



## Watershed Improvement

### *Southern California Adaptation Implementation Plan*

#### Overview

During a two-day workshop in January 2016, southern California resource managers and regional stakeholders discussed watershed improvement 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.

#### Watershed Improvement Goals and Core Activities<sup>1</sup>

1. Protect and improve upstream and downstream watersheds for sustainable current and future use through multiple use management
2. Define current and reasonably foreseeable forest resource water needs by standardizing methods, identifying multiple use conflicts, enforcing Clean Water Act compliance, improving watershed condition, and assessing collaborative approaches
3. Remove small-scale, non-functioning, man-made structures to improve aquatic organism passage (e.g., fords, dams, etc.)

Managers and stakeholders identified how these watershed improvement 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 priority adaptation strategies and actions for these management goals are described below in Table 1.

---

<sup>1</sup> The management goals and core activities listed are not comprehensive.

**Table 1.** Priority vulnerabilities and associated priority adaptation responses for watershed improvement goals.

Management Goals	Priority Vulnerabilities	Priority Adaptation Strategies & Actions
<p>1. Protect and improve upstream and downstream watersheds</p> <p>2. Define current and reasonably foreseeable water needs</p> <p>3. Remove structures to improve aquatic organism passage</p>	<ul style="list-style-type: none"> <li>• <u>Decreased water availability</u> due to increased drought, variable precipitation, and increased temperature. Decreased water availability may lead to:               <ul style="list-style-type: none"> <li>○ <u>Decreased streamflow and water depth</u>, undermining aquatic organism passage and reducing water available for multiple uses</li> <li>○ <u>Increased water temperature</u>, undermining aquatic organism passage</li> </ul> </li> <li>• <u>Increased flow rates, flood risk, and undesirable sediment movement downstream of structure removal projects</u></li> </ul> <p><i>Other Vulnerabilities:</i></p> <ul style="list-style-type: none"> <li>• Unpredictable stream channel migrations</li> <li>• Wildfire</li> </ul>	<p><b>Strategy #1:</b> <i>Expand scope of structure removal projects to consider system-wide water budget and other factors that may affect aquatic organism passage.</i></p> <p><b>Current Actions:</b></p> <ul style="list-style-type: none"> <li>• Remove “thirsty” invasive species</li> <li>• Bring special water uses into compliance by eliminating illegal water use</li> </ul> <p><b>Possible Future Actions:</b></p> <ul style="list-style-type: none"> <li>• Manage riparian zones to promote water supply</li> <li>• Prioritize projects in locations with more water (current and projected)</li> <li>• Expand program and project focus to include multiple species and/or habitat function improvement for multiple benefits</li> <li>• Determine community values to build support for management action and help identify implementation locations</li> <li>• Bring special water uses into compliance:               <ul style="list-style-type: none"> <li>○ Conduct inventory of water permits; facilitate enforcement of expired permits to prevent illegal use, allow updates to older permits, and provide rationale for not issuing new permits</li> <li>○ Prioritize and use the Endangered Species Act as leverage, if needed</li> <li>○ Where feasible, move permitted water-intensive activities off of forest land</li> </ul> </li> </ul> <hr style="border-top: 1px dashed black;"/> <p><b>Strategy #2:</b> <i>For each structure removal project, consider downstream flooding impacts to on- and off-forest ecosystems and infrastructure.</i></p> <p><b>Possible Future Actions:</b></p> <ul style="list-style-type: none"> <li>• Consider climate-informed 100-year flood projections so projects and infrastructure can be designed to accommodate larger peak flows</li> <li>• Add ecosystem-appropriate channel complexity</li> <li>• Work “bottom-up” in the watershed to evaluate potential flooding impacts and cumulative effects</li> </ul>

## 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

Get all water-related special use permits back into compliance to reduce overall water withdrawals and help maintain water availability.

#### *Implementation Plan (actions listed in order of occurrence)*

1. Create an inventory of all special use permits on the forest to determine which permits are out of compliance.
  - a. Organize permits into different tiers to facilitate management:
    - i. Expired permits, including permits signed prior to 2005 (before Forest Plan publication)
    - ii. Current permits
2. Prioritize which watersheds should be protected via special use regulation. Factors to consider for prioritization include presence of endangered/threatened species and projected water availability.
3. In priority watersheds, don't renew expiring permits and don't grant new permits.
4. Practice adaptive management by monitoring whether restrictions are increasing water yield.

#### *Challenges/Barriers to Implementation and Possible Solutions*

- Challenge #1: Although a record of all granted permits exists, this information is not centralized or easily accessible.
  - *Solution*: Collect and organize special use permit information as described above.
- Challenge #2: Forests are currently able to deny new permit requests and permit renewals, but this capacity may not exist in other agencies. Additionally, there is a lack of communication between the land management and resource factions of the Forest Service.
  - *Solution*: Increase internal and external communication to keep standards, projects, and permitted activities consistent across lands.
  - *Solution*: Use riparian 5-step screening process as additional rationale for denying new permits/renewals.
- Challenge #3: There is a lack of historical data and climate projections to use as reference for adaptive management.
  - *No solution identified*.

## Adaptation Strategy #2

Remove invasive species to increase water yield.

### *Implementation Actions (in order of occurrence)*

1. Identify and prioritize removal of invasive species that will increase water yield to the greatest degree (e.g., arundo, tamarisk, fig).
2. Prioritize treatment locations by studying the system/site/invasive species in question.
  - a. For example, determine whether the invasive species utilizes wind- or water-dispersal; for water-dispersing species, prioritize removal in upstream locations first to accommodate seed source direction and protect restored areas from re-invasion.
3. Restore treatment areas with native, climate-adapted vegetation or more resilient native species.

### *Challenges/Barriers to Implementation and Possible Solutions*

No challenges/barriers identified