Restoration & Planting

Southern California Adaptation Implementation Plan

Overview

During a two-day workshop in January 2016, southern California resource managers and regional stakeholders discussed restoration and planting goals and core activities, highlighted priority climate change vulnerabilities that could affect the ability to achieve goals, and identified adaptation strategies and actions that reduced highlighted vulnerabilities. Adaptation strategies and actions identified included those currently being implemented as well as new actions prioritized for future implementation. Managers and stakeholders then developed implementation action plans for some adaptation strategies identified as future priorities.

Restoration and Planting Goals and Core Activities[1]

1. Improve soil preservation and erosion control by implementing best management practices (BMPs), planting/seeding, installing wattles, and using mulch
2. Improve forest health:
    a. Provide better decision tools to avoid the risks associated with planting and seeding (e.g., spreading pathogens and/or invasive species)
    b. Limit tree mortality by using integrated pest management practices, thinning dense stands, and managing fuels
    c. Monitor tree health and species presence/absence and locations
    d. Restore disturbed areas (e.g., recently burned areas)
3. Restore ecosystem functioning through activities such as decommissioning roads, restoring habitat along roadways, managing invasive and/or problematic species (e.g., fire ants, trees and shrubs), restoring native plant communities, and rehabilitating meadow areas damaged by OHV use (e.g., San Bernardino mountains)
4. Enable wildlife movement by improving wildlife connectivity passages (e.g., road crossings) and riparian corridors, keeping in mind multiple objectives and potential conflicts (e.g., stabilizing streambanks benefits wildlife passage and water control)
5. Manage recreational use of trails by hosting education/outreach events with the public, creating stewardship programs, and promoting citizen science efforts

Managers and stakeholders identified how these restoration and planting goals and core activities may be vulnerable to climate change or other factors, and then identified potential adaptation responses. Climate and non-climate vulnerabilities and corresponding adaptation strategies and actions for these management goals are described below in Table 1.

[1] The management goals and core activities listed are not comprehensive.

Table 1. Priority vulnerabilities and associated priority adaptation responses for restoration and planting goals.

Management Goals	Priority Vulnerabilities	Priority Adaptation Strategies & Actions
1. Improve forest health 2. Restore ecosystem functioning	• Species range shifts • Increased disturbances (e.g., fire, drought, pests, invasive species) • Increased recreational use of trails • Changes in water use and distribution *Other Vulnerabilities:* • Human development and conflicts due to increasing human populations	***Strategy #1:*** *Increase/Enhance climate-informed habitat restoration decision-making* ***Current Actions:*** • Incorporate consideration of climate and species distribution models into planting strategies and decision guidelines ***Possible Future Actions:*** • Increase knowledge and information/data sharing on landscape scale, not just forest/boundary level • Make collaborative projects more transparent and obvious • Have an alternative plan for restoration/implement flexible planning – either change what you are restoring or how to allocate resources/energy with certain disturbance regimes • Plant a combination of drought and flood-tolerant native species
Improve soil preservation and erosion control	• Altered soil microbial processes and vegetation due to increased temperature, drought, and flooding	

Adaptation Implementation Action Plan

Managers and stakeholders developed implementation action plans for some of the identified priority adaptation strategies in Table 1. These plans include a list of sequential steps needed to successfully implement the adaptation strategy, and identification of potential implementation barriers and potential solutions.

Adaptation Strategy #1

Increase/enhance climate-informed habitat restoration decision-making.

Implementation Plan (actions listed in order of occurrence)

1. Collect information in easily accessible databases on species available for planting with consideration of climate and species distribution models (include gap analysis)
2. Increase and improve collaboration efforts to facilitate integration of information about species to help prioritize and spread risks across the landscape
3. Create planting strategies and develop decision guidelines incorporating climate considerations and species distribution models refined to the region (i.e. provide separate analysis by species) to help determine what to plant and where
4. Consider plant palette mix (e.g., planting combination of drought and flood-tolerant native species to accommodate multiple potential futures) in different locations and monitor for presence/absence over time and effects on other species in the area

Challenges/Barriers to Implementation and Possible Solutions

- Challenge #1: Limited availability of information
    - *Solution:* Utilize existing databases (e.g., BLM National Seed Strategy for Rehabilitation and Restoration) and improve collaboration and data sharing
- Challenge #2: Acceptance that certain plants may disappear or move due to climate change and/or acceptance of new, climate-adapted plants (e.g., why plant drought-tolerant species when there is no current-year drought)
    - *Solution*: Increase public education and outreach around why certain activities take place and how climate may shift current plant distributions
- Challenge #3: Planting many species may become more complicated for management; sustainability of funding, allocation of resources
    - *Solution*: Focus on providing a mixture of species during plantings
- Challenge #4: Limited availability of plants and seed banks
    - *Solution*: No solution identified
- Challenge #5: Funding restoration and planting goals as well as continued funding of seed storage and extractories (seed processing facilities)
    - *Solution*: No solution identified

Adaptation Strategy #2

Increase public knowledge, engagement, and cooperation to support climate-informed restoration.

Implementation Plan (actions listed in order of occurrence)

1. Create climate-informed restoration database/website that can provide information
2. Improve communication about climate uncertainty and confidence to improve understanding of multiple futures and consequences of decision-making
3. Improve public understanding about why certain areas may be more vulnerable (e.g., messaging around recreational use during drought periods, heavy precipitation events)
4. Incorporate climate literacy and delivery into public education more generally (e.g., signage that says we are looking out for fire), and hedge bets as far as the amount of information provided
5. Start citizen science projects so that people can be an active part of the collection and dissemination of data and information

Challenges/Barriers to Implementation and Possible Solutions

- Challenge #1: Some web servers are not updated or no longer work
    - *Solution*: Ensure backup availability
- Challenge #2: Limited availability of open access data
    - *Solution*: Increase access to and availability of free information (e.g., data, models), sharing of datasets by scientists, and training about models
- Challenge #3: Uncertainty of climate change can stall action
    - *Solution*: Create some Best Management Practices around uncertainty/ confidence
- Challenge #4: Difficult to communicate details of climate change in a consistent manner
    - *Solution*: Refine communication of details about climate change, emphasizing it in some instances and de-emphasizing in others; coordinate consistent messaging between land management entities