

Native Plants and Ecosystems of Yavapai County

U of A Cooperative Extension Master Gardener 2024

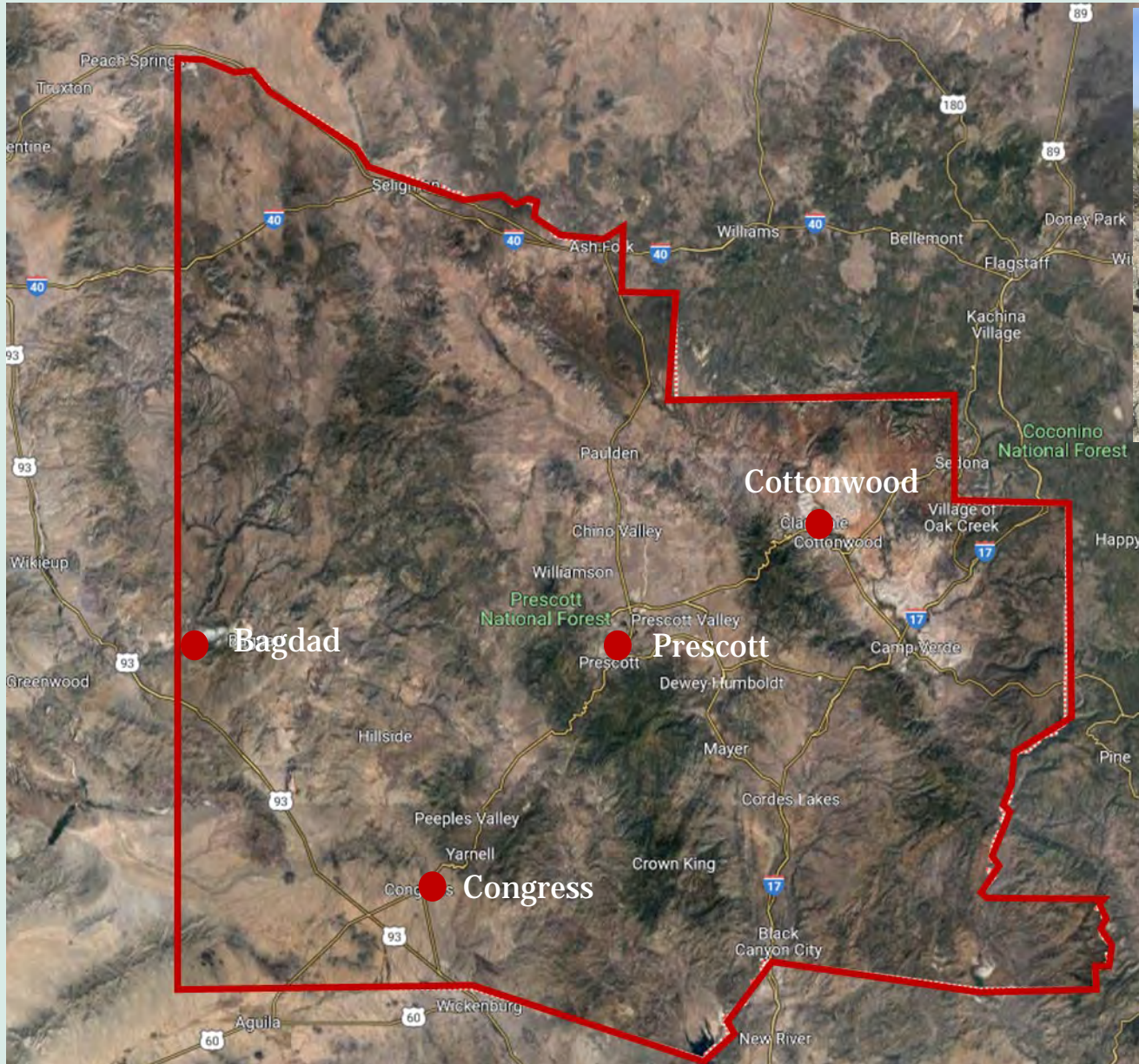
Frankie S. Coburn
Coburn Biological Consulting



Yavapai County: A region with unique and extraordinary biological diversity



Yavapai County: A Meeting of Geographic Regions



Yavapai County Geography

Figure 2.0-3 Physiographic Provinces of Arizona



Yavapai County: A meeting of geographic regions

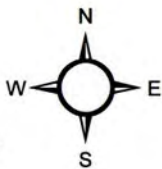


 Mogollon Highlands

Elevation

High

Low




0 37.5 75 150 225

0 62.5 125 250 375

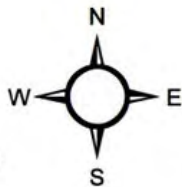
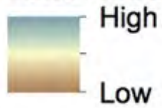
Cartography by: David Hanna

The Mogollon Highlands



 Mogollon Highlands

Elevation



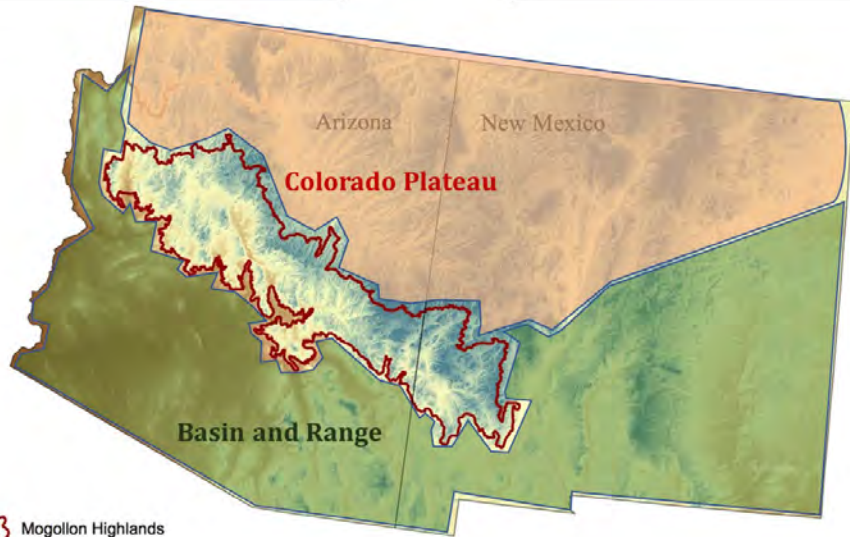
0 37.5 75 150 225 300 Miles

0 62.5 125 250 375 500 Kilometers

Cartography by: David Hanna

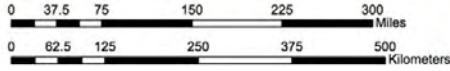
 NATURAL
HISTORY
INSTITUTE

The Unique Mogollon Rim Country



Mogollon Highlands

Elevation
High
Low



NATURAL HISTORY INSTITUTE

Cartography by: David Hanna



The Mogollon Highlands: A hotspot of biological diversity



Apache Trout



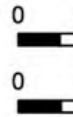
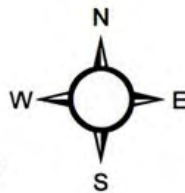
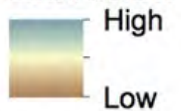
Chiricahua leopard frog



Mogollon King Snake

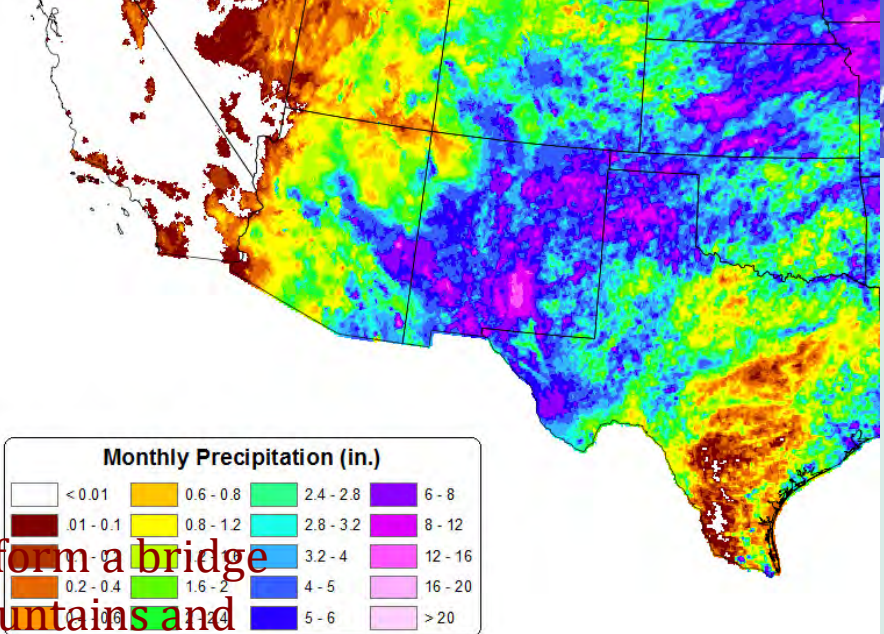
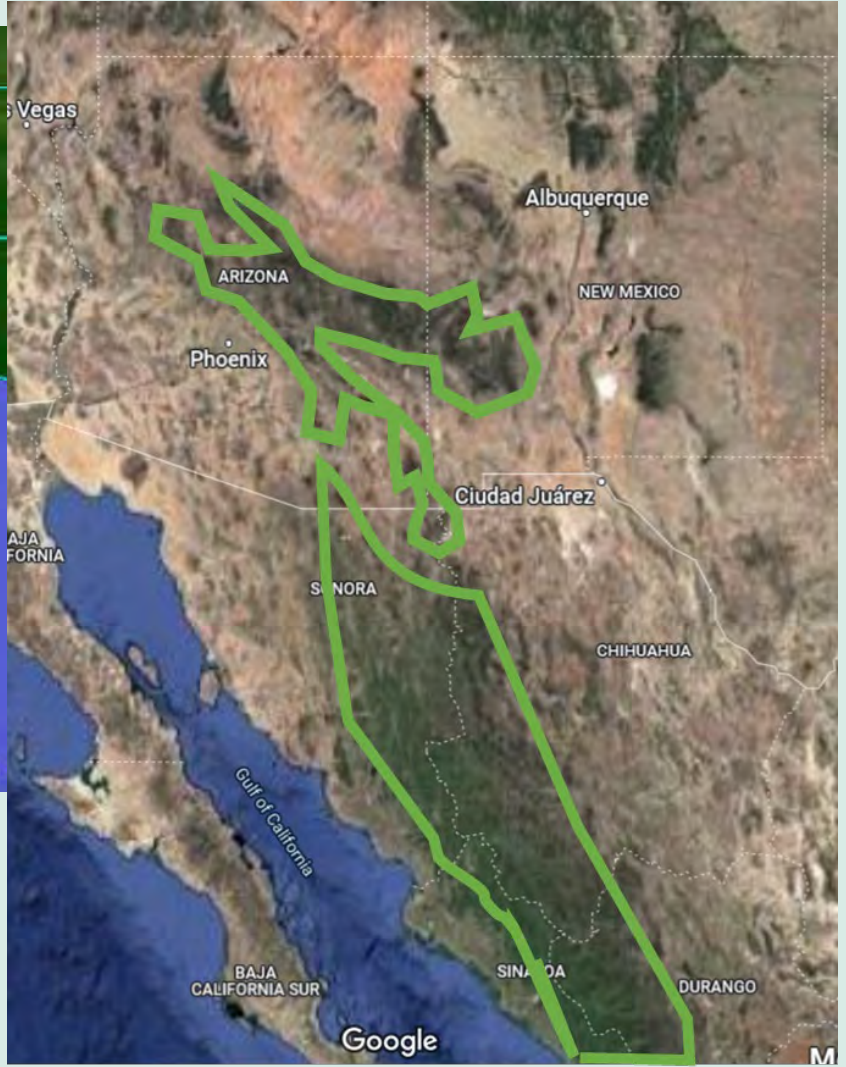


Elevation



Cartography by: David Hanna

Continental Climatic Connections



lands form a bridge
 r Mountains and

The central Highlands form a bridge
 between the Rocky Mountains and
 Subtropical Mexican Mountains

Geology and Plant Communities

Limestones



Cottonwood

Sandstones



Prescott

Basalt/Volcanic



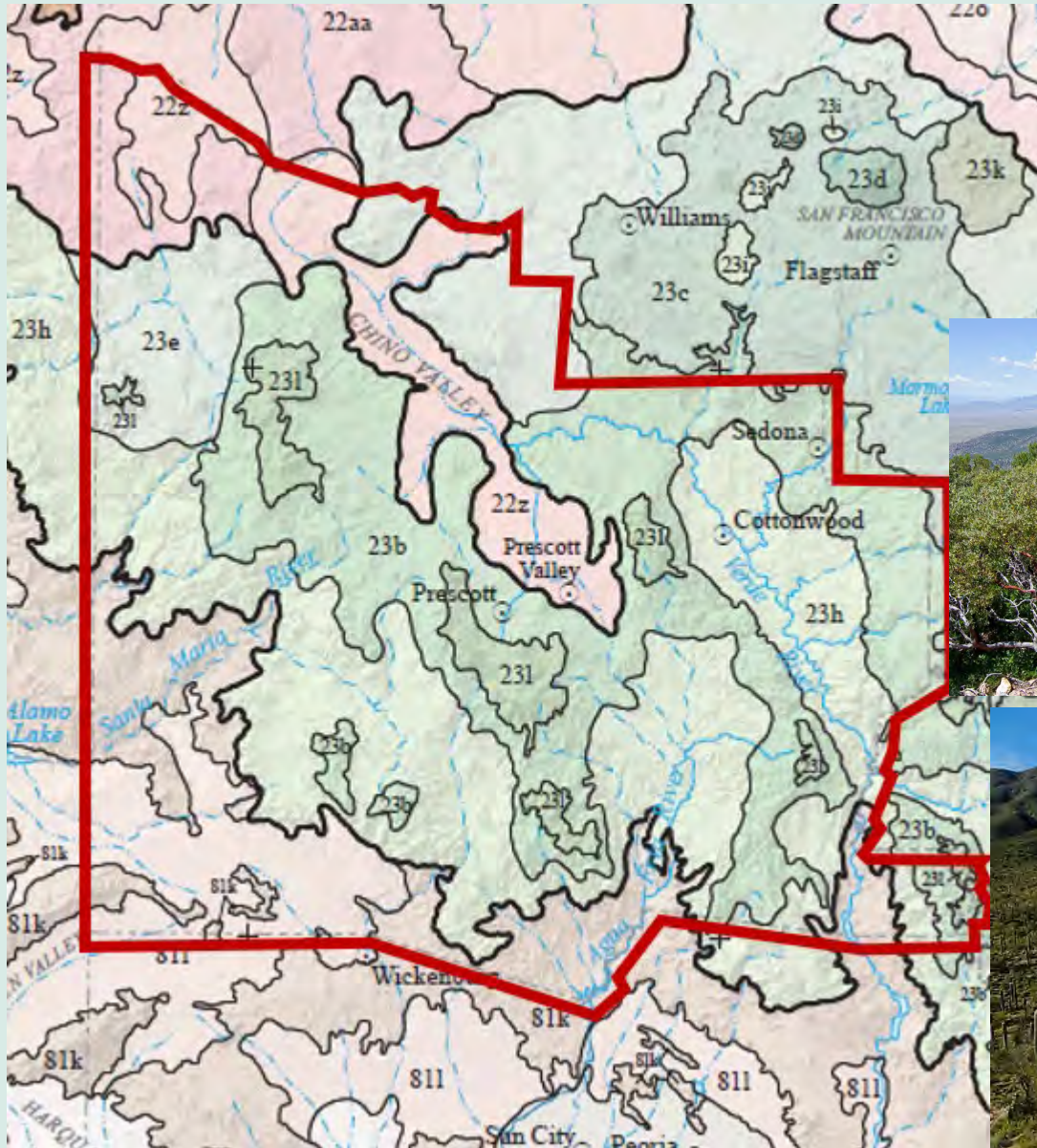
Recent Deposits



Granite/Igneous

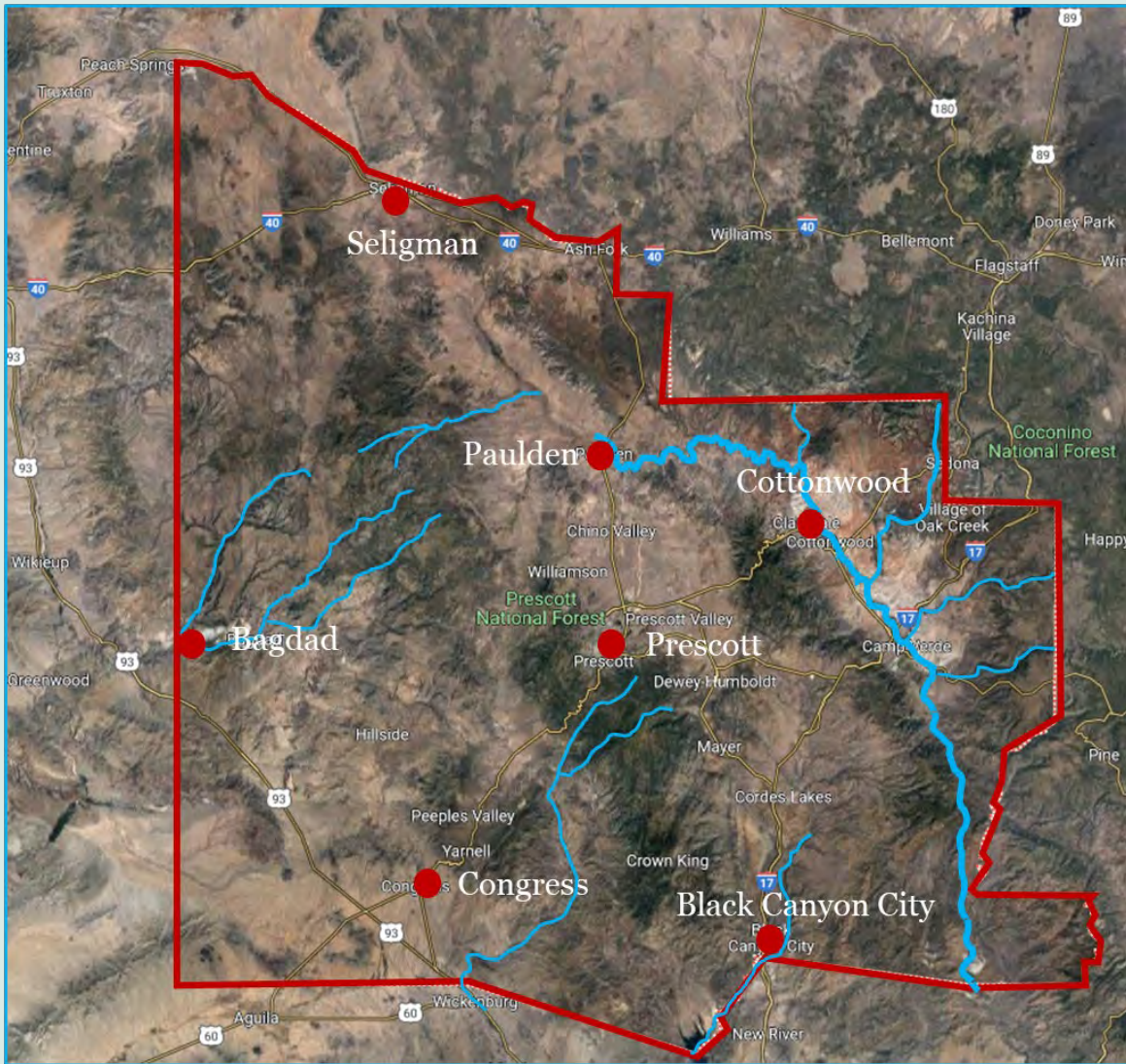
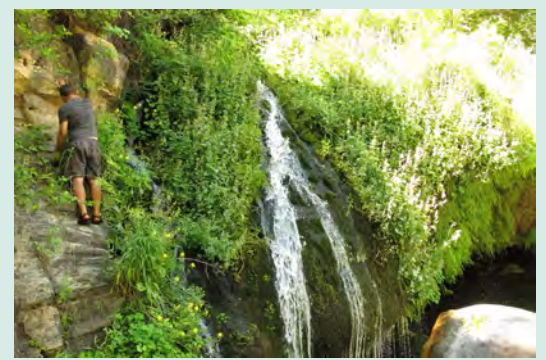


Ecoregions of Yavapai County



From Griffith et. al 2014

Watersheds, Springs and Streams



Native Plants and Ecosystems of Yavapai County: Extraordinary Diversity

>3000 plant taxa

~60% of Arizona Plants

>450 taxa of conservation concern



Endemic Species and Plants of Conservation Concern

NatureServe Global and State-Level Categories:

| | |
|----|---|
| G1 | Critically Imperiled — At very high risk of extinction or collapse due to very restricted range, very few populations or occurrences, very steep declines, very severe threats, or other factors. |
| G2 | Imperiled — At high risk of extinction or collapse due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors. |
| G3 | Vulnerable — At moderate risk of extinction or collapse due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors. |
| G4 | Apparently Secure — At fairly low risk of extinction or collapse due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors. |
| G5 | Secure — At very low risk of extinction or collapse due to a very extensive range, abundant populations or occurrences, and little to no concern from declines or threats. |

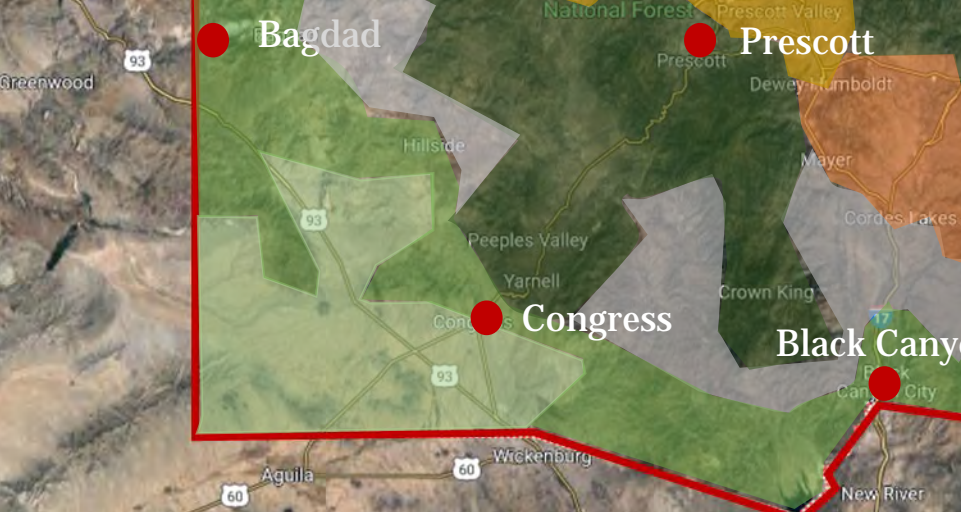
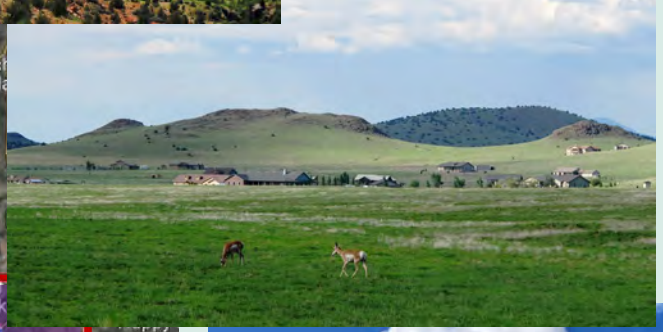
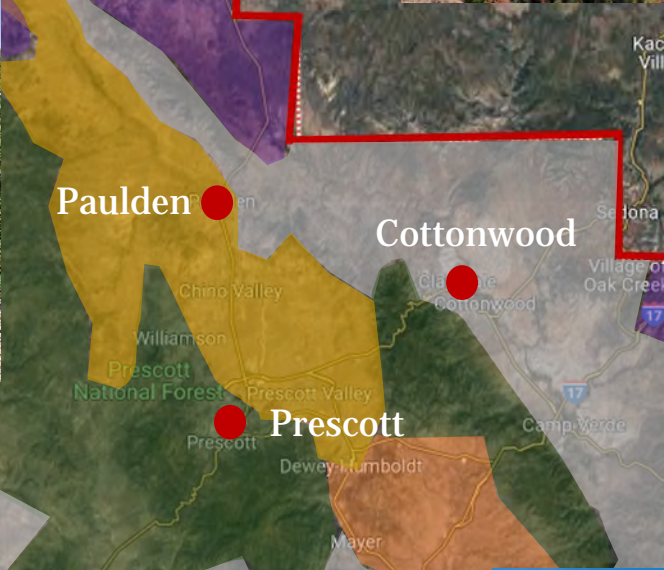


There are five categories of Arizona protected plants:

1. Highly Safeguarded (essentially endangered species)
2. Salvage Restricted (the cacti, ocotillo, etc.)
3. Export Restricted
4. Salvage Assessed (the common desert legume trees)
5. Harvest Restricted (firewood, beargrass, yucca)



Ecoregions of Yavapai County: The Big Picture



Madrean Pine/Oak and Mixed Conifer (5,500-8,000ft)



Mixed Conifer Forest (7,000-8,000ft)

Common plants



Abies concolor
White Fir

Mixed Conifer Forest

Common plants



Pseudotsuga menziesii
Douglas Fir

Pine/Oak- Mixed Conifer Forest

Endemics and plants of conservation concern



Heuchera eastwoodiae
Senator Mine alumroot



Senecio arizonicus
Arizona ragwort

Pine/Oak- Mixed Conifer Forest

Endemics and plants of conservation concern



Draba asprella
rough draba

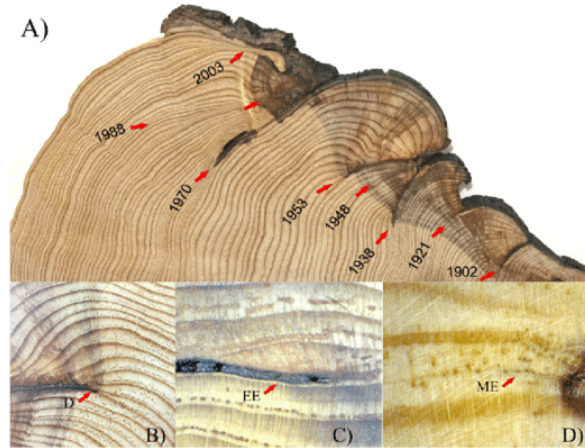


Oxalis alpina
alpine woodsorrel

Madrean Pine/Oak



Madrean Pine/Oak and Mixed Conifer



Madrean Pine/Oak and Mixed Conifer

Common plants



© Max Licher

Pinus ponderosa
Ponderosa pine



Madrean Pine/Oak

Common plants



Quercus gambelii
Gambel's Oak

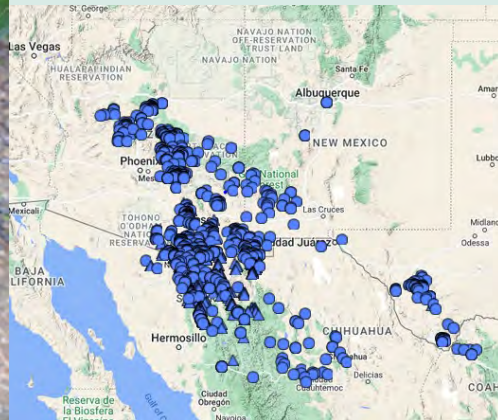
Madrean Pine/Oak

Common plants



Quercus arizonica
Arizona white oak

Quercus emoryi
Emoryi Oak

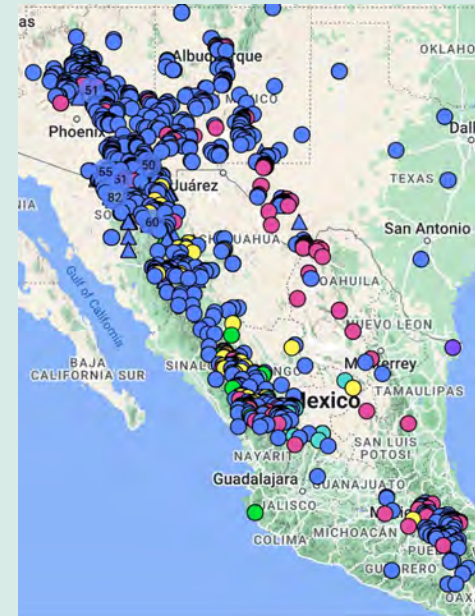


Madrean Pine/Oak

Common plants



Juniperus deppeana
alligator juniper

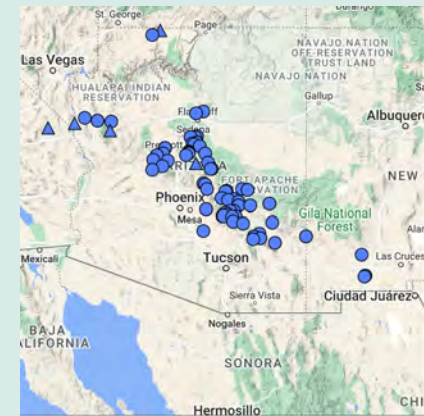


Madrean Pine/Oak

Common plants



Pinus monophylla var.
fallax
Single-leaf pinyon



Interior Chapparal/Mogollon Transition Scrub (3,400-6,500ft)

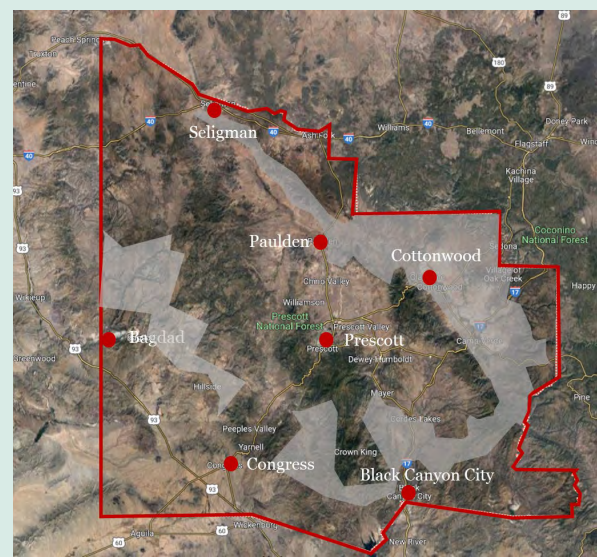


Mid Elevations and Steep Slopes

Scrub Associations: Interior Chaparral, Mogollon Scrub and woodland



Interior Chaparral/ Mogollon Transition scrub (3,400-6,500ft)



Interior Chaparral/Mogollon Transition scrub (3,400-6,500ft)



Mixed Conifer/Madrean Pine/Oak-Chapparal

Common plants for landscapes



Robinia neomexicana
New Mexico Locust

Madrean Pine/Oak/Chapparal/Mogollon Scrub

Common plants for landscapes



Rhus ovata
sugar sumac

Madrean Pine/Oak and Chapparal

Common native plants for landscapes



Arctostaphylos pringlei
Pringle's manzanita



Ceanothus pauciflora
desert ceanothus

Interior Chapparal/ Mogollon Transition scrub

Common native plants for landscapes



***Fendlera rupicola* cliff fendlerbush**

Interior Chapparal/ Mogollon Transition scrub

Common plants for landscapes



Cupressus glabra
Arizona Cypress

Madrean Pine/Oak/Chapparal/Mogollon Scrub/Grassland

Common plants for landscapes



***Nolina microcarpa* Beargrass**



***Agave parryi*
Parry's Agave**

Madrean Pine/Oak/Chapparal/Grassland

Common plants for landscapes



Echinocereus coccineus
Scarlet Hedgehog Cactus

Madrean Pine/Oak, Mogollon Scrub and Chapparal

Common native plants for landscapes



Morus microphylla
Texas mulberry

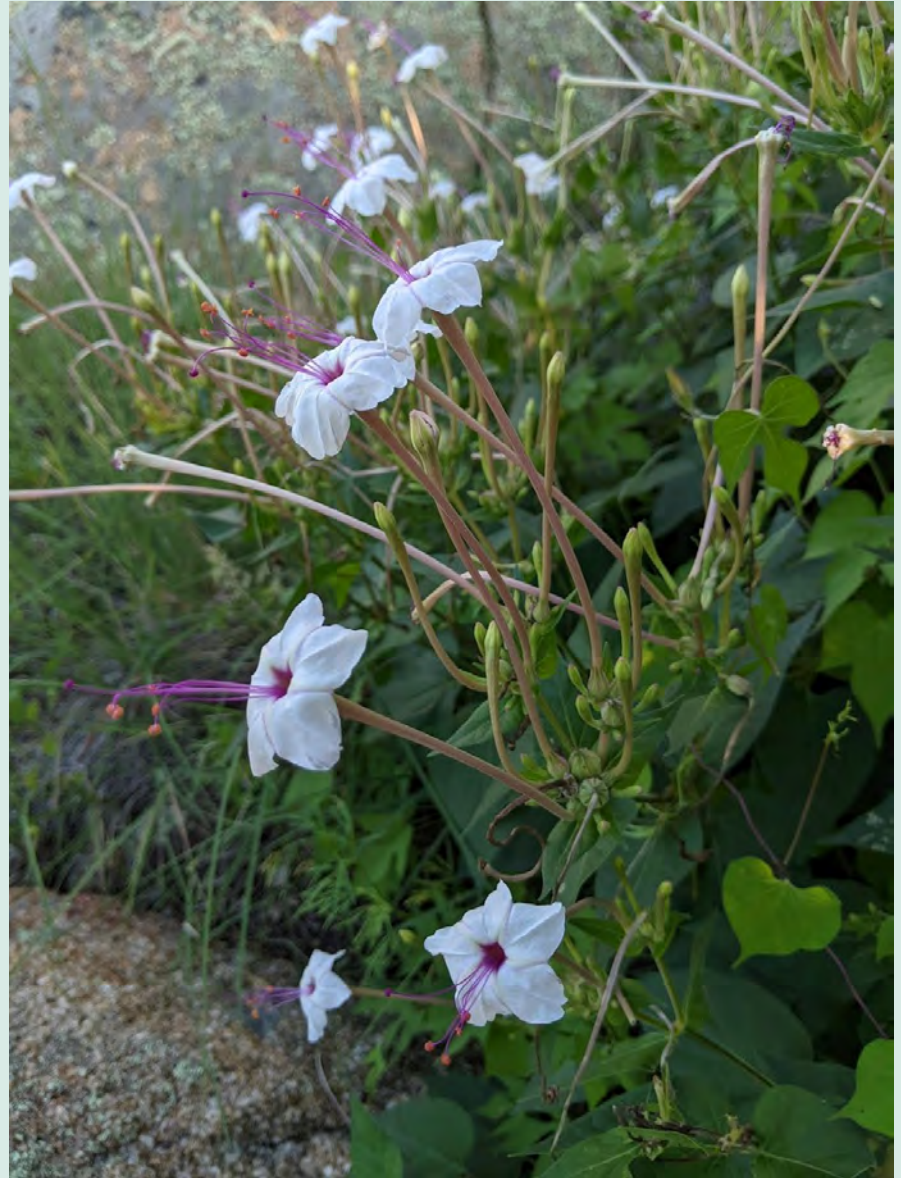


Madrean Pine/Oak and Chapparal

Common native plants for landscapes



Mirabilis longiflora
sweet four o'clock



Madrean Pine/Oak/Chaparral/Grasslands

Common native plants for landscapes



Mirabilis multiflora
Colorado four o'clock



Mixed Conifer/Madrean Pine/Oak/Chapparal

Common native plants for landscapes



Ageratina herbacea
fragrant snakeroot



Madrean Pine/Oak and Chapparal

Common native plants for landscapes



Penstemon barbatus, P. eatonii



Madrean Pine/Oak and Chapparal

Common native plants for landscapes



Tradescantia pinetorum
pinewoods spiderwort

Penstemons: *Penstemon linarioides*, *P. pseudoputus*

Madrean Pine/Oak and Chapparal

Grasses for landscapes



Eragrostis intermedia
Lovegrass



Muhlenbergia rigens
Deer grass

Madrean Pine/Oak and Chapparal

Common weedy native plants for landscapes



Sphaeralcea spp.
Globemallows



Lupinus argenteus
Silver Lupine



Madrean Pine/Oak and Chapparal

Common weedy native plants for landscapes



***Erigeron* spp.**



Ipomopsis aggregata

Madrean Pine/Oak and Chapparal

Native plants for landscapes: milkweeds!



Asclepias speciosa



Asclepias tuberosa



Asclepias asperula



Asclepias verticillata

Madrean Pine/Oak and Chapparal

Native plants for landscapes: milkweed vines



***Funastrum* and *Matelea* spp.**

Madrean Pine/Oak and Chapparal

Rock Gardens!



Perityle ciliata
fringed rockdaisy



Numerous ferns



Heuchera spp. Alum Root



Petrophyton caespitosum

Madrean Pine/Oak and Chapparal

Endemics and plants of conservation concern



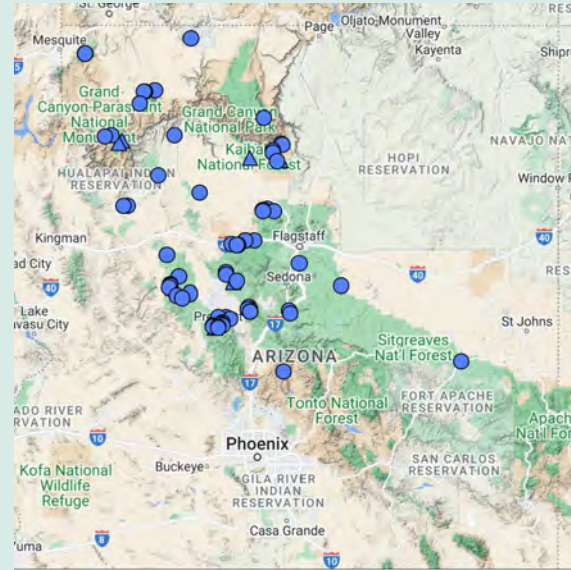
Echinocereus yavapaiensis
Yavapai hedgehog cactus



Eremogone aberrans
Mt. Dellenbaugh
sandwort

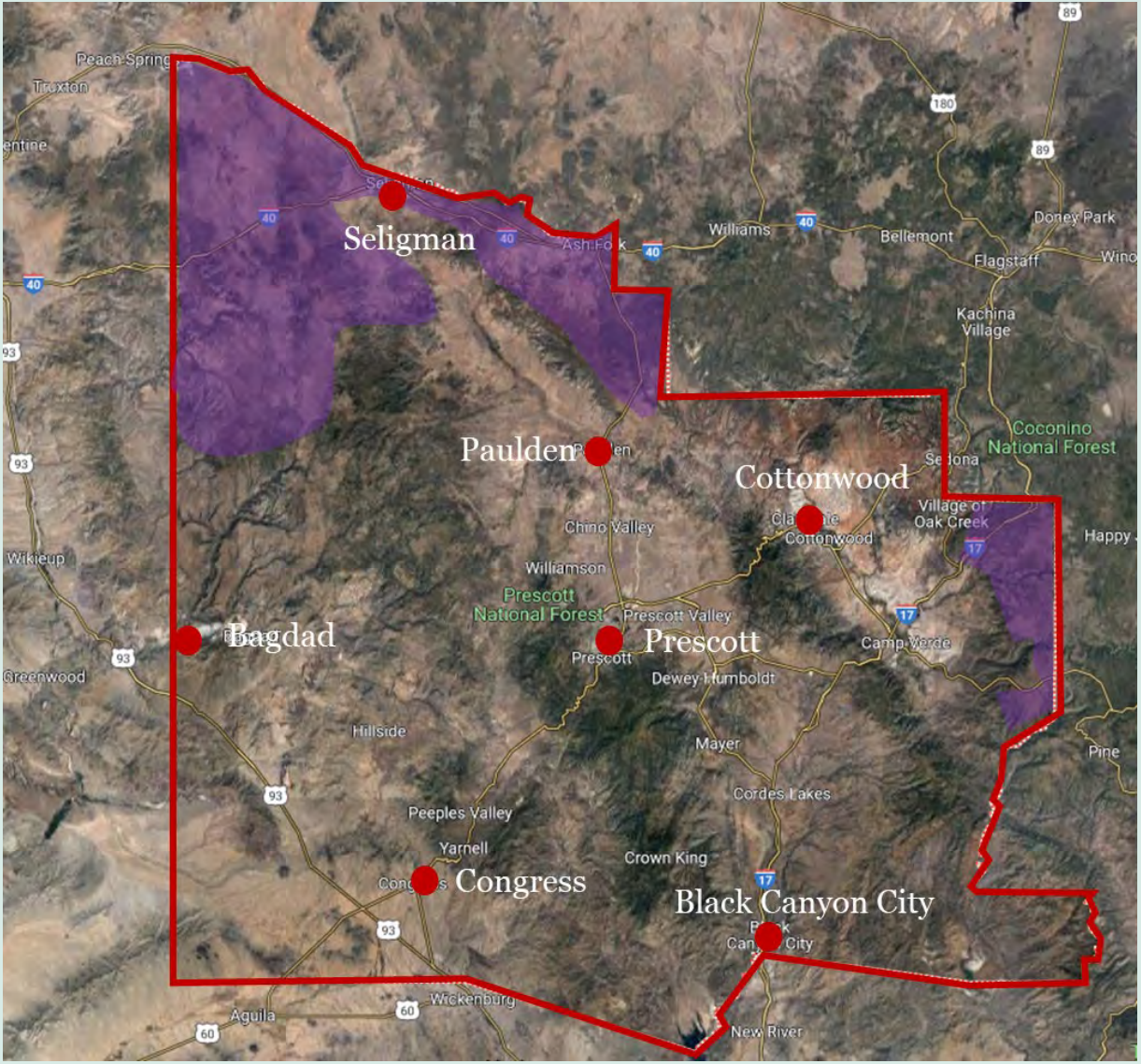
Madrean Pine/Oak and Chapparal

Endemics and plants of conservation concern



Phlox amabilis Arizona phlox

Great Basin Pinyon Juniper (5,000-6,500ft)



Great Basin Pinyon Juniper



Great Basin Pinyon Juniper

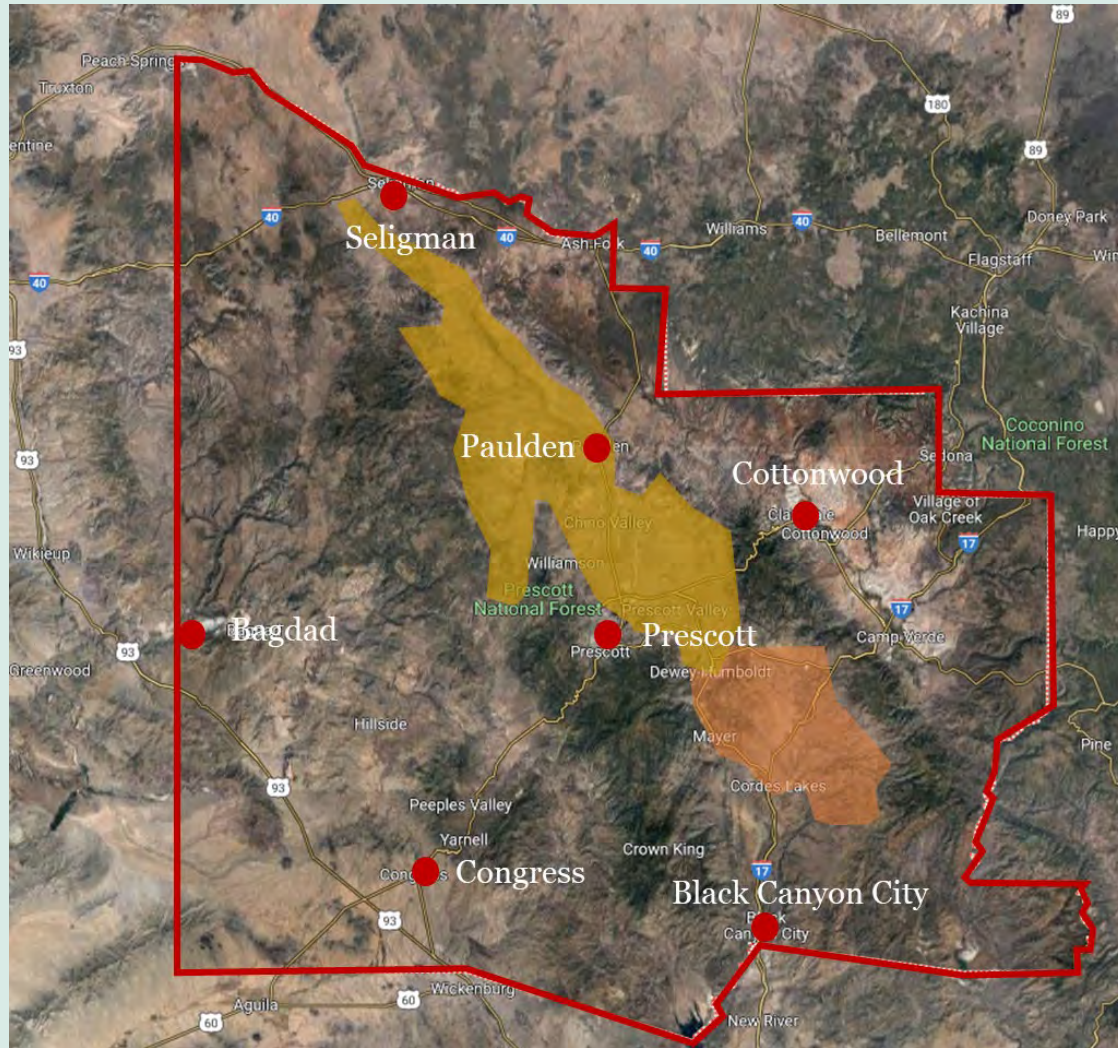
Common plants



Juniperus osteosperma and *monosperma*
Utah and single-seed junipers

Pinus edulis
twoneedle pinyon

Chino/Williamson Valleys: Prairie Grasslands and Shrub Steppe



Chino/Williamson Valleys: Prairie Grasslands and Shrub Steppe



The Grasses

Warm Season
vs. Cool
Season

Growth forms
have
ecological
function

Grass Growth Habits



Rhizomatous



Bunch



Stoloniferous

Adapted from FeedXL



Prairie Grasslands and Shrub Steppe



***Muhlenbergia* spp. Muhly grasses**



***Bouteloua* spp. Grama grasses**



***Aristida* spp. Three awn**

Chino/Williamson Valleys: Prairie Grasslands and Shrub Steppe



Asclepias involucrata
dwarf milkweed

Prairie Grasslands and Shrub Steppe

Endemics and plants of conservation concern



Astragalus mollissimus* var. *mogollonicus
Mogollon milkvetch

Verde Valley

Mogollon Transition Scrub, Grassland, Sonoran Scrub (3,400-4,500ft)



Verde Valley:

Mogollon Transition Scrub, Semi-Desert Grassland and Upper Sonoran Scrub



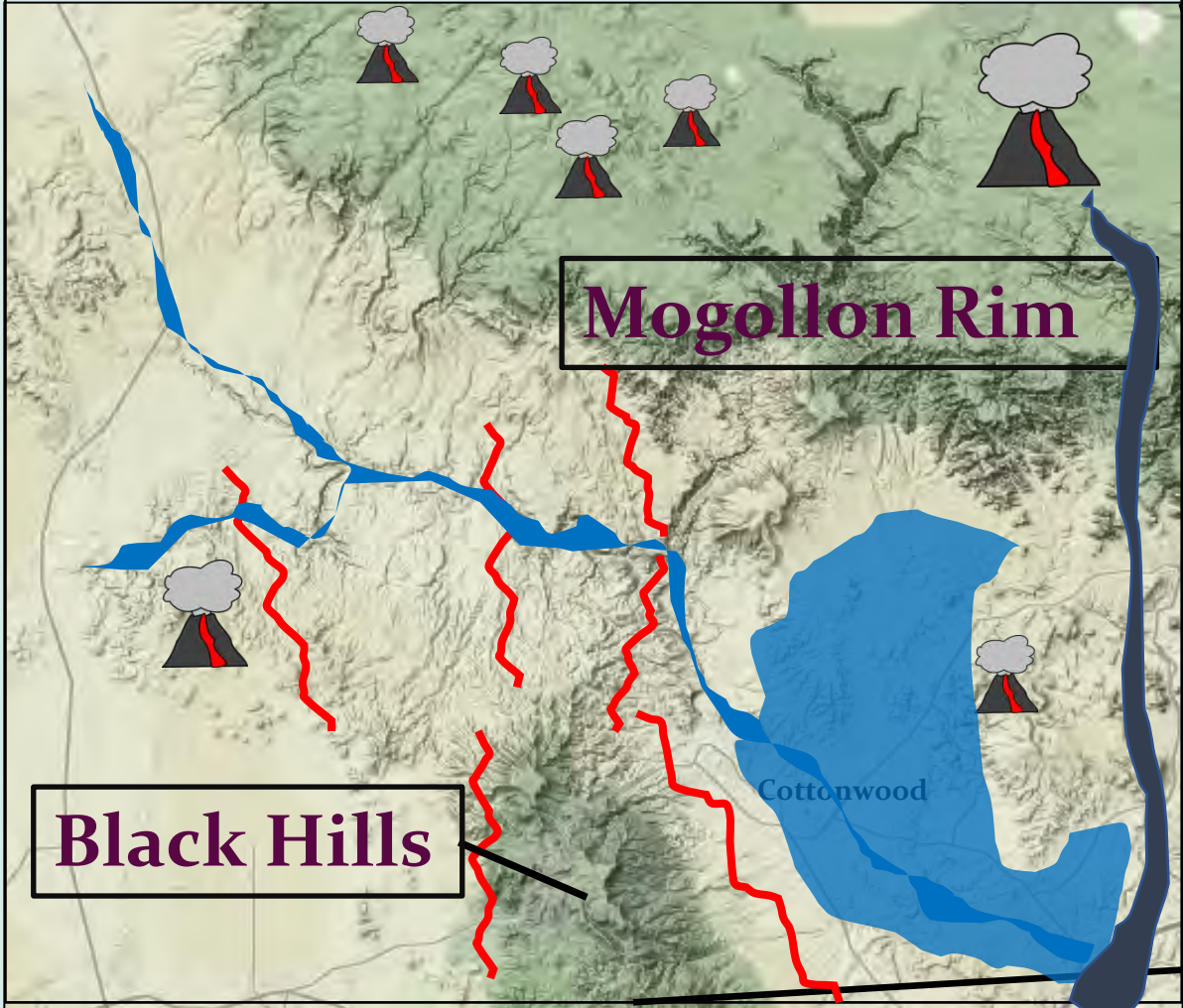
Echinocereus fasciculatus
Hedgehog cactus



Canotia holacantha
Crucifixion thorn

Verde Valley: Limestone Flora





- Major Faulting
- Uplift: Black Hills, Mogollon Rim Paleozoic forma
- Volcanism
- Lava flows, damming, freshwater lakes

Verde Valley: Limestone Flora

Endemics and plants of conservation concern



Houstonia rubra (Rubiaceae)



Penstemon thompsoniae

Verde Valley:
Limestone Flora
Endemics and plants of conservation concern



Dan Beckman

Salvia dorrii* subsp. *Mearnsii
Mearns Sage

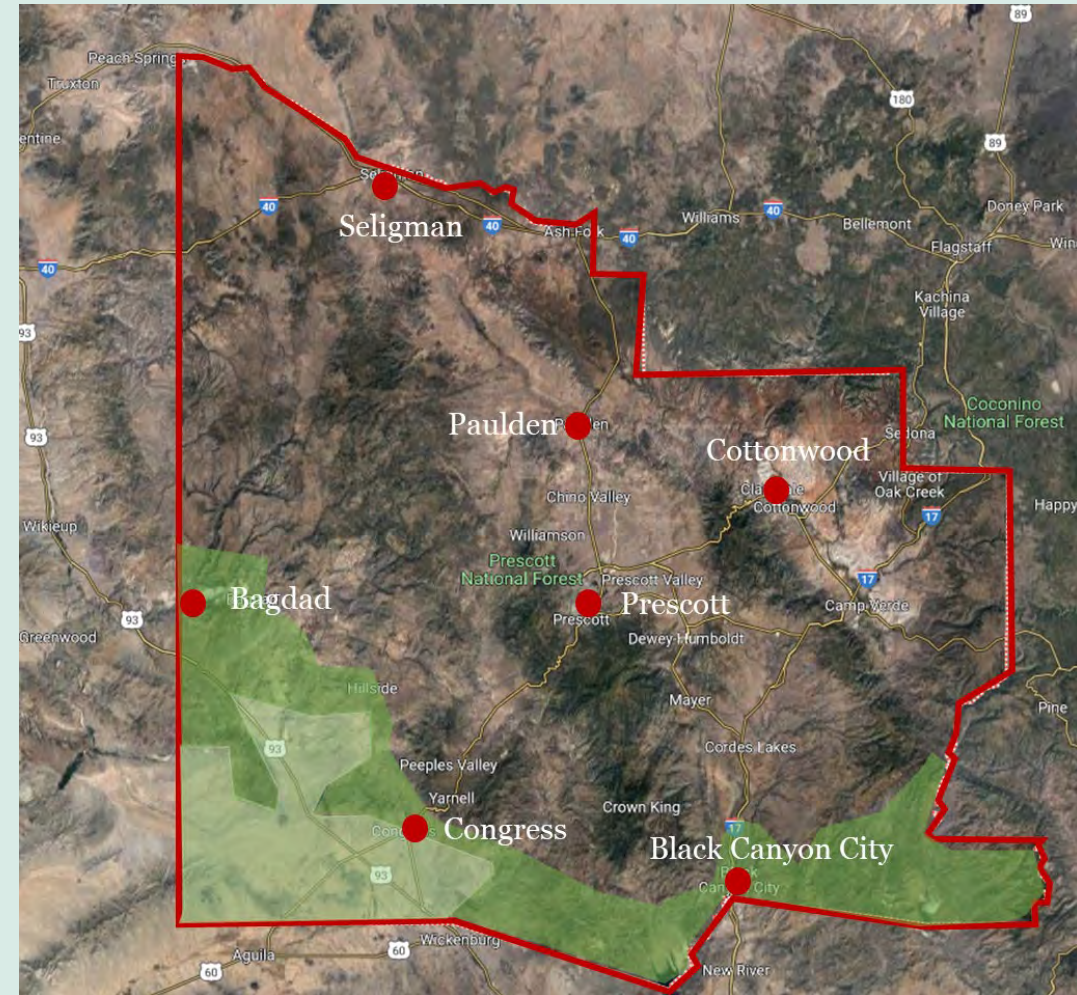


***Purshia subintegra* Arizona Cliffrose**
Highly Safeguarded



Rhinotropis rusbyi

Bagdad – Congress – Black Canyon City: Sonoran Desert Savannah and Scrub



Sonoran Desert Savannah and Scrub

Common Plants



Yucca elata
Soaptree Yucca



Carnegiea gigantea
Saguaro

Sonoran Desert Savannah and Scrub

Native plants for your landscape



Scutellaria Mexicana
Bladder Sage

Sonoran Desert Savannah and Scrub

Native plants for your landscape



Krameria erecta
littleleaf ratany

Sonoran Desert Savannah and Scrub

Native plants for landscapes



Prunus fasciculata
Desert Almond

Sonoran Desert Savannah and Scrub: Native plants for landscapes



Calliandra eriophylla
Fairyduster



Encelia farinosa
Brittlebrush

Mojave/Sonoran Desert Savannah and Scrub



***Yucca jaegeriana* Jaeger's Joshua Tree**

Mojave/Sonoran Desert Savannah and Scrub



Amsonia tomentosa
woolly bluestar

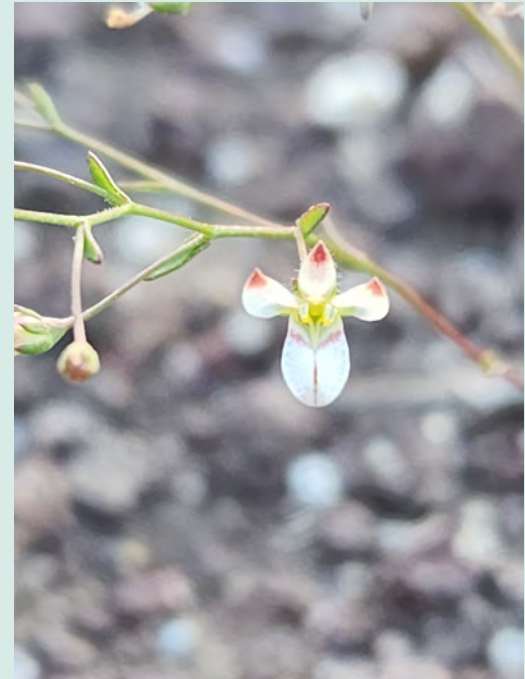
Mojave/Sonoran Desert Savannah and Scrub



Opuntia basilaris
Beavertail Prickly Pear

Sonoran Desert Savannah and Scrub

Spring Annuals



Sonoran Desert Savannah and Scrub

Unique and Rare plants



Aristolochia watsonii
Dutchmans Pipe Vine

Sonoran Desert Savannah and Scrub

Endemics and plants of conservation concern



Echinomastus johnsonii lutescens
Johnson's fishhook cactus

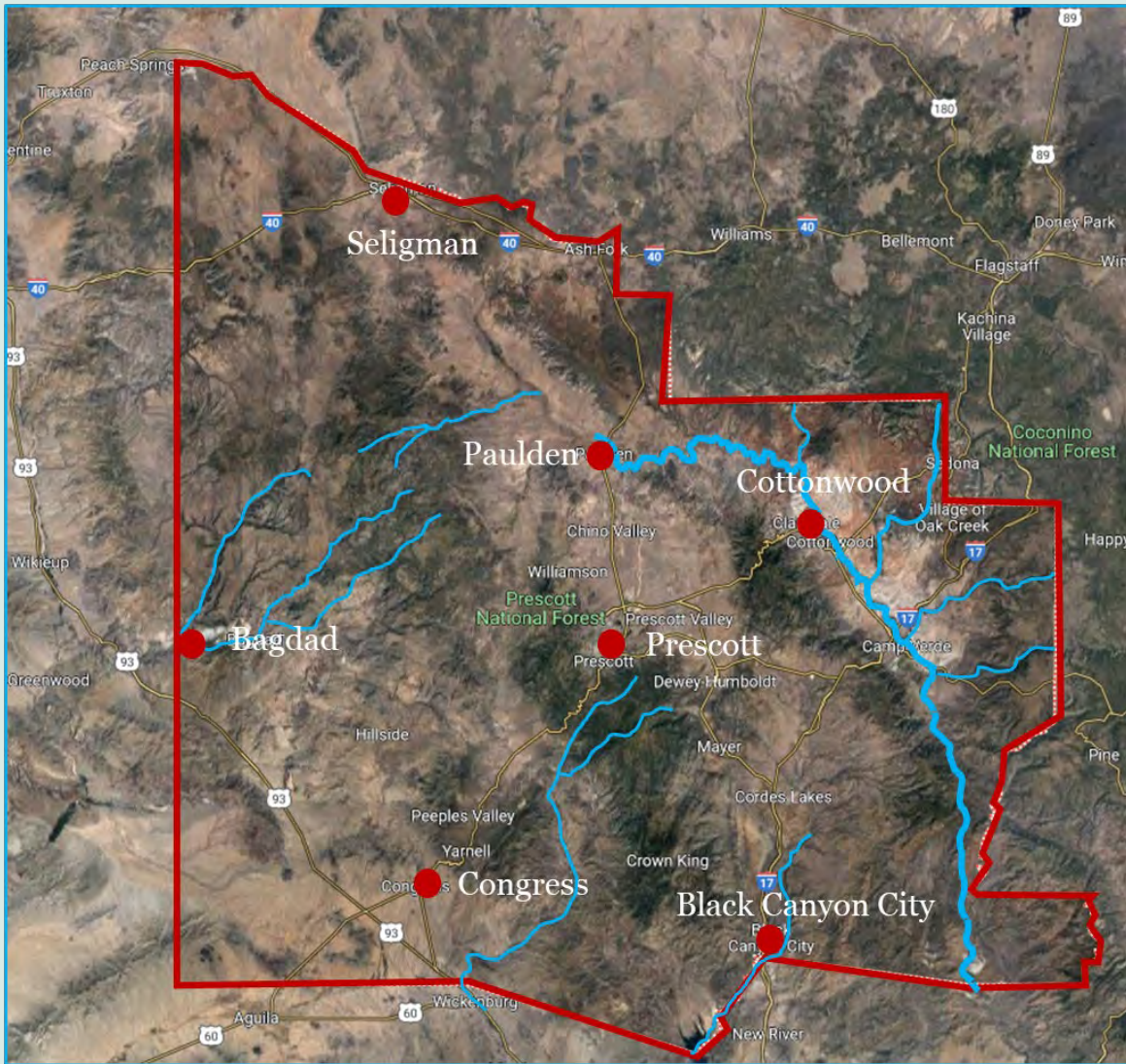
Sonoran Desert Savannah and Scrub

Endemics and plants of conservation concern



Rhinotropis acanthoclada
S1 – critically imperiled

Riparian Ecosystems



Riparian Ecosystems

Base-flow and large floods create various distinct habitats



Riparian Ecosystems: Streamside Wetlands



Riparian Ecosystems: Streamside Wetlands

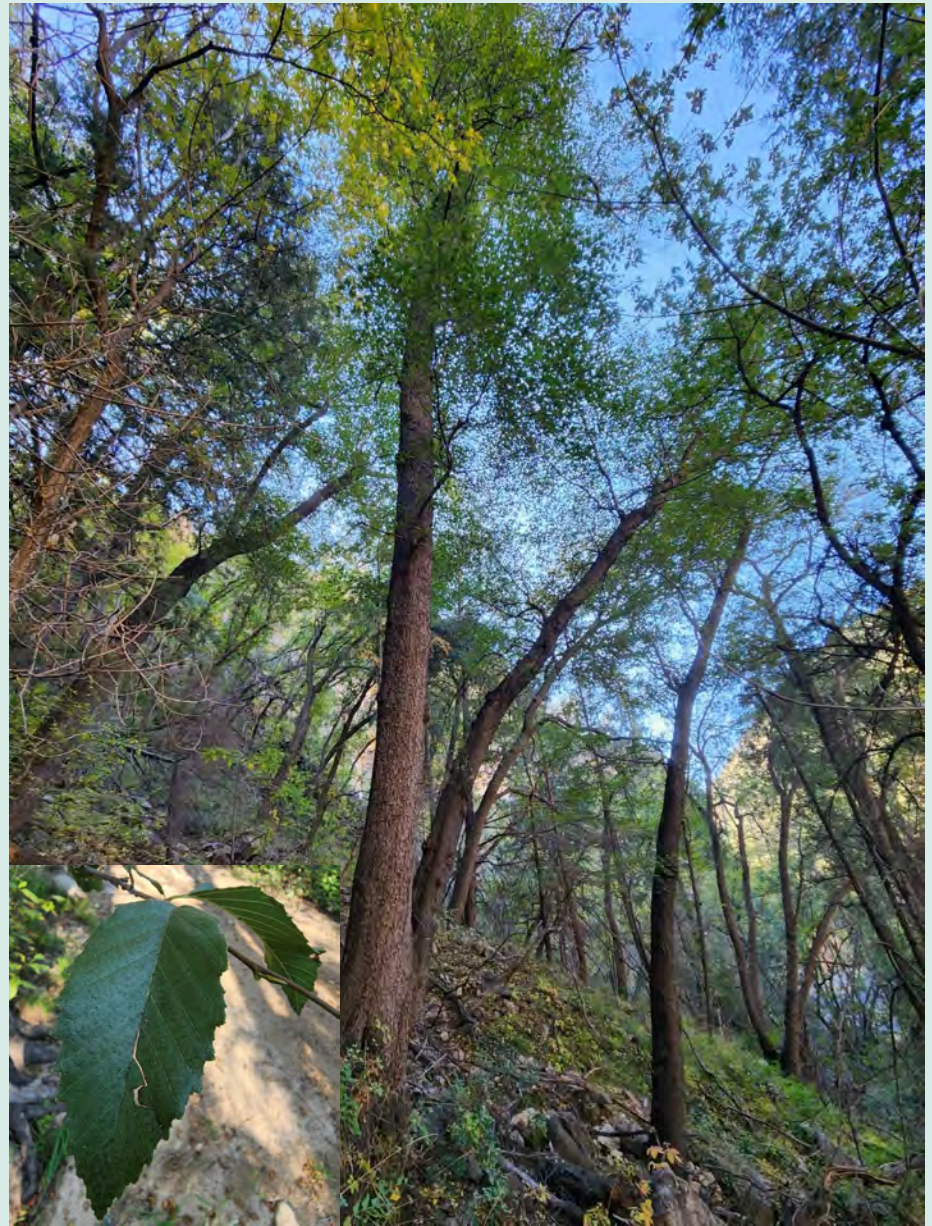


***Carex senta* - Sedges**



***Platanus wrightii* - Arizona Sycamore**

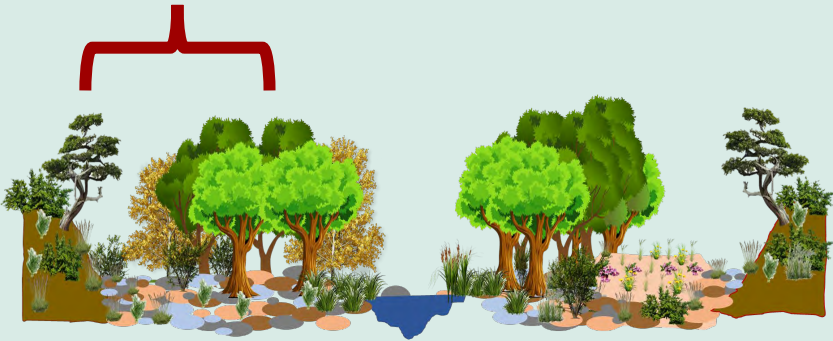
Riparian Ecosystems: Streamside Wetlands



Alnus oblongifolia - Arizona Alder

Riparian Ecosystems:

Floodplains



Riparian Ecosystems

Riparian Terraces



Ecozones of Yavapai County: The Big Picture



Field Botany and Native Plant Resources: Books

Arizona Flora (1960), T.H. Kearny and R.H. Peebles

Seed Plants of Northern Arizona (1973), W.B. McDougall

A Field Guide to Plants of Arizona (1997), A.O. Epple

Woody Plants of the Mogollon Highlands (2019) Joan and Carl Tomoff

Common Grasses of the Southwest Highlands (2021)

Debbie DeWolf Allen

Field Guide to Cacti and Other Succulents of Arizona (2017) Breslin et al.

Sonoran Desert Wildflowers (2002) R. Spellenberg

Field Botany and Native Plant Resources: Online

- **Yavapai County Native & Naturalized Plants**

cals.arizona.edu/yavapaiplants/

- **Southwest Environmental Information Network (SEINet)**

swbiodiversity.org/seinet/

- **iNaturalist**

- **Common Plants of the Verde Valley & Sedona**

www.naturesongs.com/vvplants/

- **USDA Plants Database**

plants.usda.gov


Online protected plants information:

- **Arizona native and protected plants information:**

<https://agriculture.az.gov/plantsproduce/native-plants>

- **NatureServe global and state-level rare plant ranks**

<https://explorer.natureserve.org/>



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References

Brown, D. E., & Makings, E. (2014). A guide to North American grasslands. University of Arizona for the Boyce Thompson Southwestern Arboretum.

Griffith, G. E., Omernik, J. M., Johnson, C. B., & Turner, D. S. (2014). Ecoregions of Arizona (poster) (No. 2014-1141). US Geological Survey.

Fleischner, T., Hanna, D., & Floyd-Hanna, L. (2017). A preliminary description of the Mogollon Highlands Ecoregion. *Plant Press*, 40(2), 3-6.

Photo Credits: Frankie Coburn, Max Licher, Teague Emory, Susan Carnahan

Native Plant and Ecoregional Resources:

Native and Naturalized Plants of Yavapai County website:
<https://cals.arizona.edu/yavapaiplants/index.php>

iNaturalist Application

Southwest Environmental Information Network (SEINet):
<https://swbiodiversity.org/seinet/>

NatureServe:
<https://explorer.natureserve.org/>

Ecoregions of Arizona Map (Griffith et al. 2014):
https://pubs.usgs.gov/of/2014/1141/pdf/ofr2014-1141_front.pdf
https://pubs.usgs.gov/of/2014/1141/pdf/ofr2014-1141_back.pdf