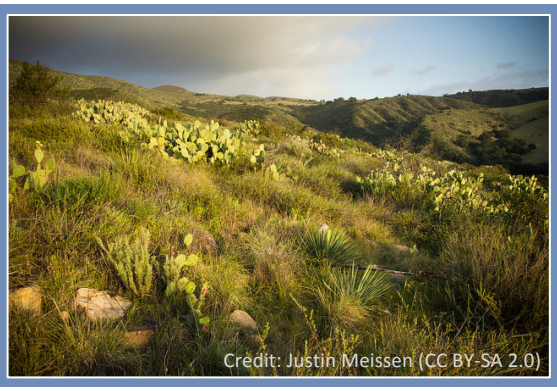
San Diego River Coastal Sage Scrub Restoration Project

A Southern California Climate Change Adaptation Case Study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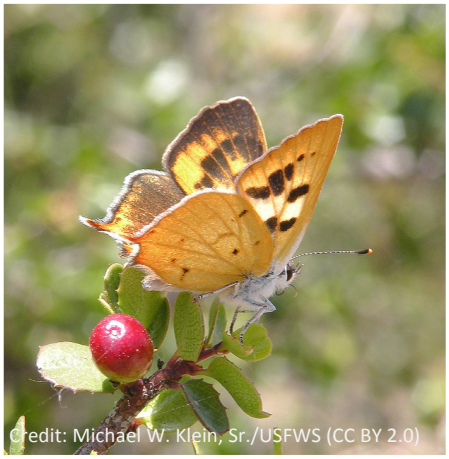
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Overview

Climate change may affect the ability to achieve on-the-ground project goals and objectives. The following case study demonstrates how climate change vulnerability and adaptation information can be integrated into existing and future habitat restoration projects to increase overall project resilience. For this example, resource managers and regional stakeholders worked together to evaluate: 1) how climate and non-climate vulnerabilities could impact the ability to achieve project goals, 2) what current project actions help to address or minimize vulnerabilities, and 3) what new actions could be added to the project to address remaining vulnerabilities. While this specific project has already been completed, restoring native species is a common activity in southern California sage scrub habitats, and this type of process could easily be replicated in future habitat restoration projects.

San Diego River Coastal Sage Scrub Restoration Project Goals & Actions

The Forest Service restored a 25-acre area of coastal sage scrub habitat located upslope of the San Diego River within the Cleveland National Forest. Following several recent wildfires, the project area had become dominated by catclaw acacia (*Senegalia greggii*) and non-native grasses.

The goal of this project was to restore the site in order to provide suitable habitat for the threatened California gnatcatcher (*Polioptila californica*) by increasing canopy cover, shrub height, and species richness.

The Forest Service revegetated the project area with a diverse mixture of native species that would provide suitable habitat structure and diversity for the California gnatcatcher. Primary project actions included:

- Seeding the site across multiple years with a mixture of drought-tolerant shrubs
- Controlling non-native plants using mechanical and chemical treatments for up to 4 years
- Monitoring vegetative cover, shrub height, and species richness yearly

Step 1: Identify Climate & Non-Climate Vulnerabilities

How may climate change and non-climate stressors affect the ability to meet goals or implement project actions?

Altered wildfire regimes

- Degrades habitat where frequent wildfires reduce the seed bank and/or prevent successful seedling establishment
- Increases non-native species that increase wildfire risk and may convert habitat to non-native grasslands

More intense winter storms

- Increases erosion in burned areas, affecting future germination sites

Changes in precipitation & increased drought

- Reduces soil moisture, which prevents shrub establishment and growth
- Increases amount of dead/dying plant matter that can act as fuel for wildfire

Increased invasive plants (e.g., annual grasses)

- Alters availability and continuity of fine fuels
- May convert habitat to non-native grasslands

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Step 2: Reducing Vulnerabilities Through Existing Project Actions
Which existing project actions help address potential vulnerabilities?

Action: Seeding the site across multiple years with a mixture of drought-tolerant shrubs

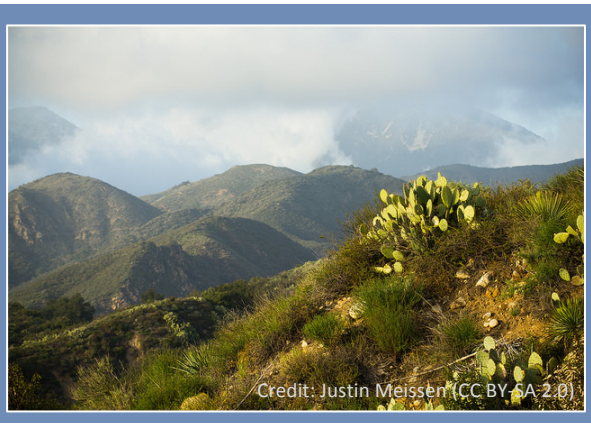
- ✔ Reduces drought-related mortality by planting tolerant species
- ✔ Reduces uncertainty about changes in precipitation by planting across multiple years

Action: Controlling non-native plants using mechanical and chemical treatments for up to 4 years

- ✔ Removes/controls invasive grasses
- ✔ Reduces the risk of wildfire by minimizing invasive annual grasses
- ✔ Increases soil moisture availability for native species by reducing competition with invasive plants

Action: Monitoring vegetative cover, shrub height, and species richness yearly

- ✔ Reduces uncertainty about changes in precipitation by increasing available information about which species are successful
- ✔ Reduces uncertainty about species range shifts due to changing climate conditions and increased disturbances by increasing available information



Step 3: Integrating New Project Actions to Address Remaining Vulnerabilities
What additional actions could be implemented in the future to further reduce identified vulnerabilities?

Action: Plant a flexible seed mix, including species that are not currently in stock

- ✔ Reduces uncertainty about species range shifts by introducing species that may be more tolerant of changing climate conditions and disturbances
- ✔ Reduces uncertainty about changes in precipitation by introducing a variety of species that may be successful under a wider range of conditions

Action: Plant at different times of year to incorporate seedling seasonality

- ✔ Increases soil moisture availability for germination by planting during seasons that provide more suitable conditions

Action: Increase signage at the trailhead to increase awareness of recreation users about the restoration effort

- ✔ Increases public awareness of climate vulnerabilities

Action: Create a database of photographs submitted by citizen scientists that document species presence/absence within the project area (e.g., Picture Post)

- ✔ Reduces uncertainty about species range shifts due to changing climate conditions and increased disturbances by increasing available information about species presence/absence
- ✔ Reduces uncertainty about changes in precipitation by increasing available information about which species are successful

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Meeting the challenges of climate change

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