasata</u>	sedge
<u>Carex nebraskensis</u>	sedge
<u>Carex rostrata</u>	sedge

JUNACEAE - Rush Family

<u>Juncus longistylis</u>	rush
<u>Juncus saximontanus</u>	rush
<u>Luzula parviflora</u>	wood rush

TABLE 1 (Continued)

LILIACEAE - Lily Family	
<u>Zigadenus virescens</u>	death camas
<u>Veratrum californicum</u>	skunk cabbage
<u>Allium rubrum</u>	red onion
<u>Smilacena racemosa</u>	false Solomon-seal
<u>Smilacena stellata</u>	starflower
<u>Disporum trachycarpum</u>	disporum
IRIDACEAE - Iris Family	
<u>Iris missouriensis</u>	Rocky Mountain iris
<u>Sisyrichium longipes</u>	sisyrichium
ORCHIDACEAE - Orchis Family	
<u>Habenaria saccata</u>	bog orchid
<u>Spiranthes romanzoffiana</u>	lady's tresses
<u>Corallorhiza maculata</u>	coral root
<u>Calypso bulbosa</u>	calypso
SALICACEAE - Willow Family	
<u>Populus tremuloides</u>	quaking aspen
<u>Salix exigua</u>	coyote willow
<u>Salix scouleriana</u>	Scouler willow
<u>Salix pseudocordata</u>	whiplash willow
BETULACEAE - Birch Family	
<u>Alnus tenuifolia</u>	thin-leaf alder
URTICACEAE - Nettle Family	
<u>Urtica gracilis</u>	nettle
POLYGONACEAE - Buckwheat Family	
<u>Eriogonum alatum</u>	winged eriogonum
<u>Rumex triangulivalvis</u>	sorrel
<u>Rumex occidentalis</u>	sorrel
<u>Polygonum sawatchense</u>	smartweed
<u>Polygonum bistortoides</u>	smartweed
CHENOPODIACEAE - Goosefoot Family	
<u>Chenopodium capitatum</u>	strawberry blight
<u>Chenopodium berlandieri</u>	goosefoot
<u>Chenopodium fremontii</u>	goosefoot
AMARANTHACEAE - Four O'clock Family	
<u>Oxybaphus linearis</u>	oxybaphus
PORTULACACEAE - Portulaca Family	
<u>Montia chamissoi</u>	indian lettuce
CARYOPHYLLACEAE - Pink Family	
<u>Stellaria longipes</u>	starwort
<u>Stellaria longifolia</u>	starwort
<u>Cerastium brachypodum</u>	mouse-ear chickweed
<u>Cerastium nutans</u>	mouse-ear chickweed
<u>Cerastium arvense</u>	mouse-ear chickweed
<u>Sagina saginoides</u>	pearl-wort
<u>Arenaria saxosa</u>	sandwort
<u>Silene scouleri</u>	catchfly
RANUNCULACEAE - Crowfoot Family	
<u>Caltha leptosepala</u>	marsh marigold
<u>Aquilegia triternata</u>	columbine
<u>Aquilegia chrysantha</u>	columbine

more correctly
S. arizonica

TABLE 1 (Continued)

RANUNCULACEAE - Crowfoot Family (Continued)

<u>Delphinium andesicola</u>	larkspur
<u>Aconitum columbianum</u>	monks-hood
<u>Ranunculus aquatilis</u>	buttercup
<u>Ranunculus hydrocharoides</u>	buttercup
<u>Ranunculus cardiophyllus</u>	buttercup
<u>Thalictrum fendleri</u>	meadow-rue
CRUCIFERAE - Mustard Family	
<u>Thelypodium longifolium</u>	thelypodium
<u>Barbarea orthoceras</u>	winter cress
<u>Rorippa islandica</u>	water cress
<u>Cardamine cordifolia</u>	bitter cress
<u>Erysimum capitatum</u>	western wallflower
CRASSULACEAE - Orpine Family	
<u>Sedum rhodanthum</u>	stonecrop
SAXIFRAGACEAE - Saxifrage Family	
<u>Saxifraga rhomboidea</u>	saxifrage
<u>Heuchera parvifolia</u>	alum-root
<u>Ribes montigenum</u>	gooseberry currant
<u>Ribes pinetorum</u>	orange gooseberry
ROSACEAE - Rose Family	
<u>Rubus parviflorus</u>	thimble berry
<u>Fragaria cuncifolia</u>	strawberry
<u>Potentilla fruticosa</u>	bush cinquefoil
<u>Potentilla hippiana</u>	cinquefoil
<u>Potentilla diversifolia</u>	cinquefoil
<u>Potentilla concinna</u>	cinquefoil
<u>Geum strictum</u>	avens
LEGUMINOSEAE - Pea Family	
<u>Trifolium fendleri</u>	clover
<u>Vicia americana</u>	vetch
<u>Lathyrus arizonicus</u>	pea-vine
GERANIACEAE - Geranium Family	
<u>Geranium richardsonii</u>	cranesbill
OXALIDACEAE - Wood-Sorrel Family	
<u>Oxalis grayi</u>	wood-sorrel
LINACEAE - Flax Family	
<u>Linum lewisii</u>	flax
EUPHORBIACEAE - Spurge Family	
<u>Euphorbia palmeri</u>	spurge
MALVACEAE - Mallow Family	
<u>Sidalcea neomexicana</u>	checker mallow
GUTTIFERAE - St. John's Wort Family	
<u>Hypericum formosum</u>	St. John's wort
ELATINACEAE - Water Wort Family	
<u>Elatine brachysperma</u>	water wort
VIOLACEAE - Violet Family	
<u>Viola nephrophylla</u>	violet
<u>Viola canadensis</u>	violet
<u>Viola adunca</u>	violet

TABLE 1 (Continued)

ONAGRACEAE - Evening Primrose Family

<u>Epilobium angustifolium</u>	fire-weed
<u>Epilobium halleanum</u>	willow-weed
<u>Epilobium saxinotatum</u>	willow-weed
<u>Epilobium oregonense</u>	willow-weed
<u>Epilobium californicum</u>	willow-weed
<u>Oenothera hookeri</u>	evening primrose
<u>Gaura ciliatum</u>	gaura
<u>Gaura macrophyllum</u>	gaura

UMBELLIFERAE - Parsley Family

<u>Osmorhiza obtusa</u>	sweet-root
<u>Perideridia gairdneri</u>	wild caraway
<u>Pseudocymopterus montanus</u>	wild parsnip
<u>Conioselinum scopulorum</u>	hemlock parsley
<u>Oxypolis fendleri</u>	Fendler cowbane

ERICACEAE - Heather Family

<u>Pyrola chlorantha</u>	shinleaf
<u>Pyrola secunda</u>	shinleaf
<u>Moneses uniflora</u>	wintergreen
<u>Vaccinium oreophilum</u>	Rocky Mountain whortleberry

PRIMULACEAE - Primrose Family

<u>Dodecatheon radicum</u>	shooting star
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GENTIANACEAE - Gentian Family

<u>Gentiana fremontii</u>	gentian
<u>Gentiana parryi</u>	gentian
<u>Gentiana affinis</u>	pleated gentian
<u>Gentiana heterosepala</u>	gentian
<u>Gentiana strictiflora</u>	gentian
<u>Swertia perennis</u>	elkweed
<u>Swertia radiata</u>	deers-ears
<u>Halenia recurva</u>	spur gentian

POLEMONIACEAE - Phlox Family

<u>Collomia linearis</u>	collomia
<u>Polemonium foliosissimum</u>	jacob's ladder

HYDROPHYLLACEAE - Water-leaf Family

<u>Phacelia alpinum</u>	phacelia
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BORAGINACEAE - Borage Family

<u>Hackelia floribunda</u>	hackelia
<u>Mertensia franciscana</u>	bluebells
<u>Lithospermum multiflorum</u>	gromwell

LABIATAE - Mint Family

<u>Scutellaria galericulata</u>	skull cap
<u>Agastache pallidiflora</u>	giant hyssop
<u>Prunella vulgaris</u>	self-heal
<u>Mentha arvensis</u>	mint

SCROPHULARIACEAE - Figwort Family

<u>Penstemon virgatus</u>	beardtongue
<u>Mimulus guttatus</u>	monkey flower
<u>Mimulus primuloides</u>	monkey flower
<u>Veronica serpyllifolia</u>	speedwell
<u>Veronica americana</u>	speedwell

TABLE 1 (Continued)

SCROPHULARIACEAE - Figwort Family

<u>Besseyia plataginea</u>	bessya
<u>Castilleja lineata</u>	paint brush
<u>Castilleja austromontana</u>	paint brush
<u>Castilleja lutescens</u>	paint brush
<u>Pedicularis racemosa</u>	lousewort
<u>Pedicularis parryi</u>	lousewort
<u>Pedicularis grayi</u>	lousewort

RUBIACEAE - Madder Family

<u>Galium tinctorium</u>	bedstraw
<u>Galium boreale</u>	bedstraw

CAPRIFOLIACEAE - Honeysuckle Family

<u>Sambucus racemosa</u>	elderberry
<u>Lonicera involucrata</u>	bear-berry honeysuckle

VALERIANACEAE - Valerian Family

<u>Valeriana edulis</u>	valerian
<u>Valeriana acutiloba</u>	valerian

CAMPANULACEAE - Bellflower Family

<u>Campanula rotundifolia</u>	harebell
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COMPOSITAE - Sunflower Family

<u>Solidago ciliosa</u>	goldenrod
<u>Aplopappus croceus</u>	goldenweed
<u>Achaetogeron chihuahuensis</u>	achaetogeron
<u>Townsendia formosa</u>	daisy
<u>Aster foliaceus</u>	aster
<u>Aster aquifolius</u>	aster
<u>Erigeron flagellaris</u>	fleabane
<u>Erigeron peconsensis</u>	fleabane
<u>Erigeron schiedeianus</u>	fleabane
<u>Antennaria aprica</u>	pussy toes
<u>Gnaphalium grayi</u>	cud-weed
<u>Wyethia arizonica</u>	mules-ears
<u>Viguiera multiflora</u>	golden-eye
<u>Helianthella quinquenervis</u>	wood sunflower
<u>Hymenopappus mexicanus</u>	mexican white ragweed
<u>Helenium hoopesii</u>	orange sneeze weed
<u>Achillea lanulosa</u>	yarrow
<u>Artemisia franserioides</u>	sagebrush
<u>Senecio bigelovii</u>	groundsel
<u>Senecio wootonii</u>	groundsel
<u>Senecio cynthioides</u>	groundsel
<u>Cirsium parryi</u>	thistle
<u>Cirsium drummondii</u>	thistle
<u>Cirsium undulatum</u>	thistle
<u>Taraxacum laevigatum</u>	dandelion
<u>Agoseris glauca</u>	mountain dandelion

+ Fraseria speciosa (= Swertia radiata)

Society of American Foresters
Committee on Natural Areas

Proposed Natural Area

Name of Proposed Natural Area Phelps Cabin

Location: State Arizona County Apache

Nearest Town Springerville

Nearest Federal, State or county highway Arizona 273

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

Name of Administration Unit Apache Nat'l. Forest, Springerville, Arizona
(National Forest, national park, national wildlife
refuge, State, university, etc.)

Listing of Timber Types on Area:

<u>S.A.F. Type No.</u>	<u>Acres</u>	<u>Average Age</u>
Engelmann spruce & Colorado blue spruce	<u>194</u>	<u>150</u>
<u>210</u>	<u>38</u>	<u>150</u>
<u>K-52</u>	<u>35</u>	<u> </u>
<u>K-50</u>	<u>30</u>	<u> </u>
<u>217</u> Barren, water, buffer zone, etc.	<u>15</u>	<u>70</u>
	<u>9000</u>	<u>9400</u>
Total:	<u>312</u>	<u> </u>

Range in Elevation: Low 9000 Feet High 9400 Feet

Topography Gentle rolling
(Level, rolling steep, broken, etc.)

Geology Volcanic - basalts
(Volcanic, alluvial, moraine, etc.)

Average Height and Diameter of each major species:

<u>Species</u>	<u>Average Height</u>	<u>Average Diameter</u>
<u>Engelmann spruce</u>	<u>75'</u>	<u>24"</u>
<u>Colorado blue spruce</u>	<u>75'</u>	<u>24"</u>

Submitted by Earl F. Aldon Title Project Leader

Rocky Mtn. Forest & Range Exp. Sta.

Mailing Address 5423 Federal Bldg., 517 Gold Ave., SW Date Aug. 7, 1969

Albuquerque, New Mexico 87101