



Abella Conservation Ecology Lab

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Reevaluating Desert Upland Habitat Restoration Sites

Clark County Desert Conservation Program

Project Number: 2017-UNLV-1760C

University of Nevada Las Vegas

PI, Dr. Scott Abella



Goals of Habitat Restoration

- Ameliorate degradation
 - Improve ecological functions
 - Reintroduce lost species, increase biodiversity
 - Create structural habitat for wildlife, including pollinators
 - Reestablish habitat connectivity
 - Maintain or improve air quality, reduce dust which can be a human health hazard
- Optimal restoration techniques
 - Cost-effective treatments
 - Long-term effectiveness, contemporary climate conditions

Desert Plants

Volume 38, Number 2
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Techniques for Restoring Damaged Mojave and Western Sonoran Habitats, Including Those for Threatened Desert Tortoises and Joshua Trees

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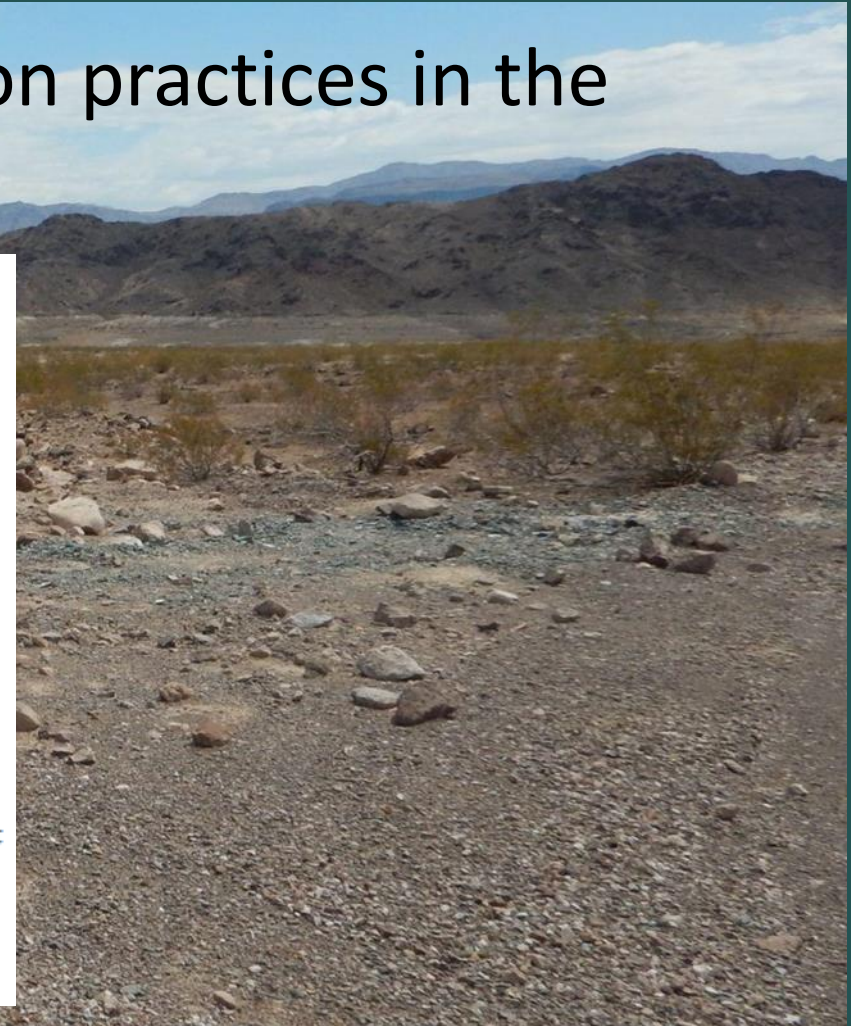
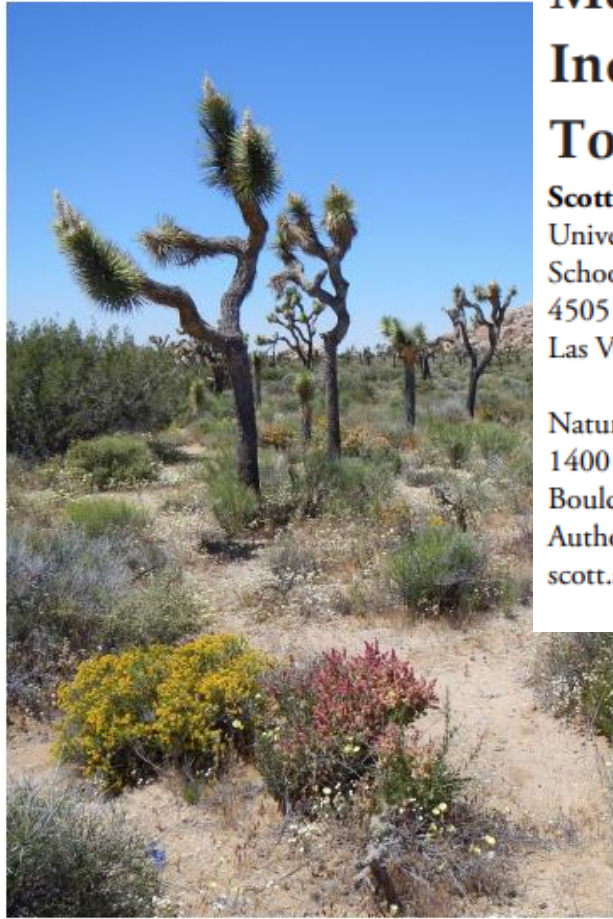
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Habitat restoration practices in the Mojave Desert

A Clark County Desert
Conservation Program-
sponsored synthesis



Techniques for Restoring Damaged Mojave and Western Sonoran Habitats, Including Those for Threatened Desert Tortoises and Joshua Trees

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Innovative techniques and bet-hedging approaches – abiotic treatments or soil amendments – little explored

- What is the long-term survival of planted individuals and the long-term effects on plant communities?
- Do restoration activities result in self-sustaining populations that reproduce naturally?
- Does planting provide floral resources to pollinators, or facilitate other native plant species?

Project Aim

To determine the long-term condition of restoration treatments that used a variety of approaches applied to a diversity of sites in southern Nevada desert upland ecosystems



Project Objectives

1. Determine habitat conditions of restoration sites established 10+ years ago and more recently.
2. Compare the effectiveness of a variety of restoration approaches: soil amendments, abiotic treatments, seeding, outplanting.
3. Model the cost-effectiveness and benefits of the different approaches.

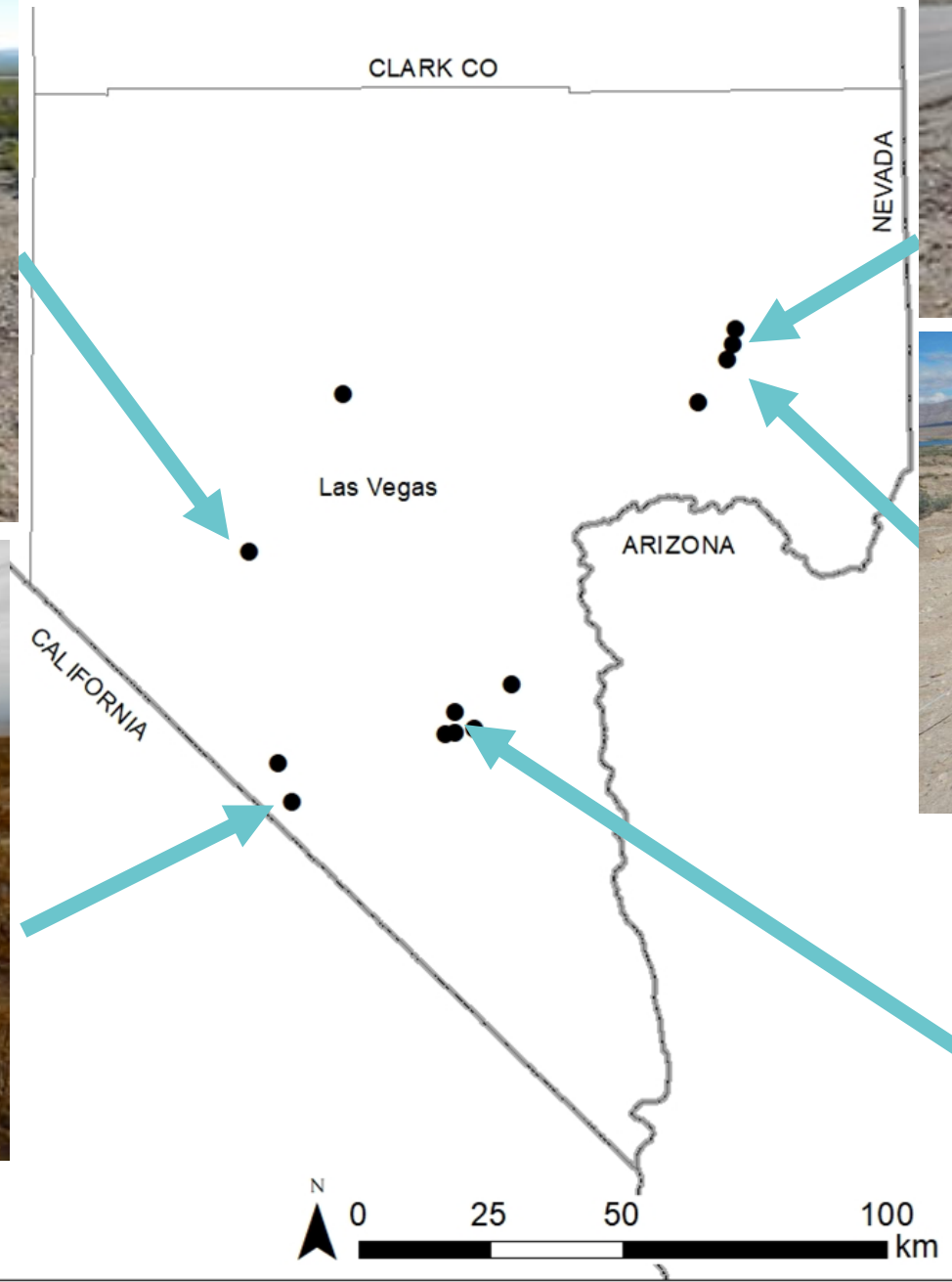
2023 Activities

- Reach out to land managers
- Compile a list of restoration sites and project records
- Review records and photos to screen restoration sites for suitability
- Perform preliminary field surveys and delineate treatment areas
- Where possible, locate untreated control and unrestored reference areas



Restoration type	Number of sites
Revegetation (seeding and planting)	13
Geomorphic site restoration (decompaction, recontouring, imprinting)	7
Soil amendment (topsoil salvage, vertical and horizontal mulch, rocks, artificial varnish)	9
Site protection (fencing, road closure)	8

UNLV-CC DCP Restoration sites



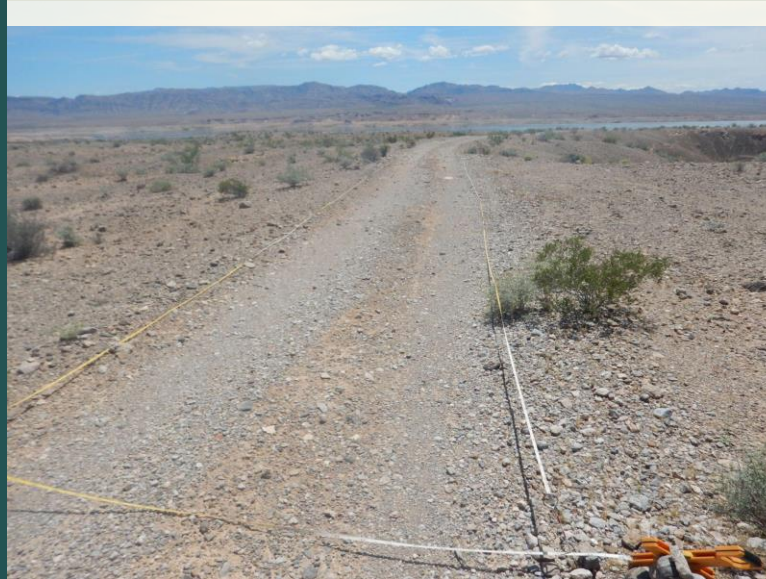
Road Closure & Treatment, 2002



Ripping Treatment



Control



Reference



Soil remediation via ripping

Road Closure & Treatment, 2002



Arctomecon californica and
Anulocaulis leiosolenus habitat
Soil remediation via ripping

Road Realignment & Planting, 2008



2008



2009



2010



2016

Planting using salvaged plants
Topsoil salvage and reapplication

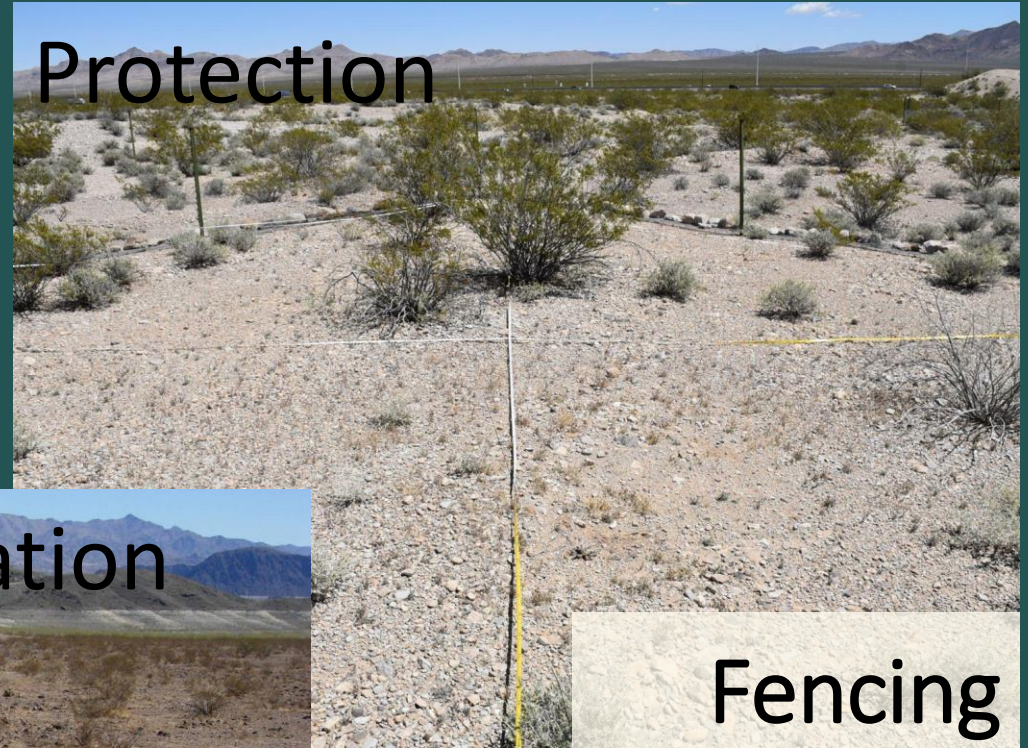
Post-fire Seeding, 2007



Abiotic



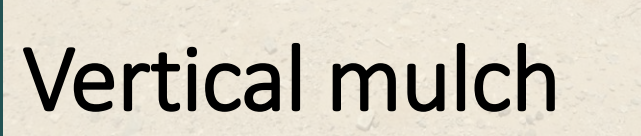
Protection



Surface manipulation



Vertical mulch



Fencing



2024 Activities

- Conduct rapid assessments: key habitat quality measures
- Where applicable, replicate original methods
- Include undisturbed reference/unrestored control for habitat comparisons

- **Supplemental data sets:** Clark Co. Regional Flood Control District weather stations, NOAA climate stations; Clark Co. soil survey
- **Data analyses:** outplanting survival (survival analyses, where applicable), community analyses (NMDS, PCA), regression (prediction), univariate and multivariate analyses to compare treatment effect

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- Erin Eichenberg, NPS

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- Katherine Kline, UNLV



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Have a restoration site in mind? Please contact us!

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Restoration Ecology and Applied Conservation Science Research
<https://abellaappliedecologylab.wordpress.com/home/>

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Anyone have contacts with the Kern Rive Pipeline restoration sites?

Questions?