

Regional projects and future directions

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Institute Director



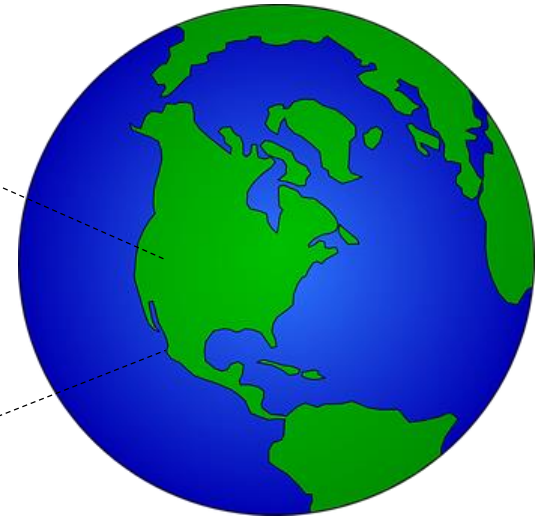
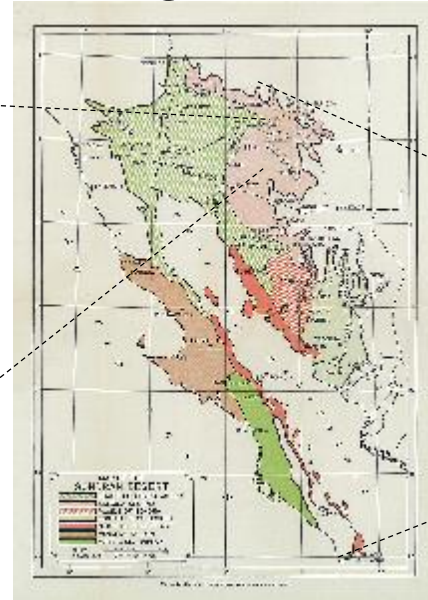
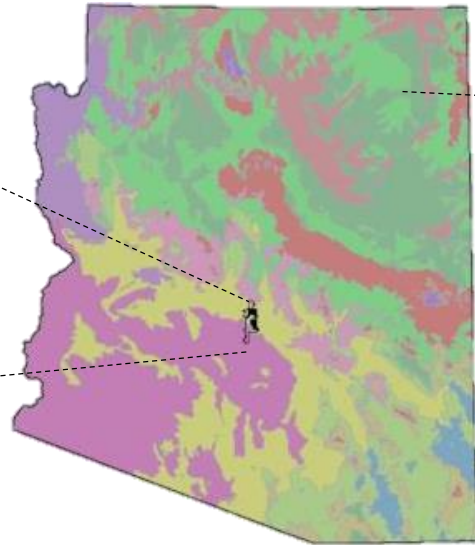
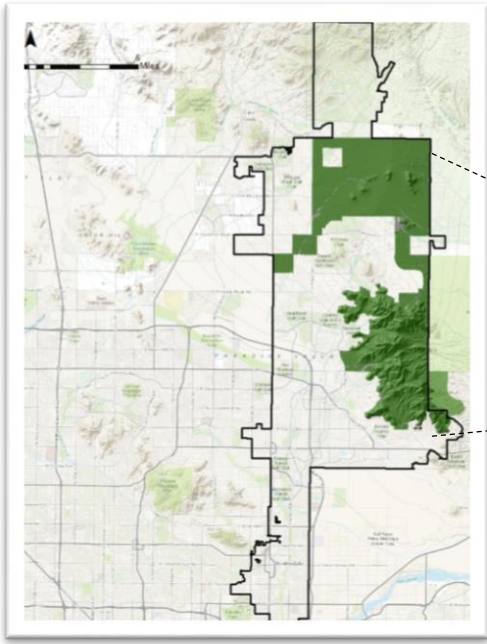
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Field Institute: from local to global

Priorities

- Monitor plants and wildlife to protect and preserve
- Improve best management practices in restoration and invasive species management



Priority 1: Assess the impact of urban stressors and climate change on the Preserve

Monitoring programs:

- Phenology (NPN)
- Arthropods (CAP-LTER)
- Bird surveys (Audubon)
- Butterfly counts – Spring and Fall (NABA)
- Bat monitoring at Dixie Mine, maternity roost
- Wildlife connectivity



Priority 1: Assess the impact of urban stressors and climate change on the Preserve

Future monitoring programs:

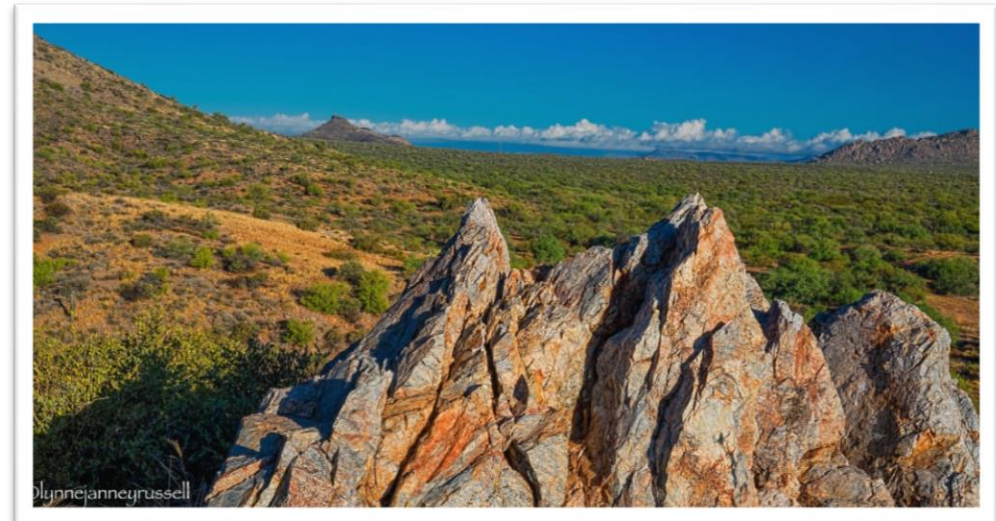
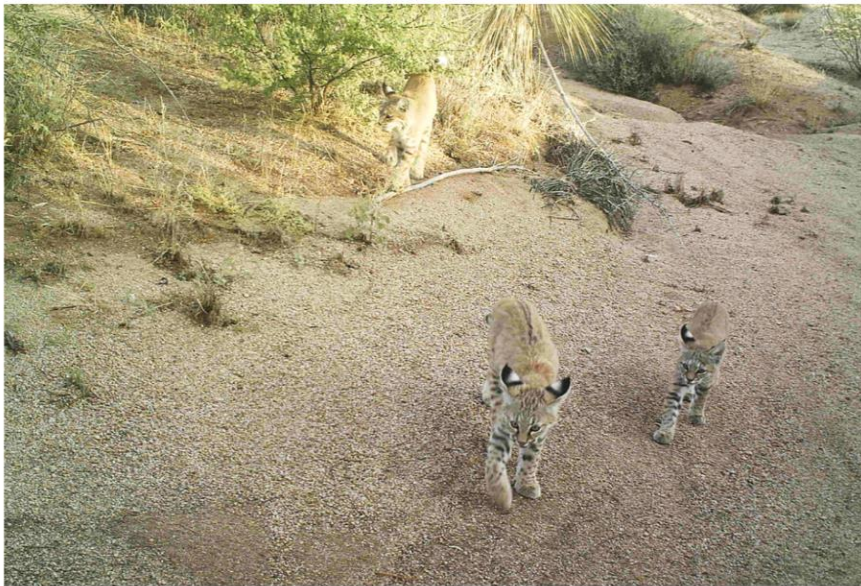
- Phenology – adding pollinators
- Wildlife...
- Expand bat monitoring (TBD)
- New herpetofauna monitoring (TBD)
- Long-term plant monitoring (TBD)
- iNaturalist (TBD)



Priority 1: Assess the impact of urban stressors and climate change on the Preserve

Wildlife research and monitoring

Corridor viability – wildlife studies in Gooseneck to detect changes in response to development and recreation



Priority 1: Assess the impact of urban stressors and climate change on the Preserve



Management implications

- Analyze and report
 - Arid Lands Symposium 2020
 - Future direction: State of the Preserve report

Priority 2: Improve best management practices for Sonoran Desert and other arid lands

Non-native plant control



Restoration of degraded lands



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Invasive species strategy

- Buffelgrass and fountain grass experiment
 - Long-term – up to five years!
- Survey, removal, monitoring
- Use Collector app data to strategize future survey and removals
- Expand regionally



Invasive species strategy

Urban removals

- Fountain grass swap
- Surveys
- HOAs
- Preserve users
- Cities
- Fire Department

Did You Know?

Plants in your front yard could be contributing to this!



This plant is wreaking havoc on our sensitive desert!

Fountain grass is not native to the Sonoran Desert. It was introduced as an ornamental but has escaped neighborhoods to spread across the natural landscape.

Fountain grass displaces native plants and wildlife and is also a primary cause of catastrophic wildfires. Because of this, it is prohibited in landscaping by many local HOAs and could result in a fine for homeowners.

You can help!

By replacing fountain grass in your yard with a species native to the Sonoran Desert, you can reduce its spread and the potential for catastrophic wildfires.

You can replace your plants for free!

Trade in your fountain grass plants for native plants! Remove fountain grass from your yard or neighborhood (with permission), take a picture of each plant (showing you dug up the roots!), and dispose of the plant. Then bring that picture to the following location and receive a free native plant in return!

When and Where:

Saturday, March 9, 11 am - 2 pm,
Appaloosa Library (7377 E Silverstone Dr, Scottsdale, AZ 85255)

Saturday, March 16, 11 am - 2 pm,
Arabian library (10215 E McDowell Mountain Ranch Rd, Scottsdale, AZ 85255)

Sunday March 31, 1-4 pm,
Mustang Library (10101 N 90th St, Scottsdale, AZ 85258)

March 11-29 (Mon-Fri only),
9 am - 5 pm, McDowell Sonoran Conservancy office
(7729 E Greenway Rd, Ste 100, Scottsdale, AZ 85260)

For more information, contact McDowell Sonoran Conservancy at 480-998-7971.

Replacement plant:



Purple three awn (*Aristida purpurea* var. *purpurea*): A showy native grass. Tall perennial with attractive red-purple inflorescences.



Priority 2: Improve best management practices for Sonoran Desert and other arid lands

Non-native plant control



Restoration of degraded lands



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Restoration Action Plan – Preserve

- ✓ Trail restoration experiments
- ✓ Past restoration surveys
- ✓ Degraded lands mapping
- Soil biocrust restoration experiment
 - Test cultivated biocrusts in the field



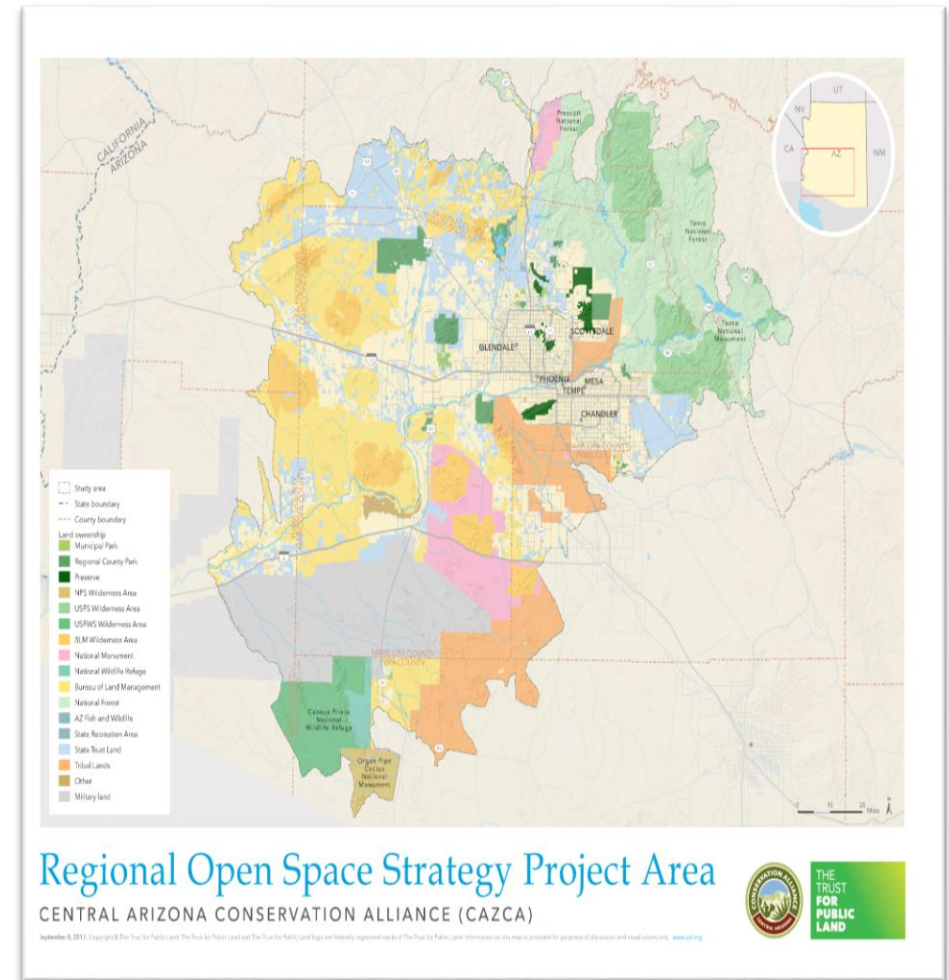
Restoration – Future Directions

- Restoration action: priority degraded lands
- Test soil treatments and seed mixes...

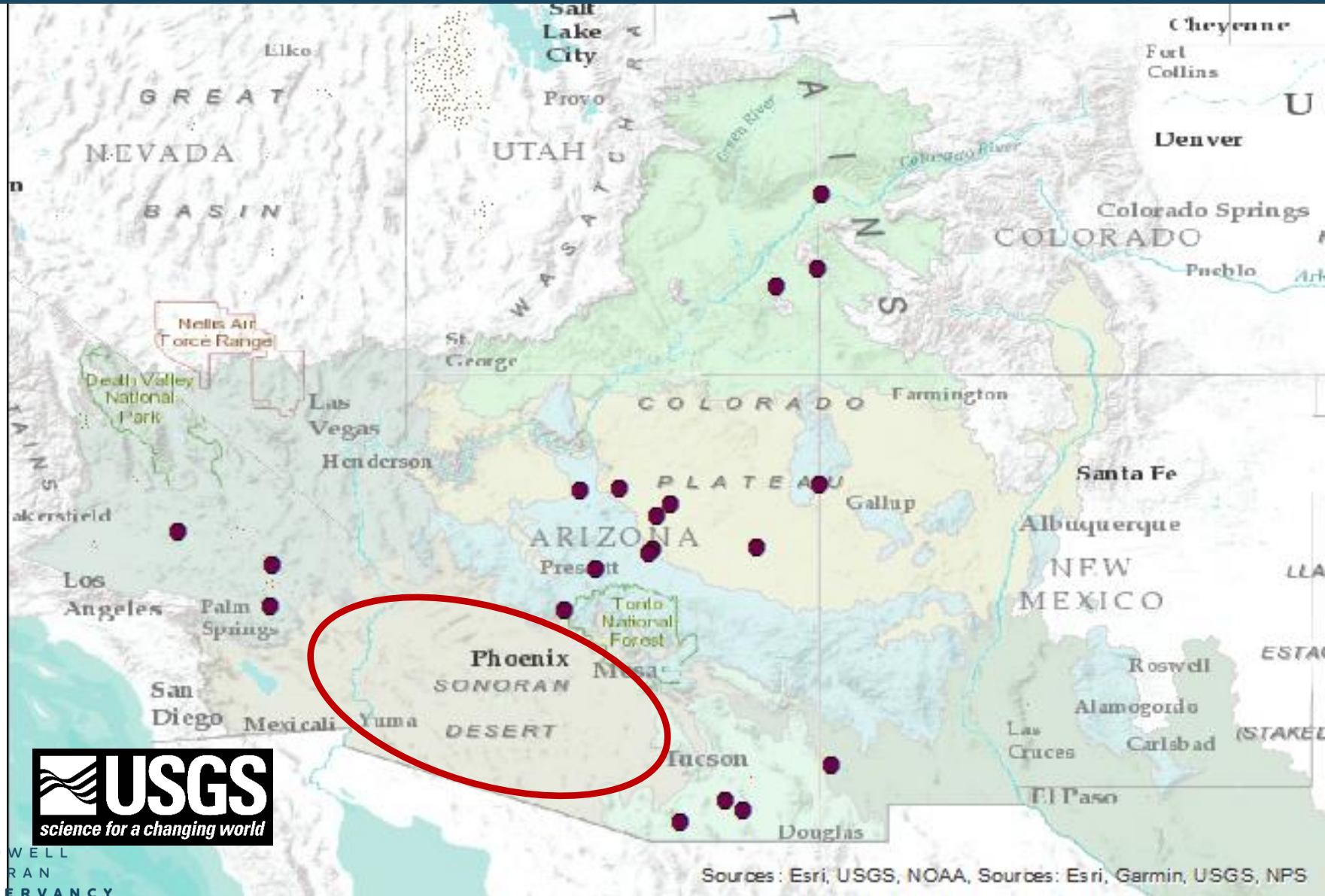


Restoration – Future Directions

- Degraded lands mapping – expand regionally
- (Invasives)
- USGS RestoreNet



RestoreNet: Current & Planned Sites



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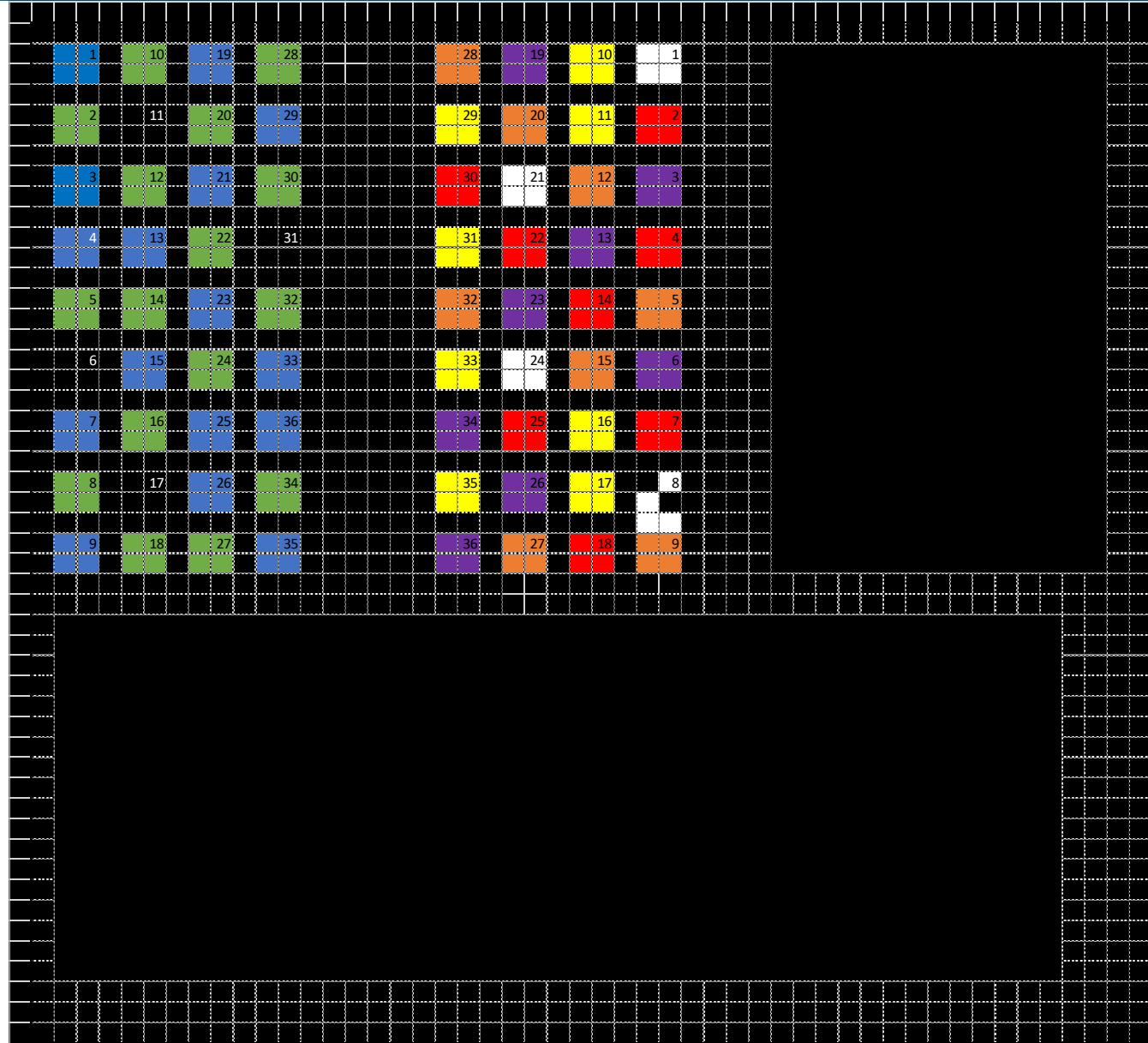
RestoreNet: Experimental Design

Experimental design

- 50m x 50m
- 3 site modification treatments
- 2 seeding treatments
- Site specific treatments



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RestoreNet: Site modification treatments



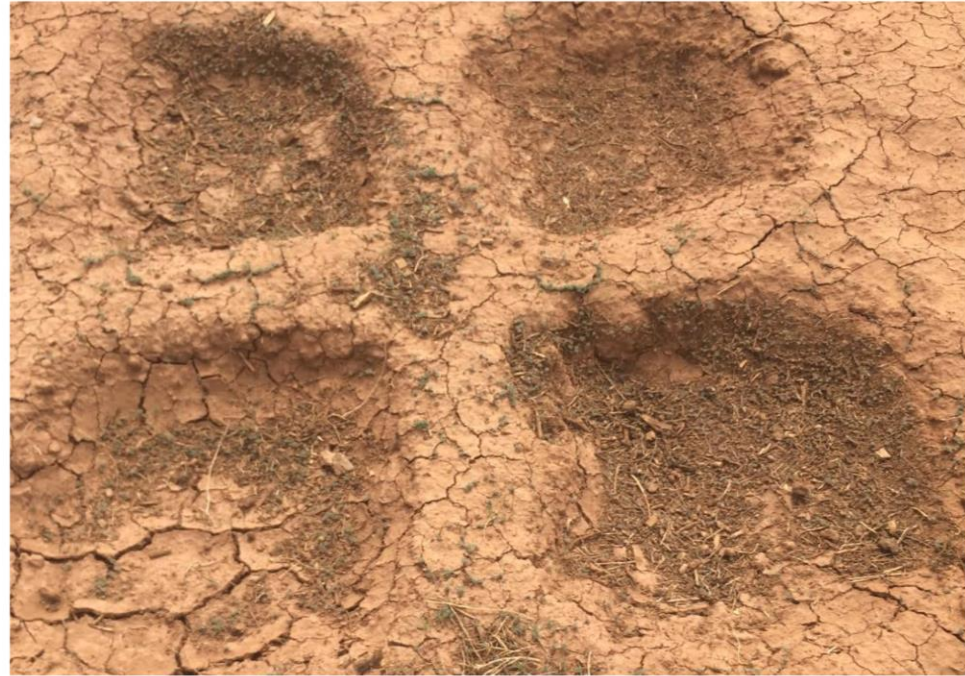
RestoreNet: Site modification treatments



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RestoreNet: Site modification treatments



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RestoreNet: Site specific questions



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International Partnerships



International Union for the Conservation of Nature (IUCN)

Sonoran Desert Plant Species
Specialist Group

Host Organization and Chair



IUCN Sonoran Desert Plant SSG

Founded in 1948, IUCN is the world's largest global environmental organization

- The only environmental organization with official **Observer Status** at the **United Nations** General Assembly.
- Provides **KNOWLEDGE, ACTION** and **POLICY**

IUCN Knowledge Products:

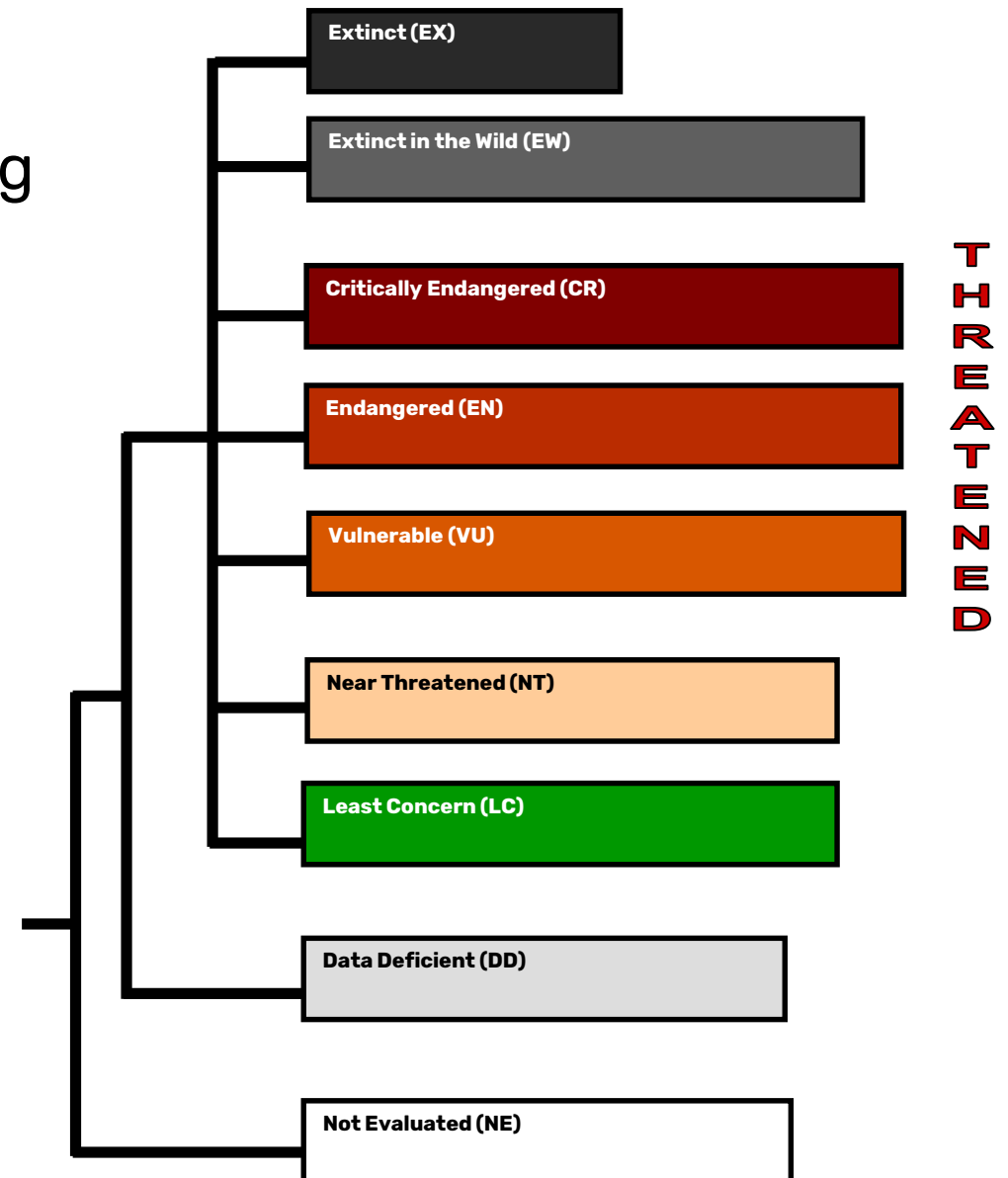
- The IUCN Red List of Threatened Species™
- The IUCN Red List of Ecosystems
- The World Database of Protected Areas
- A new list of Key Biodiversity Areas

IUCN Sonoran Desert Plant SSG

Red List Assessment

- Most globally used standard for assessing threats and species-level probability of extinction (www.iucnredlist.org)
- Apply Quantitative Criteria
- Assign 1 of 8 Red List Categories

Standardized scientific process



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Nature of the Red List criteria

5 metrics to detect if at heightened risk of extinction based on Extinction Risk Theory (Mace et al. 2008)

CRITERIA

A

Population reduction

B

Restricted geographic range

C

Small population size & decline

D

Very small or restricted population

E

Quantitative analysis

Quantitative thresholds

THREATENED CATEGORIES

Critically Endangered (CR)

Endangered (EN)

Vulnerable (VU)

Biologists

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Outcomes of Red List assessments

- Local and regional conservation planning
- Improved policy
- Protected area designation, species inventories & management
- CITES recommendations (trade)
- Biodiversity measurements for Convention for Biological Diversity and Sustainable Development Goals targets (United Nations)

U.N. agrees 2020 biodiversity targets

By Matthew Knight for CNN

October 29, 2010 -- Updated 1953 GMT (0353 HKT)



Japanese environment minister Ryu Matsumoto brings the gavel down on a successful United Nations biodiversity summit.

'Last chance' for tuna authority

By Richard Black

Environment correspondent, BBC News website



Tsukiji market in Tokyo is the final destination for a large proportion of bluefin.

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What IUCN Red List Assessment Process can provide

- Baseline inventory of all plant and animal species in the Sonoran Desert Ecoregion
- Identification of gaps in conservation and research
- Formalization of international network of scientists and partner organizations
- Guide and inform improved conservation planning

**IUCN Red List assessments completed for ~
835 species in Sonoran Desert:
Cacti, Mammals, Reptiles, Amphibians, Birds,
Freshwater Fishes, and Dragonflies.**

**Major gaps in Plants (~4000 species) and
Invertebrates (??? species)**

IUCN Sonoran Desert Plant SSG

Targets

- Vetting Sonoran Desert Plant list (nearly 4,000 species)
- 250–500 red list assessments/year
- Conservation planning for threatened species (across taxa)
- Invasive species survey and removals
- In-situ and ex-situ conservation (seeds and living collections)



IUCN Sonoran Desert Plant SSG



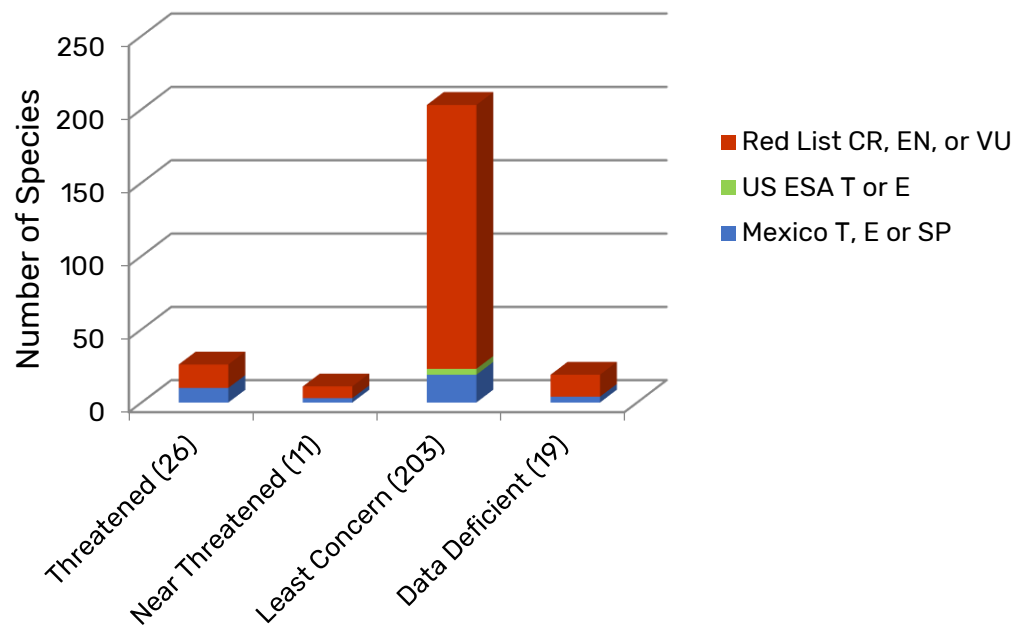
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ASU Arizona State
University

Slide credit: Beth Polidoro

IUCN Sonoran Desert Cacti

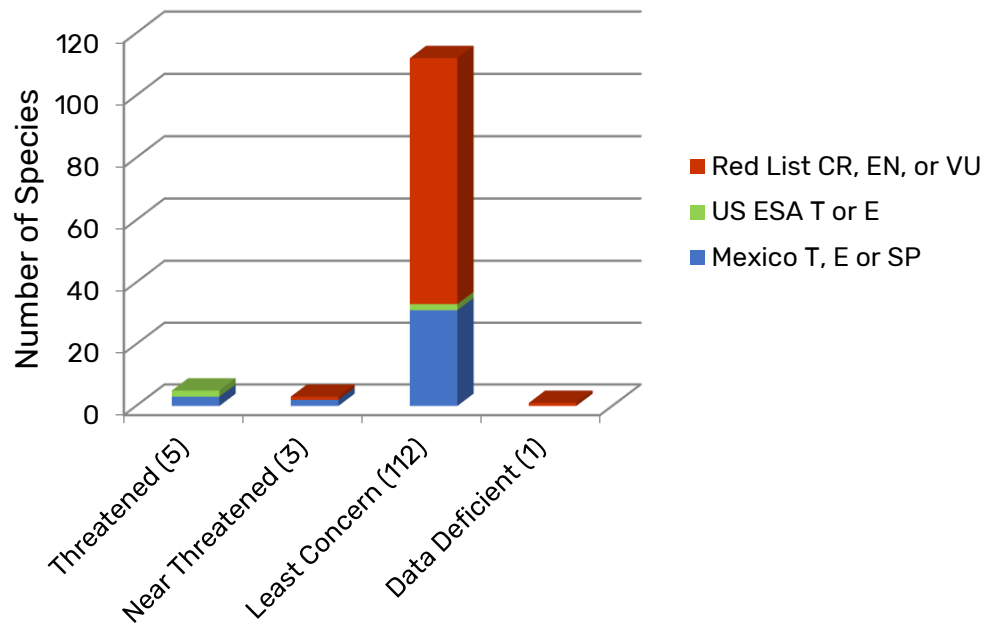
Taxa	# SD species	IUCN	ESA	Norma 059
Cacti (Family Cactaceae)	250	26	4 (varieties)	10



Mammallaria bocensis (VU) has a range of less than 15,000 km² across Sonora and Sinaloa. Declining due to habitat loss and fragmentation.

IUCN Sonoran Desert Mammals

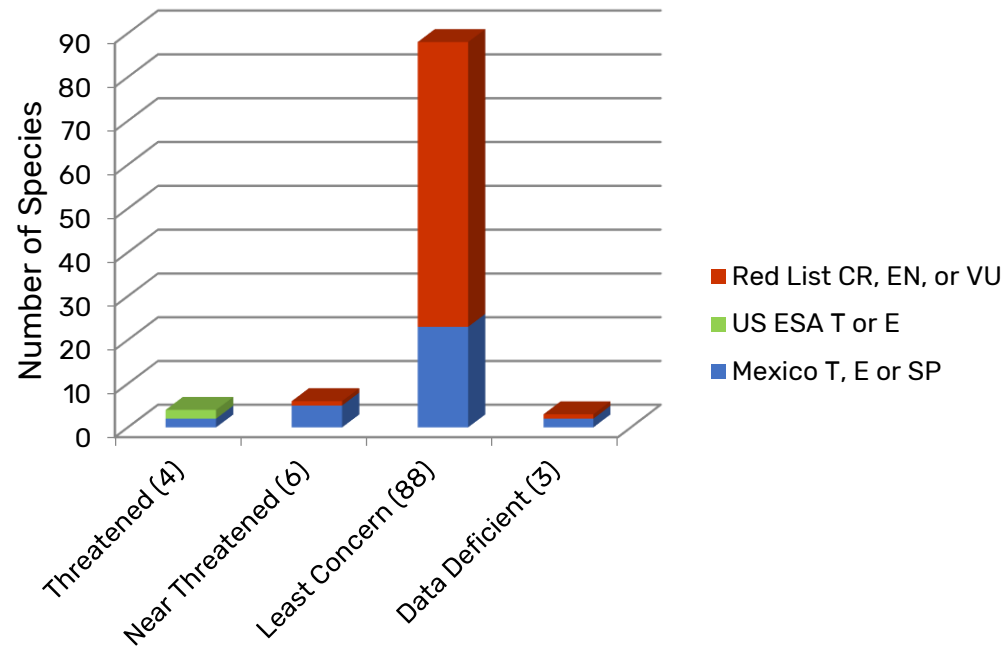
Taxa	# SD species	IUCN	ESA	Norma 059
Mammals (Class Mammalia)	120	5	3 (Pronghorn, Jaguar, Ocelot)	3



Leptonycteris yerbabuenae (VU) or the Lesser Long-nosed Bat has declined >30% over the last 10 years due to over-exploitation, shrinkage in distribution, and habitat destruction and degradation.

IUCN Sonoran Desert Reptiles

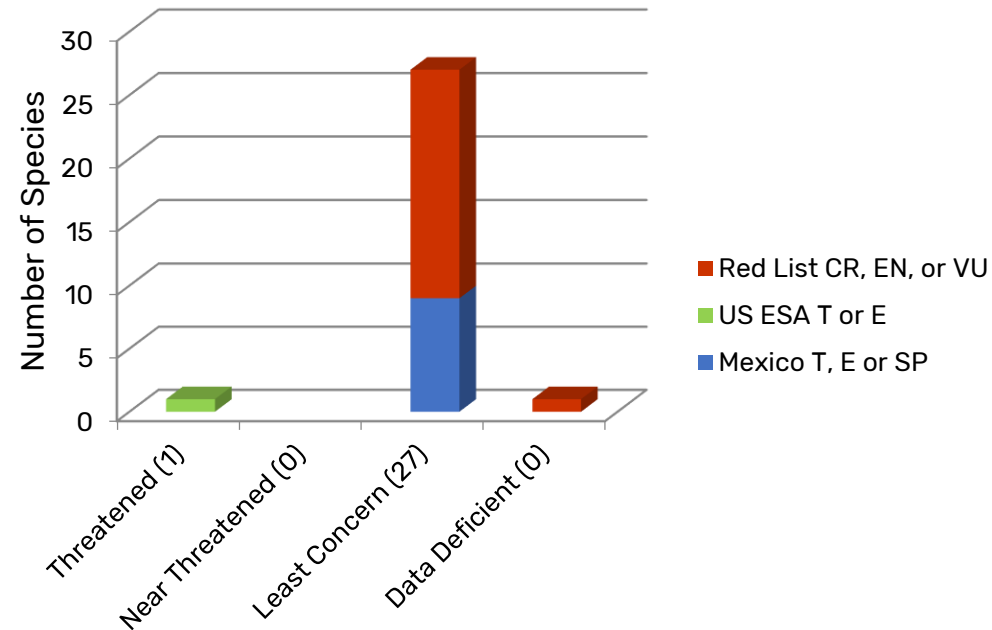
Taxa	# SD species	IUCN	ESA	Norma 059
Reptiles (Class Reptilia)	112	4/101	1 + 3 proposed	2



Sonoyta mud turtle;
Kinosternon sonoriense
(EN)

IUCN Sonoran Desert Amphibians

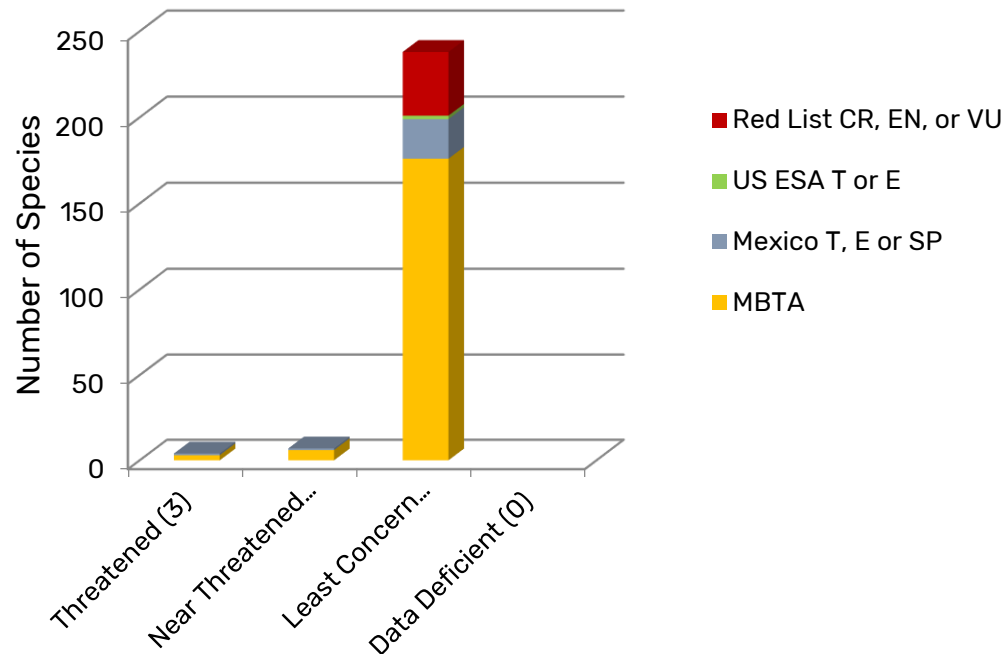
Taxa	# SD species	IUCN	ESA	Norma 059
Amphibians (Class Amphibia)	28	1	1	



Chiricahua leopard frog: *Lithobates chiricahuensis* (VU) due to habitat destruction and degradation, and the effects of exotic species and disease.

IUCN Sonoran Desert Birds

Taxa	# SD species	IUCN	ESA	Norma 059
Birds (Class Aves)	246	3	2 + 4 subspp	1 + 23 (least concern)



Synthliboramphus craveri (VU)
Craveri's Murrelet, due to small number of known locations and presence of introduced predators on breeding islands.

IUCN Sonoran Desert Aquatics

Freshwater taxa (fish, snails, crabs, dragonflies)

Taxa	# SD species	IUCN	ESA	Norma 059
Freshwater fishes	30-35	16/22	16	7
Gastropods		8/46	3 (2 in review)	



Gila elegans (CR)
Bony-tailed Chub
Endangered – ESA and
Norma 059



Pyrgulopsis bacchus (VU)
Grand Wash Springsnail
ESA Under Review

IUCN Sonoran Desert Plant SSG

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International Partnerships

International Union for the Conservation of Nature (IUCN)

How does it help us?

- Perspective (identify sensitive plant species in Preserve)
- Participation in regional conservation planning



Regional Partnerships

- Training and mentoring students
- Expanding our scope and work regionally and nationally
- Foster new partnerships

NORTHERN
ARIZONA
UNIVERSITY



Thank You!



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Stewards!



GLOBE CORPORATION

