



Upper Feather IRWM Program

**Collaborating with the
U.S. Forest Service**

Upper Feather Integrated Regional Water Management

Purpose: To encourage local agencies to work cooperatively to manage their available local and imported water supplies to improve the quality, quantity, and reliability of those supplies.

- California Water Code Section 10531



**MOU Signatories
County of Plumas**

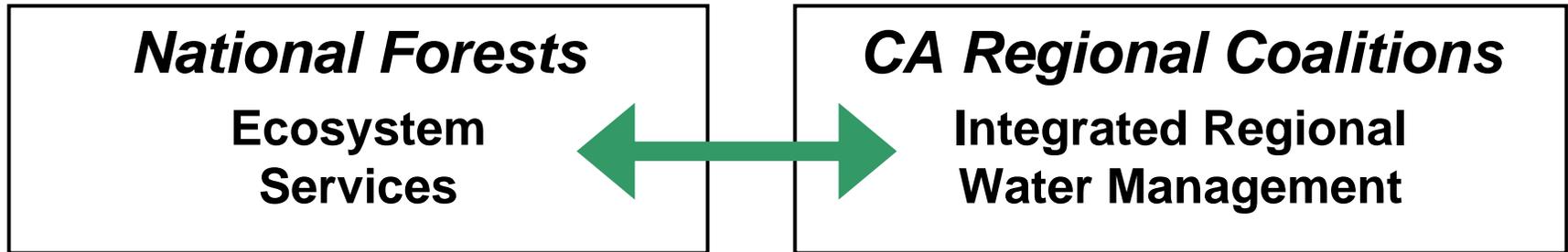
Plumas National Forest

Sierra Valley Groundwater Management District

Plumas County Flood Control & Water Conservation District



Relationships / Actions / Funding

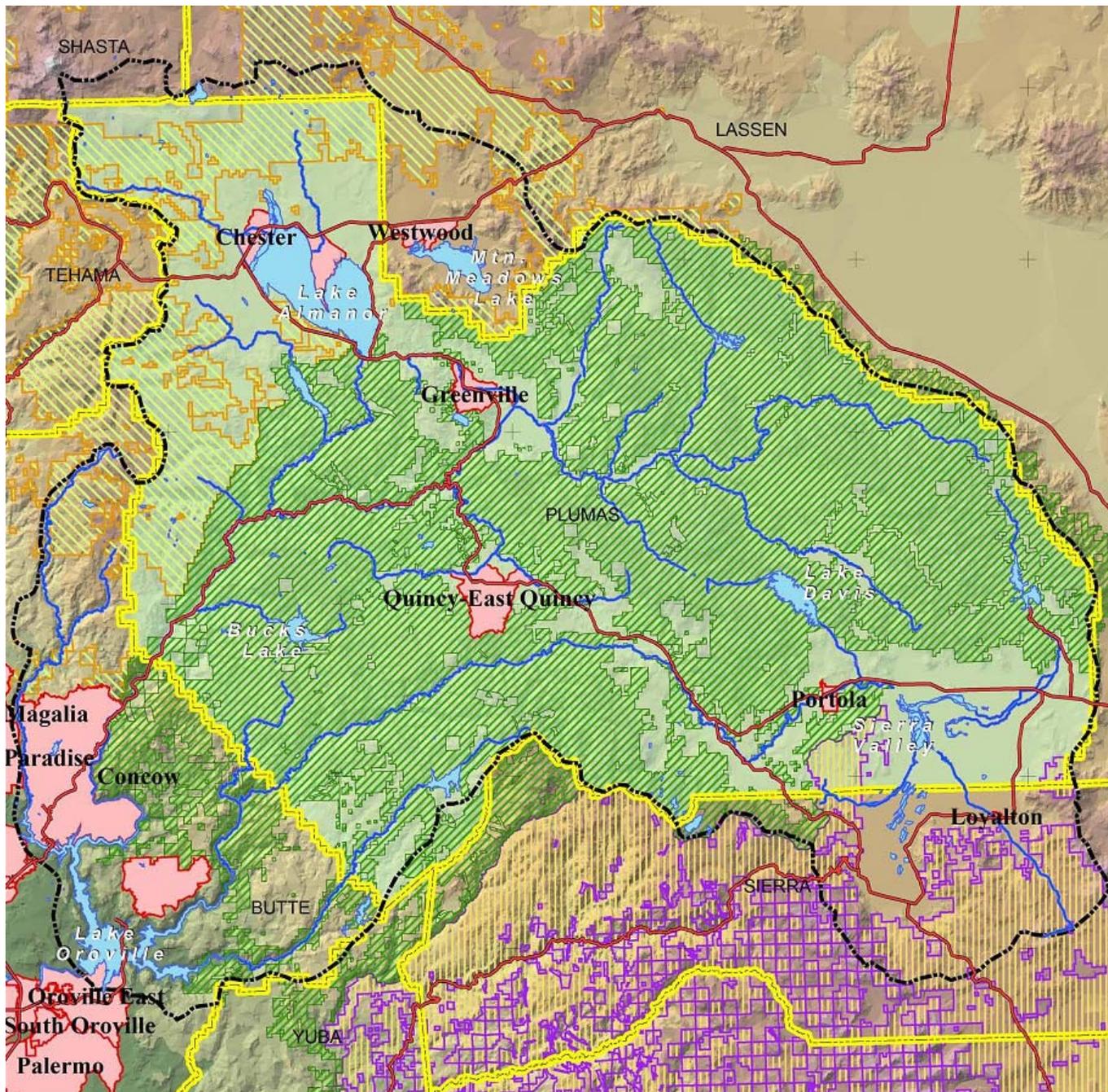


- Among the National Forests, the Plumas is at the forefront in embracing the Integrated Regional Water Management program created by California voters.
- The water quality and water supply objectives at the heart of the IRWM program present a prime opportunity for the recognition and expansion of ecosystem services provided the Forest Service.
- Opportunity to develop and test new mechanisms connecting forest initiatives and IRWM.

- Upper Feather Region has a unique relationship to greater California.
- Headwaters of the California State Water Project, serving 22 million people.
- Hydroelectric generation comparable to Diablo Canyon or San Onofre.
- Upper Feather IRWM program supported by diverse stakeholders across California.

Relationships

Political and Urban Boundaries



Legend

-  Lakes and Reservoirs
-  Rivers
-  Watershed Boundary
-  Plumas County
-  Highways
-  Urban
-  Plumas Nat. Forest
-  Lassen Nat. Forest
-  Tahoe Nat. Forest
-  County Boundary



Relationships - Current Project Partners

Feather River CRM

(1985)

Plumas County
Plumas National Forest
California Department of Forestry and Fire Protection
California Department of Fish and Game
California Department of Water Resources
Central Valley Regional Water Quality Control Board
Feather River College
North Cal-Neva Resources Conservation and Development District
Plumas Unified School District
Natural Resources Conservation Service
U.S. Army Corp of Engineers
U.S. Fish and Wildlife Service
California Department of Transportation
California Department of Parks and Recreation
Plumas County Community Development Commission
U.C. Cooperative Extension
Feather River Resource Conservation District
Salmonid Restoration Federation
Plumas Corporation
USDA Farm Services Agency
Trout Unlimited

Plumas Watershed Forum

(2003)

Plumas County Flood Control District
California Department of Water Resources
State Water Project Contractors

Technical Advisory Committee

Plumas National Forest
Sierra Valley Groundwater Management District
Sierra Valley Resource Conservation District
Sierra County
Feather River CRM
U.C. Cooperative Extension
California Department of Fish and Game
Feather River Resource Conservation District
Maidu Cultural & Development Group
Central Valley Regional Water Quality Control Board
Natural Resources Conservation Service



**Integrated Regional
Water Management Plan**



IRWM Goals and Objectives	FERC #1962 (page, Appendix: Section numbers)	FERC #2105 (page, Appendix: Section numbers)	Monterey Settlement Agreement (page number)	Feather River Watershed Management Strategy (page numbers)	FRCRM Plan (Appendix: page number)	Plumas NF-LRMP (page numbers)	SV Groundwater Management (Bill: Article numbers)
Improve Local Water Retention	■	■	19 ●	19 ●	1 ●	4-7 ●	1391.6,7 ●
Reduce Flood Potential	A.2 ●	A.3 ●	▲	▲	▲	■	■
Improve Water Quality (temperature and sediment)	5 A.1,4 ●	6 A.5 ●	19 ●	21 ●	A.3 ●	4-7 ●	■
Improve Water Quality to Meet TMDL Limits	■	■	19 ▲	21 ●	1 ▲	■	■
Improve Upland Vegetation Management	■	■	19 ●	9, 17 ●	2 ▲	4-5 ●	■
Improve Groundwater Retention and Storage in Major Aquifers	■	■	19 ●	19 ●	1 ●	■	1391.8 ●
Restore Salmon Fishery in North Fork and Middle Fork Feather River Mainstems and Tributaries	5 A.3 ▲	5 A.5 ▲	■	■	■	■	■
Maintain Continuous Flow in Perennial Streams	5 A.2 ▲	5 A.1 ●	19 ▲	19 ●	1 ●	4-7 ●	■
Streambank Protection	5 A.2 ●	5 ●	19 ▲	16, 19 ●	2 ●	4-7 ●	■
Sediment Transport Reduction	5 A.4 ●	5 ●	19 ●	15, 21 ●	2 ●	4-7 ●	■
Stream Temperature Improvement	5 A.1 ●	8 ●	▲	▲	2 ▲	4-7 ▲	■
Agriculture NPS Waiver Program	■	■	■	■	■	■	■
Wetland Wastewater Treatment	■	■	■	21 ▲	2 ▲	■	■
Road Closure or Improvement	■	■	▲	15 ●	A.3, 6 ▲	4-10 ●	■
Grazing Management	■	■	▲	9 ●	2 ●	4-5 ●	■
Groundwater Recharge-Extraction Balance	■	■	19 ●	16 ●	■	■	1401.1 ●
Instream and Riparian/Wetland Habitat	5 A.3 ●	5 A.1 ●	19 ▲	16 ●	2 ●	4-7 ●	■
Education and Outreach	■	A.6 ●	■	21, 25 ●	2 ●	■	■
Monitoring and Adaptive Management	A.2,4,7 ●	A.1,5,7 ●	■	24 ●	4 ▲	■	■

Relationships

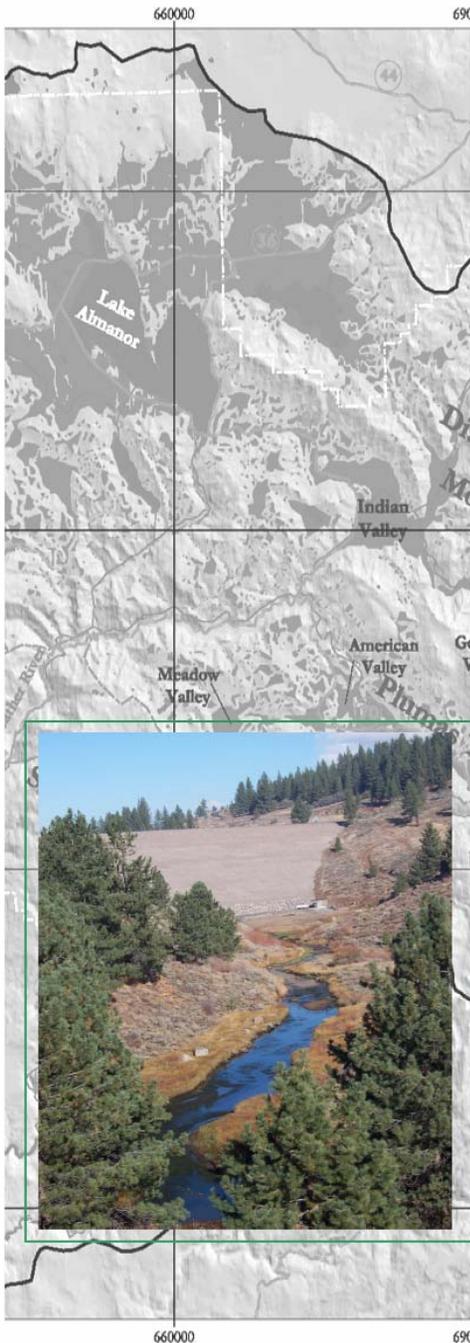
Preexisting Management Plans and Obligations

(Need for IRWM Plan)



Key:

- = Does not address the subject.
- = Fully addresses the subject.
- ▲ = Partially addresses the subject.



INTEGRATED REGIONAL WATER MANAGEMENT PLAN

UPPER FEATHER RIVER WATERSHED, CALIFORNIA

VOLUME 1

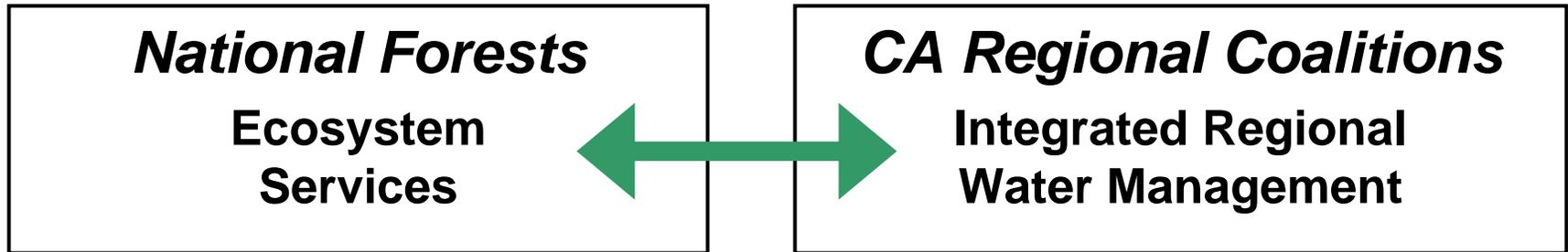
Actions



Issue Date: 6.30.05



Relationships / Actions / Funding



- Majority of watershed is managed by the Forest Service.
- Focus on forest ecosystem restoration.
- Organic Administration Act:
"to improve and protect the forest"
"ensure favorable conditions of water flows"
"furnish a continuous supply of timber"
- Recognition of Forest Service expertise in forest and watershed management.
- Recognition of full range of forest management actions impacting downstream water supply and water quality.

- Maximize the quality and quantity of water available to meet agricultural, domestic, industrial, and environmental needs.
- Integrate programs and projects that protect and enhance regional water supplies.
- Provide flood protection.
- Protect watersheds to improve water quality or water quantity.
- Provide environmental restoration or enhancement.

Relationships / Actions / Funding

National Forests

**Ecosystem
Services**

CA Regional Coalitions

**Integrated Regional
Water Management**

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- ```
graph TD; A["National Forests Ecosystem Services"] --> C["Implement upper watershed actions to:"]; B["CA Regional Coalitions Integrated Regional Water Management"] --> C; C --> D["Generate downstream benefits:"]; style A fill:#fff,stroke:#000; style B fill:#fff,stroke:#000; style C fill:#fff,stroke:#000; style D fill:#fff,stroke:#000;
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- **Implement upper watershed actions to:**
    - **Attenuate flood flows**
    - **Reduce water temperatures**
    - **Restore habitat**
    - **Improve water quality**
    - **Increase useable water yield**
  - **Generate downstream benefits:**
    - **Reduced treatment costs**
    - **Reduced infrastructure needs**
    - **Increase operational flexibility (water/hydropower)**

## **Actions - IRWM Strategies**

- 1. Water Quantity Strategy**
- 2. Water Quality Strategy**
- 3. Flood Control Strategy**
- 4. Temperature/Sediment Strategy**
- 5. Groundwater Strategy**
- 6. Land Management Strategy**
- 7. Habitat Strategy**



# **Actions**

***Eligible projects must have:***

- 1. Water Quantity Benefit**
- 2. Water Quality Benefit**

***...and at least one of the following :***

- ❖ Flood Control Benefit**
- ❖ Temperature/Sediment Benefit**
- ❖ Groundwater Benefit**
- ❖ Land Management Benefit**
- ❖ Habitat Benefit**

# Last Chance Creek, Alkali Flat, 2003

Typical Pre-Project Down-cut Channel and Lowered Water Table





Typical Post-Project Restored Water Table at Meadow Surface

**Last Chance Creek - Alkali Flat, 2006**

# Actions

## ***Last Chance Creek Project - Baseflow and Temperature***

**9-Mile Stream Restoration / Meadow Rewatering Project**

**Calculated by California Hydrologic Research Laboratory**

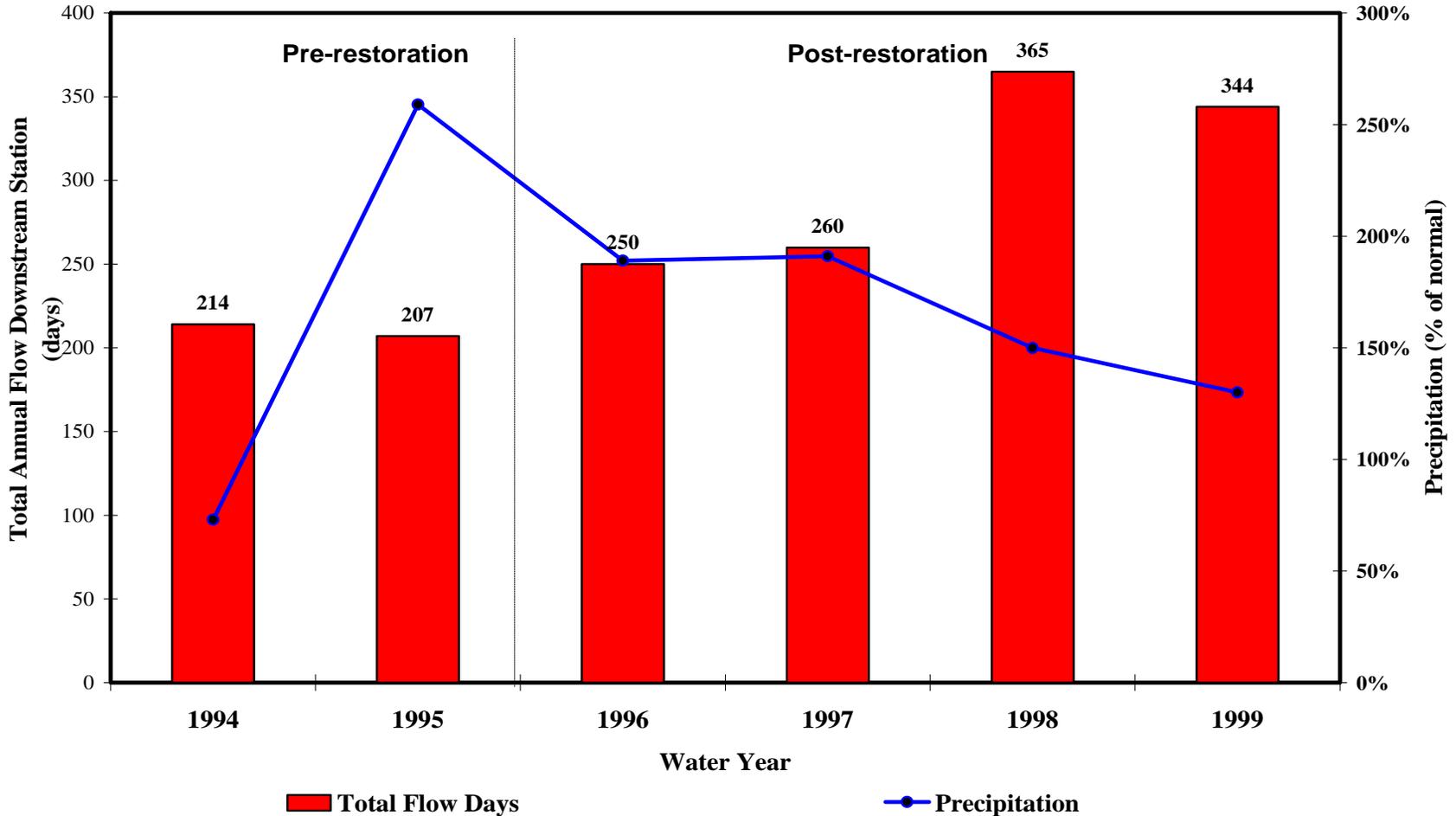
**University of California, Davis**

| <b>Change in Baseflow (acre-feet)</b> |            |            |             |             |
|---------------------------------------|------------|------------|-------------|-------------|
| Winter                                | Dec. = -43 | Jan. = -45 | Feb. = -141 | Mar. = -143 |
| Summer                                | Jun. = +49 | Jul. = +35 | Aug. = +42  | Sep. = +30  |

| <b>Stream Water Temperature (F)</b> |             |              |            |            |
|-------------------------------------|-------------|--------------|------------|------------|
|                                     | Pre-Project | Post-Project | Change (F) | Change (%) |
| June                                | 64.9        | 53.1         | -11.8      | -18%       |
| July                                | 69.6        | 57.9         | -11.7      | -17%       |
| August                              | 66.1        | 54.6         | -11.5      | -17%       |

# Actions

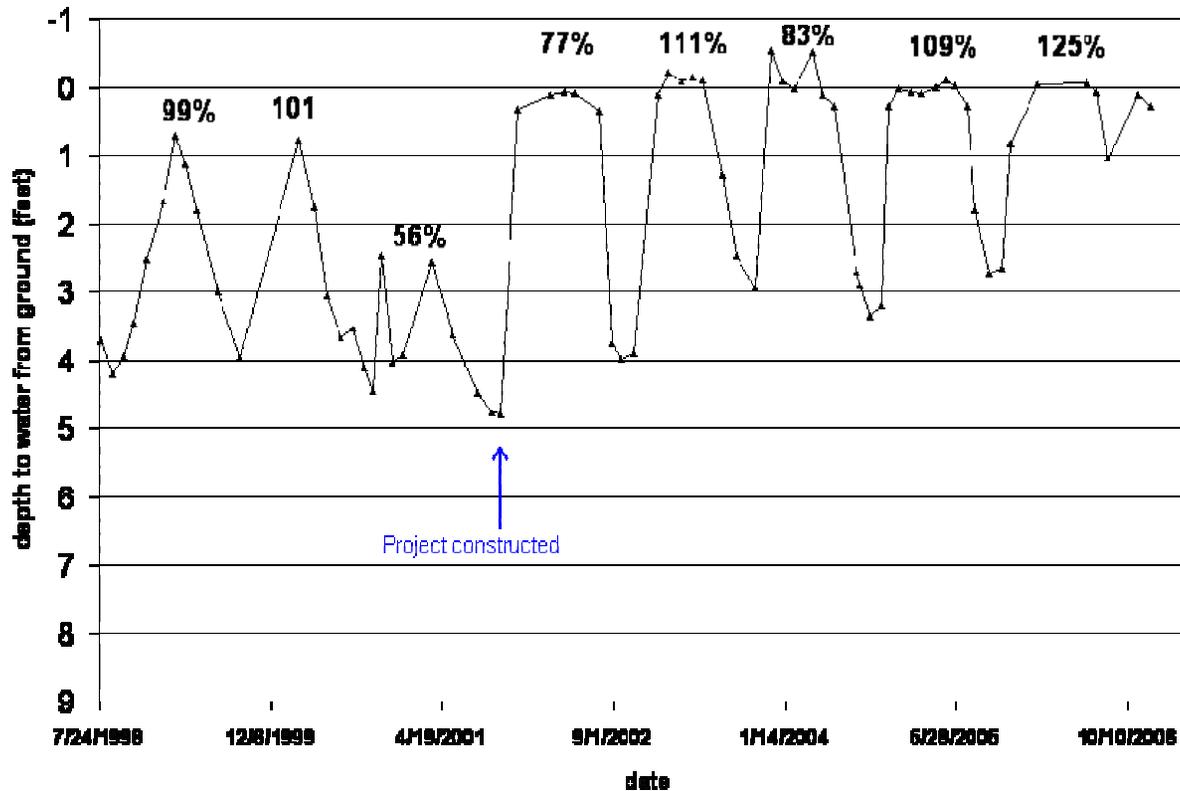
## Cottonwood Creek Project - Days of Flow



# Actions

## *Time-shift of Runoff*

**Clarks Cr Groundwater Level  
Well #UC2**



Meadow restoration projects convert peaking groundwater storage into storage “plateaus” that hold water later in the season but still ultimately release water down to pre-project levels.

# Actions

## ***Plumas National Forest - Prop. 50 IRWM Grant***

- 8 projects restore function to meadows to increase water storage, reduce winter flood flows, and make more water available later in the year when competing demands are at their peak.
- 67 projects reduce sediment, which can end up in reservoirs reducing available storage and decreasing useable water yield for downstream users.
- 31 streambank stabilization projects reduce sedimentation and improve vegetative cover over streams, lowering summer stream temperatures.
- 3 projects reduce conifers competing with riparian hardwoods and transpiring water or intercepting precipitation. (*Conversion from hardwoods to pine stands results in as much as a 20 percent loss in annual flow.*)

## Actions

### *Quincy Library Group Pilot Project Implementation*



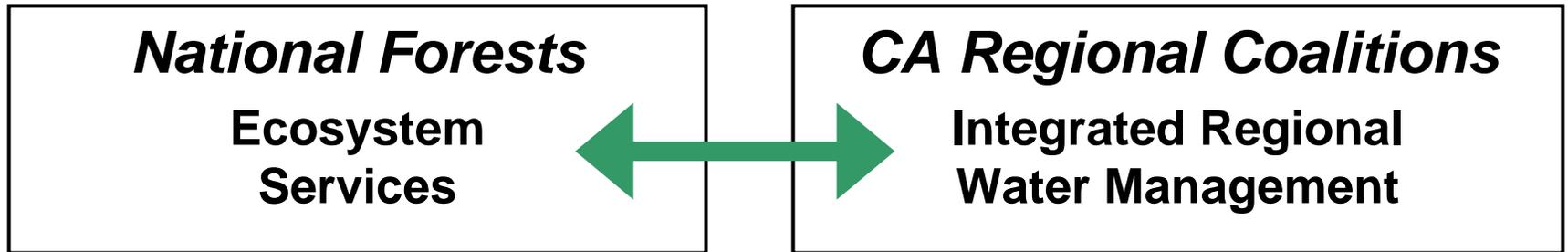
**After - 100 trees per acre**



**Before - 300 trees per acre**

- *Reduced fire danger*
- *Economic activity*
- *Improved habitat*
- *Increased water yield*
- *Improved water quality*

# *Relationships / Actions / Funding*



- Beneficiary pays
- Explore the range of market mechanisms
- Restore forest receipts to schools and counties

- Public support for resource management
- 2002 Prop. 50 = \$3.4 billion
- 2006 Prop. 84 = \$5.3 billion
- **2007 \$1.9M for Plumas National Forest**
- Statewide stakeholders recognize need for stable funding.

# National Forests in California

