



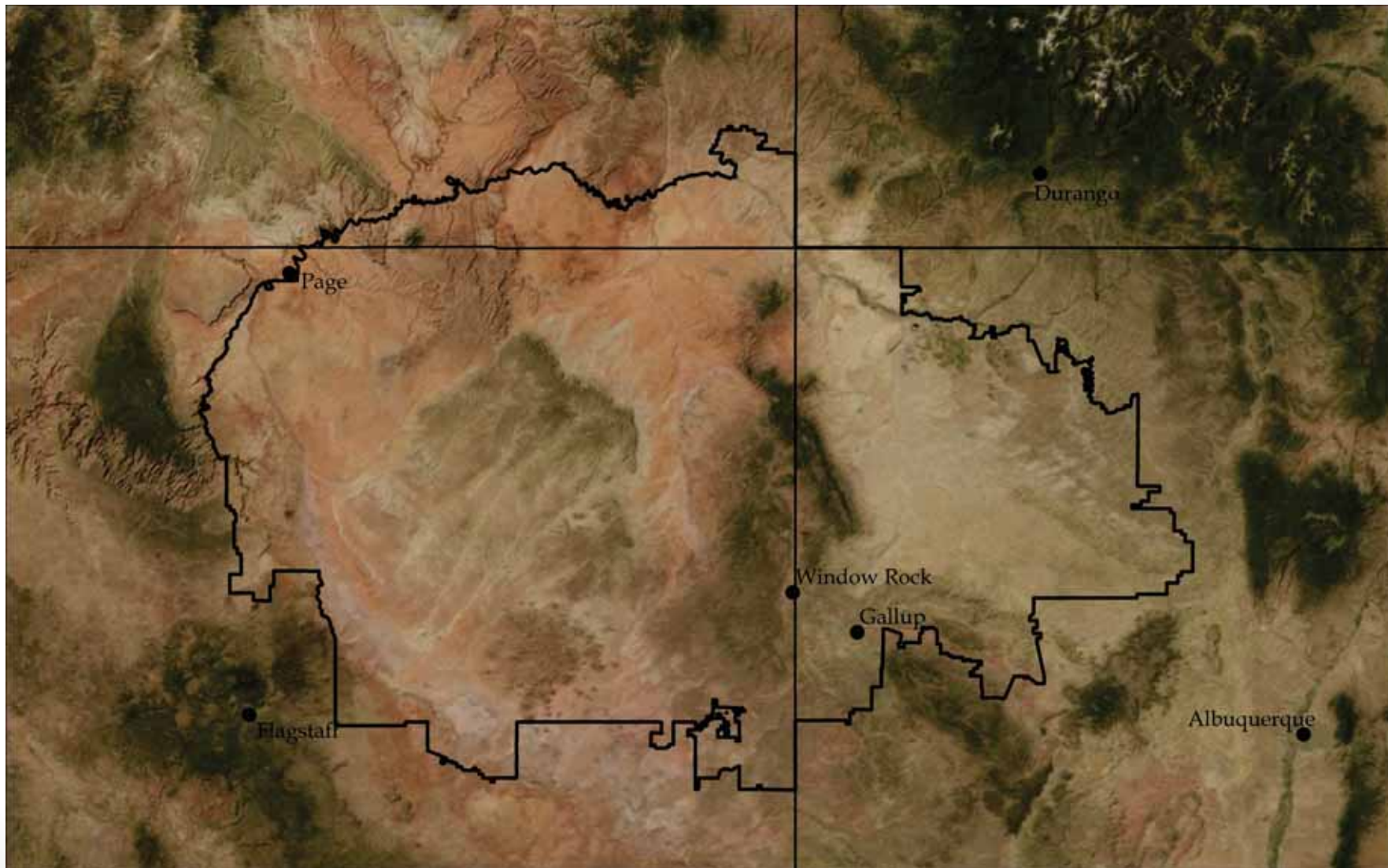
Navajo Nation's Plant Life: What Makes it So Unique?

Andrea Hazelton

Botanist

Navajo Natural Heritage Program

Diné Bikéyah is a Special Place



Unique Plants in the Navajo Nation

ENDANGERED

Cutler's Milk-vetch
Mancos Milk-vetch
Rhizome Fleabane
Brady Pincushion Cactus
Mesa Verde Cactus

THREATENED

Gooding's Onion
Welsh's Milkweed
Marble Canyon Milk-vetch
Cronquist Milk-vetch
Naturita Milk-vetch
Navajo Sedge
Acoma Fleabane
Round Dunebroom
Navajo Bladderpod
Fickeisen Plains Cactus
Navajo Penstemon
Alcove Rock Daisy
Alcove Bog-orchid
Alcove Death Camas

CANDIDATE

Aztec Gilia
Peebles Blue-star
San Juan Milkweed
Beath Milk-vetch
Heil's Milk-vetch
Navajo Saltbush

Atwood's Camissonia
Rydberg's Thistle
Yellow Lady's Slipper
Utah Bladder-fern
Grand Canyon Goldenweed
Sivinski's Fleabane
Sarah's Buckwheat
Bluff Phacelia
Cave Primrose
Marble Canyon Dalea
Parish's Alkali Grass
Arizona Rose Sage
Brack Hardwall Cactus
Welsh's American Aster

SENSITIVE

Bolack's Sand Verbena
Green-stripe Amaranth
San Juan False Carrot
San Juan Gilia
Narrowleaf Blue Star
Pigmy Sagebrush
Cutler's Milkweed
Chuska Milk-vetch
Cottam's Milk-vetch
Clifford's Milk-vetch
Chaco Milk-vetch
Zuni Milk-vetch
Monument Valley Milk-vetch
Arboles Milk-vetch

Painted Desert Milk-vetch
Sleeping Ute Milk-vetch
Gladiator Milk-vetch
Creeping Rush-pea
Fairy Slipper
Kaibab Suncup
Franklin Ceanothus
Arizona Rabbitbrush
Yellow Rabbitbrush
Canyon de Chelly Thistle
Clustered Leather-flower
Atwood's Catseye
Higgins Biscuit root
Featherleaf Spring-parsley
Bighead Spring-parsley
La Jolla Prairie Clover
Sand Lily
Canaan Daisy
Comb Wash Buckwheat
Clipped Wild Buckwheat
Ripley's Buckwheat
Marble Canyon Spurge
Spotted Fritillary
Grand Canyon Evening Daisy
Thoreau Woollybase Hymenoxys
James's Rubberweed
Intermountain Rubberweed
Bolander Quillwort
Cutler's Lupine
Wright Fishhook Cactus

Cave Evening-Primrose
Knowlton's Hop
hornbeam
Alpine Fever-few
Peebles Navajo Cactus
Snowball Cactus
Buell Park Phacelia
Howell Phacelia
Patch Phacelia
Welsh's Phacelia
Navajo Mountain Phlox
Slender Bog-orchid
Thorn Milkwort
Mancos Saltplant
Western Scurf Pea
Broom Pea
Whiting Indigo Bush
Grand Canyon Rose
Clifford's Groundsel
Hooded Ladies'tresses

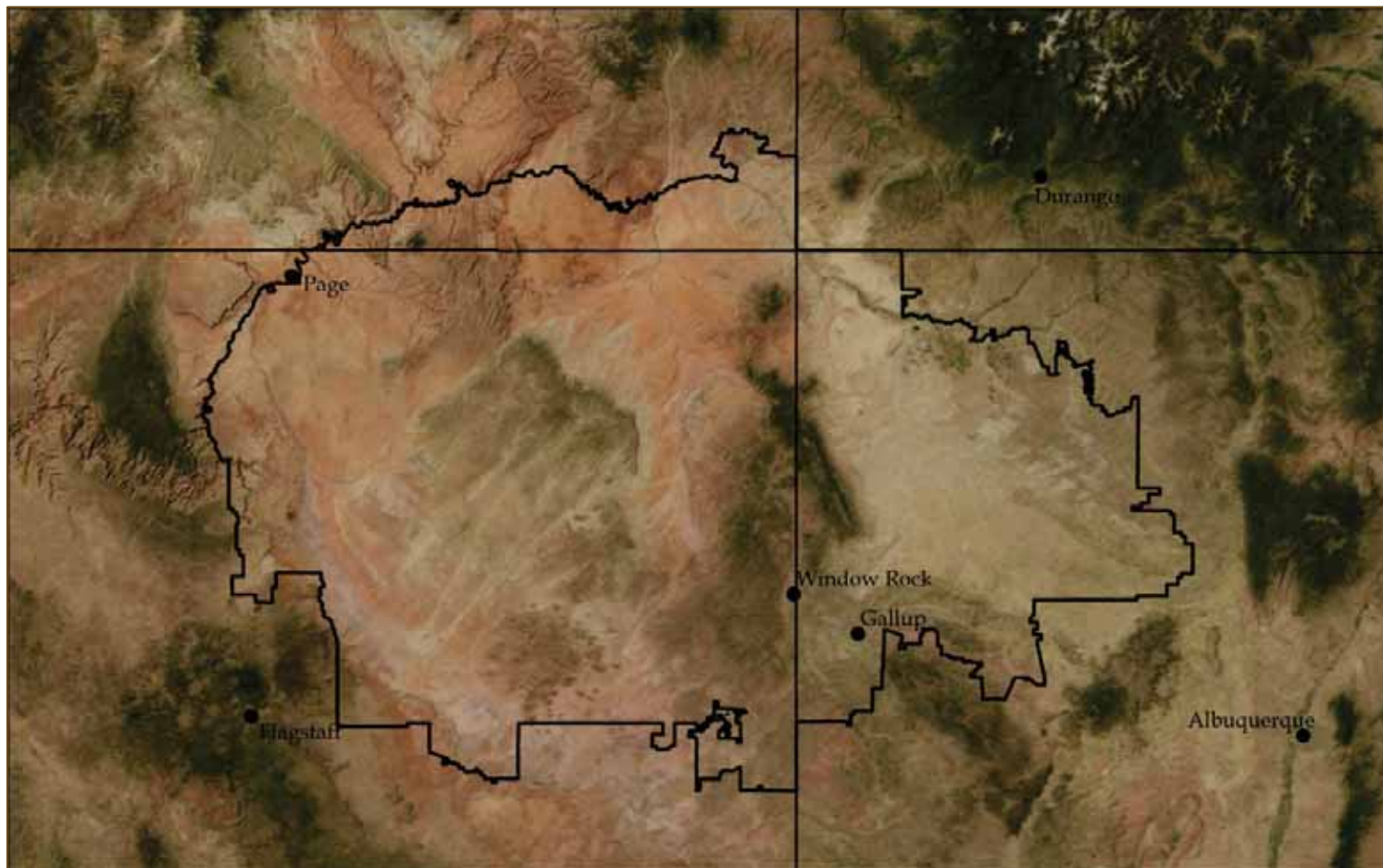
Why should we care?

- Diversity = Resilience, or the ability to recover or adapt.
 - This is important for landscapes facing a changing climate.



Why So Many?

- Unique Habitats → Unique Life Forms
- Diverse Habitats → Diversity of Life



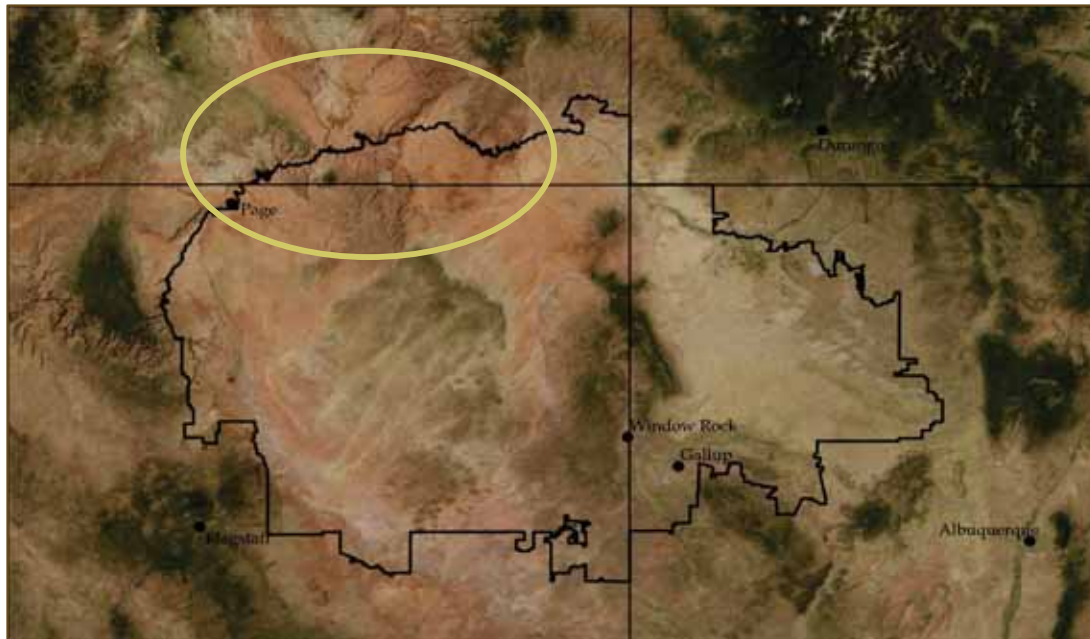
The Vocab Slide



- **Endemic**: a species that lives in a unique, well-defined area
 - Opposite of endemic is **cosmopolitan**, or found all over the world.
(e.g. *Homo sapiens*)
- Two types of endemism:
 - **Paleo-endemics** were formerly widespread, but now found in a very small area.
 - **Neo-endemics** still live in the small place where they evolved. Therefore these species have always been rare and restricted in range.

Hanging Garden Endemics

- Paleo-endemics
- Left over from the last ice age, 10,000+ years ago.
- As the climate became hot and dry, these plants moved into cool, shady alcoves.



Hanging Garden Endemics



Hanging Garden Endemics



Golden Sedge



Sheathed Deathcamas



Scarlet Monkeyflower



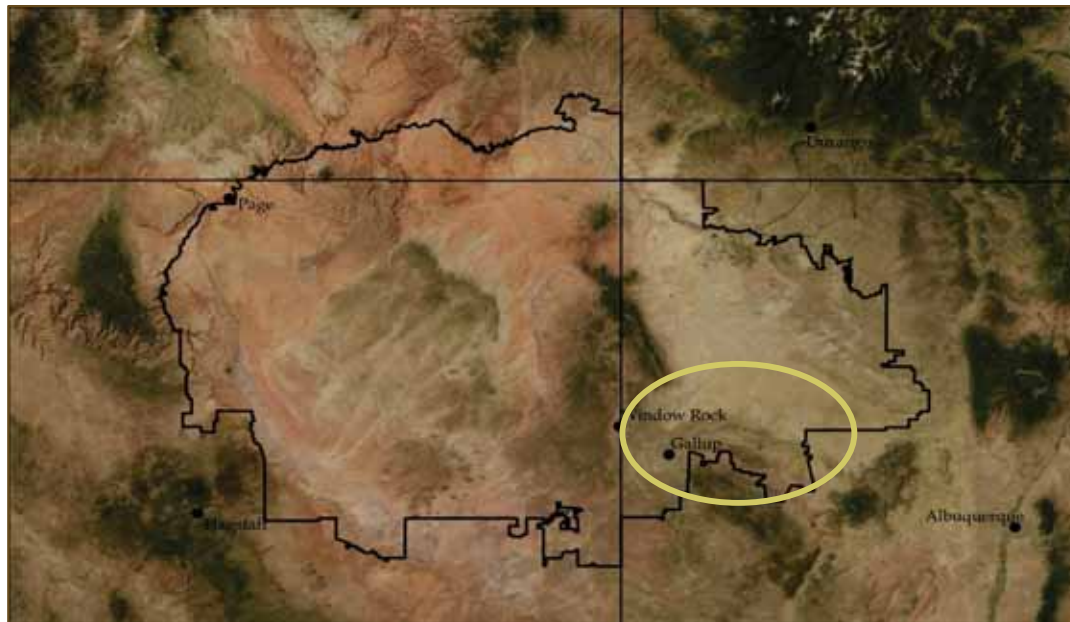
Cave Primrose



Mancos Columbine

Windy Cliff Endemics

- Lots of these on Navajo Nation.
- Windy cliffs are extreme environments. Plants that thrive there often have special adaptations.
- We'll focus on one limestone ridge near Thoreau.



Windy Cliff Endemics



Windy and Exposed + Limestone soil → Uniquely Adapted Plants

Windy Cliff Endemics



Navajo Bladderpod
Known from 9 populations

These are probably
neo-endemics



Columbia Cutleaf
White-flower morph
1 population?



Perky Sue
dwarf rayless variety
Known from 1 population?



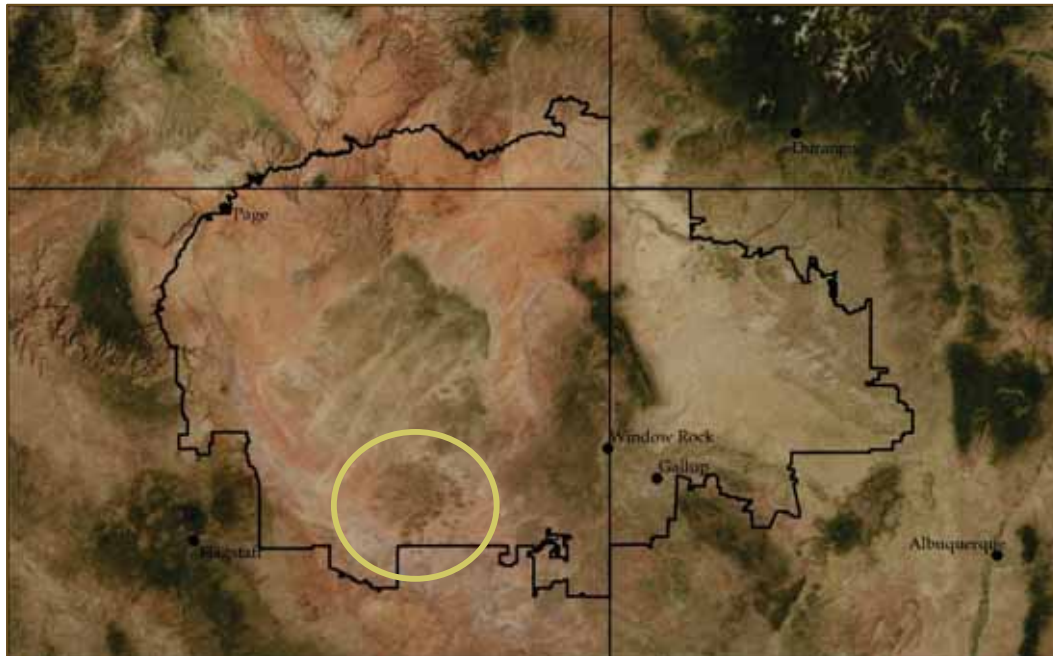
Acoma fleabane
Known from 4 populations



Clipped Buckwheat
Known from 3 populations

Arizona Rose Sage

- Lives around the bases of the Dilkon Buttes.
- Needs dark volcanic soil.
- Similar to common Purple Sage but larger, and with distinct rose-colored bracts.



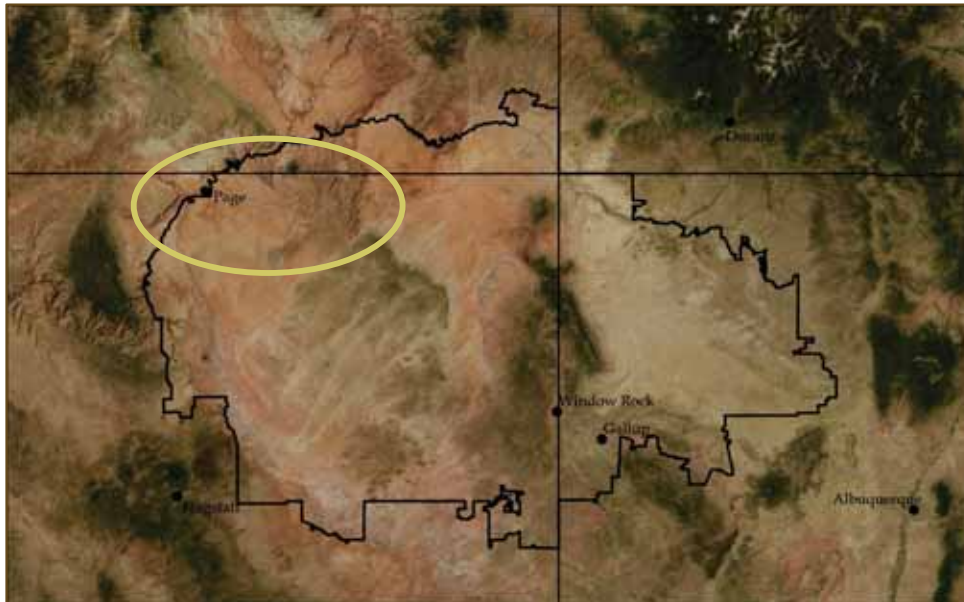
Arizona Rose Sage



Probably a *neo-endemic*

Welsh's Milkweed

- Lives in deep, active sand dunes.
- Dunes are unique habitats that are separated from each other by large distances.
- Dunes are extreme environments. Dune plants have special adaptations.



Welsh's Milkweed



Probably a *neo-endemic*



Welsh's Milkweed



Welsh's Milkweed's extensive root system is an adaptation for dune life.

Recap

- Navajo Nation has some really neat plants.
- I hope you're excited about them, too.
- Extreme or unique environments produce organisms with unique adaptations.
- Many of these plants have always been rare and will always be rare. That's OK.
- Rare species have a higher risk of extinction. We should take care not to unintentionally push any species to extinction.



Thank You!

Questions??

