

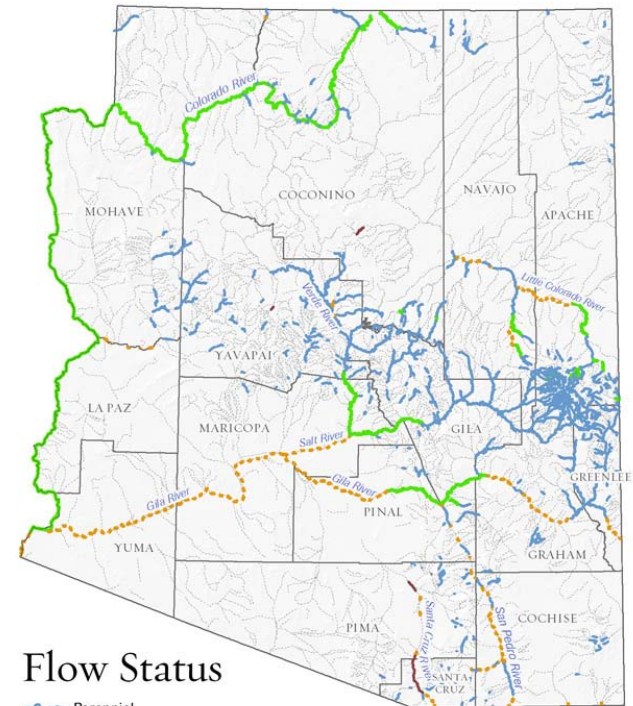
Borderlands Habitat Restoration Initiative



Site of historic cienega at confluence of
Harshaw Creek and Sonoita Creek



Temporal Canyon Wash
near Patagonia



Flow Status

- Perennial
- - - Formerly Perennial
- Regulated
- Effluent Dominated (May Be Formerly Perennial)
- Intermittent or Ephemeral

The Nature Conservancy
Protecting nature. Preserving life.™

Flow status data created from TNC Freshwater Assessment, available from azconservation.org



Pole weirs at The New Ranch
Springerville, Arizona



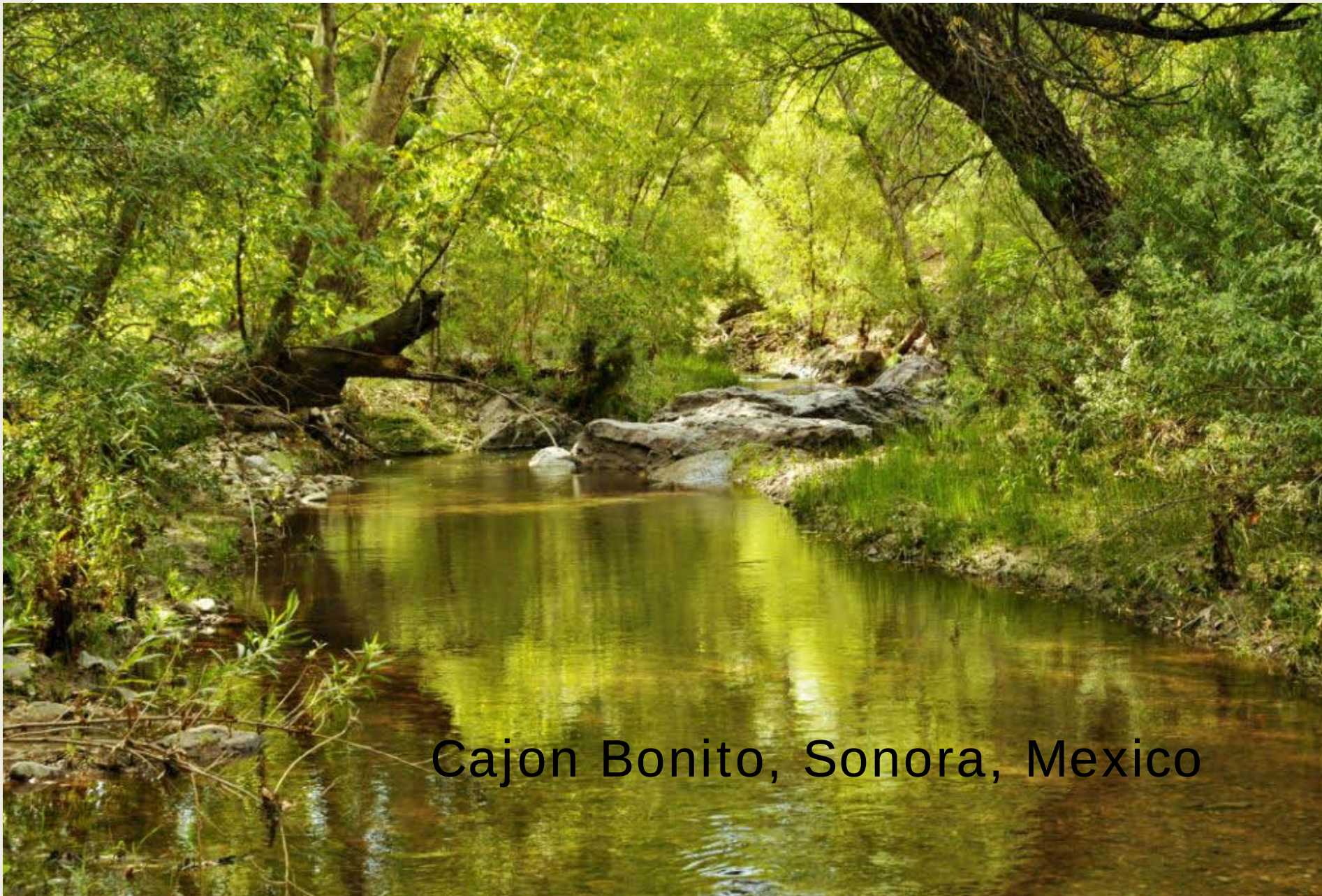
Rock basket gabions at San
Bernardino Ranch, Sonora

**Stream Restoration Technology:
slow the water down**



The Cuenca Los Ojos Foundation works to preserve and restore the biodiversity of the borderland region between the US and Mexico through land protection, habitat restoration and wildlife reintroduction.

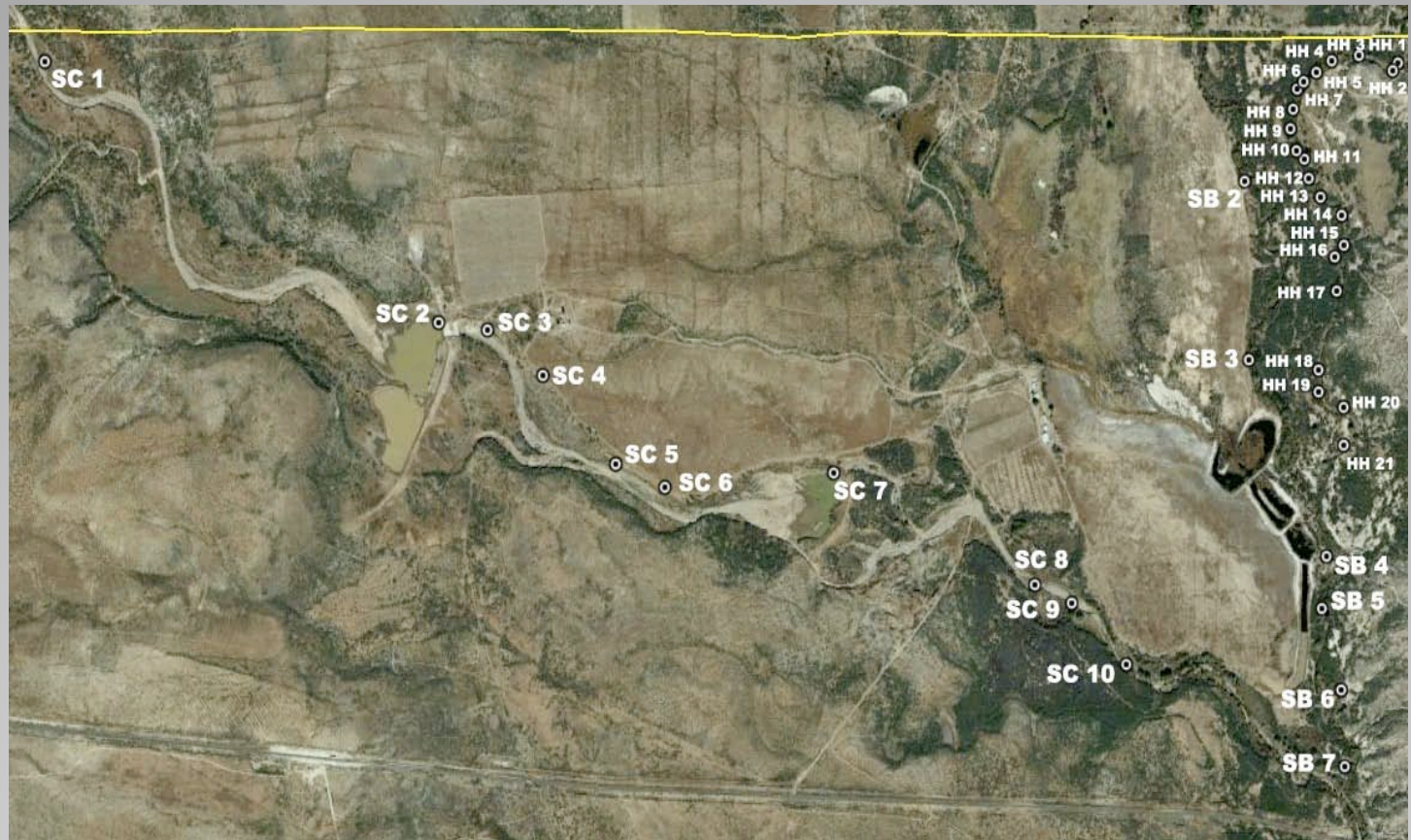




Cajon Bonito, Sonora, Mexico

Restoration Technology: Gabions





**Gabions at Rancho San Bernardino
What impact are they having?**

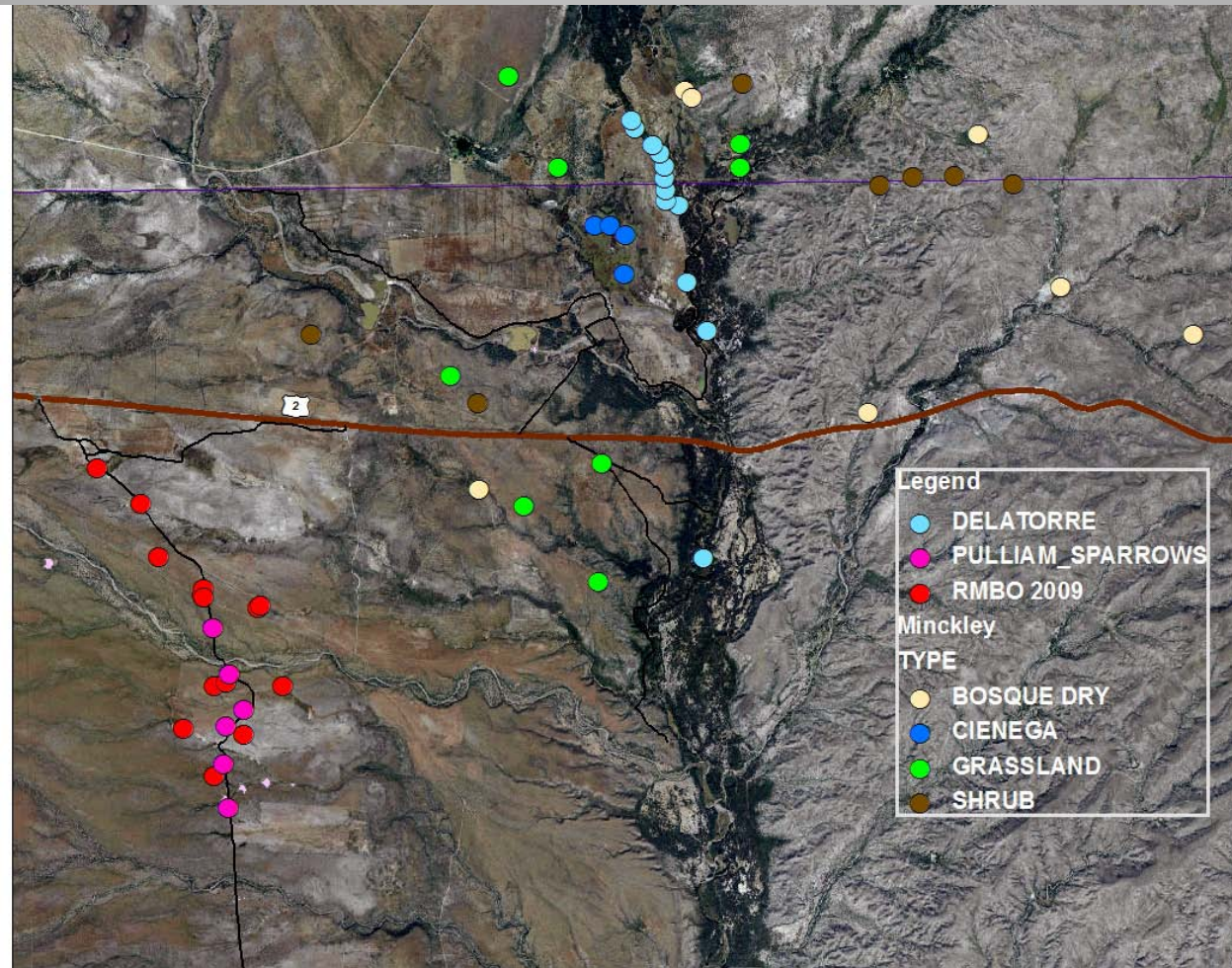


San Bernardino Ranch 2010-12 Field Work

- | | |
|------------------|-------------------------------|
| Cindy Tolle | - GIS and satellite imagery |
| Steve Delong | - hydrology and sedimentation |
| Susan Wethington | -hummingbird surveys |
| Bob Minckley | -bee and plant surveys |
| Ron Pulliam | -bird surveys |
| David Hodges | -site research history |

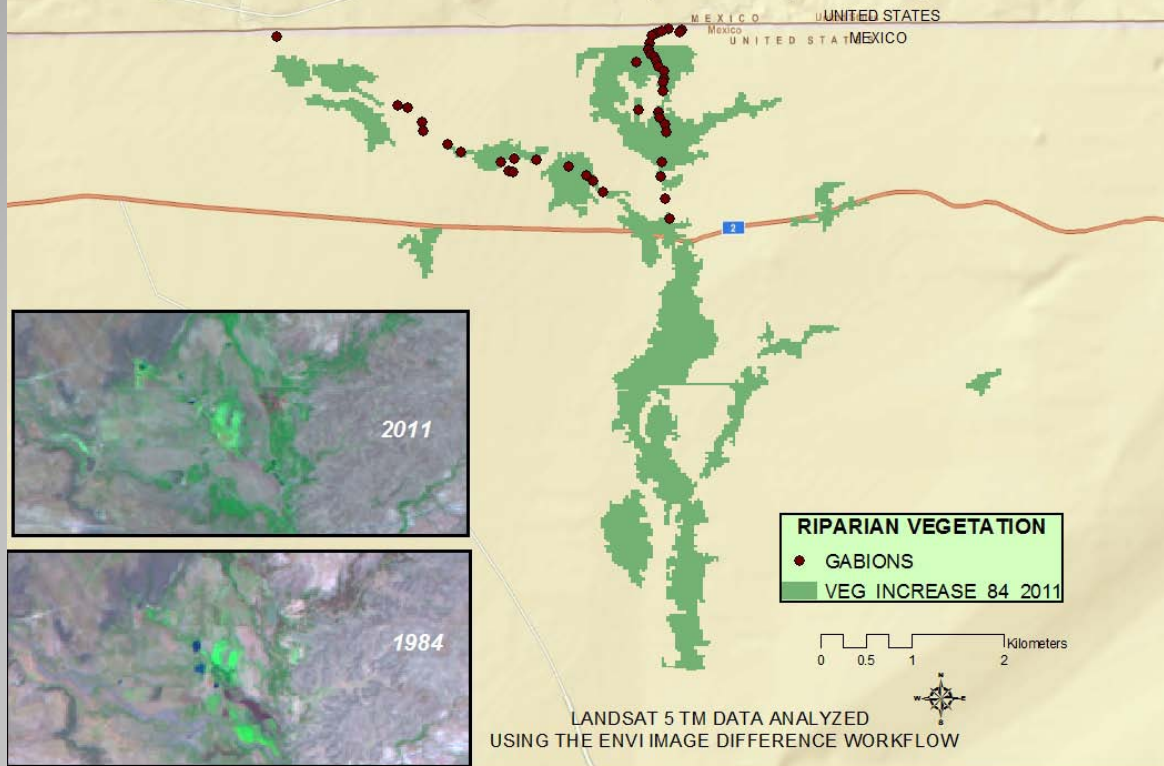
6 Undergraduate Student Interns
3 Graduate Student Assistants

Documenting Restoration Impacts at San Bernardino



Study Site Design

RIPARIAN VEGETATION INCREASE IN THE SAN BERNARDINO RANCH (SONORA, MEXICO) 1984-2011



- Increased Stream Flow
- Increase in Riparian Vegetation
- Increase in Cienega Acreage
- Increase in Vertebrate Populations

- Only partial understory recovery
- Gaps in nectar and fruit producing species
- Slow recovery of animal-dispersed plants

**Documentation of Restoration
Impacts: Partial Recovery**

Borderlands Habitat Restoration Initiative

- Restore hydrology and other physical drivers
 - focus on water and stream flow
- Identify Gaps and Restore Food Chain
 - focus on nectar and fruit-producing species at base of the food chain
- Reconnect People and Wildlife
 - involve local citizens in restoring ecosystem services in their own communities

Can we restore Sonoita Creek?



Site of historic cienega at confluence of
Harshaw Creek and Sonoita Creek

Plant-Hydrology Decoupling



Anisocanthus thurberi

Severe stream erosion has disconnected many plant populations from the stream bed. In such cases, populations may persist but not function to provide nectar and fruit to wildlife .

- Science and stakeholder meeting
- 2 Landowner/ stakeholder meetings
- Patagonia Public Form
- Propagation workshop (“Petey Mesquitey”)
- 2 “potting luck parties”
- 3 community pollinator gardens
- Radio interview, county fair, fall festival

Reconnect People and Wildlife

Sonoita Creek Pilot Project

Analysis Criteria and Species Recommendations

Criteria

Geographic Distribution
Elevational Distribution
Habitat Requirements
Use by Pollinators
Flowering Season
Ease of Cultivation

Zauschneria californica:
Recommendation;
suitable for pollinator
gardens but not
recommended for
introduction into
natural areas in
The Sonoita Creek
watershed





**Lobelia cardinalis –
Cardinalflower**



**Bouvardia ternifolia –
Firecrackerbush**



**Anisacanthus thurberi
– Thurber's Desert Honeysuckle**



**Epilobium canum
Hummingbird Trumpet**



**Fouquieria splendens
– Ocotillo**



**Penstemon barbatus
– Beardlip Penstemon**

Citizen Science:

- Learn to identify and propagate native plants*
- Identify and survey hummingbirds, butterflies, and other pollinators*
- Participate in monitoring plant survival, flowering phenology, nectar production, pollinator visitation, and seed set*



Ipomea hederacea (left) and ***Ipomea coccinea*** (right). Photos by Liz Bernays

Educating and Empowering Local Citizens to Protect Ecosystem Services



Visit our website

<http://resourceeasternsantacruzcounty.ning.com/group/borderlandshabitatrestoration>



Events

[Why Pollinators Matter
by Gary Nabhan](#)

[What is restoration?
by Ron Pulliam](#)

[Cuenca los Ojos
by David Hodges](#)

[Patagonia Pollinator Notebook](#)

2011 (First) Annual Report

