

Together

*we can solve problems that are too big for any
one organization to solve alone*

DESERT LCC

desert landscape conservation cooperative

Eastern Mojave LCD:

Developing Management Strategies



Desired Landscape Conservation Design Outcomes

- Clearly define common goals and objectives
- Map priority ecosystems & assess their current condition
- Collectively identify adaptation and conservation actions
- Integrate Scenario Planning to prioritize *where* conservation actions will be effective
- Identify partner activities to ensure integrated effort
- Measure success using common language & methods



Development of Conservation Strategies

- Determine current condition of management areas
- Identify high priority pressures/stressors and management strategies
 - Determine what actions *could* be taken
- Identify enabling conditions
 - Determine *where* to prioritize limited resources



Determine Current Resource Condition

- Apply the results of the indicator process discussed earlier today.



Determine High Priority Pressures/Stressors

- Information from LCD partners
- Information we already have
 - Desert LCC working groups
- Scenario planning integration (working with the USGS Southwest Climate Science Center)



Identify Partner Strategies

- What are land managers already doing?
- What management strategies should be coordinated across the collaborative to maximize impacts?
- What are the no-regrets strategies for now and probable future conditions?





Developing a Regional Conservation Toolbox: desertlcc.org/resource/CCAST



Case Studies Tool

Collaborative Conservation and Adaptation Strategy Toolbox (CCAST)

An Online Library of Conservation Case Studies



Components of CCAST

- An online portal for sharing management case studies.
 - Online case study pages.
 - Interactive maps.
 - 2-page handouts for contributing partners.
 - Thematic case study narratives.



Case Study Development Process



- 1) Identify projects that align with prioritized strategies
- 2) Outreach to project leads
- 3) DLCC staff and project leads co-develop content
 - ✦ This includes photos, reports, logos, and resources relevant to the project
 - ✦ Text content is co-developed and level of input from project leads varies by project. All content is approved by project leads before being shared with Science Working Group.
- 4) Draft is sent to Science Working Group for technical review
- 5) Final edited content is formatted into 2-page handout and online version for CCAST (Examples on following slides)



Invasive Species Control

Restoring Leopard Frog Habitat in Cienega Creek, Arizona

frog conservation
project
frog & fish restoration
outreach group

The Frog and Fish Restoration Outreach Group (FROG) seeks to restore habitats and reintroduce threatened and endangered aquatic species in the Cienega Creek watershed of southeastern Arizona. Cienega Creek is fed by mountain ranges that drain into expansive semidesert grasslands and the riparian corridor. The watershed harbors the most ecologically intact cienega complex (valley wetland spring system) in the southwestern United States. This area includes lands managed by the Bureau of Land Management, US Forest Service, Pima County, the Department of Defense, Arizona State Trust Lands, and numerous private landowners.



Overview of Las Cienegas NCA

KEY ISSUES ADDRESSED

In arid regions around the world, wetlands and the aquatic vertebrates they support are among the most globally threatened ecological assemblages due to water extraction, drought, habitat modification, and invasive species. The American bullfrog is an invasive species that was introduced to the Cienega Creek watershed in about 1986. It is strongly associated with local extinctions of the federally listed, threatened Chiricahua leopard frog due primarily to predation and disease transmission—bullfrogs carry but are not strongly affected by chytridiomycosis, a fungal pathogen causing global amphibian declines. Additionally, northern crayfish and several non-native fishes exist in areas adjacent to Cienega Creek. Potential invasion by these species could impede conservation and reintroduction of Chiricahua leopard frogs.

PROJECT GOALS

- Quantify the status of native and invasive frogs and other aquatic wildlife in large study landscape
- Eradicate populations of invasive aquatic species
- Enhance habitats and establish new populations of the Chiricahua leopard frog to increase distribution, abundance, and metapopulation function
- Engage the public in aquatic conservation issues through outreach and education



Habitat Created for Chiricahua Leopard Frogs and Desert Pupfish at LCNCA

PROJECT HIGHLIGHTS

Landscape Scale: the project operated on a watershed level across jurisdictions—this scale allowed the project to incorporate and observe metapopulation connectivity dynamics of both native and invasive aquatic species.

Successful Eradication: bullfrog populations were successfully eradicated by 2013, followed immediately by leopard frog recovery.

“Buffer-Zones” for Invasive Species Detection and Removal: the project established a buffer-zone consisting of stock tanks in a swath of land that serves as a barrier of invasion from extant bullfrog populations in nearby residential areas.

Leopard Frog Introduction: this effort raised 4,769 Chiricahua leopard frogs that were released at 10 new sites in the project area. Most of these populations are breeding. Site selection was guided by thermal considerations to mitigate and research chytridiomycosis

Mutual Human-Ecological Benefits: researchers collaborated extensively with all major ranchers, and engaged residents of the watershed and beyond in the topic of aquatic conservation through youth programs and outreach events.

Collaborators

Arizona Game and Fish Department, Bureau of Land Management, Cienega Watershed Partnership, U.S. Fish and Wildlife Service, Area ranchers, University of Arizona, Caldwell Design, Coronado National Forest, Pima County (Sonoran Desert Conservation Program), The Arizona Nature Conservancy

Funding Partners

National Fish and Wildlife Foundation- Keystone Initiative; Bureau of Land Management
Case study support provided by US Fish and Wildlife Service, US Bureau of Reclamation, and the US Forest Service.
Photos courtesy of Dennis Caldwell/Caldwell Design.

HABITAT RESTORATION

In addition to creating habitat for aquatic species, the enhanced and converted livestock waters now provide permanent water for native fish and wildlife.

LESSONS LEARNED

Bullfrog eradication required intensive early-season removals to prevent breeding and seasonal timely removal of juveniles approaching maturation. Fine-mesh hoop traps were effective in capturing tadpoles, while shooting with 22-caliber rifles was most effective in collecting adult frogs in complex pools.

Thermal habitat characteristics are important in selecting introduction sites for leopard frogs. The chytrid pathogen is most deadly upon rapid temperature decline. Therefore, natural springs are critical because they have the most stable thermal regimes of any regional waters.

Collaboration can engage regional ranchers in aquatic conservation to develop solutions that provide habitat for wildlife and watering opportunities for livestock.

NEXT STEPS

- Monitor success of natural and reintroduced leopard frog populations
- Evaluate and research chytridiomycosis effects and mitigation success
- Monitor for new arrivals of invasive aquatic species, with additional removals as necessary
- Complete outstanding habitat enhancement construction and establishment of native fishes in additional locations that have been made ready for them

PROJECT RESOURCES

For more information on this project, contact Phil Rosen at pcrosen@email.arizona.edu

For additional project resources and case studies, visit the Collaborative Conservation and Adaptation Strategy Toolbox : WWW.DESERTLCC.ORG/RESOURCE/CCAST



Breeding Chiricahua Leopard Frogs

Online Version of Case Study

Secure | <https://usbr.maps.arcgis.com/apps/MapSeries/index.html?appid=ec34e0d3f1ba4a7bbc9c4e6232d96124>

Native Grass Hay Production for Multiple Benefits at the Cobra Ranch

Case Study Handout   

A Case Study on Low Water-Use Agriculture and Revegetation

Introduction

Key Issues Addressed

Project Highlights

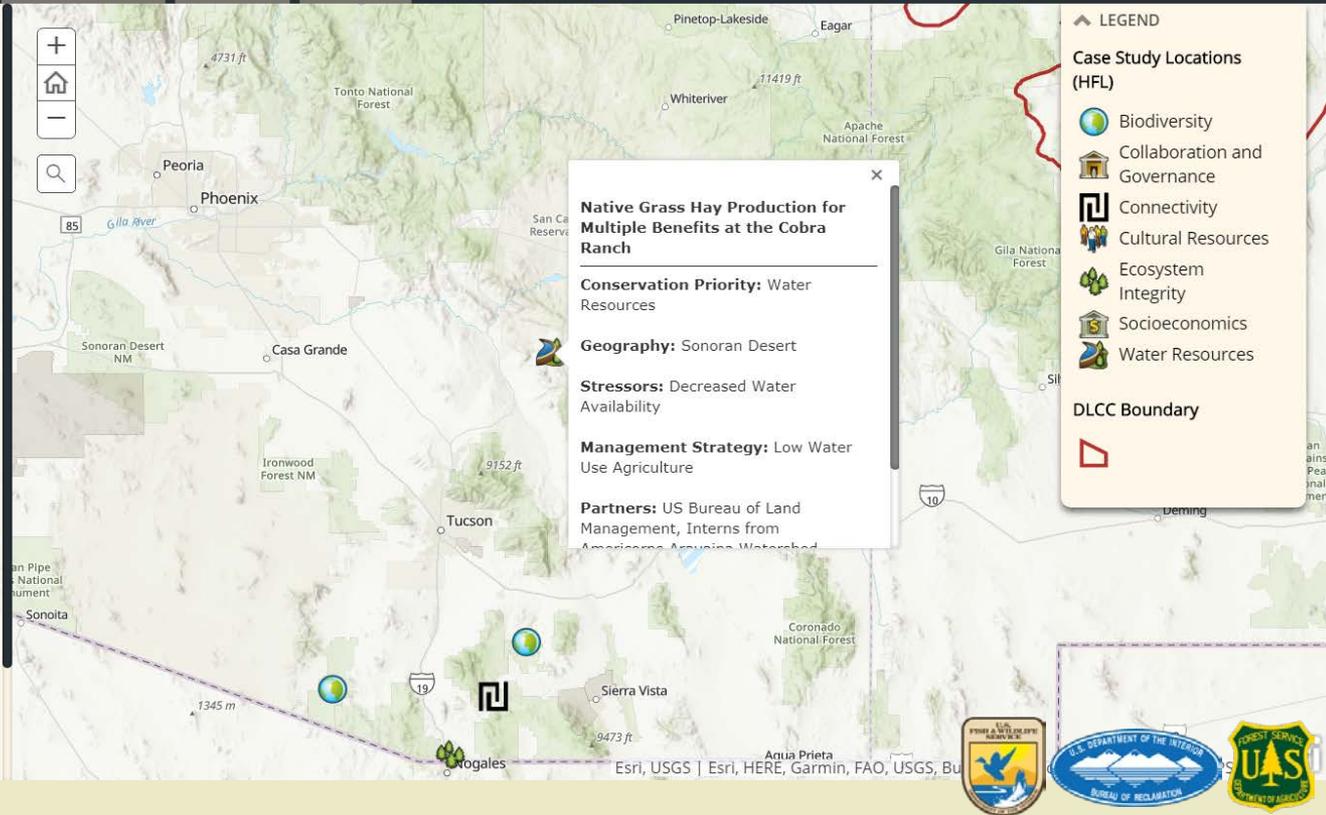
Lessons Learned

Next Steps

Resources

The Cobra Ranch is situated in Klondyke, Arizona upstream from where Aravaipa Creek emerges as a perennial desert stream that hosts a lush riparian ecosystem with seven native fish species, two of which are endangered. The Cobra Ranch is part of The Nature Conservancy's 9,000 acre Aravaipa Canyon Preserve which is managed in conjunction with surrounding public lands. The ranch and its associated public land grazing leases sit over the aquifer that feeds Aravaipa Canyon and were donated to The Nature Conservancy in 2007.

The Klondyke area has a long history of ranching beginning in the late 1870s when Anglo-Americans brought in extensive livestock herds and practiced unrestricted grazing to around 1934 when contemporary range management techniques were mandated. During this time, grazing practices combined with several droughts created lasting effects on the vegetation community and hydrology of the area. Unmanaged grazing in more recent times has continued these effects, and has helped lead to a decrease in native grass cover in favor of more woody species in upland areas. The loss in grass cover has in part exacerbated erosive forces on the land causing decreased infiltration and destructive channel incising. The ephemeral streambed of Aravaipa Creek near Klondyke has also been severely altered as a result of



Contribute your Case Studies!



"These adaptation case studies will be a great resource for the collaborative planning that is taking place in the Lower Santa Cruz watershed."
-Federal agency partner

- Share your stories
- Showcase your work and organization
- Interact with other practitioners
- Contribute to a community of practice

"I am always looking for new ideas to guide us in our restoration and resource management responsibilities. Narratives like these offer real-life examples of the challenges we all face and provide solutions." Jeff Bennett, Big Bend National Park, National Park Service

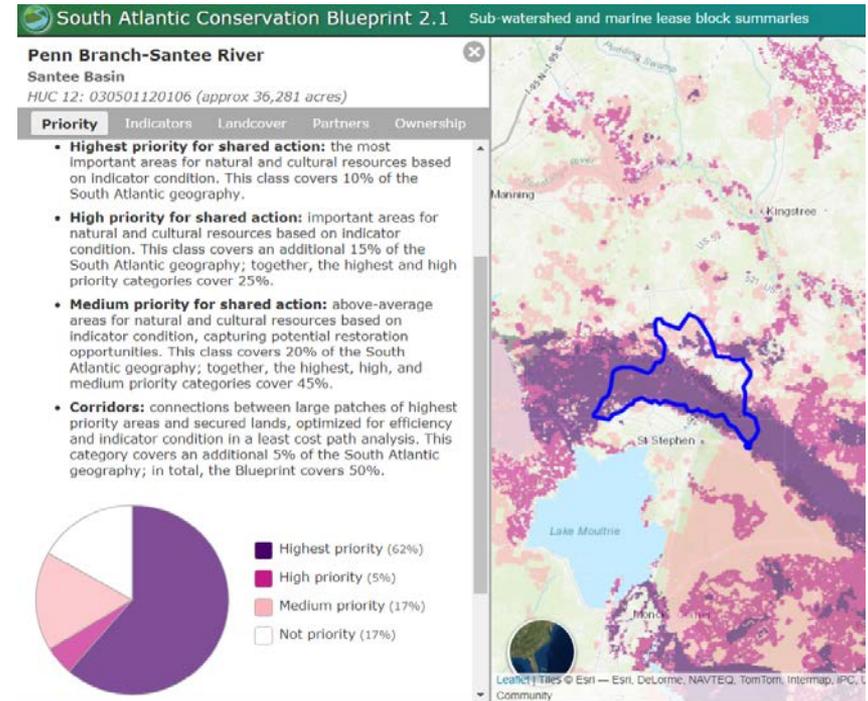


Where to Implement Conservation Action?



Example: South Atlantic Blueprint

- **Prioritization factors:**
 - Ecosystem indicator score
 - Landscape indicators (low road density, low-urban historic landscapes, and resilient biodiversity hotspots)
 - Waterscape indicators (migratory fish connectivity and network complexity).

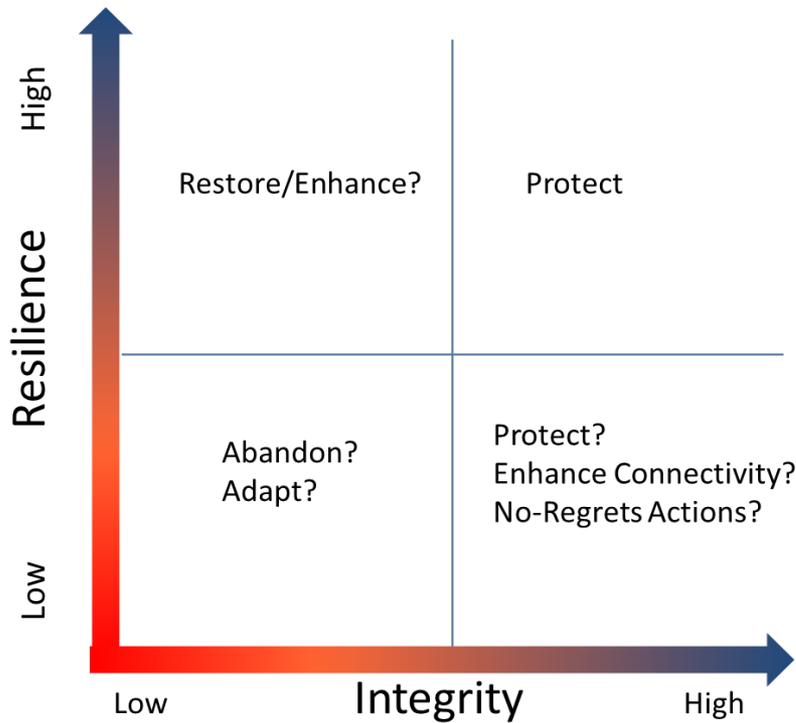


Determining Enabling Conditions

- What considerations should be used to determine *where* to take action?
 - Current conservation status/jurisdiction?
 - Areas currently in excellent condition?
 - Areas that help maintain high biodiversity?
 - Areas with high social and/or cultural values?



Example Decision Matrix



- **Value Considerations:**
 - Cultural Resources
 - Ecosystem Services
 - Socioeconomics



Next Steps for Eastern Mojave LCD

- Discuss shared and innovative management strategies (tomorrow).
- Identify projects for CCAST case studies.
- Ongoing: work with partnership to develop prioritization matrix and potential weighting.
- Any Questions?

