

Surface Water and Drought Impacts Monitoring on County Lands



Brian Powell
Pima County Office of Sustainability and Conservation

Sonoran Desert Conservation Plan



A long term vision for protecting the heritage and natural resources of the west

What is the MSCP?

- MSCP: Multi-species Conservation Plan
- Permit under the Endangered Species Act (Issued by U.S. Fish and Wildlife Service)
- MSCP must anticipate and account for impacts to affected species
- Species-centric plan



SDCP and the MSCP

What's the connection?

SDCP is the Vision



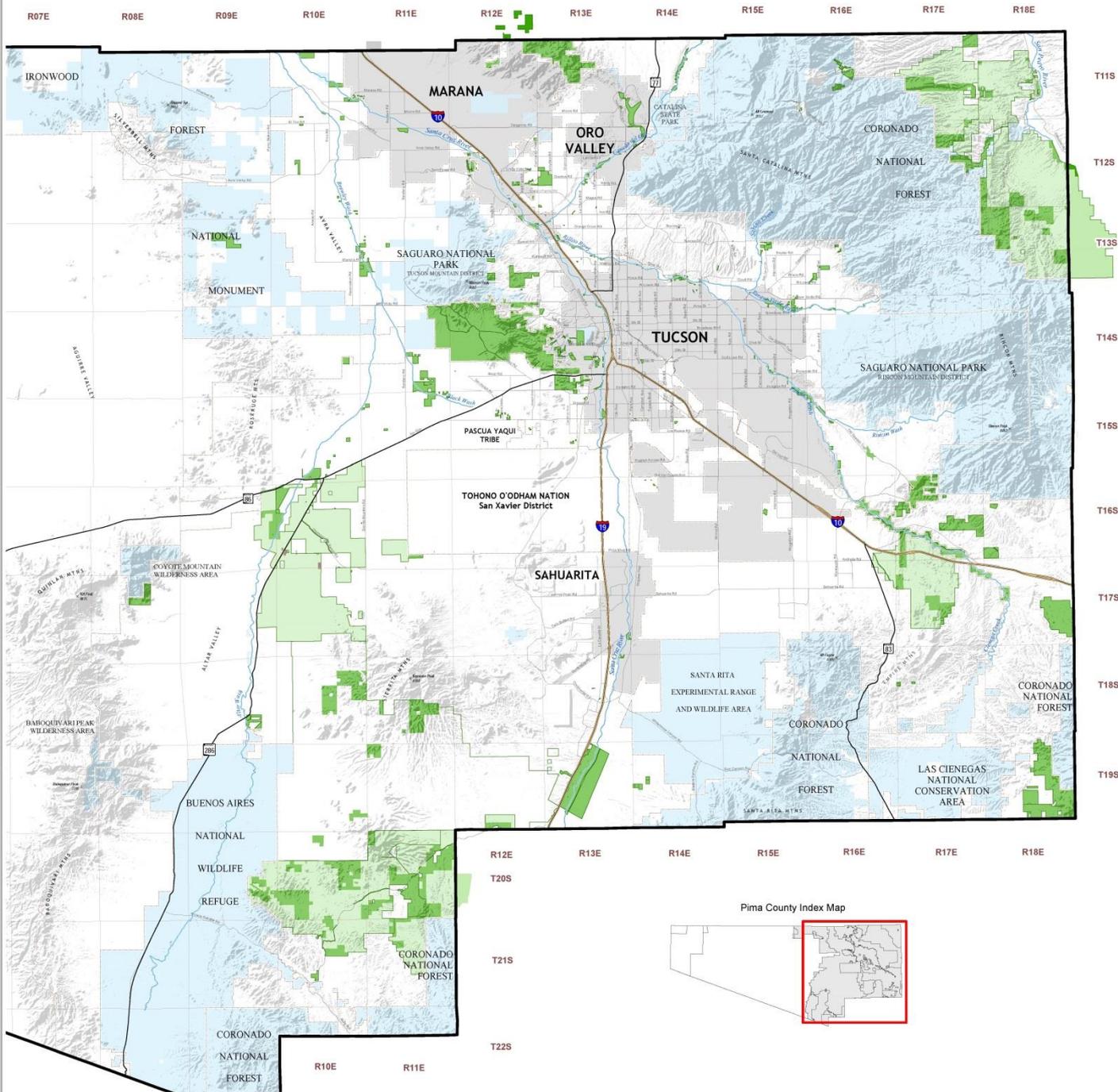
✦ Timeline:

- No termination date for SDCP;
- MSCP is limited to 30-year term

Pima County's MSCP

- Permit coverage for 44 species
- Mitigation is well underway through land purchase and lease
- Public comment period for EIS is complete and permit issuance likely in early 2015





Pima County Preserves

Lands Owned or Managed by Pima County for Open Space, Habitat, and Resource Protection

County Preserves

- Fee Land or Conservation Easement
- Grazing Lease
- Other Natural Preserve
- Incorporated Jurisdiction
- Administrative Boundary

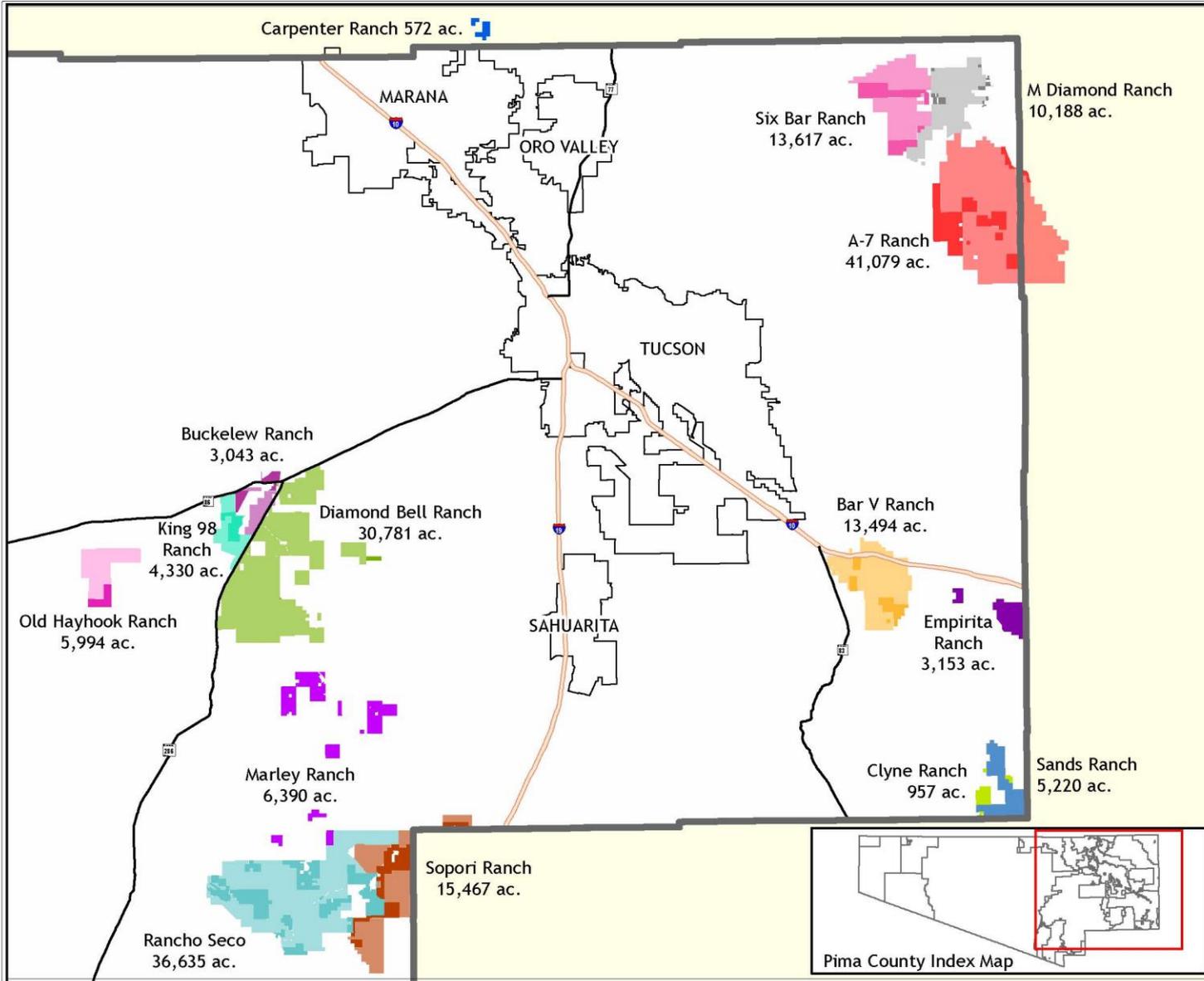


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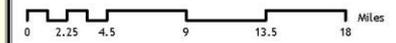


GEOGRAPHIC INFORMATION SYSTEMS
 Pima County Information Technology Dept.
 201 North Stone Avenue - 9th Floor
 Tucson, Arizona 85701-1207
 (520)746-0670 • FAX (520)768-3429



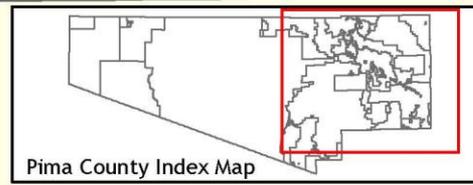


- Incorporated Area
- A-7 Ranch
- Bar V Ranch
- Buckelew Ranch
- Clyne Ranch
- Diamond Bell Ranch
- Empirita Ranch
- King 98 Ranch
- Marley Ranch
- Old Hayhook Ranch
- Rancho Seco
- Sands Ranch
- Six Bar Ranch
- Sopori Ranch
- M Diamond Ranch
- Carpenter Ranch



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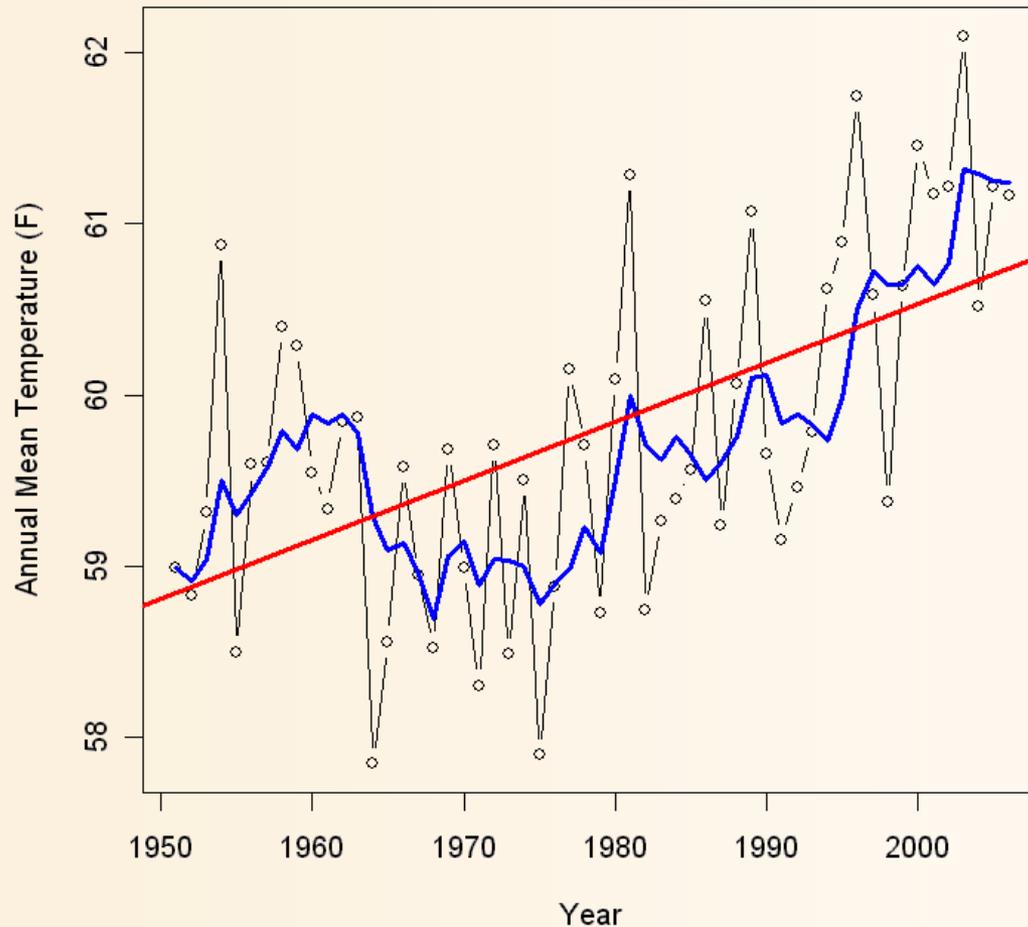


Water:
Habitat for
Key riparian
and aquatic
species

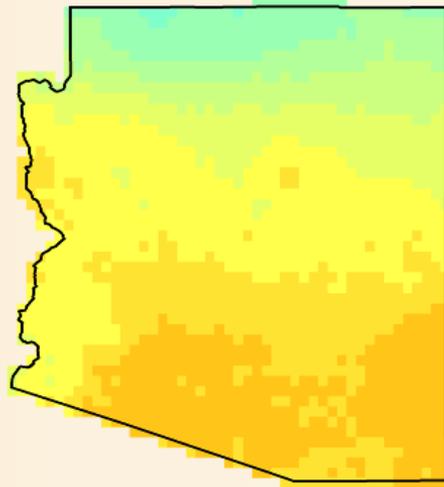


Average temperatures in Arizona rose twice as fast as the national average

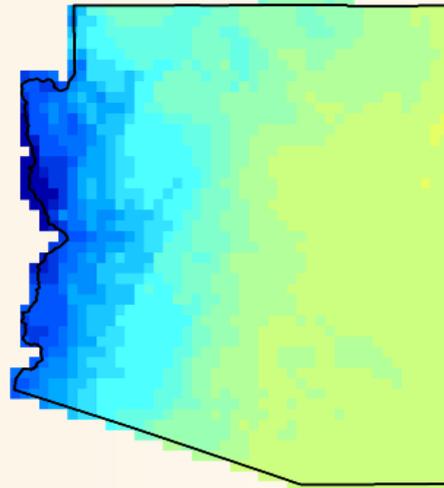
Change Rate = 0.034 F/yr, p-value = 1e-05, r-squared = 0.32



Changing Climate: Precipitation and Drought



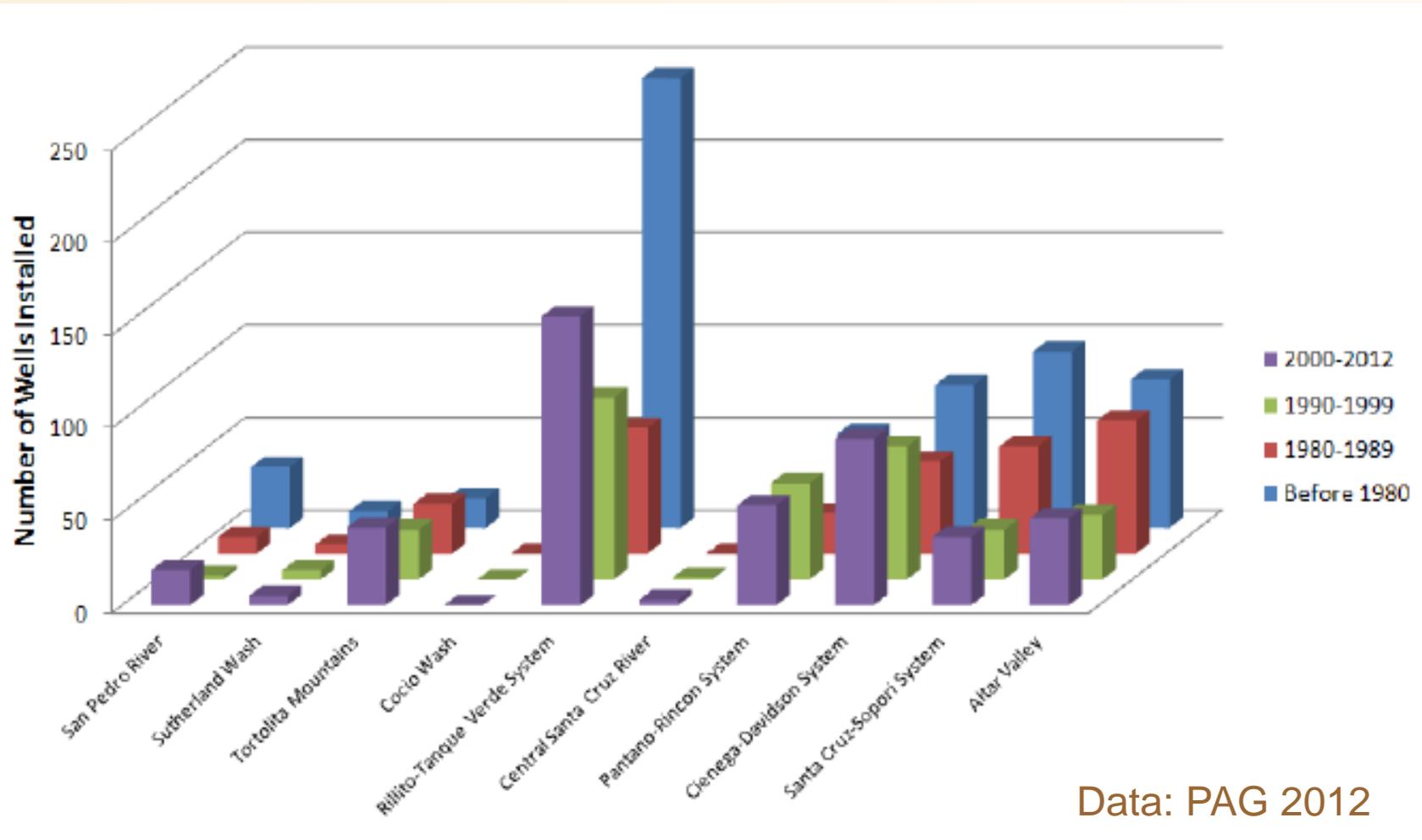
Winter



Summer

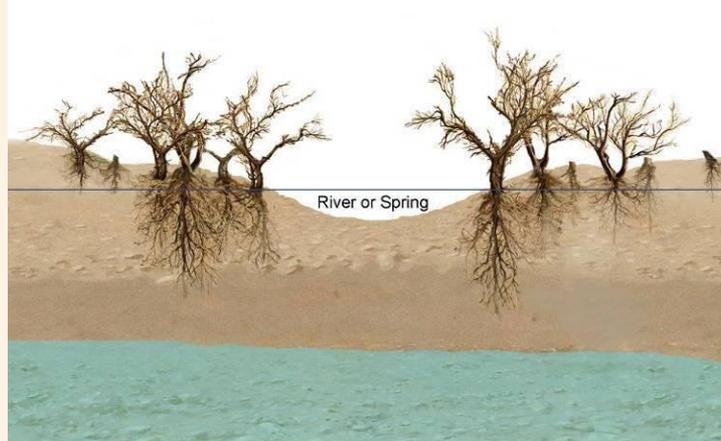
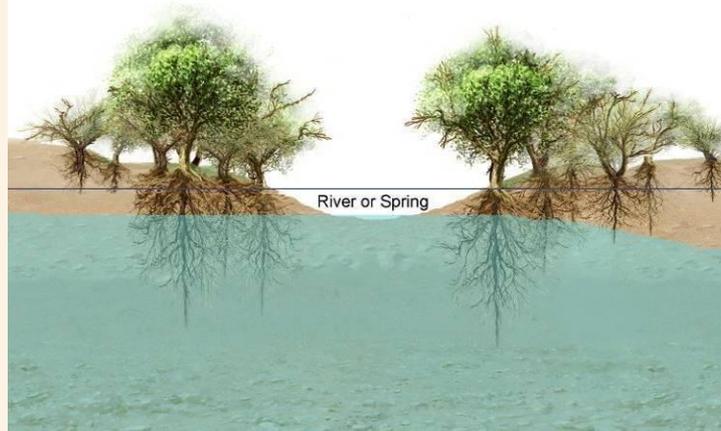
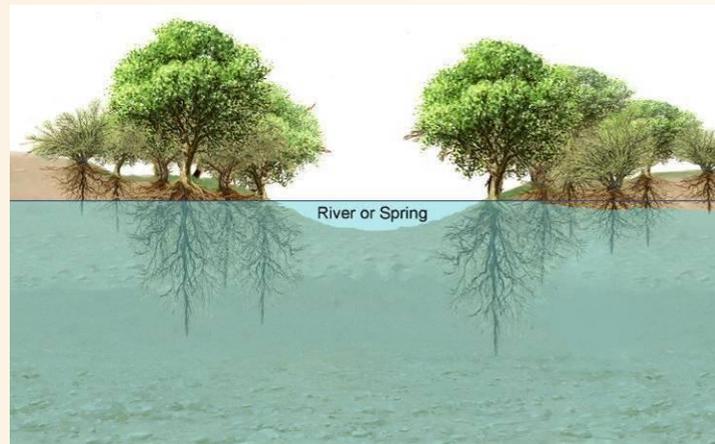


Number of Exempt Wells by Shallow Groundwater Area



Data: PAG 2012

Drought impacts on riparian areas



Aquatic Non-native Species: Threats to Native Diversity



Crayfish



American Bullfrog



Mosquitofish

MSCP Monitoring

- **Species:** Monitor 16 species (most are aquatic and riparian)
- **Habitat:** Water resources, vegetation
- **Threats:** Drought, invasive species, illegal roads
- **Landscape pattern:** Fragmentation, development



Streams

Springs



2013



2014

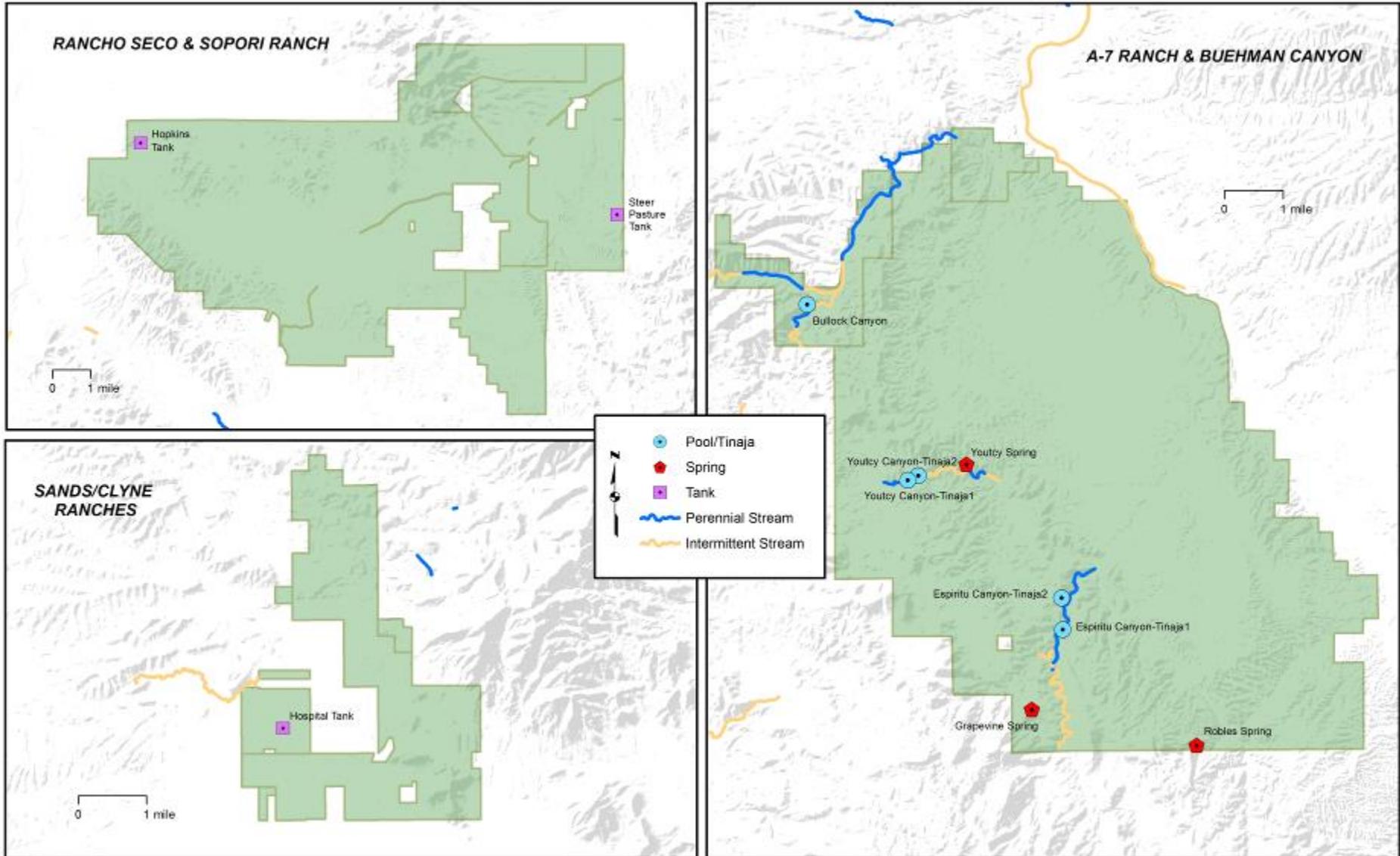


Stocktanks



Tinajas

Wet/Dry Mapping in June



Springs Stewardship Institute Website/Database

http://springsdata.org/

File Edit View Favorites Tools Help

Sun Rideshare (2) Suggested Sites Sun Rideshare Free Hotmail Google Capture Reference

Find: powe Previous Next Options

Springs
STEWARDSHIP INSTITUTE

MUSEUM of
NORTHERN
ARIZONA

Homepage

[Please Login](#)

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Springs and Springs-Dependent Species Online Database

Toward the goal of improving global springs stewardship, the Springs Stewardship Institute (SSI) has developed protocols to inventory and assess the ecological health and functionality of these fragile resources. A comprehensive evaluation requires a survey of geomorphology, soils, geology, solar radiation, flora, fauna, water quality, flow, georeferencing, and cultural resources, as well as a thorough assessment of the site's condition and risks to the ecosystem. The information we collect in each category is complex, and many of the data are interrelated. We designed a relational database that provides a framework for information compilation and analysis of biological, physical, and cultural relationships, many of which are poorly understood.

This online database offers a user-friendly interface to enter, retrieve, and analyze inventory data, making it accessible for landowners and managing agencies as well as researchers to improve the quality and integration of information about springs. Jeri Ledbetter, Larry Stevens, Abe Springer, and Marguerite Hendrie primarily contributed to the development of this database, with technical support from Benjamin Brandt. Funding has been provided from many sources, including Northern Arizona University, the Sky Island Alliance, The Christensen Fund, and the Bureau of Reclamation's WaterSMART program.

The database includes survey data collected or compiled by the Springs Stewardship Institute and its many collaborators. To access the database, create an account to acquire a user name and password. Access to the data requires permission of the land manager.

[Click here to download the tutorial for using the site.](#)

Springs Stewardship Institute Flagstaff, Arizona
contact Jeri Ledbetter at: jeri@springstewardship.org



Spring Assessments

Page 1 of 8 OBS _____

Spring Name Becky Spring Country _____ St/Prov AZ County PIMA

Access Directions _____

Georef Source _____ Datum NAD83 UTM Zone 12R Device Garmin Oregon 450

UTM E 536689 UTM N 3532909 Lat _____ Long _____

Elev 4150 ft EPE 27 feet or meters? Georef Comments don't know what 12R mean

Date 4-24-3 Begin Time 11:42am End Time _____

Surveyor's Names BRIAN POWELL, JULIA FONSECA

Code/Description	Area (m ²)	Surf Type	Sub-Type	Slope Var	Aspect	Slope Deg.	Soil moisture	Water dph (cm)	Substrate %								Precip %	Litter %	Wood %	Litter (cm)	Wet area		
									1	2	3	4	5	6	7	8	Org						
A																							

ite Description boxed spring w/ berm on top to divert water away from springhead, piped to cattle trough

Survey Notes 3 gpm acc to Basco today. This spring water is conveyed ds to a series of tanks at least as far as HQ + probably farther

Photo #	Description
<u>1</u>	<u>SPRING BOX</u>
<u>2</u>	<u>SPRING BOX + VEG</u>
<u>3</u>	<u>TANK VICINITY</u>

Photo Location _____

ite Map Location _____

mage Notes _____

unrise: D _____ J _____ N _____ F _____ O _____ M _____ S _____ A _____ A _____ M _____ J _____ J _____

unset: D _____ J _____ N _____ F _____ O _____ M _____ S _____ A _____ A _____ M _____ J _____ J _____

red by _____ Date _____ Checked by _____ Date _____

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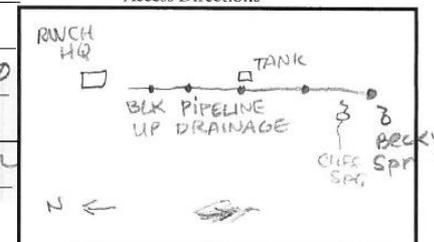


Figure 1. Concrete box around Becky Spring.



Figure 2. View of Becky Spring from the west.

Future Actions

- Continue June wet/dry mapping, flow at select sites
- Inventory new areas for springs and continue assessments
- Begin monitoring vegetation and vertebrates, possibly early 2015

