Melanie Tluczek  
Steward Class 33  
Assistant Director  
Field Institute
Our program today

Welcome & CS Leadership – Melanie Tluczek
2016-17 Recap – Debbie Langenfeld
On-going projects update – Team Leads
A Look Ahead – Dr. Helen Rowe
Closing Remarks – Melanie Tluczek
So let’s get started with a recap of the past 12 months...
A recap...

Debbie Langenfeld
Program Chair
Steward, Class 50
Certified Citizen Scientist
Nonnative Plants

Study group
Fountain & Buffel Grasses
Sahara Mustard
Tamarisk @ Dixie Mine
Nonnative Plants

Training & certification

Removed

\[ \approx 20,000 \]

Treatments – delayed

Mapping – 100 acres
Prairie Falcons

2 training sessions
Patrol, pathfinders, nature guides, COS
Chicks heard – 5/8!
No nestlings – yet
Stats

16 classes
252 field days
516 stewards
97 non-stewards
~ = 2500 hours

<table>
<thead>
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<th>TYPE</th>
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<td>NORTH PRESERVE BIRD SURVEY</td>
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<td>PEREGRINE SURVEY</td>
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<td>WEEKLY PHENOLOGY</td>
<td>24</td>
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<td></td>
<td>NON-NATIVE PLANT</td>
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</table>
New Species

12 Birds – 152 species

3 Butterflies – 44 Species
New Species

1 Amphibian

4 Grasses

3 Flowers

381 species
Student Involvement

ASU School of Life Sciences – Kara Barron

Fire impact study

SCC – Dr. Nagy class – 4 research projects

Phenology

Nonnative grasses

Herps

Butterflies

SCC – CNUW – Natalie Case

Fairy shrimp study
Jr. Citizen Science Festival

3 sponsors
18 exhibits
210 students
100+ volunteers
Presentations & Publications

Scottsdale’s McDowell Sonoran Preserve Ecological Resource Plan

Developed by the McDowell Sonoran Conservancy Field Institute in partnership with the City of Scottsdale and EPIC (Environmental Planning Group)

126092: Citizen Scientist Quartz Vein Investigation Produces Significant Findings

Daniel G. O’Donnell* and Brian H. Gossard

McDowell Sonoran Conservancy Field Institute, McDowell Sonoran Preserve, Scottsdale, Arizona

The Field Institute Insider

January 2017

Scientific Magazine of the McDowell Sonoran Conservancy

Feature Article

Helping the wildlife roam

Also inside:
A green belt for Maricopa County
The search for the Preserve’s large mammals
Meet our new scientific advisor
Virtual reality that isn’t the future
Tracking the phenophases of Preserve plants
Acoustic ecology will help to sustain the Preserve
Assign researchers in the Preserve

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And now, some project status reports
First Up, Phenology
Melanie Tluczek
Steward Class 33
Assistant Director
Field Institute
McDowell Sonoran Conservancy Phenology Report Highlights
What is phenology?

The study of the timing of plant and animal seasonal and cyclical changes, such as migration, germination, flowering and fruiting.
Why phenology?

Provides information about environmental changes due to climate or other factors

Provides early warning signs of mismatches between animals and their resources

Science for everyone!
Field Institute phenology goals

Track phenology of species:

Iconic Sonoran Desert species
Used by numerous wildlife species
Pollinator plants
Symbiotic relationship with other species
Being studied in other areas of the southwest
Species studied

Buckhorn Cholla
Saguaro
Jojoba
Species studied

Desert Senna

Soap Tree Yucca

Velvet Mesquite

© 2017 McDowell Sonoran Conservancy Field Institute
Site Visits by month 2017
Phenology records

Records by species, McDowell Sonoran Conservancy Phenology Trails, 2017

Common Name
- buck-horn cholla
- Coues' cassia
- jojoba
- saguaro
- soaptree yucca
- velvet mesquite

1,420
2,202
852
2,299
1,178
2,543
Saguaro

Saguaro/Flowers or flower buds
Saguaro/Open flowers
Saguaro/Fruits
Saguaro/Ripe fruits
Saguaro/Recent fruit or seed drop

USA National Phenology Network, www.usaphn.org

© 2017 McDowell Sonoran Conservancy Field Institute
Velvet Mesquite

© 2017 McDowell Sonoran Conservancy Field Institute
Desert Senna
The even bigger picture

Spring is advancing in three of every 4 national parks

Early springs, late season freezes may become new normal

Nature’s Notebook Observations help to manage invasive Buffelgrass

Future springs may arrive three weeks early across the US

Increasing winter temperatures and rainfall cause shifts in phenology in four California species
Mckenzie Meeker
Levi Wittrock

Scottsdale Community College
School of Life Sciences
Urbanization's effects on jojoba (Simmondsia chinensis) phenology

Mckenzie Meeker¹, Niousha Aramimehr¹, Shiva Senemar¹, and Levi Wittrock¹

¹Department of Life Sciences, Scottsdale Community College, Scottsdale, AZ 85256-2626, USA
Goals

1. To understand how plants react to changes in their local environment
2. To compare phenology of jojoba plants in urbanized and non-urbanized environments
3. To understand if urbanization can predict a shift of plant phenology
Methods

Phenology record were extracted for jojoba plants in **non-urbanized** settings in the McDowell Mountain Preserve and **urbanized** settings in Tucson
Scottsdale, AZ

McDowell Sonoran Preserve (MSP) and vicinity
- Brown’s Ranch, Jane Rau Nature Trail
- Pinnacle Peak Park Nature Trail
- Lost Dog Kovach Nature Trail
- Gateway, Bajada Nature Trail

MSP and vicinity sites are all located in non-urbanized environments meaning they do not receive manual water and/or nutrients.
Geographic Comparison – MSP Sites

Brown’s Ranch
Jane Rau
Pinnacle Peak
Gateway
Lost Dog

© 2017 McDowell Sonoran Conservancy Field Institute
Tucson, AZ

Tucson
• Desert Botanical Garden
• Tucson Biosphere Garden Phenology Walk
• Pima Community College Northwest
• Joseph Wood Krutch Garden

Tucson sites are all located in urbanized environments meaning they receive manual water and/or nutrients.
Geographic Comparison – Tucson Sites

Pima C.C. to JWKG at U of A

Biosphere Phenology Walk

Botanicle Gardens
Scottsdale and Tucson
Geographic Comparison
Climate – Scottsdale vs. Tucson

<table>
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<tr>
<th>Annual Avg. 2016</th>
<th>Scottsdale, AZ (MSP)</th>
<th>Tucson, AZ</th>
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</thead>
<tbody>
<tr>
<td>Rainfall (in.)</td>
<td>10.73</td>
<td>12.15</td>
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<tr>
<td>Avg. July High (°F)</td>
<td>109.4</td>
<td>107.6</td>
</tr>
<tr>
<td>Avg. Jan. Low (°F)</td>
<td>35.6</td>
<td>30.2</td>
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<tr>
<td>Elevation (ft.)</td>
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<td>2,512</td>
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Results – Young Leaves

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<th>3</th>
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<td>101-1,000</td>
<td>1,001-10,000</td>
<td>&gt;10,000</td>
</tr>
</tbody>
</table>

Young Leaves at MSP

Young Leaves in Tucson
Results – Fruits

Fruits at MSP

Week
1 2 3 4 5
8 6 4 2

Fruits in Tucson

Week
1 2 3 4
8 6 4 2

<table>
<thead>
<tr>
<th>Intensity</th>
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</tbody>
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Discussion

Greater intensity of young leaves and fruits in non-urbanized environments
  – Urbanized environments can predict a lesser intensity of young leaves and fruit

Greater variation of young leaf intensity in non-urbanized settings
  – Greater prevalence of large mammals consuming foliage

Greater variation of fruit intensity in urbanized settings
  – Greater prevalence of rodents like the bailey’s pocket mouse consuming fruits
Acknowledgements

We would like to thank...

– Scottsdale Community College, Department of Life Sciences
– McDowell Sonoran Field Institute
– Dr. Helen Rowe
– Melanie Tluczek
– Leona Weinstein
– Sabrina Jones
– Dr. John Weser
– Dr. John Nagy
References


Next, Corridor Viability
Project: Corridor Viability

Ralph Lipfert
Team lead
Steward, Class 42
Certified Citizen
Scientist
Project Purpose

Assemble enough data to accurately estimate the population and distribution of selected mammal species in the Gooseneck area of the Preserve
Project: Corridor Viability

Science Advisor
Dr. Jan Schipper
Research Fellow, ASU
The Preserve
McDowell Gooseneck Corridor
Proposed study site for survey of mammals (camera-trapping), evaluating connectivity of Browns Ranch and Toms Thumb/McDowell management units.
Current Gooseneck camera locations
DOS not dead!

Three DOS programs are used to transform the meta data on the pictures into the analysis ready data.
Collared Deer Movements

32 deer collared Feb. 2016

6 “replacements” collared in Feb 2017

Data from collars downloaded approximately every six weeks

Collars drop off in Feb 2018, will be recovered
Where do we stand now?

10 more cameras arrived, installation being planned

“Practice” file containing over 3,000 useful images successfully run through process

Practice file not statistically adequate but shows that we know how to do the process

Entire project will take about two years
Now it’s time for a short break
Effects of Weather Variation on Butterfly Populations in the McDowell Sonoran Preserve

Iztel B. Claire, Helen Rizahi, Evey Adkins, Destiny R. Lekty, and Corey Lycopolus

Department of Life Sciences, Scottsdale Community College

Abstract
Throughout the years, environmental change has affected the diversity variation and population dynamics of many species. Butterflies are known for their quick response to climate and habitat change which makes them great environmental indicators (Gates, 2004). They are useful when trying to predict the impact that climate changes have on habitats, biodiversity and organisms in general (Plowright, 2012). Investigating the factors that affect population dynamics among species is extremely important and it is of interest when trying to protect sensitive species (Coulter et al., 2004). Therefore, if there has been any significant increase or decline in butterfly population in the McDowell Sonoran Preserve, we compared years of butterfly count data from three different sites: Sabino Canyon, Boyce Thompson Arboretum, and the Preserves itself. We then compared our results to weather data, to try to better understand the changes in potential contributors to variation population dynamics of butterfly species in the McDowell Sonoran Preserve. Here we show there is no evidence of a significant change in the number of butterflies observed in any of the three sites for these families over time, except for the Papilionidae family at Sabino Canyon, for which we found strong evidence of an increase in their population over time. In addition, there is no evidence of a significant change in the taxonomic diversity of butterflies observed for the three sites, except for the Papilionidae family, for which we found strong evidence of an increase in its population over time. In addition, there is no evidence of a significant change in the taxonomic diversity of butterflies observed for the three sites, except for the Papilionidae family, for which we found strong evidence of an increase in its population over time.

1. The Papilionidae family shows trend of potential increase in abundance at Sabino Canyon (Figures 1 & 2), with a significant increase in male butterflies observed at that site (p-value of 0.000056 vs self-data quality of 0.000002).
2. There are more butterflies from the Papilionidae family at Sabino Canyon than there are in the other two sites (ANOVA, p-value of 0.000025 vs self-data quality of 0.000031).
3. Buckeyes, sorrel, and monarch butterflies were determined to be considered sensitive on the McDowell Sonoran Preserve, based on the three common hostplants: Texas lead, subulata, and Arizona swallow-wort.

Main Results

Discussion
There was a lot of climate, environment, or threatened species, but we found that the Preserves site itself is where the butterflies were observed to increase in abundance. This increase is likely due to the increase in the number of butterflies observed at Sabino Canyon, which is the only site where the butterflies were observed to increase significantly. This increase is likely due to the increase in the number of butterflies observed at Sabino Canyon, which is the only site where the butterflies were observed to increase significantly. Other factors that might have contributed to the increase in the number of butterflies observed at Sabino Canyon include the availability of food sources, the presence of predators, and the presence of other butterflies.

Methods

- The dataset includes data from the McDowell Sonoran Preserve and the Boyce Thompson Arboretum, both in Scottsdale, Arizona, from 2007 to 2015.
- The butterfly species were identified using a combination of morphological and molecular methods.
- The data were analyzed using a combination of descriptive and inferential statistical methods.

Acknowledgments

- Dr. Helen Rizahi from the McDowell Sonoran Preserve Field Institute.
- SIO Department of Life Sciences, ASU Department of Life Sciences, and Sonoran Loewi.
- Central Arizona butterfly Association, Mary Kleinik, Southeast Arizona butterfly Association.

References


Works Cited

McDowell Sonoran Conservancy Field Institute Update
May 2017
Next, Water resources
Project: Water Resources

Brian E. Munson, BCES
Team lead
Steward, Class 49
Certified Citizen Scientist
McDowell Sonoran Preserve

Ground Water Investigation
Why This?

Preserve surrounded by many registered wells

Groundwater reserves have met critical levels

Population and development have increased

Prolonged drought

Concern that groundwater withdrawals in surrounding areas could impact Preserve resources
Research Goals

Identify relevant GWSI wells
Examine water supply trends
Assess potential impacts of withdrawals
Identify potential monitor wells on the preserve
FIGURE 4.—Distinction between phreatophytes (A) and xerophytes (B) shown by their occurrence in relation to the water table.
Scottsdale Water Supply History

1963 - Arizona v California - upheld Arizona’s right to 2.8 million acre feet of Colorado River Water

1968 - Congress authorized the Central Arizona Project (CAP)

Prior to 1980, 100% Scottsdale water from groundwater wells
Scottsdale Water Supply History

Prior to 1980, US Department of Interior demanded that Arizona enact tough groundwater laws prior to funding the CAP

1980 - passage of the Groundwater Management Act - goal of safe yield by 2025
Scottsdale’s Recent Success

Today - groundwater provides <10% of Scottsdale’s water supply; Scottsdale achieved safe yield by 2006
Scottsdale’s Recent Success

Scottsdale (since the late 1990’s) actively supplements groundwater supply to create reserves in the event of CAP shortages

– Treatment and injection of treated wastewater into vadose zone
– Treatment and injection of treated CAP water into dual use production and injection wells (ASR)
Use this application to find well registry numbers, owner information, associated water rights, & pumping data.

Search by registry number, owner name, cadastral (township & range), basin or subbasin.

Search for wells with an interactive map by address, buffer or polygon.

Search Wizard  Map

User's Guide

Looking for water levels? Click here.
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<tr>
<th>Local ID</th>
<th>Site ID</th>
<th>Registry ID Latitude NAD27</th>
<th>Longitude NAD27</th>
<th>Alt. (ft amsl)</th>
<th>Water Use</th>
<th>Well Depth (ft)</th>
<th>Case Dia. (in)</th>
<th>Drill Date</th>
<th>Latest WL Date</th>
<th>DTW (ft)</th>
<th>WL Elev. (ft)</th>
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<td>626829</td>
<td>111°54’27.3”</td>
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<td>18</td>
<td>12/9/1979</td>
<td>11/30/2016</td>
<td>364.2</td>
<td>1136.8</td>
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</table>

**Graph: Depth to Water feet bbls vs Measurement Date**

- **GWSI** is ADWR’s technical database of well locations, construction data, and water levels.

Created on 12/10/2016
<table>
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<tr>
<th>Local ID</th>
<th>Site ID</th>
<th>Registry ID Latitude NAD27</th>
<th>Longitude NAD27</th>
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<th>Water Use</th>
<th>Well Depth (ft)</th>
<th>Case Dia. (in)</th>
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<th>Latest WL Date</th>
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<th>WL Elv. (ft)</th>
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<td>629249</td>
<td>33° 34' 36.9&quot;</td>
<td>111° 50' 20.0&quot;</td>
<td>1421</td>
<td>PUBLIC SUPPLY</td>
<td>890</td>
<td>16</td>
<td>12/1/1972</td>
<td>11/30/2016</td>
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**Graph Description:**
- **Depth to Water feet bsl**
  - Measurement Dates:
    - 3/8/1971
    - 2/18/1982
    - 1/31/1993
    - 1/14/2004
    - 12/27/2014
  - Water Level Levels:
    - ○ Water Level
    - ● Water Level with Remark

**Note:** GWIS is ADWR's technical database of well locations, construction data, and water levels.
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<th>Longitude NAD827</th>
<th>Alt. (ft above)</th>
<th>Water Use</th>
<th>Well Depth (ft)</th>
<th>Case Dia. (in)</th>
<th>Drill Date</th>
<th>Latest WL Date</th>
<th>DTW (ft)</th>
<th>WL Elev. (ft)</th>
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<td>33939111433101</td>
<td>33° 36' 38.6&quot;</td>
<td>111° 43' 30.5&quot;</td>
<td>PUBLIC SUPPLY</td>
<td>735</td>
<td>20</td>
<td>10/18/1971</td>
<td>12/16/2015</td>
<td>319.3</td>
<td>1354.7</td>
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</table>

Graph shows a trend of depth to water levels over time. The graph includes markers for water levels and dates. The vertical axis represents depth in feet, while the horizontal axis represents measurement dates. The graph suggests changes in water level over the years, with peaks and troughs indicating variations in water supply.
Summary

Water levels early decline prior to 1980’s
  – Increase depth
  – Ground subsidence
Scottsdale acceptance of CAP water
  – Reduced demand on groundwater supply
  – Groundwater resources supplemented

Recent water levels appear to be increasing
Summary

No apparent issues of immediate concern
Likely minimal communication
Greater concern likely with prolonged drought
Most immediate impacts on water-sensitive species
NEXT STEPS

Continue investigation on subsurface geology of McDowells and Brown’s Ranch (verify suspected lack of communication)

Locate wells on Preserve for future monitoring

Investigate potential for using phreatophyta as indicator of water-related ecosystem health
# Phreatophytes

By T. W. Robinson

**GEOLOGICAL SURVEY WATER-SUPPLY PAPER 1423**

---

**TABLE 1.—Phreatophytes in Western United States**

<table>
<thead>
<tr>
<th>Scientific name</th>
<th>Common name</th>
<th>Occurrence and phreatophyte</th>
<th>Depth to water below land surface (feet)</th>
<th>Use (area)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atriplex canescens</td>
<td>Senna, desertl.</td>
<td>Southern California to Arizona.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alkali crenulata</td>
<td>Camelthorn, Arizona</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allaria prostrata</td>
<td>Pickleweed, Idaho- Utah, western Nevada.</td>
<td>California to western Texas.</td>
<td>1-0</td>
<td>Uses more water than mesquite (McGilton and Arnold, 1961, p. 231). Tolerates alkali along streams and washes. Occurs along streams, other borders land, and other wet areas. The use of 3.5 ft. (Sherer and others 1965, p. 211) was for the period May to October 1956 in the Colorado River, latitude 3.61 ft., San Bernardino Mountains, Calif., where water constituted 62 percent of the vegetation.</td>
<td></td>
</tr>
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</table>
The End
Questions?

watermonitor@mcdowellsonoran.org
Next, 2C Restoration
Project: 2C Restoration

Lisa Rivera
Team lead
Steward, Class 59
Certified Citizen Scientist
Phase 2C Closed Trail Restoration Study
Why is restoration important?

Ecological restoration combats habitat degradation and fragmentation

Increases plant diversity

Preserve ordinance requires degraded lands in Preserve be restored

Photo credit: Lisa Rivera
Need for Study

Currently, closed trails mechanically ripped, covered with large pieces of vegetation litter to deter use by humans.

We do not know if this is most successful, quickest method to restore degraded lands to natural condition.

Photo credit: Lisa Rivera
Purpose of the study

Created by Dr. Helen Rowe, Director of the McDowell Sonoran Conservancy Field Institute

Test various ecological restoration techniques on trails that have been closed
Purpose of the study

Through results, develop best practices & methods for restoring trails, old roads, degraded areas with soil compaction

Study results relevant to regional land managers (The Central Arizona Conservation Alliance identified improving restoration best practices as high priority)
Research questions

Does soil ripping improve establishment of native plant community? And establishment from seed mixes?

Does establishment of seed differ when seed mixes are applied before monsoon vs winter rains?

How does purchased seed mix compare with local topsoil in establishing diverse native plant communities?
Study design/methods

10 transect sites with 8 quadrats/plots at each site

4 plots in control (non-ripped) portion of closed trail

4 plots in ripped portion of closed trail

Photo credits: Leona Weinstein
Soil ripping

Decreases bulk density
Improves water infiltration
Better plant growth
Could disturb soil symbionts (microbial/fungal health of the soil)
Study design/methods

Four ecological restoration methods tested at each site

- Seed mix applied before summer monsoons
- Seed mix applied before winter rains
- Application of local topsoil collected from under nearby plants
- No treatment applied (control)

Photo credit: Lisa Rivera
Location of study

North-central area of Preserve, “2C” area
North of Cholla, Granite Mountains; south of Tonto NF
Red stars approximate locations of sites
Creation of 10 transect sites

Completed Spring 2016

At each transect, set up eight 0.5 x 1 meter test quadrats/plots surrounded by 1 x 1.5 meter buffer quadrat/plot

Baseline plant data collected in non-ripped plots

Photo credit: Leona Weinstein
Seed selection

Native seed species were chosen by Field Institute

Purchased in bulk by City of Scottsdale in July 2016

Challenging search for suitable vendor

Photo credit: Lisa Rivera
Seed selection

A few seed varieties excluded due to purity concerns after being examined by botanist Steve Jones

Seeds precisely weighed to create 40+ duplicate seed packets with 10 species
Seed species

Mexican Gold Poppy
(*Eschscholzia californica mexicana*)

Fairy duster
(*Calliandra eriophylla*)

Photo credit: Patrick Alexander, courtesy of SEINet
(Southwest Education and Information Network)

Photo credit: Karen Wellner, courtesy of SEINet
(Southwest Education and Information Network)
Seed species

Paper flower

(*Psilostrophe cooperi*)

Photo credit: Liz Makings, courtesy of SEINet
(Southwest Education and Information Network)

Desert Senna

(*Senna covesii*)

Photo credit: Sue D. Carnahan, courtesy of SEINet
(Southwest Education and Information Network)
Seed species

Tanglehead
(Heteropogon contortus)

Purple Threeawn
(Aristida purpurea)

Photo credit: Sue Carnahan, courtesy of SEINet
(Southwest Education and Information Network)

Photo credit: Max Licher, courtesy of SEINet
(Southwest Education and Information Network)
Seed Species

Squirrel tail
*(Elymus elymoides)*

Photo credit: Max Licher, courtesy of SEINet (Southwest Education and Information Network)

Chia
*(Salvia columbariae)*

Photo credit: Patrick Alexander, courtesy of SEINet (Southwest Education and Information Network)
Seed species

Desert marigold
(Baileya multiradiata)

Globemallow
(Sphaeralcea ambigua)

Photo credit: Max Licher, courtesy of SEINet
(Southwest Education and Information Network)

Photo credit: Lisa Rivera
Summer seed treatment

In July 2016, planted seeds from seed packets in one plot on ripped and non-ripped areas at each transect site.

Photo credit: Debbie Langenfeld
Winter seed treatment

In Nov 2016, planted seeds from our seed packets in one plot on the ripped and non-ripped areas at each transect site.

Photo credit: Debbie Langenfeld
Seed bank treatment

Nov. 2016, topsoil was collected from the base of many different plant species near each transect site.

All of collected topsoil was combined at central location and thoroughly mixed.

Photo credit: Debbie Langenfeld
Seed bank treatment

Equal amounts of soil and two cholla balls were placed in one plot on the ripped and non-ripped areas at each transect site.
Seed bank treatment (control)

Some seed bank soil being grown in control environment at Scottsdale Community College greenhouse

Plant growth monitored by students

Provides clearer understanding of which seed species are present in the seed bank soil

Photo credits: Clayton Grubb
Spring 2017 data collection

Originally planned for February, but postponed until mid March to allow for more plant growth

March 2

March 20

Photo credit: Bill Soule

Photo credit: Leona Weinstein
Spring 2017 field work

Visited each of 10 transect sites to collect data

Worked in teams consisting of botanist and 1-3 citizen scientists

Collected all data in 4 work days from Mar 13-20

Photo credit: Debbie Langenfeld
Data collection: seedling counts

Counted number of seedlings of each seed species in all plots, not just ones receiving summer and winter treatments.

Data will help determine if seedlings were result of planted seeds or naturally occurring seeds from area.

Photo credit: Debbie Langenfeld
Number of seedlings by species and treatment
Total number of seedlings by seed and rip treatments
Seedling richness by seed and rip treatment
Data collection: coverage

Recorded species and percent cover of plants growing in study plots. Also recorded percent cover of bare ground, litter, gravel, stones, and soil crust.

Photo credit: Debbie Langenfeld
Native plant % cover by rip treatment

![Graph showing native plant cover by rip treatment for different treatments and years.](image)
Native plant % cover by seed and rip treatment
Native richness of plant % cover by seed and rip treatment
Summary of data analysis

Four seed species have not established seedlings (at least not yet)

The Winter Seed plots had the highest number of seedlings

3 non-native species have grown in the study plots (red brome, hairy burstwort, and *Schismus barbatus*)
Summary of data analysis

Ripped plots had overall higher amount of plant cover

Perennials appear to grow better in ripped plots

Overall, native richness of plant species greater in non-ripped plots than ripped plots

Most exciting: The high native species richness in non-ripped Seed Bank plots rivaled non-ripped Winter Seed plots
Also...new species was found!

On last day of data collection, botanist Steve Jones noticed tiny *Linanthus bigelovii* seedling at edge of one quadrat.

Plant is native to Sonoran Desert.

All signs point to plant originating in Preserve, and not result of contaminant in seed mix planted.

Photo credit: Max Licher, courtesy of SEINet (Southwest Education and Information Network)
What’s next?

Data will be collected this October to gather more information on plant growth and diversity.

Data collection repeated in spring 2018 to monitor long-term results.

After 2 years, likely to be a break in data collection, with a return a few years later to collect longer-term results.

Photo credit: Leona Weinstein

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Questions?

Photo credit: Lisa Rivera

To sign up for Restoration project email updates, contact:

Lisa Rivera, Restoration Project Lead
restoration@mcdowellsonoran.org
Let’s take a look at the plan for the next 12 months...
The next 12 months...

Dr. Helen Rowe
Director, MSCFI
Steward, Class 54
Project research partners and national organizations

Wildlife: Scott Sprague, Jan Schipper, Garth Paine, Sharon Hall

Butterflies: Ron Rutowski, National Butterfly Association

Arthropods: Stevan Earl

Plant Phenology: National Phenology Network

Birds: Walter Thurber, Audubon

Herps: Dave Webber & Natalie Case

Bats: Marianne Moore, Russ Benford

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

Plants

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

Water resources

Wildlife
Monitoring is critical to inform adaptive management and ensure ongoing protection of Preserve in face of climate change, urbanization and other perturbations.
Our ongoing monitoring

– Phenology (NPN)
– Arthropods (CAP-LTER)
– Bird surveys (Audubon)
– Butterfly Counts – Spring and Fall (NABA)
– Bat monitoring at Dixie Mine, maternity roost
– Surface water maps and monitoring on preserve (and weather stations)
– Investigating wells on the preserve for groundwater monitoring
– Amphibian monitoring
Priority 2: Improve best management practices in ecological restoration and control of invasive non-native plant species for the Sonoran Desert and other arid lands.

Nonnative plant monitoring & removal

Restoration

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Closed trail restoration project
Fountain grass & Buffelgrass

Dispersed removals

Mapping
Mule Deer Collar Project

Two-year project

Collars fall of in February 2018!
Camera trapping with acoustic ecology
Jr. Citizen Science Festival

Fall and Spring
2-day events
Symposium February 2018

McDowell Sonoran Preserve Research Symposium
Planned for October 24-25

Please join us for the first-ever McDowell Sonoran Preserve Research Symposium

This two-day event brings together researchers, students, citizens, and community leaders to share and learn about the scientific and historical research conducted within Scottsdale’s McDowell Sonoran Preserve and the surrounding area. This event is hosted by the McDowell Sonoran Conservancy’s Field Institute and Scottsdale Community College’s Center for Native and Urban Wildlife.

Purpose:
- Promote awareness of the research being undertaken on the Preserve and Sonoran Desert.
- Encourage networking among scientists, students, and the public.
- Trigger new research and collaborations that benefit the Preserve and surrounding parks, preserves, and natural areas.

When:
- October 24, 8:00 am – 4:00 pm
- Presentations
- Posters
- Biodiversity tours
- October 25, 8:30 am – 12:00 pm
- Educational hikes to research sites in the Preserve
- Workshops and tours at Scottsdale Community College

Where:
Scottsdale Community College, 9000 E Chaparral Rd, Scottsdale, AZ 85256 in the Science Lecture Building.

Registration
Registration for the symposium is $20, which includes a Saturday continental breakfast, morning and afternoon refreshments (coffee & tea), and Sunday activities. A student rate of $10 is offered to undergraduate and graduate students. To register, go to www.mcdowellsonorans.org and find link under “Latest News”. For more information, to submit an abstract, or to inquire about scholarships, contact mspresearch@mcdowellsonorans.org.

Schedule
Scottsdale’s McDowell Sonoran Preserve Research Symposium

October 24-25 Scottsdale Community College, Science Lecture Building
9000 Chaparral Road, Scottsdale 85256

Saturday, October 24
8:00 – 8:20: Sign-in and registration
8:20 – 8:30: Welcome and Introduction: Helen Rowe and John Wieser
8:30 – 9:00: Keynote Speaker: Virginia Korte, Scottsdale City Council

Oral Presentations:
9:00 – 9:15: Geologic History of the McDowell Mountains
9:15 – 9:30: Ghost Road
9:30 – 9:45: Vegetation and Flora of the McDowell Sonoran Preserve
10:00 – 10:20: Refreshment break – refreshments, posters, and tours

Oral Presentations (continued)
10:35 – 10:50: Ground Dwelling Arthropods in Scottsdale’s McDowell Sonoran Preserve: Results from a Three-Year Study
10:55 – 11:30: A Story of Survival at Brown’s Ranch: Re-vegetating With Tall Pits
11:15 – 11:30: A Survey of the Herpetofauna Occurring in Scottsdale’s McDowell Sonoran Preserve
11:55 – 12:10: McDowell Sonoran Conservancy Stewards: The Experience of “Place”: A Focus Group Pilot Study
12:15 – 1:00: Lunch and Center for Native and Urban Wildlife guided tours
1:00 – 2:00: Poster presentations
2:00 – 2:30: Keynote speaker: Sharon Hall, CAP UTER
2:30 – 3:45: Panel Discussion: The Future of Conservation in the Phoenix Valley
3:45 – 4:00: Closing

Sunday, October 25
8:30 – 12:00 Guided Hikes in Scottsdale’s McDowell Sonoran Preserve
- Marcus Landslide Hike – Bruce Gooden and Ron Rutowski
- Brown’s Ranch Hike – John Wieser and Len Macaroz
8:30 – 12:00 Scottsdale Community College Center for Native and Urban Wildlife workshops and tours
- Biscuit workshop
- Tours of propagation yard
- Yellow-collared workshop
- Tours of burrowing owl habitat

For information contact mspresearch@mcdowellsonorans.org

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Pending funding…

Next year new and expanded projects
Buffelgrass and Fountaingrass Removal Study

What is the most cost effective approach to:

a) Control buffelgrass and fountain grass

b) Protect native plant diversity
New and expanded projects

• Bat monitoring (expanded)
• Long term plant monitoring study group
• Restoration planning for native seed development
• Remove tamarisk at Dixie Mine (monitor community response)
Regional Partnership Building

Goal Two

Open Spaces are managed to conserve native biodiversity, preserving user experiences and socio-economic benefits connected with the Sonoran Desert.

Central Arizona Conservation Alliance
Regional Open Space Strategy
Questions?
McDowell Sonoran Conservancy
Field Institute Update
May 2017
Some closing remarks from Melanie...
And then cupcakes!